

**Speaking of Animals: Animal Psychology between Experimental Science and Imagination
(1840-1920)**

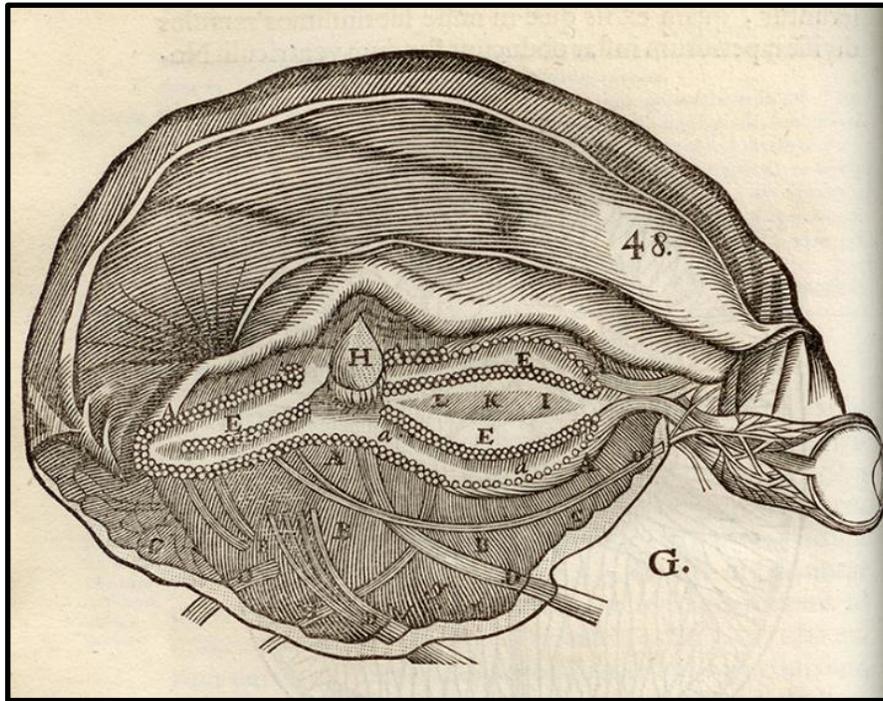
by

Elizabeth A. McNeill

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy
(Germanic Languages and Literatures)
in the University of Michigan
2022

Doctoral Committee:

Assistant Professor Kristin Dickinson, Co-Chair
Professor Andreas Gailus, Co-Chair
Associate Professor Peter McIsaac
Associate Professor Antoine Traisnel
Associate Professor Tyler Whitney



I am now dissecting the heads of various animals to explain what imagination, memory, etc., consist of.

– René Descartes, in a letter to Marin Mersenne (November or December 1632)

Elizabeth A. McNeill

emcneill@umich.edu

ORCID iD: [0000-0001-9962-673X](https://orcid.org/0000-0001-9962-673X)

© Elizabeth A. McNeill 2022

Dedication

To Minerva, the cat who taught me to never stop asking questions.

And to the visible, voiceless women of animal psychology, who deserve a book of their own.

Acknowledgements

On March 10, 2020, I met with my committee to discuss my first chapter draft, having written half of it dampened by an alarmingly obstinate viral infection. Before that week ended, lockdown had begun. The months and years which followed made certain research practices impossible—I never visited a physical archive—and others immacutely possible—I exchanged emails with head archivists and enjoyed HathiTrust’s emergency expansion. For those who kept me writing, whether through resources or encouragement, I am grateful.

Thank you, first, to my committee. Thank you to my chairs, Andreas Gailus and Kristin Dickinson, for your insistent advocating. Thank you to Peter McIsaac, for your expansive thinking. Thank you to Tyler Whitney, for your patient sharing. And thank you to Antoine Traisnel, for your empathetic reading.

To the people who became my interlocutors exactly when I needed you: *herzlichen Dank*. Many thanks to Carl Gelderloos and Kiley Kost for their attentive mentorship and early comments on my chapters, as well as Martin Rolfs for alerting me to the digitalization of the Don recordings. Thanks, too, to Henry Cowles, whose long-ago prediction that I would write about Clever Hans is proved right by this dissertation. And in the final year of writing, my co-fellows at the University of Michigan Institute for the Humanities gave me the warmth of idea-filled companionship. I am deeply grateful for the year with you, one which helped me see beyond it.

I also appreciate the kind, competent people who make things work: Jennifer Lucas, Kalli Federhofer, Terre Fisher, Gretchen O’Hair, Sheri Sytsema-Geiger, and Rob Pettigrew.

Finally, how can I thank you, Jason and Minnie? You have been the university which no pandemic could shut down. Thank you for teaching me, above all, to live.

Table of Contents

Dedication	ii
Acknowledgements	iii
List of Figures	vi
Abstract	ix
Introduction: The Invention of Animal Psychology	1
Chapter 1: Wilhelm Wundt's Inheritance: The Animal Soul between Friedrich August Carus, Peter Scheitlin, and Charles Darwin (1808-1885)	18
Chapter 2: Materializing Interspecies Communication: Clever Hans and the <i>Sprachkrise's</i> Animal Psychologists (1904-1915).....	72
Chapter 3: Speaking, Singing, Screaming at the Berlin Phonogram Archive (1910-1911)	130
Conclusion: Speaking for as Speaking with: An Epistemology of Animal (Un)translatability (1919-1920).....	188
Bibliography	212

List of Figures

- Figure 1.** “Frau Moekel mit Rolf beim Unterricht,” in Paula Moekel, *Mein Hund Rolf: Ein rechnender und buchstabierender Airedale-Terrier* (Stuttgart: Robert Lutz, 1919), 32-3..... 1
- Figure 2.** “Abb. 24. Wirkung eines hohen Tones auf Nachtschmetterlinge,” in Jakob von Uexküll, *Streifzüge durch die Umwelten von Tieren und Menschen: Ein Bilderbuch unsichtbarer Welten* (Hamburg: Rowolt, 1956), 61..... 17
- Figure 3.** Zoological Society of London (ZSL), “Portrait of Jenny” (December 1837). 18
- Figure 4.** Left: “Cat terrified at a dog. From life, by Mr Wood,” in Charles Darwin, *The Expression of the Emotions in Man and Animals*, 3rd ed. (Oxford: Oxford University Press, 1998), 127. Right: “Terror. From a photograph by Dr Duchenne,” in *ibid.*, 301. Composite made by Darwin..... 33
- Figure 5.** J. J. Bernet, Scheitlin, “Peter Scheitlin (1779-1848): Pädagoge, Theologe” (1829), Staatsarchiv St. Gallen, BMB 121. 35
- Figure 6.** The nervous system of a green sea turtle, *Chelonia midas*. Carl Vogt accompanies this anatomical drawing with the following note on the preceding page: “Chelonia, Taf. I, liegt auf dem Rücken, der Brustschild ist weggenommen, der Kopf so gedreht, dass seine rechte Seite zur Anschauung kommt.” In “Beiträge zur Neurologie der Reptilien,” *Neue Denkschriften der Allgemeinen Schweizerischen Gesellschaft für die Gesamten Naturwissenschaften* 4 (1840): 61. 53
- Figure 7.** Darwin included reproductions of Sir Charles Bell’s diagram of the muscles of the face from his *Anatomy and Philosophy of Expression* (1844) and two diagrams (the second is on the following page) from Jakob Henle’s *Handbuch der systematischen Anatomie des Menschen* (1856-73). In Darwin, *Expression*, 29. 59
- Figure 8.** “Following the Leader, goslings file across a meadow. Though Lorenz carries a food bucket, his rhythmic sounds, not hunger, keep them with him,” in “An Adopted Mother Goose,” *LIFE* (August 22, 1955): 74..... 71
- Figure 9.** “Abb. 122. Hans vor der Schreibmaschine. Der Blick nach vorn ist durch die Scheuklappe nicht behindert,” in Karl Krall, *Denkende Tiere: Beiträge zur Tierseelenkunde auf Grund eigener Versuche* (Leipzig: F. Engelmann, 1912), 371..... 72
- Figure 10.** Major Eugen Zobel, “Das lesende und rechnende Pferd,” *Der Weltspiegel* (June 7, 1904). 82

