

And those that are missing: The role and experience of Dr. Sabin's chimpanzees in the polio crusade of the 1950s

By Amelia Brackett, New York University

On July 5, 1955, Dr. Albert B. Sabin of the Children's Hospital Research Foundation in Cincinnati, Ohio, sent a night letter to Mr. John Ash at the Chimpanzee Farm in Dania, Florida. It read: "What has happened to the chimpanzees. (*sic*) Please advise."¹ Ash was a middleman for the chimpanzee trade between Africa and research labs in the United States, and he was attempting to provide Sabin with chimps for his experiments. That year, Dr. Sabin had requested funds for forty chimpanzees from the National Foundation for Infantile Paralysis in his quest to produce a vaccine against poliomyelitis.² By the time his polio work was finished, he had developed a successful vaccine, and performed studies on over 300 chimpanzees in the process.³

What did happen to the chimpanzees? The answer to Sabin's question exposes a number of other questions that challenge basic assumptions about the history of human-chimpanzee relationships, and the role of that history in a contemporary debate about the rights of both species. In an attempt to answer Sabin's question, this paper will tell the salvageable stories of the polio chimpanzees in his lab, tracing their life stories when possible and describing their daily lives and intersections with humans. The discussion will focus on Sabin's lab so that the stories of the chimpanzees who lived and died there can enter a personal plane, while maintaining a hold on the larger picture of the polio crusade and the chimpanzee trade.

In part, this is an exercise in justice. The *Homo sapiens* of the polio story have received their credit, where it is most soundly due. The *Pan troglodytes* have not. These chimpanzees *did* serve the polio cause, and this is reason enough to reconstruct what their lives may have looked like. Their role in the development of the polio vaccine is also an important factor in current debates on animal experimentation. Scientists cite their usage as historical precedent that proves the necessity of primate experimentation, while activists argue that the primates suffered needlessly in extraneous tests. This common citation demands further inquiry to determine how chimpanzees were used in the polio labs. In fact, chimpanzees were essential to the

development of the polio vaccine. Their daily lives were hard, but they were costly parts of a focused, extensive system. In the context of the contemporary biological sciences, they were also the crucial final step before human testing. This more detailed investigation of the polio labs sets the foundation for an equal playing field in the experimentation debate. After exploring the history of chimps in polio research, this paper will briefly address the contemporary possibilities for chimpanzees in medical research, considering the questions and themes that emerge from the preceding examination.

Use and Abuse: A Brief History of Animal Experimentation

In 1789, in the midst of cruelty toward animals and humans alike, British philosopher and jurist Jeremy Bentham asked, "The question is not, Can they *reason*? nor, Can they *talk*? but, Can they *suffer*?"⁴ Bentham may have been attempting to hone popular inquiry, but his words evoke more questions. How long had humans wondered if animals could reason, if they could talk? Why would they care? And, of course, what had Bentham witnessed that would cause him to ask, Can they *suffer*?

Primates have been subjugated to human experimental curiosity since antiquity. Marcus Aurelius' physician, Galen, employed apes in his presentations.⁵ Galen and subsequent physicians used experiments to exemplify established theories, rather than to test hypotheses.⁶ As the scientific method developed away from Galen, animal experimentation developed alongside it, becoming a mode of discovery instead of a chalkboard.⁷ For example, Galen would have cut open a dog to show that he could bleed, while the scientific method of William Harvey's era would have cut open a dog to see how he bled.⁸ With this new method came new problems: How accurately can anatomical functions in animals be applied to humans? When Harvey mapped blood circulation in the seventeenth century, there were unresolved debates over the

1 Sabin, Albert. Letter to John Ash, July 5, 1955. Animal Correspondence, Box 9. Albert B. Sabin Papers, Winkler Center for the History of the Health Professions, University of Cincinnati, Ohio.

2 Sabin, A.B. Grant proposal, 1955. National Foundation for Infantile Paralysis, Box 5, Folder 7. AS, WCHHP, UC, Ohio.

3 Sabin, A.B. Letter to Alfred Roller, Oct. 29, 1965. Correspondence, Box 3, Folder 24. AS, WCHHP, UC, Ohio.

4 Jeremy Bentham. *Introduction to the Principles of Morals and Legislation*, 1781. Quoted in Anita Guerrini. *Experimenting with Humans and Animals: From Galen to Animal Rights*, (Baltimore: Johns Hopkins University Press, 2003), 3.

5 Guerrini, 2003, 16.

6 Ibid, 13,16.

7 The use of primates in experimentation continued through Louis Pasteur's rabies vaccine. Guerrini, 2003, 99.

8 Ibid, 3, 23.

universality of like anatomical structures in different species.⁹ By the eighteenth century, animal experimentation debates also included a concern for the animal experience of pain, as well as skepticism regarding the validity of projecting animal results onto untested human bodies.

Nineteenth-century scientist Marshall Hall used vivisection--surgical experimentation on a living organism--to continue Harvey's circulation work.¹⁰ While performing his studies, he created guidelines for a research society that would monitor the use of animals in experiments. He proposed that animal experiments be necessary and goal-oriented, and cause minimal pain.¹¹ While these concerns may have been genuine, Hall was also writing in an era that encompassed, among other movements, the foundation for the Society of the Prevention of Cruelty to Animals in Britain. The public profile of his work suggests that he was responding to this newfound sensibility to the animal experience¹²

Almost a century after Bentham wrote his famous line, it seems that humans were no closer to understanding if animals suffered, but they might be inclined to care. One development would drastically change both the concept of and the concern for animals' pain: anesthesia. Anesthesia was first used in Boston in 1846,¹³ after which it derailed the pain discussion. Gone were the images of the dog, paws nailed to the table, howling and twisting as Francois Magendie's knife sliced its face open¹⁴. Anesthesia solved vivisection's aesthetic complication. And since no one had answered Bentham's implied question on animal communication, the now-anesthetized dog could not be asked about his post-op experience, or if anesthesia even worked the same way on dogs as it did on humans. The discussion of pain faded, and the question of anatomical relevance remained inadequately addressed into the twentieth century.

Chimpanzees in Twentieth-Century Research: Learning about Chimpanzees to Benefit Humans

Early twentieth-century work with chimpanzees involved psychological and psycho-biological experimentation.¹⁵ These experiments challenged doubts about the similarities between humans and chimpanzees by answering basic questions about chimpanzee anatomy, emotionality, and intelligence.¹⁶ Dr. Robert Yerkes was a psycho-biologist who developed an

early fascination with chimpanzees and how they might be used in psychobiological studies.¹⁷ Yerkes studied chimpanzees and documented his work extensively, including an entire book compiling great ape knowledge up until 1929.¹⁸ His writings display the scientific knowledge of and interest in primates in the time immediately preceding the polio crusade.

When he began his research, there were federal and private collections of chimps, and the first chimpanzee was born in captivity on April 27th, 1915.¹⁹ But Yerkes dreamed of a different type of collection: he wanted a chimpanzee colony specifically for scientific research. Before Yerkes opened his dream facility, the Yerkes Laboratory of Primate Biology, he compiled all the anthropoid-related knowledge he could access in *The Great Apes: A Study of Anthropoid Life*. In his section on chimpanzees, Yerkes discussed recent examinations of the social, intellectual, and emotional capacities of chimpanzees in the wild and in captivity. Comparing these aspects, Yerkes wrote, "The chimpanzee more closely resembles man affectively than in its intellectual or cognitive life," implying behavioral distinctions between a chimpanzee's capacity for emotion and its intellectual/cognitive abilities.²⁰

Throughout his work, it is clear that Yerkes was not comfortable with contemporary distinctions of habit and instinct, nature and nurture. The occasions of his adamancy — his insistence on the emotionality of chimpanzees and their importance to science, for example — stand out all the more amidst his caution, especially his belief "that such terms as temperament, individuality, and personality are as useful, nay even as essential, in the description of the chimpanzee as of man."²¹ Yerkes was so convinced that chimpanzees could access emotion that he insisted on applying anthropomorphic terms to them in a time when not everyone was comfortable being related to primates.²² He was less sure of their intellectual likeness, but he wanted to continue experimenting on all aspects of their lives.

The trends of approach and discourse in Yerkes' work are best described through a quotation from a section on food:

Often perhaps than any other question, those who have chimpanzees in captivity are asked, what do they eat? Our reply is, what they are taught to, as we do! This is an intimation of our conviction that the selection, acceptance, or rejection and

9 Guerrini, 2003, 3, 17.

10 *Encyclopædia Britannica Online*, s. v. "vivisection," web.

11 Guerrini, 2003, 77-78.

12 Ibid, 78.

13 Ibid, 78.

14 French physiologist famous for his public surgeries on animals. Guerrini, 2003, 70.

15 Yerkes coined the term psychobiologist and founded the discipline.

16 Yerkes, Robert, *Almost Human* (New York: The Century Co., 1925), xi-xii; *The Great Apes* (New Haven: Yale University Press, 1929), 299.

17 D.D. Dewsbury, *Monkey Farm: A History of the Yerkes Laboratories of Primate Biology, Orange Park, Florida, 1930-1965* (New Jersey: Associated University Presses, 2006), 47.

18 *The Great Apes*.

19 Dewsbury, 2006, 46.

20 Robert Yerkes and Ada Yerkes, *The Great Apes: A Study of Anthropoid Life* (New Haven: Yale University Press, 1929), 299.

21 Yerkes, 1929, 278. Cite second and onward citations as Author Year, Page.

22 Yerkes, 1925, xii.

manner of eating foods are chiefly manners of habit, and therefore individually determined... it is so generally assumed or implied that choice and manner of taking foods are instinctive and characteristic for a species.²³

The dialogue is completely dependent on the chimpanzee's relation to the human species. Yerkes leaps from a repeated chimpanzee action to its human counterpart constantly with little interest in an actual explanation for the resemblance; rather, there is an underlying assumption that the merit of an observation and, by extension, a species, is constructed by its proximity to human characteristics. Although Yerkes believed that "the humble primates may be helpful," it is clear his contemporaries did not want to associate humans with the anthropoid apes. In order to combat these "ill-founded and unprofitable prejudices and superstitions," Yerkes wrote about his findings and founded his lab.²⁴ His goal was to convince his contemporaries of the merit of primate research, which he believed would reveal lessons for mankind.²⁵

Yerkes' education informed his understanding of the natural order. At Harvard, he studied comparative psychology and met leading faculty in eugenics, namely Francis Galton, and took courses in philosophy.²⁶ These influences often appear in his later primate work. In *Almost Human*, published when he was a professor of psychology at Yale, Yerkes answered his own question, "Who is a primate?" relying heavily on the Linnaean classification system, clearly regarding man as a "creature" in this system.²⁷ While he alludes to anatomical differences between the non-human primates and man, such as opposability in the feet, Yerkes seems to see the most significant difference as man's propensity for control and "perfectibility:"

[Man's well-nigh universal habitation] is due chiefly to the measure of man's control of his environment, for whereas the gorilla or other ape adapts to climatic conditions chiefly by change in physical characters, man depends quite as much on modifications or control of the environment itself.²⁸

He cites the use of fire to illustrate his point.²⁹ This control factor extends to the lab: "Experimental study...yields understanding of the nature, relations, principles, and conditions of vital processes. It enhances our ability to control them."³⁰ In his books, Yerkes presents an understanding of the

natural order that allowed him to respect and even be in awe of chimpanzees and other primates, and still to subjugate them to experimentation. In fact, the control factor is perhaps the most definite characteristic in Yerkes' differentiation between non-human and human primates; thus, in engaging in this outlet for perfectibility, Yerkes was exerting that which made humans distinct from other primates.