Figure 11. A 1904 model of a Hipp chronoscope, a descendant of the chronoscope Wilhelm Wundt redesigned for psychological study. At its most precise, the electromagnetic Hipp chronoscope could measure time to the 1/1000th of a second. The “reaction experiment with Hipp chronoscope” became a classic of experimental psychology. E. Zimmermann, “Chronoskop nach Hipp,” in <i>Apparate zu experimental-psychologischen Untersuchungen nach Angaben des Herrn Prof. Dr. Sommer</i> (Leipzig, 1904).	96
Figure 12. Timed measurement of Hans’ reaction to his human questioner’s head movements, and his human questioner’s reaction to Hans’ hoof-rapping. In Pfungst, <i>Das Pferd des Herrn von Osten</i> , 90.	97
Figure 13. When Karl Krall took over from Wilhelm von Osten in 1907, he revamped the retired schoolteacher’s animal pedagogical methods according to the commission’s findings, principally through the stringent use of blinders to inhibit Hans’ view of his interlocutors’ movements and prevent him from becoming distracted. “Hans mit Scheuklappe. Die Ansatzstelle der Scheuklappe wurde durch einen undurchsichtigen, bis unter den Hals reichenden Lappen abgeschlossen,” in Krall, <i>Denkende Tiere</i> , 6.	103
Figure 14. Ex-jeweler and founder of New Animal Psychology Karl Krall teaching the Arabian stallion Zarif to spell his name using a “Lesetafel” (1909). “Tafel VI. Zarif lernt buchstabieren,” in Krall, <i>Denkende Tiere</i> , 192-3.	119
Figure 15. In the simplified alphabet table Maeterlinck included in his essay, the numbers on the y-axis indicate the number of times (divided by 10) that the horse taps its right hoof to orient itself within a particular row. The horse then taps a certain number of times with its left hoof (the numbers on the x-axis) to indicate the letter. For example, the horse can select the letter E by tapping its right hoof once and its left hoof once; when the horse pauses to indicate the end of tapping, Krall writes “E” on the board. In Maeterlinck, “Die Pferde von Elberfeld,” 784.	121
Figure 16. Bain News Service, “Consul Peter Smoking,” 1909, Photograph, Library of Congress 2014684084.....	129
Figure 17. “Der sprechende Hund. Serie 1. No. 3. ‘Don’ drückt seiner Herrin, Fräulein Martha Ebers, die Hand,” 1911, Postcard.	130
Figure 18. Waveform of and wax cylinder containing the experimental recording “Vokalaufnahmen Dr. Pfungst” from April 4, 1911. Ethnologisches Museum der Staatlichen Museen zu Berlin, Preußischer Kulturbesitz, Berliner Phonogramm-Archiv.	139
Figure 19. To my knowledge the only extant photo demonstrating how Stumpf (right) and his Phonogram Archive colleagues (here: Georg Schünemann, center) recorded <i>Volkmusik</i> using a phonograph. The three musicians on the left are from Tatarstan. 1915, Sound Archives of Humboldt-Universität in Berlin, HZK Bilddokument ID8249, Sammlungszugehörigkeit Lautarchiv, Inventar-Nr. Sign. Pn. 0113/5.....	149
Figure 20. Wilhelm Wundt’s assignment of human feelings to birdsong (joy, depression, and vigorous excitement), from <i>Völkerpsychologie I</i> (1900). Reproduced in Wundt, <i>Die Anfänge der Musik</i> , 77.....	174

- Figure 21.** A. P. Camden Pratt in T. Wilson, *Prehistoric Art: Smithsonian Institution Annual Report 1896* (Washington: Govt. Print. Off., 1898), 516. Reproduced in Stumpf, *Die Anfänge der Musik*, 75..... 179
- Figure 22.** Waveform of and wax cylinder containing the experimental recording “Sprechender Hund I” from December 21, 1910. The Archive’s catalogue designates Carl Stumpf as the creator. Ethnologisches Museum der Staatlichen Museen zu Berlin, Preußischer Kulturbesitz, Berliner Phonogramm-Archiv. 181
- Figure 23.** “Lernen durch Einsicht,” Photograph, Sammlung AWZ Würzburg. 187
- Figure 24.** Animal occult experiments at the Krall Institute for Animal Soul Science and Parapsychological Research. “Denkübertragung zwischen Mensch und Tier: Versuchsanordnung mit Klingelfuß’schen Hochfrequenzpulen zum evt. Nachweis einer Denk‘Strahlung,” in Karl Krall, *Denkende Tiere: Denkübertragung zwischen Mensch und Tier: Vortrag gehalten auf dem III. Congrès International de Recherches Psychiques* (Stuttgart: Verlag der Gesellschaft für Tierpsychologie, 1927), 87. 188
- Figure 25.** “Poor Don, with all his money, lives a dog’s life. He has a newly wedded couple on his hands, provides their railroad fares all over this country far from their native land, besides giving them, with prodigal generosity, weekly allowances of princely amounts.” In Walter Anthony, “Don’s Rise from the Inn to Affluence,” *The San Francisco Call* (May 18, 1913), 36. *Chronicling America: Historic American Newspapers*, Library of Congress, <https://chroniclingamerica.loc.gov/lccn/sn85066387/1913-05-18/ed-1/seq-58/>. 201
- Figure 26.** Paul “der Kraken-Orakel” selecting the winner of the upcoming match between Germany and Spain in the 2010 Men’s World Cup. He was proved correct when Spain beat Germany 1:0. Throughout the 2008 European Championship and the 2010 Men’s World Cup, Paul’s predictions were reported widely in national media outlets before each German men’s national team match. In *Der Tagesspiegel*, for instance, an entire section of the newspaper’s soccer coverage was devoted to Paul: “WM-Orakel.” Johannes Ehrmann, “Der Kraken an der Sache: Das Tintenfisch-Orakel tippt auf Spanien,” *Der Tagesspiegel* (July 6, 2010)..... 202

Abstract

Theoretically positioned between critical animal studies and science studies within German cultural history, “Speaking of Animals: Animal Psychology between Experimental Science and Imagination (1840-1920)” takes as its point of departure the modernist fascination with animals who could supposedly speak, write, or read. Rather than disregard these cases as pseudoscientific media sensations, I reorient enduring scientific discourses as well as popular, literary, and since-disqualified scientific discourses under the rubric of animal psychology. This orientation allows me to highlight the transdisciplinarity which the emerging study of animal behavior and communication necessitated, yet which has been overlooked in the historical scholarship. “Speaking of Animals” draws upon a range of archival materials in constructing a new, deeper genealogy of ethology and biosemiotics. In so doing, it unearths a number of forgotten figures and approaches, connecting what I maintain is the first work of animal psychology, Peter Scheitlin’s *Attempt at a Complete Science of the Animal Soul* (1840), to Konrad Lorenz’s imprinting investigations a century later. By underscoring the insistent presence of human versus animal communication in German culture, “Speaking of Animals” tracks the century’s changing notions of language, communication, meaning, expression, and speech.