Another interesting aspect of Yerkes' work is his conception of the natural order as a porous continuum, rather than a ladder. His complex view of the human species followed eugenics theory, not unpopular at the time, which organized different groups within each species based on perceived intraspecific differences. Just as traits overlapped among species, species could be subdivided. In fact, some races shared traits of other primates, while still remaining human:

Negro and chimpanzees seem to recognize in each other similarities which attract and differences which repel. The feelings of the negro are pretty generally shared by mankind, for the appearance and behavior of monkeys and apes offend while they fascinate most of us.³¹

Eugenics and Social Darwinism are not new historical concepts, but their place in Yerkes' work deserves more than appalled dismissal. This quotation shows his willingness to place humans in relation to primates, but also primates in relation to humans, based on specific traits that he believed experimentation could identify. Animal experimentation relies on this fluid understanding of the interrelationships of humans and animals, and the assumption that humans can learn something from animals.

Yerkes' passion for using primate experimentation to advance mankind betrays another, more sinister of his beliefs.³² As the above quote shows, "negroes" existed in a space between human and primate: while "mankind" is similarly repulsed and attracted to its mirrored image within the chimpanzee, these feelings are only "pretty generally shared." These distinctions among the three subjects correspond to the fear of Yerkes and other scientists that the intelligence of the human race was declining on a backwards trajectory towards its evolutionary roots.³³ In one of the most oft-cited experiments of the period, Yerkes conducted intelligence testing on Army soldiers and concluded that blacks were less intelligent than whites by an

23 Yerkes, 1929, 231.

24 Yerkes, 1925, vii.

25 Ibid, vii.

26 Dewsbury, 2006.

27 Robert Yerkes, *Chimpanzees*, (Oxford: Oxford University Press, 1943), 1, 3.

28 Yerkes, 1925, 25.

29 Ibid, 25.

30 Yerkes, 1943, 1.

31 Yerkes, 1925, 26-27

32 Yerkes, 1925, vii.

33 Steven Selden, "Transforming Better Babies into Fitter Families: Archival Resources and the History of the American Eugenics Movement, 1908-1930," *Proceedings of the American Philosophical Society* 149 (2005): 205.

average of 3 mental years, even classifying them as “moronic.”³⁴ In the face of general lower intelligence, Yerkes believed that the key to reversing this downward trend was studying the relation between biology and intelligence on the sliding scale of whites, blacks, and primates. As scientists in the eugenics movement, the same ability that allowed Yerkes to imagine and subsequently examine interspecies relations also promoted the intraspecies division of humans into racial categories purportedly based on levels of intelligence.

Yerkes’ conclusions in his army tests contributed to popular “scientific racism,” but other of his conclusions were less popular.³⁵ Yerkes believed and explicitly professed that man was not a “unique organism” because of his “genetic relations to other types of living creatures.”³⁶ Using these other living creatures, Yerkes hoped to engage in “inquiries of behavior, experience, and [in] anatomical and physiological correlates; in social relations and institutions, neural functions, endocrine effects and imbalance; in pathology and experimental surgery.”³⁷ In chimpanzees, Yerkes saw the possibility for even greater service:

If as a servant of science the chimpanzee should help to make clearer and more attractive to mankind ways for the achievement of greater social-mindedness, dependability, and cooperativeness, how immeasurable our debt! The really important things for us at present are recognition and active acceptance of the principles of modifiability, controllability, and consequent improvability, of human nature.³⁸

Yerkes takes his literary license to the extreme here, but even beneath the flourish, he suggests that studying the chimpanzee could help humans become more human by improving their understanding of themselves.

Yerkes was not alone in ascribing such importance to chimpanzee research. Wolfgang Köhler studied chimpanzees in the Canary Islands, employing them in some of the world’s first psychological tests. He published his findings in 1925, in his book, *The Mentality of Apes*.³⁹ Yerkes refers to Köhler’s work in the Canary Islands as a study of ape intelligence, measured by

problem-solving skills, especially in relation to other animals. Köhler believed that chimpanzees were particularly useful in intelligence testing:

We may, under the simplest conditions, gain knowledge of the nature of acts of intelligence... So one may be allowed the expectation that in the intelligent performances of anthropoid apes we may see in their plastic state once more processes with which we have become so familiar that we can no longer immediately recognize their original form: but which because of their very simplicity, we should treat as the logical starting-point of theoretical speculation.⁴⁰

Köhler evaluated the intellectual workings of chimpanzees as a “plastic state” from which scientists could understand basic human functions. He believed these tests were vital in determining the origin of intelligence, which could not be thoroughly investigated using grown male humans because their nurtured intelligence would not display the basic steps of problem solving ‘natural’ to a brain unfamiliar with the trappings of culture.⁴¹ Köhler, like Yerkes, was inspired to investigate the origins of man and their infant capacities in chimps because of their physical “human” resemblance:

[Apes] show so many human traits in their “everyday” behaviour that the question was quite automatically suggested whether the animals do not behave with intelligence and insight under conditions which require such behaviour. This question expresses the first, one may say, naïve, interest in the intellectual capacity of animals. We wished to ascertain the degree of relationship between anthropoid apes and man in a field which seems to us particularly important, but on which we have as yet little information.⁴²

These men show that scientific inquiry was interested in explaining humans, and any discoveries regarding chimpanzee biology would be interpreted through that lens.

Yerkes’ writing reflects a lack of concern for the chimpanzees’ pain, even on a scientific level. A small section titled “PAIN” in *Great Apes* continues the historical narrative of simultaneous avoidance and fascination with different species’ pain experiences. Yerkes refers to observations of pain expression, adding that he himself saw those expressions caused by surgery. He admits that he had limited knowledge on the science of pain, yet displays no interest in exploring the neurology further: “Our data on pain...suggest that the acuity of the cutaneous pain sense is very considerably less

34 National Academy of Sciences, *Psychological Examining in the United States Army*, 1921. Fred Galloway, “Inferential Sturdiness and the 1917 Army Alpha: A New Look at the Robustness of Educational Quality Indices as Determinants of Interstate Black-White Score Differentials” *The Journal of Negro Education* 63 (1994): 252. John Jackson and Nadine Weidman, “The Origins of Scientific Racism” *The Journal of Blacks in Higher Education* 50 (2005): 76.

35 Jackson, 2005, 76.

36 Yerkes, 1943, 2-3.

37 Yerkes, 1943, 3.

38 Ibid, 11.

39 Wolfgang Köhler, *The Mentality of Apes*, Trans. Ella Winter, (London: Routledge, 1925).

40 Köhler, 1925 1-2.

41 Köhler, 1925, 1-2.

42 Ibid, 1.

than in man.”⁴³ While Yerkes’ writing style does not want for generalization, it also does not lack for words and repetition. Thus his cursory treatment of this section and the absence of a call for further analysis encourage skepticism.

Conceptions of Chimpanzees

Scientists such as Köhler and Yerkes reflect an intense interest in chimpanzee anatomy and behavior. The detail and devotion dedicated to the study of chimpanzees was completely enveloped in their relation to people and how they might help the human species. The scientists understood on a rudimentary level the similarities between humans and chimpanzees, and they reveled in the opportunity to use the primates in experiments.⁴⁴ The question for Yerkes and his contemporaries was not, “what is a chimpanzee?” but rather, “what aspects of chimpanzees are identical to those of humans?” By parsing out degrees of “human” and “non-human,” they would be able to determine how and to what extent they could use chimpanzees to learn about and to serve humans. Yerkes’ and Köhler’s work represents the scientific conception of chimpanzees at the time they began to be used in the polio crusade.

The Polio Fight

By 1952, the United States had suffered through two massive epidemics of poliomyelitis, accompanied by an ever-increasing rate of infection.⁴⁵ That year, there were 57,879 documented cases, the highest ever recorded.⁴⁶ The United States was not alone: by the mid-twentieth century, every section of the world, including isolated places such as Australia, reported cases of the disease.⁴⁷

Poliomyelitis, or infantile paralysis, takes three main courses: abortive, non-paralytic, and paralytic. An abortive case manifests as flu-like symptoms, and non-paralytic involves aching of the legs and neck. Paralytic polio causes temporary or permanent paralysis, and it can attack any part of the body, from a muscle in a hand to the muscles used in respiration.⁴⁸ One such victim, Norma Smith, was paralyzed from the waist down:

I’ve always thought that paralyzed people were numb. I always thought if anybody was paralyzed they wouldn’t feel anything and of course you do feel everything. It’s a deep bone ache. It’s in every muscle and everything and your whole body seems

to shriek with pain.⁴⁹

To combat this disease, scientists all over the United States used chimpanzees and other primates to learn about the strains of poliomyelitis and to create a vaccine. One such scientist was Dr. Albert Sabin who, working in his lab at the Children’s Hospital at University of Cincinnati, would eventually use more than 300 chimpanzees in his experiments.

Chimpanzees were the key experimental tools in the development of the polio vaccine. With the current reliance on genetics, the reasons for their selection may seem obvious. It is commonly repeated that humans and chimpanzees share more than 99% of their DNA.⁵⁰ While this revelation has had immense imaginative effect on perceptions of chimpanzees and humans alike, it neglects other indicators that were available to the polio scientists. It also overemphasizes the role of genetics in determining relationship: after all, DNA codes for all biological processes. Organisms as seemingly disparate as clams and elephants share the DNA that allows them to turn carbohydrates into energy.⁵¹ Fortunately for the scientists working before molecular biology was a common reference, chimpanzees and humans share similarities that can be measured in other ways. For example, their evolutionary divergence occurred only around four million years ago.⁵² That calculation was made in the 1960s, overthrowing the previous notion that placed the separation nearly ten million years earlier. Here again is a measurement unavailable to Sabin and other polio scientists, who believed chimpanzees and humans to be more distant relatives. The main method of comparison that encouraged polio scientists to use chimpanzees was anatomy. These anatomical studies, discussed earlier, qualified chimpanzees for polio studies, for which they proved apt instruments. Other animals, such as mice and macaques, can be infected with polio in the lab and can even show symptoms of paralysis.⁵³ Chimpanzees, however, acquire polio in the same manner and display symptoms that are the most similar to humans.⁵⁴ When inoculated in the lab, chimpanzees can acquire all three responses: non-paralytic, paralytic, and passive immunity, just

43 Yerkes, 1929, 323.

44 Yerkes, 1925, preface and introduction.

45 M.R. Smallman-Raynor, et al, *A World Geography: Poliomyelitis Emergence to Eradication* (Oxford: Oxford University Press, 2006), 134, 150, 257-258.