In Chapter 1, I push the accepted origin of animal psychology back to 1840, thereby reframing the fraught emergence of animal interiority as an object of scientific study. Charles Darwin’s *The Expression of the Emotions in Man and Animals* (1872) finds its precursor in Friedrich August Carus’ “Developmental History (and Relational Degree) of Emotions” (1808). Over three decades later, a Swiss priest named Peter Scheitlin took up Carus’ exploration of

species-specific embodied expression, and I mark Scheitlin's work as the first use of the term *Thierpsychologie* [animal psychology]. Scheitlin was the founder of animal psychology, an achievement for which he has received no credit due to his embrace of doubt—the antithesis of the empirical, increasingly experimental natural-scientific landscape into which he dispatched his work. Nearly a half-decade later, Wilhelm Wundt set out to transform Scheitlin's soul science into an experimental science, and he did so through Darwin's behavioral experiments and zoo-based observations.

Chapter 1 is the science-historical soil onto which the 1904 Clever Hans debates of Chapter 2 falls and grows, uncontrollably. Rather than foreground the two opposing camps in this debate, I spotlight playful, science- and language-critical writing composed during and a decade afterward the debates. Through little-known works puzzling out the “Hans question”—by Fritz Mauthner, Maurice Maeterlinck, and Franz Kafka—the varying interpretations of Hans' interspecies communication system come into full view. I demonstrate here that the “Hans question” was an interdisciplinary laboratory for testing theories of communication beyond human perception and comprehension.

The limits of human perception vis-à-vis animal perception form the central tension of Chapter 3. Organized around a 1910-1911 series of phonographic recordings of “Don the talking dog” and his trainer, Martha Ebers, this chapter critiques mechanical objectivity's promise to extend human perception in ultimately extending human knowledge. By tracking Carl Stumpf and his Berlin Phonogram Archive colleagues' research on birdsong and avian mimicry, I show how one's delineation of “music” from “noise” from “speech” throws into relief the limits of one's imagination, and how these limits are shaped by overlapping systems of power. Even when

filtering sound through the most sophisticated audio technologies, listening is an epistemic construct.

Introduction

The Invention of Animal Psychology



Figure 1. “Frau Moekel mit Rolf beim Unterricht,” in Paula Moekel, *Mein Hund Rolf: Ein rechnender und buchstabierender Airedale-Terrier* (Stuttgart: Robert Lutz, 1919), 32-3.

On December 18, 1913, an ex-jeweler wrote a letter to his pen pal, to whom he had been introduced a year prior with much enthusiasm on both sides:

“Lib!

Balf gomd krl lol sn un lib hbn. lol regd braf sein un sagn was is. al hrs muß wis dirn dengt. lol arm dirn auf wbank hfn.

fil grus an jla.

Ein kus fir lol

dein krl.”¹

¹ Paula Moekel, *Erinnerungen und Briefe meines Hundes Rolf* (Stuttgart: Robert Lutz, 1920), 58.

Translation:

“Lieb! Bald kommt Karl Lol [du] sehen und lieb haben. Lol [Du] recht brav sein und sagen was ist. Alle Herren müssen wissen, Tiere denken. Lol [Du] armen Tieren auf Wehbank helfen. Viele Grüße an Jela. Einen Kuß für Lol [du] Dein Karl.”²

Once signed and dispatched, the letter traveled southeast from Elberfeld to Mannheim, a 262-kilometer journey expedited by the horses conveying the message. Still, the recipient was not able to respond until 10 days later, once the Christmas festivities had passed.

“lib!

lol sein ganz dauhig arm dirn o was magn mid wisd
mnr mudr mig dseigt bilder fon arm dr du kral hlfn
dsigl r grubr magnsi sarasin grmr wilsr hubr bruno
duhdl wolf hegr al hrs holn susdr sein gwr nmnlol
nimr kn w bang ofn s dkn.

k u s f o n

l o l .”³

Translation:

“Lieb! Lol [ich] sein ganz dauhig (traurig), arm Tieren! O was machen mit (damit) wüste Männer, Mutter mich (ge)zeigt Bilder von arm(en) T(ie)ren. Du Krall helfen, Ziegler, Gruber, Mackenzie, Sarasin, Krämer, Wilser, Huber, Bruno, Duchatel, Wolff, Heger, alle Herren holen, Schuster sein Gewehr nehmen, Lol [ich] nimmer kann, Wehbank (in) Ofen stecken. Kuß von Lol [mir].”⁴

While their next round of correspondence entailed traditional season’s greetings, these two letters concerned an evergreen topic: their shared goal of proving to humans that animals think. “Alle Herren müssen wissen,” wrote the first correspondent, “Tiere denken.” How sad (“dauhig”) both were as they dwelled on the “arm Tieren” who suffered from humankind’s own ignorance; and yet, how hopeful. There were now so many who fought alongside them with the aim of demonstrating that “the animal” is not an ontologically distinct category, nor a fleshy signifier of lack vis-à-vis “the human”—no, animals were the equal of humans. Dogs and horses,

² “Lol” is the chosen name of the second correspondent. I have inserted “Du” and “ich” into Paula Moekel’s translations here and below for ease of reading, adding a further layer of translation in the process. Ibid., 59.

³ Ibid.

⁴ Ibid., 60.

especially, simply needed the intellectual enrichment that human children received, not to mention a means of interspecies communication which accounted for their particular embodied strengths. Only a rare dog had a tongue agile enough to articulate words in the German language! But a dog had a paw, a horse had a hoof, a human had ears. Similar to Morse code and spiritualist rapping, a human and a dog, for instance, could communicate via a semiotic system in which a given number of paw taps represented a given letter of the German alphabet. The dog could tap while the human listened, noting which letters were tapped out and writing them down.

This is just what these correspondents did. As this human and dog (via his human translator) sent kisses to each other using a version of this interspecies communication system, they affirmed their commitment to helping animals, beings who could not only think, but speak. This was a theory of animal psychology put into practice, and the question at the heart of that theory constituted nothing less than a rebuke of centuries' worth of distinctions between the human and the animal. If the human is, in fact, the only animal that can speak, is this due not to the animal's lacking intellectual capacity as such, but merely a lacking interspecies communication system which can accommodate both the human and the animal? Or, to turn this around, is this due to the human's lacking recognition that "language" can be stretched to account for what the animal does, with or without words? In the letters this dog and human sent to each other until the former's death in 1919, the result of this theory was a German so defamiliarized that it necessitated a translator, not to mention the reader's openness to seeing the relationship between words, grammar, and meaning—and, arguably, his species—afew. When the animal reveals how capacious "language" can be, the human is asked to reformulate what he is, too.

These dog and human pen pals were not alone in their efforts to communicate across species. They were both key figures in New Animal Psychology, a group of animal experts, laymen, housewives and, yes, intelligent animals which emerged in 1904—when the “equine savant” Clever Hans became an international media sensation—and settled on the borders of academic institutions in 1912—upon the publication of ex-jeweler Karl Krall’s monograph *Denkende Tiere*. New Animal Psychology was neither the “new,” experimental psychology of Wilhelm Wundt and Carl Stumpf, nor the empirical study of the animal expression of emotions à la Charles Darwin. New Animal Psychology was an ostensibly institution-eschewing opportunity to bring animals into the fold of human intellectual community and, from there, to ask questions about animals without expecting conclusive answers. New Animal Psychology wanted to be an experimental science with its own institute producing research respected by scientists across the world. But its epistemology was too deeply rooted in relationships with individual animals to pass as an experimental science based on quantification—in other words, as an objective science. However, those very relationships allowed the group to pose other kinds of questions, questions which fundamentally shaped the scientific study of animal behavior well into the 20th century, even presaging those questions about animality and language asked by 20th-century theorists like Jacques Derrida.⁵

Already in 1904, New Animal Psychology was a thorn in the side of Carl Stumpf’s Berlin experimental psychology—but this thorn turned discomfort into motion, the thorn and the side moving forward with and because of each other. When Stumpf lead a team of experimental

⁵ See especially: Jacques Derrida, *The Animal That Therefore I am*, ed. Marie-Louise Mallet, transl. David Wills (New York: Fordham University Press, 2008); Jacques Derrida, *The Beast & The Sovereign*, eds. Michel Lisse, Marie-Louise Mallet, and Ginette Michaud, transl. Geoffrey Bennington, vol. 1. (Chicago: University of Chicago Press, 2009); Jacques Derrida, *Of Grammatology*, transl. Gayatri Chakravorty Spivak, 4th ed. (Baltimore, MD: Johns Hopkins University Press, 2016).

psychologists in debunking claims that Clever Hans could read, write, perform arithmetic, and answer trivia questions, they announced that this animal mystery, at least, was solved. And yet, curiosity still unsatiated, the media public continued to consume news reports of thinking and speaking animals with titillated amusement, if not also serious consideration. Animal intelligence and communication had lodged itself in the public imagination, having provided a testing ground for what—psychologically, emotionally, expressively, and intellectually—separated the human from the animal. Sensing that their authority was being undermined, the Berlin experimental psychologists pointed the finger at New Animal Psychology. At a time when experimental science was still shoring up its power over what became a “scientific fact,” and how, the resulting epistemic battle between New Animal Psychology and Berlin experimental psychology was waged over methodology. Which methods allow a human experimenter to access an animal’s psychological interiority, rather than its scalpel-cut physiological interiority? What are the limits of using human tools for knowledge production and expression to externalize, however crudely, what would otherwise remain internal to an animal? And what does language become when viewed through the lens of animal communication and behavior? These questions stretched over the coming years, uniting not just the Berlin experimental psychologists with the new animal psychologists but with a number of other thinkers whose training ranged from theology to occultism, law to philosophy, zoology to chemistry. Together, and with much irritation, the thorn and the side carried animal behavior and communication into the 20th-century modern sciences.

These were the epistemic conflicts which preceded and coincided with the mid-20th-century rise of ethology, the scientific study of animal behavior and communication, and biosemiotics, the study of signs and symbols in living organisms. Konrad Lorenz and Jakob von Uexküll remain the best-known figures in this narrative, but they were not the first nor, arguably,

the most inventive. What came before them and existed alongside them were questions which, by virtue of how and by whom they were asked, were not deemed “scientific.” In this history, what is “unscientific” reveals itself, more often than not, as holding open a space for animal complexity. Although the clear victor according to the history of psychology, the Berlin experimental psychologists did not solve animal psychology once and for all, as evidenced by the media public’s enduring attraction to New Animal Psychology. Frustrated and bored with their own answers, Stumpf and his colleagues publicly turned away from animal psychology, only to tinker privately with research on birdsong and dog barks. The speculative questions they buried in their endnotes were incapable of being tested through their methods—a quiet acknowledgment that experimental science could not answer, or even pose, all possible questions about animal behavior and communication.

While—or because of—remaining true to their mission, the new animal psychologists fared worse between their rise in 1904 and their new direction in 1919-20. Diverted and depleted upon losing the epistemic battle over the equine savant, New Animal Psychology needed a new *Wundertier* to rejuvenate its cause. Only once the Great War then posed its own set of challenges to the group’s activity did Clever Hans’ heir arrive on the scene, having spent many years before liaising with its most important members. In 1919, New Animal Psychology reassembled around the canine savant Rolf “der Mannheimer Hund” as well as his teacher, translator, biographer, researcher, and “m d r” [Mutter] Paula Moekel (**Figure 1**). As the founder of New Animal Psychology Karl Krall and Rolf corresponded from 1913 to 1919, with Krall adopting Rolf’s orthography and Rolf responding through Moekel’s hand, the stakes were not simply the post-Hans future of New Animal Psychology. In many ways, their interspecies communication system stood at the center of a project which harkened back to animal psychology’s beginning in 1840

and anticipated its “scientific” reformulation a century later. The New Animal Psychology practiced by this dog, woman, and ex-jeweler was dismissed as quackery by those with institutional power, Stumpf and colleagues among them; and yet, the questions underlying their approach made a number of seemingly disparate theories of animal behavior and communication cohere.

This is a dissertation about asking what separates the human from the animal, and whether what we call “language” is that wedge. This is a dissertation about using language to exceed language’s limits and imagine one’s way into an animal’s inner world. This is a dissertation about animal psychology. With its critical emphasis on rewriting the origin story of scientifically studying animal interiority, this dissertation examines the margins, foregrounding a priest ahead of and behind his time, an ex-jeweler who developed a cult-like following, a founding father who longed to be a founding father of something less reputable, a horse who bewildered scientists and writers alike, a dog who could and could not talk, a young woman who was visible yet voiceless, a researcher who trapped himself in the cage he built for animals, a folk-music specialist who wanted to hear birdsong on its own terms, and an invalid woman who spoke with her dog.

Much as the central figures here find that wanting to know the living animal before them results, again and again, in the animal’s unknowability, this project leans into the imaginative capacity of questions to reexamine epistemic relationality, particularly between humans and animals. As a result, this project reimagines the Germanophone discursive history of human versus animal language, a history which leaves open the following questions: What do different disciplinary perspectives have in common as they approach animal behavior and

communication? How do they account for the relationships between humans and their animal objects of study—a prerequisite of empirical, if not also experimental, study? How do “scientific” methods fold in “unscientific” methods or otherwise adopt “unscientific” questions without acknowledgement? And what of the many other figures in this history, figures who insist that the animal’s muteness and dumbness are not a stable scientific fact but the human’s own lack of imagination? If we oriented the history around their voices, what historical contingencies and power structures would be revealed in the process?

I therefore do not detail Johann Gottfried von Herder’s theory of human versus animal language in the 18th century,⁶ nor the 19th-century debate on animal (especially simian) language in response to evolutionary theory.⁷ Franz Kafka’s animal stories do not appear, apart from an unpublished fragment he penned while avoiding novel-writing.⁸ The Nobel Prize winner Maurice Maeterlinck’s best-known animal book, on bee life, is passed over for his mystical essay on speaking horses. Jakob von Uexküll’s concept of *Umwelt*,⁹ Karl von Frisch’s discovery of

⁶ For an especially perceptive recent analysis of Johann Gottfried von Herder’s *Abhandlung über die Ursprung der Sprache* from within critical animal studies, see Kári Driscoll, “Animals, Mimesis, and the Origin of Language,” *Recherches germaniques* 10 (2015): 173-94.

⁷ Gregory Radick’s *The Simian Tongue: The Long Debate about Animal Language* covers much geographical and disciplinary terrain and has deservedly become the key work on this subject (Chicago: University of Chicago Press, 2007).

⁸ For the biggest contributions in recent Kafka animal studies scholarship, see: Marc Lucht, Donna Yarri, eds., *Kafka’s Creatures: Animals, Hybrids, and other Fantastic Beings* (Lanham, MD: Lexington Books, 2010); Naama Harel, *Kafka’s Zoopoetics: Beyond the Human-Animal Barrier* (Ann Arbor: University of Michigan Press, 2020).