46 Ibid, 262.

47 Ibid, 192-193.

48 Smallman-Raynor, 2006, 30-33.

49 Edwin MacColl, Charles Parker, Peggy Seeger, *Body Blow: A radio-ballad about the psychology of pain*, first broadcast 27 March 1962, album released 13 July 1999 on Topic Records, accessed via Spotify.

50 Jonathan Marks, *What it means to be 98% chimpanzee*. Berkeley: UC Press, 2003.

51 Ibid, 28.

52 Marks, 2013, 11.

53 Howard Howe, “Antibody Response of Chimpanzees and Human Beings to Formalin-Inactivated Trivalent Poliomyelitis Vaccine,” July 28, 1952, <http://aje.oxfordjournals.org/>.

54 D. M. Oshinsky, *Polio: An American Story*, (New York: Oxford University Press, 2005), 130.

like humans.⁵⁵ Chimpanzees were also documented as having been infected by “accidental contagion” from other lab animals without inoculation.⁵⁶ These characteristics of acquisition of and response to polio mimic humans effectively enough to make chimpanzees excellent predictors of human response to different attenuations and formulas for the vaccines, serving not only as experimental tools, but also as a protective step before human testing.

The year after the record number of cases was reported, Dr. Sabin asked the National Foundation for Infantile Paralysis (NFIP) for funds to purchase his first twelve chimpanzees. President Roosevelt had announced the creation of NFIP in 1938, seventeen years after he was stricken with polio.⁵⁷ The foundation launched its famous fundraising campaign, The March of Dimes, the same year.⁵⁸ Polio labs such as Sabin’s were funded through NFIP, and it would suggest importing firms and even regulate the intergovernmental tensions that arose in the process of procuring live animals.⁵⁹ In a 1939 letter to Basil O’Connor, the director of NFIP, Sabin lamented the scarcity of polio research due to the cost of the monkey, “the only animal which has yet been found susceptible [to polio].”⁶⁰ Over the next two decades, NFIP funding and international intervention would make possible primate experimentation for polio labs.

During his time with chimpanzees, Dr. Sabin’s laboratory worked to determine the passage of polio through the body and to differentiate the different strains and their respective effects.⁶¹ The chimpanzees were the largest, most expensive part of a complex system of lab animals, in which they occupied the top tier of an experimental hierarchy constructed to determine their biological relationship to each other as well as to provide a similar framework for each experiment.⁶² Lab mice, cows, and other such non-primates were used in initial testing, then cynomolgus monkeys (or crab-eating macaque), chimpanzees, and finally humans. Each new species required two types of observation: first, the similarities between the current species and the species before it would have to be determined, then that species’ reaction would also be recorded. The typical experiment was set up thus: Can x

virus do y when z in chimpanzees, as it did in monkeys? Or, can x virus do a when b in humans, as in chimpanzees? In the semiannual report for January to June 1954, Sabin describes this relationship:

Strains of each of the 3 types [of polio virus] which possess this limited virulence for monkeys by the spinal route were found to be completely avirulent when inoculated into the spinal cord of chimpanzees, producing neither paralysis nor lesions.⁶³

In the report for the second half of 1954, similar experiments included humans, tested with these same polio strains that were not virulent in chimpanzees.⁶⁴

Sabin never fully explained the specifics of his methods in his grant requests or semiannual reports, but the budget sections of the grant requests illuminate a key difference between chimpanzees and the rest of the laboratory animals that may partially explain their top position: cost. In the NFIP grant proposal⁶⁵ for 1955—a median year in time and characteristics for the chimpanzee period—Sabin requested a total of \$181,000. This request included money for more than 9,000 lab animals, including 40 chimpanzees. Of the top three most used animals (mice, cynomolgus monkeys, chimpanzees), these 40 chimpanzees represented only .004% of the population, but they accounted for more than 20% of the purchasing grant allotted for these three categories of animals.⁶⁶ Overall, those 40 chimpanzees made up 11% of the total grant. They cost \$500 each. In the same year, one cynomolgus monkey shipped all the way from India cost \$35, and one mouse cost \$0.25. Although the total allotted for the cynomolgus monkeys was \$50,000 more than for the chimpanzees, that amount accounted for fifty times more animals.⁶⁷

These numbers show that chimpanzees were extraordinarily valuable. At the same time, they were not the only animals used in experimentation; they were only a piece of a huge system, including tens of thousands of animals. Even so, the chimpanzees were different. Their inclusion in the lab required international diplomacy, special training, money, and time. These difficulties were worthwhile, however, because

55 H. Howe and D. Bodian, “Non-Paralytic Poliomyelitis in the Chimpanzee,” *Journal of Experimental Medicine*, March 1, 1945; “Passive Immunity to Poliomyelitis in the Chimpanzee,” March 1, 1945; PubMed.

56 Howard Howe, “Poliomyelitis by Accidental Contagion in the Chimpanzee,” *Journal of Experimental Medicine*. Nov. 1, 1944. Pubmed.

57 Oshinsky, 2005, 24, 53

58 Ibid, 54.

59 Ibid, 119.

60 Sabin. Letter to Basil O’Connor, Feb. 8, 1939. Box 6, Folder 2. AS, WCHHP, UC, Ohio.

61 Semiannual Reports. NFIP, Box 7, Folder 16. AS, WCHHP, UC, Ohio.

62 Lab notebooks. Lab Notebooks Polio: Chimps, Box 51, 54, 58, 59. AS, WCHHP, UC, Ohio.

63 Semiannual Report, January 1-June 30, 1954. NFIP, Box 7, Folder 16. AS, WCHHP, UC, Ohio.

64 Semiannual Report, June 30-December 31, 1954. NFIP, Box 7, Folder 16. AS, WCHHP, UC, Ohio.

65 Grant proposals do not reflect actual numbers, but are best for comparative purposes because they are well preserved for the period in question, and Sabin procured all his chimpanzees through the National Foundation for Infantile Paralysis, to whom these grant proposals were addressed.

66 Semiannual Reports. NFIP, Box 7, Folder 16. AS, WCHHP, UC, Ohio.

67 Grant proposal 1955. NFIP Box 5, Folder 7. AS, WCHHP, UC, Ohio.

chimpanzees mostly closely mimicked the human process and symptoms of polio. Some of the humans who came into contact with them noted their special qualities and even developed bonds with them. The chimpanzees used in the polio fight had life histories of their own, and some of those stories were closely documented by their human captors.

Sabin's Chimps: Origins

Most of Sabin's chimpanzees came directly from the jungles of West and Central Africa. The laboratory system in the United States relied on intermediary firms, such as the Chimpanzee Farm in Dania, Florida, and Trefflich's Bird & Animal Company in New York and California. These companies arranged international and domestic paperwork, capture, blood sampling, shipment, and health of the chimpanzees until they were safely delivered to the various American labs. The chimpanzees were captured all over British, French, Spanish, and Belgian colonial Africa, including Spanish Guinea, French Guinea, Gabon, Liberia, and the Congo.⁶⁸ The American companies had on-the-ground representatives who captured the chimpanzees and took their blood samples to check for polio antibodies.⁶⁹ One such representative was Phillip Carroll, who worked for Henry Trefflich, of Trefflich's Bird and Animal Company. In a memorandum to Sabin, Trefflich describes Carroll's methods for capturing the chimpanzees:

They were trapped...by spreading a net under the palm trees in which the chimpanzees slept. After being trapped they were put in a compound in the American Mission where they were housed in big cages, 4 to 6 chimpanzees per group. They were fed by native boys and the food consisted of rice cooked in palm oil, fruit, yams, etc. These chimpanzees left Africa June 22 and arrived [in New York] on the morning of June 30. They were bled immediately after arrival.⁷⁰

This account reflects the typical manner of and subsequent waiting period for capturing chimpanzees. The chimpanzees would also be bled as soon as they were captured in Africa, with

a 30 cc Sheppard-Keidel vacuum tube.⁷¹ During the entire time from capture to delivery, the health of the chimpanzee was paramount: Trefflich would have to pay for any sick or dead chimpanzees sent to Sabin, in addition to taking the expense for any that arrived dead to his firm in New York.

Some chimpanzees came directly from Africa, but not from the jungle. Two chimpanzees named Aba and Yangambi were captured in the "Belgic Kongo" (*sic*) and sent to Sabin in the winter of 1955. Dr. Jezierski of the *Laboratoire de Recherches à l'Institut National pour l'Etude Agronomique du Congo*⁷² sent Sabin the serum samples. In his accompanying letter, Jezierski wrote: "The one of them was captured near Stanleyville, Congo River-Central Congo, and must be about 8 months old. The [other] one was captured near Aba, Soudan (*sic*) border-North-east Congo and is aged about ten months."⁷³ Due to the high presence of polio antibodies in larger wild chimpanzees, as well as their relative difficulty to handle and to transport, Sabin wanted young chimps between ten and twenty pounds.⁷⁴ These baby chimpanzees would be perfect.⁷⁵

Not all of Sabin's chimps came directly from the jungle, however. June and Agnes, for example, came the Army Medical Graduate School at Walter Reed Hospital in Maryland, where they were used in typhoid experiments.⁷⁶ On May 5th, 1954, scientists at Walter Reed wrote a letter regarding these two chimpanzees:

"In the event you are interested in identifying the chimps, they may be differentiated on the basis of the following characteristics: June is slightly smaller in stature and lighter in weight. She has an irregular area of pigmentation extending over the bridge of her nose. Her pleasant personality may not be evident initially, but, although less demonstrative of her affection, is more phlegmatic and manageable. Both animals are easy to handle."⁷⁷

When he received them, Sabin wrote that they were "excellent."⁷⁸

68 Letters, notes, memos. NFIP, Animals, Box 9, Folder 13, 14, 15; Research Notes & Materials, Box 24, Folder 1, 3. AS, WCHHP, UC, Ohio.

69 Sabin insisted on immediate sampling upon capture for two reasons. First, he had noticed that adult chimpanzees had polio antibodies already, and he wanted to know if there was a type of jungle polio that chimpanzees were infected with in the wild. Second, he could not accept any chimpanzee with polio immunity, and he wanted to ensure that he only received chimpanzees without polio antibodies.

70 Memorandum from Phillip Carroll and Henry Trefflich, 1954. Box 54, Folder 1. AS, WCHHP, UC, Ohio.

71 Letter from Sabin to Phillipp Carroll, 11 Oct. 1954. NFIP, Animals, Box 9, Folder 13. SA, WCHHP, UC, Ohio.

72 Research Laboratory at the National Institute for Agronomic Study in the Congo.

73 Letter to Sabin from Dr. Jezierski, 16 Nov. 1955. Research Notes & Materials, Box 24, Folder 3. SA, WCHHP, UC, Ohio.

74 Sabin. Letter to John Ash, April 29, 1954. NFIP, Animals, Box 9, Folder 14. AS, WCHHP, UC, Ohio.

75 Letter to Jezierski from Sabin, 27 Dec. 1955. Research Notes & Materials, Box 24, Folder 3. AS, WCHHP, UC, Ohio.

76 Letter from Dr. Joseph Smadel at Walter Reed to Sabin, 22 April 1954. NFIP, Animals, Box 9, Folder 13. AS, WCHHP, UC, Ohio.