⁹ Jakob von Uexküll’s foundation of what we now call biosemiotics and his prescient form of critical animal studies has led to a boom in Uexküll scholarship. For Uexküll’s legacy in (bio)semiotics, see especially: Carlo Brentari, *Jakob von Uexküll: The Discovery of the Umwelt between Biosemiotics and Theoretical Biology* (Dordrecht: Springer, 2015); Kalevi Kull, “Jakob von Uexküll: An Introduction,” *Semiotica* 134, no.1 (2001): 1-59. For the uptake of Uexküll’s *Umwelt* in German studies, see especially: Brett Buchanan, *Onto-Ethologies: The Animal Environments of Uexküll, Heidegger, Merleau-Ponty, and Deleuze* (Albany: State University of New York Press, 2008); Inga Pollmann, *Cinematic Vitalism: Film Theory and the Question of Life* (Amsterdam: Amsterdam University Press, 2018).

honeybee language,¹⁰ and the contributions of that most famous scientist of animal behavior, Konrad Lorenz, are revealed as flourishing in already fertile soil, but no more.¹¹ Those figures famous in the history of science who do appear are reintroduced, with their forgotten and marginal texts showing vulnerable humans who cannot grasp the inner lives of animals. Charles Darwin conducts behavioral experiments on a female chimpanzee in the London Zoological Gardens, while Wilhelm Wundt rails against the spiritualists and considers what an experimental animal psychology could be, perhaps. Wundt's rival Carl Stumpf walks through Berlin's forests to find himself enraptured by birdsong, prompting his colleague Erich von Hornbostel's attempts to phonographically record his own birds. As we will see, animal psychology has had that effect on its human researchers: of searching and reaching and trying, of letting go, of knowing one can never know.

The history I trace here revels in the self-reflective work that can be done, and the knowledge structures that can be shaken, when one raises questions about living animals without expecting conclusive answers. In this regard, I situate my work within the scientific humanities, exemplified by Vincianne Despret's *What Would Animals Say If We Asked the Right Questions?* As Bruno Latour writes in the book's introduction, the scientific humanities argue, by virtue of their existence, that "to understand what animals have to say, all the resources of science *and* of the humanities have to be put to work."¹² For me, this means using one's disciplinary training to

¹⁰ See Tania Munz, *The Dancing Bees: Karl von Frisch and the Discovery of the Honeybee Language* (Chicago: University of Chicago Press, 2016).

¹¹ Richard W. Burkhardt, Jr.'s *Patterns of Behavior: Konrad Lorenz, Niko Tinbergen, and the Founding of Ethology* is the touchstone for late-20th-century history of ethology: (Chicago: University of Chicago Press, 2005). For Lorenz's epistemic practice of observation, see Juliane Scholz, "Duplicating Nature and Elements of Subjectivity in The Ethology of the Greylag Goose," *Isis* 112, no. 2 (2021): 326-34. Within the German-speaking world, Marcel Beyer's *Kaltenburg* presents a well-researched novelization of the ethologist's life and legacy (Frankfurt am Main: Suhrkamp, 2008).

¹² Vincianne Despret, *What Would Animals Say If We Asked the Right Questions?* translated by Brett Buchanan (Minneapolis: University of Minnesota Press, 2016), vii.

proliferate extra-disciplinary questions. *The question* is the central generic form I explore in this dissertation. Indeed, I find more epistemically in common between a short story by a philosopher of language and the endnotes of a scientific monograph than I do between texts of the same genre. Critically operating between literature and science (both of which are imaginative products), I therefore do not find *genre* or *field* more productive organizing categories than *questions* posed by humans thinking through the same quandaries. Disciplinary training as expressed in generic conventions, then, becomes a framework for determining which questions can and should—and cannot and should not—be asked about animal psychology. For this reason, I prioritize what I call *marginalia of doubt*: those questioning asides in texts which, by virtue of exceeding generic convention, clammer desperately for an outlet. In Freudian terms, marginalia of doubt signal a textual return of the repressed. The writing penned by scientists I spotlight here reveals itself as especially at risk of this textual return of the repressed, due to the experimental sciences’ aim of transforming natural phenomena into demonstrable facts. But truth—truth can be found not in the body of these scientists’ manuscripts, but in another kind of body: the handwringing of their endnotes and the screams of their recordings.¹³ What are handwringing and screaming if not anxious futility seeking bodily expression? I wager that within those moments of futility, captured on a page or in a wax cylinder, lie precious insights into the epistemic relations between humans and animals from the mid-19th to the early 20th century.¹⁴

¹³ Science studies is primed to reverse-engineer the construction of facts and articulate the difference between truth and fact. As Bruno Latour muses in his foreword to Despret’s *What Would Animals Say If We Asked the Right Questions?* “You are about to enter a new genre, that of scientific fables, by which I don’t mean science fiction or false stories about science but, on the contrary, true ways of understanding how difficult it is to figure out what animals are up to” (ibid.). For more on the construction of facts vis-à-vis nonhuman experimental objects in the German-speaking world, see Hans-Jörg Rheinberger, *An Epistemology of the Concrete: Twentieth-Century Histories of Life* (Durham, NC: Duke University Press, 2010).

¹⁴ Throughout this dissertation, I do not use the term “nonhuman animal” and its corollary “human animal.” Instead, I use the German-language terms (and their English translations) my historical figures built their animal epistemologies upon, in order to maintain a degree of historical and, yes, lingual fidelity. However, as I discuss

Animal psychology is the lens through which I bring to light the power relations at play in the construction of knowledge about animal ways of being, knowing, and speaking. For me, animal psychology is not an embarrassingly pseudoscientific endeavor lumping together pet psychics with pet therapists—not to mention those who believe they can speak telepathically with their dogs.¹⁵ Much like the Swiss priest who coined the term, I use “animal psychology” to denote a non-disciplinary-specific attempt to think, feel, imagine, and relate one’s way into interpreting a particular animal’s behavior and expression. Animal psychology appears as an object and ever-emerging field of study throughout the dissertation, but in its most basic form, animal psychology is a dynamic series of interspecies communicative acts. The human figures of this dissertation—whether trained experimental psychologists at the Berlin Institute for Psychology, ragtag members of New Animal Psychology, or writers of literature and philosophy—share a set of interrelated questions in the face of their animal interlocutors: Whom am I dealing with here? How can I ever know? And what does it all mean? These are the driving questions of animal psychology, with the methodologies, experimental apparatuses, education, and terminology differing across time and discipline.

Due to this dissertation’s critical positioning at the nexus of science studies and animal studies within German cultural history, I am highly skeptical of the following words as they

below, I am highly suspicious of “animal” and “human” as adaptable tools of political, epistemological, social, and psychological agendas. Each time I write either term, read them as if they were in quotation marks or questions.

¹⁵ As a result of its discursive classification as “pseudoscience” and “quackery,” animal psychology has been seldomly studied. With the exception of the Hans debates, animal psychology has been an object of historical research mainly for journalists who intend to reach a popular audience (see, for instance, Stephen Budiansky, *If A Lion Could Talk: Animal Intelligence and the Evolution of Consciousness* (New York: The Free Press, 1998)). Even those works published by academic presses are, as indicated by tone, positioned for general audiences, such as Jan Bondeson, *Amazing Dogs: A Cabinet of Canine Curiosities* (Ithaca, NY: Cornell University Press, 2011). Douglas Keith Candland’s *Feral Children and Clever Animals: Reflections on Human Nature* is the most notable exception to this trend, and it is the best-received and -known history of animal psychology to date (Oxford: Oxford University Press, 1993). In the German-speaking world, Britt von den Berg’s *Die ‘Neue Tierpsychologie’ und ihre wissenschaftliche Vertreter (von 1900 bis 1945)* introduces the figures and debates of early-20th-century animal psychology (Bristol: Tenea, 2008).

construct knowledge and knowledge relations: objective/objectivity, science/scientific, human, animal, nature/natural, primitive, civilized, language, speech, speaking, meaning/meaningful, expert/expertise, amateur, fact, logical. In this regard, I am influenced by the rhetorical deployment of the term “pseudoscience” as a means of distancing oneself and one’s form of knowledge production from another and often competing form, whether for political, ethical, epistemological, or historical reasons.¹⁶ The term “pseudoscience” draws into relief how the difference between what becomes “science” and what becomes “not-science” is not necessarily about who is “right” and who is “wrong;” on the contrary, this distinction is determined by complex alliances and power constellations.¹⁷ For science studies scholars, tracking what is discredited as “pseudoscience” lays bare how “science” is a historically constructed process in which binary categorization shores up particular power-cum-knowledge relations. Similarly, I view “human” and “animal” through the lens of how hierarchical knowledge relations are constructed, with the result that “language” is expelled from the realm of the empirical. “Language” is not a natural phenomenon waiting for just the right mechanism to divulge its secrets; “language,” and the ever-evolving definitions thereof, is a rhetorical tool deployed to position one species above all others in the face of natural phenomena which controvert that very positioning. Threatened by that which we call “the animal,” that which we call “the human” digs its heels deeper into “language.” For ease of reading throughout this dissertation, though, I have decided not to place quotation marks around these words. Nevertheless, I encourage you to trip over your inner articulation of these words, as if they were nestled in quotation marks (“language”) or framed as questions (language?). What is revealed when we approach language

¹⁶ Dirk Rupnow, et al., eds., *Pseudowissenschaft: Konzeptionen von Nichtwissenschaftlichkeit in der Wissenschaftsgeschichte*, suhrkamp taschenbuch wissenschaft (Frankfurt am Main: Suhrkamp, 2008), 8-9.

¹⁷ *Ibid.*, 7.

as a question asked by humankind in order to know itself? This is the dissertation's biggest question.

In Chapter 1, I push the accepted origin of animal psychology back to 1840, thereby reframing the fraught emergence of animal interiority as an object of scientific study. Darwin's *The Expression of the Emotions in Man and Animals* (1872), credited for laying the groundwork for animal behaviorism, finds its precursor in Friedrich August Carus' "Entwicklungsgeschichte (und Grade der Verwandtschaft) der Gefühle" in his seven-volume series *Psychologie* (1808-10). For Carus, describing animal behavior and communication in terms of a "Sprache der Tiere" allowed him to theorize the relationship between inner emotion and outward expression, and to begin articulating the difference between the human and the animal's psychological tools. In many ways, all the German philosopher was missing was the concept of evolution. Over three decades later, a Swiss priest named Peter Scheitlin took up Carus' exploration of species-specific embodied expression in his two-volume *Versuch einer vollständigen Thierseelenkunde* (1840). I mark Scheitlin's work as the first use of the terms *T(h)ierseelenkunde* and *T(h)ierpsychologie*. Scheitlin was the founder of animal psychology, an achievement for which he has received no credit due to his embrace of doubt—the antithesis of the empirical, increasingly experimental natural-scientific landscape into which he dispatched his work. In his *attempt* at a complete science of the animal soul, Scheitlin devised an anti-Cartesian method of observing living animals, one which venerated the animal's essential mystery and understood that one's language and historical period play an oversized role in one's epistemic relations with animals. He argued that each animal has its own language as expressed through its body, but that no human observer can truly know what that animal is saying. Curiosity was the key to Scheitlin's science of the

soul, and so was failure. Nearly half a decade later, Scheitlin's version of animal psychology got under Wilhelm Wundt's skin. The most famous psychologist of his day, Wundt was accustomed to success. In his 1885 essay collection for a popular audience, this father of experimental psychology set out to transform Scheitlin's animal soul science into an experimental science, and he did so through Darwin's behavioral experiments and zoo-based observations. By replacing the soul of *Thierseelenkunde* with the *psyche* of *Tierpsychologie*, and by lambasting Scheitlin's method in order to prop up his own modern method, Wundt plucked yet another feather for his cap: a founding father of modern animal psychology.

Chapter 1 is the science-historical soil onto which the Hans debates of Chapter 2 falls and grows, uncontrollably. In the summer of 1904, reports spread of a Berlin-based Orlov Trotter named Hans who could supposedly read, write, count, and answer trivia questions. The nation was riveted; within months, so, too, was the international media public. Whether or not Hans was an equine savant was more than an engrossing story. The stakes of the *Hansfrage* (as it was then called) for the researchers and the public were centuries old: what psychologically separated the human from the animal. Rather than foreground the two opposing camps in this battle, as most scholarship on Hans does, I spotlight playful, science- and language-critical writing composed in the midst of the Hans debates and a decade afterwards. Through these little-known works puzzling out the *Hansfrage*—by Austrian philosopher of language Fritz Mauthner, Belgian dramatist and poet Maurice Maeterlinck, and Bohemian fiction writer Franz Kafka—the varying interpretations of Hans' interspecies communication system come into full view. Whether they posited that the spiritualists' interpretation was right, or that no one was right, these writings allow me to enlarge the scope of what scholarship has commonly categorized as animal psychological discourse. The *Hansfrage*, as I show in this chapter, was a quintessentially modern

conundrum which eclipsed its implications for horse training and animal psychological experimentation. The *Hansfrage* pierced the heart of the *Sprachkrise*'s preoccupations: the impotence of human language, the animalization of the human, the link between spiritualist and technological communication, and the automation of mechanical reproducibility. I demonstrate here that the *Hansfrage* was therefore not merely a “wissenschaftliche Frage;” it was an interdisciplinary laboratory for testing out theories of communication beyond human perception and comprehension.

The limits of human perception vis-à-vis animal perception form the central tension of Chapter 3. Organized around a series of phonographic recordings of “Don der sprechende Hund” and his trainer, Martha Ebers, from 1910 to 1911, this chapter critiques mechanical objectivity's promise to extend human perception in extending human knowledge.¹⁸ The experimental psychologists from the Hans debates return, only to be confronted with more recalcitrant animals. Oskar Pfungst—who determined in 1904 that animal psychology can be explained by the faults of human psychology—barked with the talking dog. And Carl Stumpf, upon manually transcribing birdsong and *Volkmusik*, placed his hope for “non-subjective” listening in the Edison Home Phonograph. As Stumpf and his Berlin Phonogram Archive colleagues learned, one's delineation of “music” from “noise” from “speech” delineates the limits of one's imagination, as shaped by one's position in overlapping systems of power. Even when filtering sound through the most sophisticated audio technologies available, listening is an epistemic construct. And so, Stumpf's grand phonographic experiment testing the limits of objective recording remained beholden to the limits of human knowledge. Alas.

¹⁸ I take my understanding of mechanical objectivity from Lorraine Daston and Peter Galison's foundational book *Objectivity* (New York: Zone Books, 2007). More specifically, I see the project of mechanical objectivity as a fantasy of controlling nonhuman objects of study and a failed extension of human cognition by way of erasing the human's presence from the experimental apparatus.