77 Letter from Smadel to Sabin, 22 April 1954, *ibid*.

78 Letter from Sabin to Smadel, 22 May 1954. NFIP, Animals, Box 9, Folder 13. SA WCHHP, UC, Ohio.

Their excellence allowed them to be useful in a special operation-experiment called, “Inoculation of Mahoney KP33 Virus Into Spinal Cord of Chimpanzees.” The Mahoney virus was the most virulent strain of polio.⁷⁹ Routine inoculation involves swabbing tongues, intramuscular, intra-cerebral, or intra-spinal injections with needles.⁸⁰ For injected inoculations, the chimpanzees were anesthetized. For this experiment, however, Sabin wanted to see exactly where on the spine the virus was being injected and to bypass the tough process of piercing chimpanzee skin.⁸¹ June, number 6621, was first under the knife. Her laminectomy—removal of the vertebrae necessary to expose the spinal cord—was made “where ribs leave the spinal column.”⁸² Agnes, number 6622, was incised in the middle of her spine, forcing the experimenters to remove more of her vertebrae than planned until they located the desired region.⁸³ June and Agnes were killed at the end of the observation period so that the internal results could be evaluated.⁸⁴

Sabin received at least five other chimps from Walter Reed. Geoffrey Edsall, Director of the Immunology Division, wrote: “The remaining chimpanzees are champing (?) (*sic*) at the bit, looking forward to the opportunity to serve the cause of polio.”⁸⁵

June’s and Agnes’ story hints at a complex emotional method in dealing with chimpanzees. First, the correspondence here disclosed is between scientists. The enthusiasm apparent in their words lacks the motivation of monetary reward; these are colleagues discussing a mutual tool. The May letter describes not only June’s physical stature but also her personality. Discussion of personality as a method of identification does not necessarily denote a belief in the ‘humanity’ of these chimps, although it does suggest the belief that they can demonstrate human qualities. This letter describes such a nuanced personality, however, that it begs more attention than the descriptions of “playful” chimps that litter other correspondence. These observations necessitate an intimate relationship in order to identify these characteristics in the chimpanzee, *as well as* the assumption that a complete stranger will recognize them. While experimenting on her, Dr. Smadel established a deep understanding of June’s multilayered personality. This tension between acknowledging a developed personality and forcing

that personality to undergo experimentation recurs in the chimpanzee story because their physical and emotive similarity to humans is so striking to these scientists. Yerkes’ work includes the same friction, as he observed “that such terms as temperament, individuality, and personality are as useful, nay even as essential, in the description of the chimpanzee as of man” while insisting that it was essential to use chimpanzees in experimentation, including surgery.⁸⁶

Just as Yerkes rectified this tension by creating a willing role for chimpanzees in research, Edsall’s letter about the chimpanzees “champing at the bit” connects the chimpanzees to the eradication of polio. By expressing the role of chimpanzees in this way, Edsall shows that for at least one scientist, all the intimacies in the world between chimpanzee and man could not compare to the fight against polio; Edsall dedicated the lives of the chimpanzees to the a defense against disease, just as he had dedicated his. In fact, framing this discussion in terms of ‘tensions’ projects the concept of contradiction necessitating rectification onto a group of men who may not have seen any conflicts in their use of chimpanzees. Yerkes’ natural order allowed him to identify his humanity based on his control of the environment and his own perfectibility. Both of these ‘human’ characteristics include the subjugation of animals as a function of the human species. Perhaps the best way to understand Sabin and other polio scientists’ ability to recognize emotionality in the very chimpanzees whose brains they later dissected to answer “what has happened to the chimpanzees” with another question: what *could* happen with the chimpanzees? The possibility of scientific discovery, prestige, and most importantly, of saving lives, lay ahead of these scientists, and chimpanzees were an integral piece in obtaining those goals. It is possible that such a question as this paper poses exists only in retrospect.

The Importers: Trefflich and Ash

Henry Trefflich was the colorful owner of Trefflich’s Bird & Animal Company, Inc., Importers & Exporters of Mammals, Birds, & Reptiles. His main headquarters were on Fulton Street in New York City. His company imported all species of animals from Africa and India, and his letterhead declared his firm the “Monkey Headquarters of the United States.”⁸⁷ His letterhead from 1940 is plain and straightforward; ten years later, the now-fancy lettering is covered with animals.⁸⁸ Part of his success in that period was due to his contract with the NFIP, through which Sabin became aware of his business. Sabin was not satisfied with Trefflich for long, however. By May 1954, their letters were riddled with accusations from

79 Oshinsky, 2005, 118.

80 Lab notebooks. Lab Notebooks Polio: Chimps, Box 51, 54, 58, 59. AS, WCHHP, UC, Ohio.

81 Lab notebook, 17 May 1954. Lab Notebooks Polio: Chimps, Box 51. AS, WCHHP, UC, Ohio.

82 New Oxford American Dictionary, “laminectomy,” web. Lab notebook, 17 May 1954. Lab Notebooks Polio: Chimps, Box 51. AS, WCHHP, UC, Ohio.

83 Lab notebook, 17 May 1954. Lab Notebooks Polio: Chimps, Box 51 AS, WCHHP, UC, Ohio.

84 Lab notebook, 17 May 1954. Lab Notebooks Polio: Chimps, Box 51. AS, WCHHP, UC, Ohio.

85 Letter from Dr. Geoffrey Edsall at Walter Reed to Sabin, 1954. NFIP, Animals, Box 9, Folder 13, AS WCHHP, UC, Ohio.

86 Yerkes, 1943, 3, 278. See page 9.

87 Trefflich. Letters to Sabin. NFIP Animals, Box 9. AS, WCHHP, UC, Ohio.

88 Trefflich. Letter to Sabin, May 23, 1940. NFIP Animals, Box 2, Folder 6. AS, WCHHP, UC, Ohio.

Sabin and defensive pandering from Trefflich.⁸⁹ No doubt, both men were in difficult, demanding positions. But by 1957, their relations were so bad that Phillip Carroll—Trefflich's representative in Africa—was soliciting Sabin directly.⁹⁰

Sabin sought out John Ash after his troubles with Trefflich began.⁹¹ Ash ran the Chimpanzee Farm in Dania, Florida. In addition to being a fresh alternative, he only charged \$500 per chimp, just at the time in the mid-50s when Trefflich was raising his price to \$600.⁹² Both Trefflich and Ash dealt with legal difficulties in procuring the chimps, mostly in the form of rising fees and permits that constantly needed renewing. Ash received his share of letters from Sabin, complaining of unfit chimps and delayed orders. Procuring chimps was an arduous process for all involved. It is interesting to note that the firms named all the chimpanzees that they sent to Sabin, and sometimes even inquired after specific chimps. In their lab notebooks, Sabin and his assistants always referred to the chimpanzees by their lab numbers, with the exception of June and Agnes. But when Sabin had to write to Trefflich or Ash about certain chimpanzees, he used the names the firms' had given them so that they would know which ones he was talking about.⁹³

Transnational Transportation

The chimpanzees had to be transported thousands of miles before they finally arrived in the polio labs. Even though the upmost care was taken to keep them healthy by shipping them with food and water, and sending instructions to regulate temperatures, many died en route.⁹⁴ Once they were caught in Africa, they were often shipped out in the same month after being held by the firms' African associates. They were placed on airlines such as Air France and Pan American with direct flights that would last twenty-four hours.⁹⁵ Sometimes, the flights had stopovers in Europe.⁹⁶ On one occasion, the weather in London became so cold that the chimpanzees

froze to death.⁹⁷ Those who arrived safely in the U.S. were checked for health, weight, and polio antibodies again at the respective firms before being sent to the labs. Once they had been thoroughly examined and deemed fit, they were shipped by air, train, truck, and even station wagon.⁹⁸ One letter from Trefflich refers to a shipment of fourteen chimpanzees by "our Station Wagon (*sic*)," all the way from New York to Ohio.⁹⁹

Complications arose right from the beginning of the process. By the time Sabin started ordering chimps, international cooperation had stalled as colonial powers began to guard their colonized regions' zoological resources. The firms that sold the lab animals to Sabin dealt with importers and representatives from all over the European, Asian, and African regions, and the powers in these regions began demanding permits and increasing their export taxes for captured chimpanzees. Phillip Carroll, Trefflich's representative in Africa, reported such demands from the British in Sierra Leone, the Spanish in Spanish Guinea, and the French and Belgians in Central Africa. The demand for the animals created an economic opportunity for these governments, but they claimed to have other reasons, as well. P. Bourgoïn, the Inspector General of Hunting and the Protection of Fauna at the French Ministry, demanded a scientific permit for the firm, explaining,

We are obliged, given the scarcity of the apes and the increasing demands, to ensure the proper exchange for all those used in scientific experiments. Current international regulations do not allow us to work with organizations that will use [the chimpanzees] commercially.¹⁰⁰

These types of regulations and demands increased the cost of chimpanzees as well as the paperwork involved in procuring them. Now, the labs and the firms had to provide documentation attesting to the scientific nature of the research to representatives of European governments in Africa and in Europe, as well as to the U.S. government, whose primary concern was the role of imported animals as vectors of human

89 Letters between Trefflich and Sabin, May 1954. NFIP Animals, Box 9. AS, WCHHP, UC, Ohio.

90 Phillip Carroll. Letter to Sabin, Aug. 19, 1957. NFIP Animals, Box 9, Folder 13. AS, WCHHP, UC, Ohio.

91 Sabin. Letter to Ash, April 29, May 17 1954. NFIP Animals, Box 9, Folder 14. AS, WCHHP, UC, Ohio.

92 Ash, John. Bill to Sabin, March 25, 1955; Trefflich, Henry. Invoice to Sabin, March 25, 1955; NFIP Animals, Box 9, Folder 13. AS, WCHHP, UC, Ohio.

93 Letters between Sabin and Trefflich; Letters between Sabin and Ash; Box 2, 9. AS, WCHHP, UC, Ohio.

94 Dascomb, Captain Harry at Walter Reed, June 22, 1952. NFIP Animals, Box 9, Folder 13. AS, WCHHP, UC, Ohio.

95 Franz, K. H. Letter to Dr. Henry Kumm at NFIP, Dec. 18, 1954. NFIP Animals, Box 9, Folder 13. AS, WCHHP, UC, Ohio.

96 Ibid.

97 Trefflich. Letter to Sabin, Feb. 11, 1954. NFIP Animals, Box 9, Folder 13. AS, WCHHP, UC, Ohio.

98 Trefflich to Sabin, Feb. 8, 1954; Trefflich to Sabin May 17, 1954; Trefflich, Invoice to Sabin, Oct. 4, 1954; Walter Reed Hospital to Sabin, Telegram June 24, 1954. NFIP Animals, Box 9, Folder 13, 15. AS, WCHHP, UC, Ohio.

99 Trefflich to Sabin, Feb. 8, 1954. SA, Acc. NFIP Animals, Box 9, Folder 15. WCHHP, UC, Ohio.

100 "Nous sommes obligés, étant donnée la rareté des anthropoïdes et l'augmentation constante des demandes, de contrôler la bonne livraison de tous ceux que nous cédon pour des expériences scientifiques. Les conventions internationales actuelles ne nous permettent pas d'en accorder à des organismes susceptible d'en faire un commerce." Bourgoïn, P. of the French Ministry. Letter to Sabin, March 23 1955. NFIP Animals, Box 9, Folder 14. AS, WCHHP, UC, Ohio.

diseases, and which also collected an import tax.¹⁰¹ Import and export permits were issued to a firm for a specific number of chimpanzees from a particular area.¹⁰² Each new batch of chimpanzees required a new permit. These dealings mostly resulted in approved permits, although sometimes the firms' representatives were able to manipulate colonial tensions by landing exclusive contracts with fledgling governments such as Cameroon in the midst of its war for independence from France.¹⁰³ It seems that Sabin and the firms with whom he dealt carefully complied with these demands, sending letters confirming the chimps' scientific purposes along with annual request estimates. While this paper focuses on Sabin's lab, it is important to remember that the story of research chimps is international. Just as Yerkes was inspired by Köhler, a German scientist working in the Canary Islands, and corresponded with the French Pasteur Institute in French Guinea (now the "Guinea" on the east coast of Africa,) chimpanzee research for the polio vaccine involved not only the chimpanzees' native regions, but also the European powers that were still governing there in the 1950s.¹⁰⁴ Including the macaques from India, polio primates were a tricontinental phenomenon.

Chimpanzee shipment faced more difficulties than international relations. Letters between Sabin and Trefflich and Sabin and Ash are riddled with threats from Sabin's end and apologies from the firms' sides for the delivery of unhealthy or dead chimpanzees. Trefflich and Ash often cited transportation as the cause of the unfit chimpanzees; whether or not this was actually the case or whether the firms were trying to cover other mistakes, the results were the same for the chimpanzees: disease, injury, and death. After another unsatisfactory shipment, Sabin wrote, "The problem appears to be not one of death shortly after arrival but one of developing illness after they arrive by air which in time leads to their death. We have never had anything like it happen before."¹⁰⁵ He suggested that Ash's firm switch from Riddle Airlines, whose temperature regulation Ash accused of causing the illnesses, to Railway Express. Trefflich had a similar problem: "The chimps seem to be leaving in good condition but somehow during the

air trip something happens."¹⁰⁶ There is no record of what may have caused these strange deaths.

Chimpanzees were part of a vast trade of exotic species for zoos, private collectors, and scientific research that had existed for decades. They were rare and sensitive animals who required expert handlers and specific environmental regulations in order to arrive safely in the laboratories that relied on them, but for every death in the lab, the firms' letters suggest that countless more chimpanzees died along the routes between Africa and the U.S. and between the U.S. firms and the labs.

Daily Life

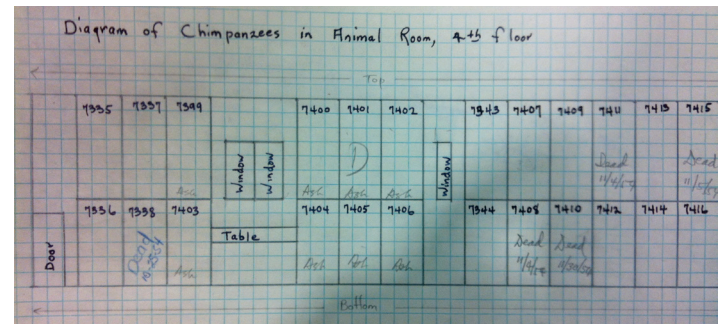


Figure 1. Diagram of a wall of cages labeled with the chimps' lab numbers, including some from the Chimpanzee Farm ("Ash") and several cages of deceased chimps. Chimpanzees were kept in individual enclosures, often developing the chimpanzee's emotional and social reliance on his caretakers.

The lives of laboratory chimpanzees were marked by physical captivity, human contact, inoculation through food and injection, blood and stool samples, and disease. Each chimpanzee was housed in his own cage lining the walls of the room (*figure 1*).¹⁰⁷ Sometimes, a chimpanzee outsmarted her captivity:

Note: On the night of 2/26 to 2/27 chimp 7404 became a liberator. Although she herself cannot get out of her cage—she was able by banging herself around to move her cage around (it is on wheels) close enough to others to open the cage. On Sunday morning 2/27 chimp 7406 was found loose and on Monday morning chimp 7343 was loose. Measures were then taken to prevent a recurrence.¹⁰⁸

On 7343's chart the next morning, someone noted: "out of his cage last night—wandered around room."¹⁰⁹

Some information about the chimpanzees' daily life

101 Ash to Sabin, May 14, 1954; Ash to Sabin, Sept. 18, 1954; Trefflich to Sabin, June 11, 1953; Sabin to Trefflich, July 27, 1954; Trefflich to Sabin, Nov. 15, 1954. NFIP Animals, Box 9, Folder 13, 14, 15. AS, WCHHP, UC, Ohio. Department of Health, Education, and Welfare Public Health Service Washington 25, DC; Excerpt from Foreign Quarantine Regulations, PHS, 71.156 a and b. "Etiological agents and vectors"

102 Permit from P. Bourgoïn to Sabin, 28 March 1955. NFIP Animals, Box 9. AS, WCHHP, UC, Ohio.

103 Carroll, Phillip. Letter to Sabin August 19, 1957. NFIP Animals, Box 9. AS, WCHHP, UC, Ohio.

104 NFIP, Animals, Box 9, Folder 14. AS, WCHHP, UC, Ohio.

105 Sabin. Letter to Ash, Oct. 23, 1956. NFIP, Animals, Box 9, Folder 14. AS, WCHHP, UC, Ohio.

106 Trefflich. Letter to Kumm. NFIP Animals, Box 9, Folder 15. AS, WCHHP, UC, Ohio.

107 Diagram. Box 51, Folder 4. AS, WCHHP, UC, Ohio.

108 Lab notebook. Box 51, Folder 5. AS, WCHHP, UC, Ohio.

109 Lab notebook. Box 51, Folder 5. AS, WCHHP, UC, Ohio.

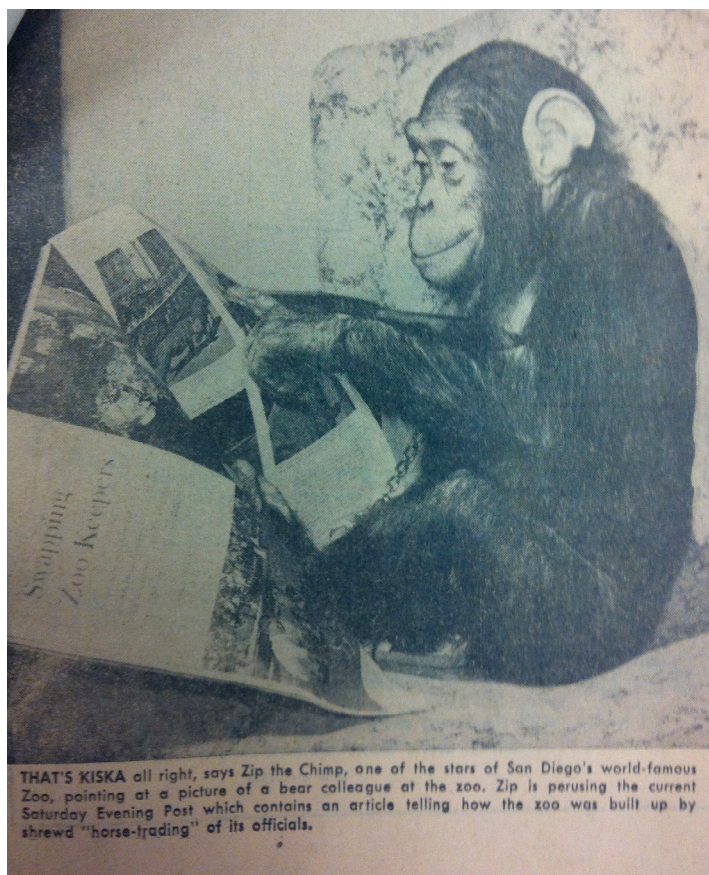


Figure 2. Chimpanzees were traded between labs, zoos, and even private collections. “Zip the Chimp” first came to the States for Sabin’s lab, later continuing his captivity at the San Diego Zoo.

can be gleaned from lab notebooks, but comprehensive records of care procedures and life statistics are hard to find. This area of inquiry is well supplemented by a newsletter sent out to the laboratories using chimpanzees in the early 1950s, by the Assistant Director of the Yerkes Laboratories of Primate Biology in Orange Park, Florida, Henry Nissen. The letter from April 1, 1952, presents a convenient inventory of all 138 chimpanzees possessed by the laboratory since June of 1930, which gives a comparative overview of different chimpanzee life stories:

We may next ask what has happened to the animals: 58 of them are not at the [Yerkes] Orange Park Laboratories.

8 of them are on loan at several other laboratories and zoological parks.

21 have been transferred to other laboratories for experimental purposes. According to present information all but two of these are now dead, some having died of diseases and some having been sacrificed in connection with experimental procedures.

51 Animals have died at the [Yerkes] laboratories

as the result of disease, accidents, and experimental work.¹¹⁰

This inventory reflects the intricate network of chimpanzee users in the United States, all of whom traded chimpanzees back and forth. A chimpanzee brought over from Africa who first came to a zoo could easily be sent to Sabin’s lab if the owner wanted to contribute to the fight against polio or to make a bit of money, just as a chimpanzee brought over for lab work could eventually ‘retire’ to a life at a zoo.

One such transfer occurred in 1955 between Sabin and the San Diego Zoological Gardens. C.R. Schroeder of San Diego sent a request for any male chimpanzees Sabin might be willing to part with, writing, “We have no objection whatsoever to securing chimpanzees which have been used in medical research, polio or otherwise...in fact, we make a point of telling the public that these animals have already contributed their services to medical research and are now entertaining our children.”¹¹¹ For \$600, Sabin shipped two males by Railway Express:

Chimpanzee No. 7829 is particularly affectionate. He is very expert in drinking his milk and other beverages from a pop bottle and, as a matter of fact, delights in doing so. Chimpanzee No. 7405 is very playful but has not been pampered by attention during his stay in this institution.¹¹²

The next year, Schroeder sent a note to Sabin, along with a newspaper clipping: “One of your former charges, and coming along in good style, and as you will note, quite contented.”¹¹³ The newspaper clipping (*figure 2*) shows Number 7829, now called Zip the Chimp, sitting on an upholstered chair and reading a newspaper. The caption reads, “That’s Kiska all right, says Zip the Chimp, one of the stars of San Diego’s world-famous Zoo, pointing at a picture of a bear colleague at the Zoo.”¹¹⁴ From Africa, to New York, to Cincinnati, and finally to San Diego, Zip had traveled the world and lived as a test subject and an entertainer.