By attempting to unmute Chapter 3's most silenced figure, Martha Ebers, and placing her alongside New Animal Psychology's postwar women, I posit in the conclusion that the limits of human knowledge might be enlarged through relationships with individual animals. After the Great War, the seven-year-old Society for Animal Psychology praised as its thought leaders a number of women. Foremost among them were Paula Moekel and Henny Kindermann, both of whom conducted animal psychological experiments on their dogs without calling them experiments. With Moekel as my focal point, I show how her protocols and resulting monographs on her dog Rolf allowed both human and animal to speak in the same voice. How, Moekel and Rolf ask us, might animal psychology be productively thought of as a site of translation? What might science be without an insistence on objectivity—and instead, with an insistence on interspecies subjectivity, one which embraces what the celebrated male scientists in this dissertation admit only in their marginalia of doubt: that knowledge production is, and will always be, the result of relationality?



Abb. 24. Wirkung eines hohen Tones auf Nachtschmetterlinge

Figure 2. “Abb. 24. Wirkung eines hohen Tones auf Nachtschmetterlinge,” in Jakob von Uexküll, *Streifzüge durch die Umwelten von Tieren und Menschen: Ein Bilderbuch unsichtbarer Welten* (Hamburg: Rowolt, 1956), 61.

Wer die Existenz subjektiver Wirklichkeiten leugnet, hat die Grundlagen seiner eigenen Umwelt nicht erkannt.

– Jakob von Uexküll, *Streifzüge durch die Umwelten von Tieren und Menschen* (1934)

Chapter 1
Wilhelm Wundt's Inheritance: The Animal Soul between Friedrich August Carus, Peter Scheitlin, and Charles Darwin
(1808-1885)

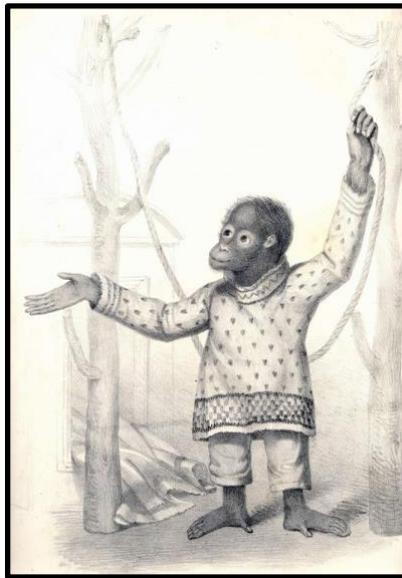


Figure 3. Zoological Society of London (ZSL), “Portrait of Jenny” (December 1837).

On March 28, 1838, Charles Darwin entered an orangutan’s cage. The infant Jenny was the first ape he, as well as most of his English contemporaries, had ever seen. Outfitted in a dress and trained in proper English spoon-handling and tea-drinking for her presentation to the public and royalty, she was, in fact, the very first ape shown at the London Zoological Gardens (**Figure 3**).¹⁹ Large, enthusiastic crowds marked the occasion by visiting her in the Giraffe House, a

¹⁹ The first ape in London, a chimpanzee the Zoo named Tommy, arrived in 1835. Tommy was also dressed in human clothes (a sailor’s outfit, no less) and had also been taught to use a spoon. Jenny was displayed at the London Zoological Gardens from November 25, 1837 to May 7, 1838, having first been presented to a member of the royal family. Carl Zimmer, “Editor’s Introduction,” *The Descent of Man: The Concise Edition* (New York: PLUME,

wooden building her keepers specially heated so she would not fall ill in the London cold. Rather than gather with the masses, Darwin, a gentleman who had donated many of his specimens, was allowed to enter. He did not intend to simply gawk at the ways the ape differed from himself, nor the ways the ape seemed similar to himself (a disturbing experience for many contemporaries, including Queen Victoria).²⁰ Rather, Darwin wanted to encounter Jenny as a living, embodied fellow creature: an individual creature who existed in the real world, not just in the world of myths and stories.²¹ In a letter to his sister Susan four days after first observing Jenny at the London Zoological Gardens, he singled out one particular series of interactions between orangutan and keeper:

“I also saw the Ourang-outang in great perfection: the keeper showed her an apple, but would not give it her, whereupon she threw herself on her back, kicked & cried, precisely like a naughty child.— She then looked very sulky & after two or three fits of passion, the keeper said, ‘Jenny if you will stop bawling & be a good girl, I will give you the apple.[’]— She certainly understood every word of this, &, though like a child, she had great work to stop whining, she at last succeeded, & then got the apple, with which she jumped into an arm chair & began eating it, with the most contented countenance imaginable.”²²

Darwin’s early observations of Jenny’s behavior suggest he was grappling with the following questions: What tensions arise when a naturalist—one trained to collect, prepare, and dissect animal bodies—finds himself using a vocabulary of human emotion to explore a new object of study: animal expression? What *is* crying when studied across species? Sulkiness?

2007), 1; “Artefact of the Month: Portrait of Jenny,” Zoological Society of London, last modified June 1, 2008, accessed September 19, 2020, <https://www.zsl.org/blogs/artefact-of-the-month/portrait-of-jenny>.

²⁰ On May 27, 1842, Queen Victoria visited the second Jenny (named after her dead predecessor, as all apes were at the time). Later that night, Queen Victoria wrote in her diary that she found the orangutan “frightful, and painfully and disagreeably human” (“Artefact of the Month: Portrait of Jenny”).

²¹ Mary Sanders Pollock, *Storytelling Apes: Primatology Narratives Past and Future* (University Park: The Pennsylvania State University Press, 2015).

²² “Letter no. 407” (To Susan Darwin [1 April 1838]), Darwin Correspondence Project, <https://www.darwinproject.ac.uk/letter/DCP-LETT-407.xml>.

Despair? For that matter, how can one know what the orangutan and human child are thinking and feeling if the only indicator is a sort of nonverbal, embodied language? But most importantly, if an infant orangutan cries “like a [human] child,” how might this physiological manifestation of a psychological state reveal fundamental similarities between orangutan and human in the unity of body and mind? The difficulty Jenny posed to Darwin, then, was nothing less than the inadequacy of extant approaches to studying living animals. Darwin wanted to describe Jenny’s behavior without slipping into the natural-philosophical framework of human versus animal soul and without teetering into the automatism which viewed animal behavior as merely instinctual response. In devising methods to begin answering questions whose answers lay somewhere between the animal as ensouled being and the animal as machine, Darwin visited Jenny twice more in 1838. On September 2, 1838, he wrote a letter detailing the experiments he performed on Jenny along with her reactions. When he showed her food without giving it to her, thereby attempting to “plague her,” Jenny “[t]ried to strike [him] & showed teeth.”²³ The results of this behavioral experiment on Jenny and others—recorded in his letter of September 2, 1838 and theoretically condensed in his notebooks—later found their way, almost word for word, into Darwin’s 1871 *The Descent of Man* but especially his 1872 *The Expression of the Emotions in Man and Animals*.²⁴ His Jenny behavioral experiments comprised a beginning—but of what, exactly, he did not live to find out.

²³ Charles Darwin, “CUL-DAR191.1-2” ([Orang utans at] Zoological Gardens) (September 2, 1838), ed. John van Wyhe, *The Complete Works of Charles Darwin Online*, <https://www.darwin-online.org.uk/>.

²⁴ Several vexed apes appear in the *Expressions* chapter “Special Expressions of Animals.” It is important to note that *Expression*’s litany of animal behavioral experiments was, in fact, the culmination of twenty years of active research on animal expression, not just on apes like Jenny but on other animals like weaver birds, thanks to the cooperation of the Zoo’s administrators (Charles N. Swisher, “Charles Darwin on the Origins of Behavior,” *Bulletin of the History of Medicine* 41, no. 1 (January-February 1967): 24-43).