Disease

Of the seventy total deaths from the original group

110 Nissen, Henry. Carworth Farms Quarterly Newsletter, April 1, 1962. Box 3, Folder 21. AS, WCHHP, UC, Ohio.

111 Schroeder, C.R. Letter to Sabin, August 22, 1955. NFIP Animals, Box 9. AS, WCHHP, UC, Ohio.

112 Sabin. Letter to George Pournelle at the San Diego Zoological Gardens, October 28, 1955. NFIP Animals, Box 9. AS, WCHHP, UC, Ohio.

113 Schroeder. Letter to Sabin, February 11 1956. NFIP Animals, Box 9. AS, WCHHP, UC, Ohio.

114 See *figure 2* at end. Schroeder. Letter to Sabin, February 11, 1956 with newspaper clipping. NFIP Animals, Box 9. AS, WCHHP, UC, Ohio.

of 138 at Yerkes Laboratory, Nissen attributed sixteen to experimental procedures, six to accidents, and forty-eight to disease. Two of the accidental deaths were infants killed by first-time mothers, but Nissen does not make clear who or what perpetrated the other four accidents.

The number of chimpanzees who succumbed to disease is striking, especially considering that death by experimentation is a significantly smaller proportion: of the original 138, 50% had died by 1952, 69% from disease, but only 23% from “sacrifice.”¹¹⁵ Laboratory diseases included colds, lobar pneumonia, dysentery, tuberculosis, parasitism, vitamin deficiencies, and meningitis (*figure 3*).¹¹⁶ As previously discussed, the most useful chimpanzees were small ones without polio antibodies. This meant that the lab chimps were mostly infants and early adolescents, making them particularly susceptible to catching diseases from their human handlers.¹¹⁷ Most of Sabin’s diseases were respiratory, which his lab treated with penicillin.¹¹⁸ Routine for dead chimpanzees usually included an autopsy even if the chimpanzee died independent of experimental tests. Chimpanzee number 7338 was intramuscularly injected with the Leon strain and was found dead on October 25, 1954. The chimpanzee was put into a refrigerator until an autopsy could be performed, where the scientists found nothing in particular in the region of inoculation, but preserved two pieces of the muscle for histology. Over the course of the experiment, number 7338 had suffered and been treated for severe diarrhea, difficulty breathing, and a runny nose.¹¹⁹ This story is emblematic of the chimpanzees who died in the lab, many of them experiencing combined symptoms from the experiments and communicable diseases.

Experimentation

The experience and process of experimentation is inseparable from disease and death, but many chimps repeatedly fulfilled their purpose as experimental tools while they were alive. Sabin used the chimpanzees and other lab animals to study how they reacted to the three different strains of poliovirus and how the strains traveled through their bodies after being injected or ingested. As was the case with June and

Agnes, the two chimpanzees from Walter Reed who underwent intra-spinal inoculation and laminectomies, chimpanzees were also used in surgical experimentation, usually for higher inoculation precision but sometimes to assess internal symptoms of inoculation (*vivisection*). Other ways of assessing post-inoculation symptoms were blood and stool samples, and pharynx, cheek, and tongue swabbing.¹²⁰ The scientists used several methods to inoculate the chimps: intra-spinal, intra-cerebral, and intramuscular injection; and ingestion, or feeding the chimpanzees food such as bananas or milk with the virus in it.¹²¹ While these treats were probably not daily staples, these notes of lab technicians inoculating the chimpanzees through bananas and milk are the only specific references to the chimpanzees’ diet. After blood and stool sampling, this was the most common experimental event in the chimps’ lives. Notes for an experiment using the Mahoney strain describe an intra-spinal injection:

The muscles on the chimpanzees (*sic*) back are big and powerful and it is difficult to palpate the spinous processes. A point was taken roughly at the lower edge of the ribs—an 18 gauge 1.5” needle was pushed through until a little spinal fluid was seen—and then the syringe was attached and 0.2 mil [of the strain] was inoculated...No traumatic paralysis immediately after inoculation.¹²²

This excerpt highlights one of the main challenges scientists faced when using chimpanzees. Their size and muscle mass made them difficult to maneuver, even when anesthetized. Sabin made sure that he obtained chimps under twenty pounds, but they grew and became stronger while they were in captivity, and even a small animal can be difficult to manage when the mood sets in.

This is not to say that every chimpanzee encounter was fraught with physical stress and danger, although of course the possibility of catastrophe for both the humans and the chimpanzee was always present. The scientists, veterinarians, and animal husbandry staff were all highly trained, and the chimpanzees were mostly small and amenable to human contact. For routine processes such as blood sampling, most chimpanzees were trained to sit still while their blood was drawn. Henry Nissen even attested to the phenomenon of chimpanzees who were isolated in their cages growing attached to their only other animal contact: the humans in the lab. He observed: “The animal caged by himself becomes much more dependent on the caretaker; the caretaker becomes not only the source of food and such necessities, but also the chief source

115 Nissen, Henry. Carworth Farms Quarterly Newsletter, October, Box 9; Lab notebook April 20, 1955, Lab Notebooks 1954, Box 51, Folder 5; AS, WCHHP, UC, Ohio.

116 See *figure 3* at the end. Picture of rhinitis chimp. Seminannual Report 1955, Box 9, Folder 17; Nissen, Henry. Carworth Farms Quarterly Newsletter, October, Box 9; Lab notebook April 20, 1955, Lab Notebooks 1954, Box 51, Folder 5; AS, WCHHP, UC, Ohio.

117 Nissen, Henry. Carworth Farms Quarterly Newsletter, July 1 1952. Box 3, Folder 21. AS, WCHHP, UC, Ohio.

118 Lab notebook, April 20, 1955. Lab Notebooks 1954-55, Box 57, Folder 4. AS, WCHHP, UC, Ohio.

119 Lab notebooks, October 25, 1954. Lab notebooks, Box 51, Folder 4. AS, WCHHP, UC, Ohio.

120 Lab notebook. Lab notebooks, current chimpanzees 1956, Box 59, Folder 1. AS, WCHHP, UC, Ohio.

121 Lab notebook. Lab notebooks, 1954, Box 51, Folder 5. AS, WCHHP, UC, Ohio.

122 Lab notebook. Lab notebooks, 1954-55, Box 54, Folder 1. AS, WCHHP, UC, Ohio.

of the social stimulation or companionship which the young chimpanzee needs.”¹²³

When he received a shipment of chimpanzees from Walter Reed Medical Hospital, Sabin replied, “They are much larger than chimpanzees we have handled before and thus far have the upper hand over their caretakers, but I hope that in due time a *modus vendi* will be worked out.”¹²⁴ There is no record of what Sabin’s *modus vendi* may have looked like, but there is also no evidence in Sabin’s notes or in any of the instructive literature he received that suggests fear tactics or physical violence were used to control the chimpanzees. In fact, this one sentence is the only suggestion in Sabin’s chimpanzee records that even hints at any issues of control or handling.

In his Quarterly Newsletter, Henry Nissen attributed sixteen out of fifty-one deaths to “experimental work.”¹²⁵ Such chimpanzees would have been killed in order to perform autopsies. In Sabin’s lab, autopsies were carefully recorded and followed strict procedure. The scientists collected blood samples by puncturing cardiac vessels, and tissue samples. They also collected entire organs, including lymph nodes, livers, spleens, kidneys, hearts, lungs, and pieces of the brains.¹²⁶ By the end of chimpanzee 7827’s autopsy, the scientists had collected his entire lymphatic system and ten separate organs, in addition to assorted “ganglia,” and blood, tissue, and “brown fat” samples.¹²⁷ The body parts and samples obtained from these procedures were used to assess effects of inoculation as well as provide new information for comparative anatomical studies.

While investigating the details of these experiments, it is important to recognize the complexity of comparative anatomical studies in this period. The brief summary of primate experimentation laid out at the beginning of this paper described the assumption of early anatomists that animal and human structures were essentially alike and thus would respond to inflictions in the same way. Through a long history of anatomical discoveries and debates, by Sabin’s time, this had been disproven. But the theory of evolution and its myriad implications held a special place in this narrative for primates, whose anatomical, chemical, and biological similarities to humans allowed them to be one of the most valuable experimental tools. This broad-stroke narrative plays out in the microcosmic example of Sabin’s lab, as the hierarchy of his lab animals depended upon their biological relation to each other, and the chimpanzees’ ultimate relation to humans. Before reaching this point, strains were tested on lab mice, rabbits, etc.; then monkeys, and finally chimpanzees. Along each step, there were simultaneous experiments and observations to

determine the reactions of each species to the one previous. This process continued right through chimpanzees to humans.

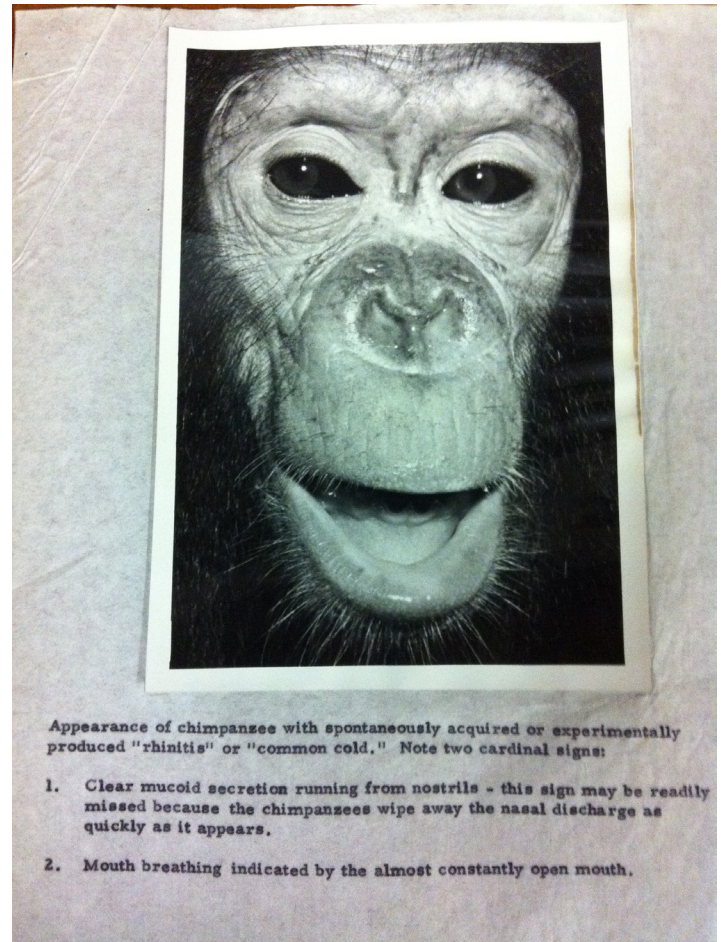


Figure 3. Chimpanzee with symptoms of a cold.

Yet science is never a complete story, and Sabin’s lab is no exception. The chimpanzees were essential as a substitute for human testing, as humans were used only after thorough experimentation in the lab. Even as he relied on scientific knowledge of comparative anatomy among the lab animals and between chimpanzees and humans, his and other polio labs were also working in uncharted territory, relying on their own experiments, observations, and samples to develop a vaccine and learn more about chimpanzees relative to humans.

Following inoculation, each experiment included an observation period. This period usually lasted 20-30 days. Each day, a technician would take blood and stool samples and note the chimp’s condition. Most of these notes address minor cold symptoms and some note more serious symptoms, but most of the days pass acknowledged only by a “check mark.”

Lee, number 7970, arrived from Ash’s Chimpanzee Farm in Florida on April 13, 1955. He arrived in a shipment of chimps that were “in very poor shape and had undergone no previous handling,” but Lee was “good” in comparison to the

123 Nissen, Henry. Carworth Farms Quarterly Newsletter, July 1, 1952. Box 3, Folder 21. AS, WCHHP, UC, Ohio.

124 Sabin. Letter to Captain Harry Dascomb at Walter Reed. NFIP Animals, Box 9, Folder 13. AS, WCHHP, UC, Ohio.

125 Nissen, Henry. Carworth Farms Quarterly Newsletter, April 1, 1952. Box 3, Folder 21. AS, WCHHP, UC, Ohio.

126 Lab notebook. Box 51, Folder 4. AS, WCHHP, UC, Ohio.

127 Lab notebook. Box 51, Folder 4. AS, WCHHP, UC, Ohio.

others, such as Spook, who was “very nervous” and “afraid.”¹²⁸ 7970—referred to exclusively by his lab number outside of Sabin’s correspondence with Ash—made it through his first experiment with no notable symptoms of disease or other affliction aside from than a cough on the twenty-second day of observation.¹²⁹

A shipment from Trefflich arrived in Cincinnati that same spring with two chimpanzees from another lab. These two, 7827 and 7832, were used in an experiment in which they were inoculated by mouth with a virus obtained from a child in New Orleans. 7827 weighed just 10 pounds, and was a “scrawny chimp” that “lies curled up in box.” On day 16 of observation, 7827 was eating only orange slices. Two days later, s/he was dead of “extensive pneumonia.” This small chimpanzee was the same 7827 from the autopsy report.¹³⁰ 7832 came into Sabin’s lab with a runny nose and was treated with penicillin,¹³¹ but came through the New Orleans experiment with nothing but checks.¹³²

In the same spring shipment were three chimpanzees from British West Africa: 7827, 7828, and 7830. Shortly after arrival, 7830 was found dead. Cause of death was not listed on the log, but it was most likely due to disease or stress from shipment. 7828 and 7829 survived to be used in an experiment for which they were inoculated by mouth with a virus obtained from a child in Cincinnati. Sabin wanted to assess “comparative behavior” of the virus. 7828 passed the observation log without any notable symptoms or behavior, but not 7829. 7829 was “almost moribund upon arrival. After treatment with penicillin improved. Then relapsed—treated again...Marked improvement except for ulcerating lesion around left ear.” 7829 also had severe diarrhea, and this up-and-down pattern of health continued throughout the log. In the margins of 7829’s log, an observer wrote, “Craves

affection.”¹³³

Doctors for Dogs: The Expropriation of the Polio Animal Story

In the early 1990s, animal rights activists began hijacking quotes from iconic scientists to bolster their cause against animal experimentation. Albert Sabin and his polio research was a focal point. He had been a respected member of the medical community before the polio crusade, but his development of the oral polio vaccine made him a hero, and also a target. The activists’ main argument was that chimpanzees were not necessary to the development of a polio vaccine, and thus the experiments caused needless suffering.¹³⁴ An article in the *Winston-Salem Journal* from 1992 is typical of the tactic. Dr. Steph R. Kaufman quoted Sabin’s Congressional testimony by citing, “the polio vaccine was based on a tissue culture preparation...not animal experimentation.”¹³⁵ In a letter to the editor, Sabin responded, “Dr. Kaufman correctly quoted my 1984 testimony... but drew wrong conclusions from it. On the contrary, my own experience in more than 60 years in biomedical research amply demonstrated that without the use of animals and of human beings, it would have been impossible to acquire the important knowledge needed to prevent much suffering and premature death not only among humans but also among animals.”¹³⁶ The logic behind Sabin’s assertion that animals were helped by his biomedical research is unclear; certainly, it is even absurd in the case of his polio work, since no non-human animal can naturally contract the disease. However, there is no doubt that animal experimentation effectively served humans in that case. In the span of two years, Sabin received at least four separate requests for counterstatements to misquotations such as these, from institutions such as Yale and UC-Berkeley. Sabin responded to each supportively, and sent statements and even entire letters to the various newspapers. By Sabin’s own words, it is impossible to misconstrue his belief in animal experimentation.

Some detractors went even further, claiming that animal experimentation harmed the scientific process. Dr. Richard Simmons at the University of Nevada wrote to Sabin in such a situation, calling on him to rebut “the irrational accusations of the animal rights cultists.”¹³⁷ He was complaining

128 Their sera samples, which had arrived six days earlier, were accompanied by samples from Chillicothe, where Sabin was testing on human prisoners. Their shared shipment serves as a reminder of the scope of the polio crusade and the many animal and human lives that were affected by the disease and the search for a defense. Shipment note, 14 April 1955. Research Note & Materials 1955-56 Tests on Trefflich and Florida Chimps, Box 24, Folder 3. AS, WCHHP, UC, Ohio.

129 Lab notebook 20 April 1955. Lab Notebooks 1954-55, Box 51, Folder 4; Sera Notes March 1955, Shipment note, 14 April 1955. Research Note & Materials 1955-56 Tests on Trefflich and Florida Chimps, Box 24, Folder 3. AS, WCHHP, UC, Ohio.

130 First cited on page 31. Lab notebook. Lab notebook chimps 1954-55, Box 51, Folder 4. AS, WCHHP, UC, Ohio.

131 Sera notes. Research Notes and Materials 1955-56 Tests on Trefflich and Florida Chimps, Box 24, Folder 3. AS, WCHHP, UC, Ohio.

132 Lab notebook. Lab notebook chimps 1954-55, Box 51, Folder 4. AS, WCHHP, UC, Ohio.

133 Lab notebook. Lab notebook chimps 1954-55, Box 51, Folder 4. AS, WCHHP, UC, Ohio.

134 Oshinsky, 2005, 17-18. Advertisement. *Los Angeles Times*. Box 1, Folder 8. AS, WCHHP, UC, Ohio.

135 Quoted in Sabin’s letter to the editor, from “Misrepresenting Research,” *Winston-Salem Journal*, Feb. 20, 1992. Use of Animals in Research, Box 1, Folder 8. AS, WCHHP, UC, Ohio.

136 Sabin. Letter to the editor, “The Correct Conclusion,” *Winston-Salem Journal*, March 20, 1992. Use of Animals in Research, Box 1, Folder 8. AS, WCHHP, UC, Ohio.

137 Richard Simmons. Letter to Sabin. Use of Animals in Research, Box 1, Folder 8. AS, WCHHP, UC, Ohio.

PHYSICIANS, SCIENTISTS, AND OTHER HEALTH PROFESSIONALS REJECT ANIMAL EXPERIMENTATION

An Open Letter to the American People
We represent thousands of concerned health professionals who oppose animal experimentation (vivisection). We'd like you to know why.

False Promises, False Claims
The biomedical research industry's claim that our health and survival depend on vivisection is patently false. Animal experiments fail to address the true causes of human disease. Our illnesses are a result of numerous factors—lifestyle, environmental toxins, genetics, poverty, etc.—which cannot be recreated in animals. In fact, information derived from animals is misleading and often dangerous when applied to humans.

Historically, clinical practice with sound deductive reasoning has resulted in the major health improvements. The discovery of penicillin and digitalis, the development of x-rays, the microscope, and hygienic principles for infection control, are just a few of the examples that owe nothing to animal experimentation. To justify its consumption of public health resources, the vivisection industry credits itself with important developments, but in reality:

- ❑ The practice of open heart surgery was delayed by at least ten years by misleading dog experiments.
- ❑ "Work on polio prevention was delayed by an erroneous conception of the nature of the human disease based on misleading experimental models of the disease in monkeys." —Dr. Albert Sabin.
- ❑ Scientific studies have shown that modern improvements in longevity are due not to animal-tested medicines, but to better sanitation, nutrition, and other living conditions.

No Miracle Cures
People and animals alike suffer from the failure of vivisection:

- ❑ Heart disease is still the number one cause of death. Yet recent human patient studies prove that it is preventable and reversible through lifestyle changes, including diet.
- ❑ Animal research has failed to stem a four-fold increase in birth defects over the last forty years. Easter Bats now have only 50% survival.
- ❑ While three animals die every second in U.S. laboratories, one in three Americans can expect to contract cancer in their lifetimes.

"It is impossible to arrive at any satisfactory conclusion in regard to cancer in man by experimenting on animals." —Robert Bell, M.D., Vice President, International Cancer Research Society

Vivisection Squanders Science Health Care Dollars
The U.S. spends \$500 billion per year (12% of our GNP) on illness treatment—more than any other country in the world. Yet our health care system is in shambles.

The U.S. has a higher infant mortality rate than 22 other developed nations. Tens of millions of Americans have no access to health care. Trauma, mental health and drug rehab centers are closing for lack of funds. Efforts to end the environment of disease-causing toxins are severely underfunded.

Vivisection is Unacceptably Cruel
Behind the locked doors of hundreds of institutions, atrocities are inflicted on frightened animal subjects. They have no rights, no voice or representation, and no way of escape. Breeding farms, public pounds, and rubber pet doctors provide an endless supply of innocent victims. For example, millions of animals a year die purely for cosmetics products striving just to provide liability protection for manufacturers.

- ❑ "I can find no evidence that the Draize Test, LD-50 test, or any other tests using animals to support the 'safety' of chemicals and cosmetics, have any relevance to the human species." —David C. Doll, M.D., Columbia, MO

Vivisection is Big Business
Biomedical "research" is a vast, lucrative industry, supported each year by \$15 billion in taxes and charity—while killing off to 100 million animals. Animal experiments grant a privileged status with an enormous financial network of charities, and control the Federal agencies for health testing funding. This multi-billion dollar industry is self-perpetuating, self-enriching and self-protecting. Meanwhile our health care system is self-destructing.

APPROXIMATE
IN DEFENSE OF ANIMALS • NEW YORK • 212-691-1100
LAST CHANCE FOR ANIMALS • TAMPA • 813-271-0100 • 212-174-0000 OFFICE
CALIFORNIA ANIMAL DEFENSE • SAN FRANCISCO • 415-398-1100
ANIMAL DEFENSE FUND • TAMPA • 813-271-0100
SPECIAL THANKS TO: JOHN PAUL, SPONSOR, BOSTON • 617-552-3366
HARVEY P. KATZ, SPONSOR, NEW YORK • 212-691-1100
CLARENCE WHITE, SPONSOR, NEW YORK • 212-691-1100
DONOR LIST: 1991
National Anti-Vivisection Society, Boston, CA •
American Anti-Vivisection Society, Chicago, IL •
Animal Research Alternatives, Los Angeles, CA •
Many Others, Val Verde, CA • People for Research in Science & Medicine, Woodland Hills, CA •
Society for Humane Experimentation, Los Angeles, CA •
WITH GRATEFULNESS TO ALL THE INDIVIDUAL CONTRIBUTORS.

IN DEFENSE OF ANIMALS • LAST CHANCE FOR ANIMALS
❑ I support vivisection as an appealing waste of our limited resources. Thank you for publishing this expensive information. Enclosed please find my ten dollarable donation to help achieve your goal and expand your educational efforts.
❑ Please send me additional information.
❑ Please send "The Truth About Vivisection" flyers for me to distribute.
Please send checks payable to: IHS USA
1001 Vermont Blvd., Suite 105, Dept. A
Tampa, FL 33606

Signers:
Kenneth F. Stoller, M.D., Pediatrics • J. Leitchberg, M.D. • Kathleen Wadden, Ph.D., Clinical Psychologist • Paula Kishin, D.V.M. • Sam Snyder, Ph.D., M.P.H. • Jonathan Lander, D.C. • Kathy Madenay, Ph.D. • Lorin Lindner, Ph.D., M.P.H. • L.J. Marx, M.D., Psychiatry • Susan Stewart, R.N. • Ellen Katz, D.V.M. • Richard S. Rowland, M.D., F.A.C.E.P., Emergency Medicine • Julie Foran, R.N. • Donald E. Davis, M.D., F.A.C.S., Otolaryngology & Facial Plastic Surgery • Jose Priester, M.D., General Medicine • Cheryl Anne Reller, R.N. • A. Vincent Hill, M.D., C.E.R.N. • Joseph Nicholas, Ph.D., Biochemistry • Harry J. Shinn, M.D. • Lou Stewart, D.D.S. • Charles Knuth, Ph.D., Family Counseling • Richard S. Blumstein, M.D., Dermatology • Neilson C. Blankenhorn, V.M.D. • Michael Kluge, M.D., General Medicine

Robert Sharpe, Ph.D., The Cruel Deception, 1986.
"The real choice is not between dogs and children, it is between good science and bad science, between methods that directly relate to humans and those that do not."

Robert Sharpe, Ph.D., The Cruel Deception, 1986.
"All our energies and resources must be committed to productive endeavors such as preventive medicine and research methodologies which relate directly to human beings including ethical human-based research, human tissue testing, and population studies (epidemiology). It is time to embrace ways of living and learning that are self-sustaining, non-polluting, and respectful of all life. Only then will our health-care goals be realized."

Robert Sharpe, Ph.D., The Cruel Deception, 1986.
"I abhor vivisection. It should at least be curbed. Better, it should be abolished. I know of no achievement through vivisection, no scientific discovery, that could not have been obtained without such barbarism and cruelty. The whole thing is evil."

Dr. Charles Mayes, Founder, Mayes Clinic, New York Daily News, March 13, 1961

Figure 4. An advertisement in the LA Times: "Physicians, Scientists, and Other Health Professionals Reject Animal Experimentation: An Open Letter to the American People. We represent thousands of concerned health professionals who oppose animal experimentation (vivisection). We'd like you to know why." To the right is Dr. Stoller, and the highlighted section is a quote from Dr. Sabin.

Dr. Sharpe's words highlight the dilemma in using the polio labs as evidence against the usefulness of animal research. As this paper has shown, the labs used the chimpanzees methodically and purposefully, and experiments exploiting their similar biology helped produce a vaccine. Their usage was not "bad science" in the least. Children today who grow up free from the fear of paralysis and death at the swimming pool owe that freedom to the polio scientists, and to the chimpanzees and other lab animals they sacrificed.

Recognizing the importance of chimpanzees and telling their individual stories encourages a new approach to the ethical debate. When history is used not as a weapon but as an illuminator, it becomes clear that focused animal research has saved countless human lives, a fact that merits no judgment value. The scientific possibilities do not have to end there, though; biomedical science can continue to progress, while considering animal welfare of equal importance. Instead of trying to disprove the accuracy of previous trials, doctors and scientists such as Dr. Sharpe can focus on new ways to conduct research.¹⁴² Acknowledging the important role of chimpanzees in the polio lab and investigating their lives encourages new dialogue about the relationship between past and future animal experimentation.

Conclusion

Dr. Albert Sabin insisted on the importance of chimpanzees during his polio career and for decades afterwards. He developed the oral polio vaccine using chimpanzees; he would know. His lab notebooks are precise, detached, and methodical, suggesting that each and every undertaking had an explicit purpose toward the creation of a polio vaccine. There is no evidence of abuse in his lab beyond the inherent terrors of being a lab animal. And why would he waste his chimps, or neglect them? They cost the NFIP thousands of dollars to provide, and Sabin himself must have spent countless hours dictating letters back and forth about the chimps. With so much time, effort, and money, it is inconceivable that he would do anything but use the chimps for carefully constructed experiments and make sure they maintained their daily health. Perhaps in order to maintain the professionalism of his lab, Sabin was also very careful about how he referred to his chimpanzees. In his lab, they were always referred to by numbers. He used names only when corresponding with his providers. There are two exceptions: June and Agnes. In the lab notebooks that documented their final days, June and Agnes are referred to by their lab numbers and their names. Perhaps there was something particularly special about their personalities; certainly, the scientists at Walter Reed provided detailed analyses of them. More likely, based on the referent trends in all his other notebooks and correspondences, Sabin wanted to make sure he kept track of which chimpanzees came from Walter Reed, so he could report on their service to his colleagues there.

The chimpanzees in Sabin's lab—one aspect of the larger chimp-polio story—illuminate several important themes for the lab animal debate. First, these scientists relied on a fluid understanding of the natural order at a time when the double helix was still being puzzled out and the evolutionary divergence between chimpanzee and human was three times

138 Advertisement. *Los Angeles Times*. Box 1, Folder 8. AS, WCHHP, UC, Ohio.

139 Oshinsky, 2005, 17-18.

140 Oshinsky, 2005, 17-18.

141 See figure 4 at end. Advertisement. *Los Angeles Times*. Box 1, Folder 8. AS, WCHHP, UC, Ohio.

142 Jane Goodall Institute. <http://www.janegoodall.org/chimps-GAPA-fact-sheet>.

farther back than it is currently placed. This is not to say that Yerkes, Sabin, and the rest had no concept of genetics; when Yerkes wrote that humans resemble other animals genetically, he was working with an understanding of inheritable traits as detailed as the knowledge that chromosomes carried those traits from parent to child.¹⁴³ But physical evidence for genetics and even evolution was still developing behind the theories, and public opinion was—and still is—even slower to catch up. In effect, the most concrete measurement of similarity between chimpanzees and humans was appearance and, to a lesser extent, mannerism. Based on these characteristics and the contemporary understandings of evolution and genetics, scientists selected chimpanzees as the final step before human testing. It was these same mannerisms that allowed a scientist to record that a small chimpanzee “craves affection” or that June had a blooming wallflower personality. It was also this same appearance that convinced these scientists that chimpanzees were necessary to develop a polio vaccine, and they were right. Now, instead of positing science and animal rights as having separate interests, perhaps science can turn its attention towards the implication of such similarities in its analysis of aspects of animal life such as pain.

Efforts such as those discussed in the previous section to dismantle the history of the polio vaccine serve no one. Instead, the exercise of tracing the life histories of the animals, of asking what happened to the chimpanzees, engages them as part of the polio story along with their “higher” primate brethren. In this way, their stories can become not something to exploit, but rather a way to acknowledge their importance and their service—unwitting and unwilling though it may have been—and treat them as creatures with histories who deserve the attention and protection of modern scientific efforts not in spite of their history as lab animals, but because of it.

Bibliography

- Albert Sabin Papers at the Henry R. Winkler Center for the History of the Health Professions, University of Cincinnati Donald C. Harrison Health Sciences Library. Boxes 1, 2, 3, 5, 6, 7, 9, 24, 51, 54, 58, 59.
- Encyclopedia Britannica Online Academic Edition. Encyclopedia Britannica, Inc., 2013. Web.
- Dewsbury, D.D. *Monkey Farm: A History of the Yerkes Laboratories of Primate Biology, Orange Park, Florida, 1930-1965*. New Jersey: Associated University Presses, 2006.
- Galloway, Fred. “Inferential Sturdiness and the 1917 Army Alpha: A New Look at the Robustness of Educational Quality Indices as Determinants of Interstate Black-White Score Differentials” *The Journal of Negro Education* Vol 63 No 2, Spring 1994, pp. 251-266. JSTOR.
- Gerald of Wales. *The History and Topography of Ireland*. Trans. J.J. O'Meara. London: Penguin Books, 1982.
- Guerrini, Anita. *Experimenting with Humans and Animals: From Galen to Animal Rights*. Baltimore: Johns Hopkins University Press, 2003.
- Howe, Howard. “Antibody Response of Chimpanzees and Human Beings to Formalin-Inactivated Trivalent Poliomyelitis Vaccine.” July 28, 1952. <http://aje.oxfordjournals.org/>.
- Howe, H. and D. Bodian. “Non-Paralytic Poliomyelitis in the Chimpanzee.” *Journal of Experimental Medicine*, March 1, 1945. Pubmed.
- Howe, H. and D. Bodian. “Passive Immunity to Poliomyelitis in the Chimpanzee,” March 1, 1945. PubMed.
- Howe, Howard. “Poliomyelitis by Accidental Contagion in the Chimpanzee.” *Journal of Experimental Medicine*. Nov. 1, 1944. Pubmed.
- Jackson, John P. and Nadine M. Weidman. “The Origins of Scientific Racism.” *The Journal of Blacks in Higher Education*. No. 50, Winter 2005, pp: 66-79. JSTOR
- Jane Goodall Institute. “Chimps in Captivity: The Great Ape Protection Act Fact Sheet.” <http://www.janegoodall.org/chimps-GAPA-fact-sheet>. Accessed 16 Dec. 2012.
- Köhler, Wolfgang. *The Mentality of Apes* Trans. Ella Winter. London: Routledge, 1925.
- MacColl, Edwin, Charles Parker, Peggy Seeger. *Body Blow: A radio-ballad about the psychology of pain*. First broadcast 27 March 1962, album released 13 July 1999 on Topic Records. Accessed via Spotify.
- Marks, Jonathan. *What it means to be 98% chimpanzee*. Berkeley: UC Press, 2003.
- Oshinsky, D. M. *Polio: An American Story*. New York: Oxford University Press, 2005.
- New Oxford American Reference, 2008. Web.
- Smallman-Raynor, M.R., et al. *A World Geography: Poliomyelitis Emergence to Eradication*. Oxford: Oxford University Press, 2006.
- Selden, Steven. “Transforming Better Babies into Fitter Families: Archival Resources and the History of the American Eugenics Movement, 1908-1930.” *Proceedings of the American Philosophical Society*. V. 149 No. 2, 2005, pp: 199-225. JSTOR.
- Yerkes, Robert. *Almost Human*. New York: The Century Co., 1925.
- Yerkes, Robert. *The Great Apes*. New Haven: Yale University Press, 1929.
- Yerkes, Robert and Ada Yerkes. *The Great Apes: A Study of Anthropoid Life*. New Haven: Yale University Press, 1929.
- Yerkes, Robert. *Chimpanzees*. Oxford: Oxford University Press, 1943.

¹⁴³ Yerkes, *Chimpanzees*, 3. First citation on page 9.