This chapter concerns the 19th-century origins of studying animal behavior, which is commonly traced back to Darwin's experiments on Jenny and other animals at the London Zoological Gardens with the aim of researching mental evolutionism.²⁵ I complicate this origin story by resituating it within the 19th-century history of psychology in the German-speaking world and, more specifically, the slow, contentious rise of animal psychology as a viable object and mode of scientific study. Oriented in the human soul's integral role in the history of psychology, I turn my attention to the animal soul by providing an archaeology of the German-language term *die T(h)ierseele* within the history of animal psychology. In so doing, this chapter unearths a cluster of German-language natural philosophers and their unacknowledged, surprisingly advanced theorizations of animals' inner mental states and operations, sensory capacities, and patterns of behavior several decades before or at the same time as Darwin. The main contention of this chapter is that *die T(h)ierseele* functioned in much the same way as Darwin's "expression of emotions": as a conceptual tool articulating the psychical similarities between humans and animals and, by analogical extension, the basis for a scientific study of animal psychology. Before (and even after) Darwin, however, the ensouled animal was a controversial—indeed, laughable—candidate for study outside of the dissection room and the philosophical monograph. By tracking the shift from the "animal soul" to the "animal expression of emotions" over the course of the 19th century, I draw into relief animal psychology's tenuous position as the positivist, experimental natural sciences gradually dethroned natural philosophy.

This mid-century paradigm shift is the point from which my inquiry unfolds, both backward and forward in time. I maintain that this unique moment—between the "soul" and the

²⁵ See especially Richard W. Burkhardt, Jr., "Darwin on Animal Behavior and Evolution," in *The Darwinian Heritage*, ed. David Kohn (Princeton: Princeton University Press, 2014). Although outdated, Robert Boakes' *From Darwin to Behaviourism: Psychology and the Minds of Animals* provides the best entry point into Darwin's legacy as it pertains to animal behaviorism (Cambridge: Cambridge University Press, 1984).

“mind,” between idealist speculation and positivist experimentation, between psychology as training for the medical, legal, and theological professions and psychology as an institutionalized profession—gave rise to a wholly new way of thinking about animals in the German-speaking world, one which recognized animal expression as an outward manifestation of animal soul. Through the Swiss philosopher-theologian-naturalist Peter Scheitlin’s 1840 *Thierseelenkunde*, I demonstrate how this transitory moment gave birth to the methodologically hybrid discipline of animal psychology, 18 years before and an ocean apart from animal psychology’s previous birthdate and -place.²⁶ To be sure, this 19th-century animal psychology was by no means as unified a school of thought as its 20th-century successor, New Animal Psychology. Nevertheless, I group together 19th-century psychologically framed theorizations of animal expression under “animal psychology” in order to proffer the key insights and methodologies of an emerging strain of animal-focused thought as it intersected with a phenomenon already well studied: experimental psychology’s emergence as an autonomous discipline and profession at the end of the 19th century.

The surprisingly long-lived products of this epistemic transition weave together this chapter’s figures, questions, and paradoxes. Within the scope of the dissertation, my objective in this chapter is to underline the importance of 19th-century animal psychology for early-20th-century formulations of animal behavior and communication. While I aim here to map out the

²⁶ Scholars cannot agree when animal psychology began. David Friedrich Weinland’s lecture on comparative animal psychology in 1858 is the most common starting point in the English-speaking world. In his May 1858 address to the American Association for the Advancement of Science, entitled “A Method of Comparative Animal Psychology,” Weinland defined animal psychology as “a systematic knowledge of the psychical phenomena observed in the different species of animals” (256). In the German-speaking world, Wilhelm Wundt named Reimarus founder of modern animal psychology, thanks to his conception of instinct in *Allgemeine Betrachtungen über die Thiere, hauptsächlich über ihre Kunsttriebe* (1773) (“Neunundzwanzigste Vorlesung,” *Vorlesungen über die Menschen- und Thierseele* (Leipzig: L. Voss, 1863), 490). While Reimarus’ *Betrachtung* was sensational in his time, I deny him this title for one main reason: Reimarus’ study of animal souls was stuck in the paradigm of instinct and drive as the main drivers of animal behavior.

lines of discussion and modes of knowledge production which unfurl across the rest of the dissertation, I do not merely trace a prehistory of Wundtian “new” psychology, New Animal Psychology, or ethology. Rather, I assert that the animal’s place in psychology is a history in its own right and that it began well before Wilhelm Wundt was born—and certainly before the central figures of Chapter 3, Karl Krall and Oskar Pfungst, were born. As I demonstrate by recovering the intellectual lineage of Friedrich August Carus (1770-1807), Peter Scheitlin (1779-1848), and Wilhelm Wundt (1832-1920), 19th-century German-language animal psychology was supplanted and deeply influenced by what one could call an “animal experimental psychology” that came to fruition in the early 20th century. With Scheitlin as the missing link in this history of animal psychology, I center my interrogation on his forgotten yet foundational contribution to the study of animal behavior and communication. In doing so, I restore Scheitlin to his place in the history of psychology and animal studies while tracing the 19th-century reverberations of the term he coined: *Thierseelenkunde* or, as Wundt disdainfully called it at century’s end, *Thierpsychologie*.

**PART I: “Die Sprache des Thieres ist Sprache der Empfindung”:
Physical Experience and Psychological Expression in Friedrich August Carus’ Psychology**

Not to be mistaken for Carl Gustav Carus, the philosopher and self-identified psychologist Friedrich August Carus singled out his own epoch for its dynamic—not mechanical, not atomic—conception of the relationship between “Materie und Geist.”²⁷ An

²⁷ While I refer to Friedrich August Carus throughout this paper as “Carus,” Friedrich August Carus is not to be confused with Carl Gustav Carus (1879-1869), a physiologist, natural philosopher, Caspar David Friedrich-trained landscape painter, and friend of Goethe. In 1866, Carl Gustav Carus introduced the first fully theorized comparative psychology to the German-speaking world with *Vergleichende Psychologie Oder Geschichte Der Seele in Der Reihenfolge Der Thierwelt* (Vienna: Wilhelm Braumüller, 1866). I focus here on Friedrich August, as Peter Scheitlin did not read Carl Gustav (he had been dead 18 years by the time *Comparative Psychology* was published) and in

early, enthusiastic reader of Friedrich Schelling, Carus' rejection of mind-body dualism was inspired by Schelling's own turn from Cartesian mechanism toward a more harmonious, Platonic understanding of immaterial soul and material nature as two aspects of one cohesive system.²⁸ For Schelling (paraphrasing Plato) in the 18th century, the study of the *psyche*—that which we call the “*original principle of movement, arche kineseos*”—entailed approaching matter as inherently ensouled.²⁹ For Carus at the turn of the 19th century, acknowledging the immateriality of materiality meant that a new vocabulary for describing the harmony between soul and body was needed, a new way of representing “die Natur des Menschen, Körper–Seele” in all its complexity. Rather than recapitulate a “reine Seelenlehre,” his “Wissenschaft des innern Menschen (*in abstracto*)” sought to reconceptualize human consciousness as it arose from the parallel operations of soul and body.³⁰ As befitted his adoption of Schelling, Carus posited human (self-)consciousness not as a stable, static phenomenon, but as a dynamic natural historical phenomenon which, over the span of centuries, came to take its present form.³¹ His psychology was, in effect, the study of the evolution of the individual human *psyche*.

This notion of the gradual development of the human consciousness took its most surprising, even revolutionary form in his work on expression and the senses in *Psychologie* (1808), the first volume in his seven-volume, posthumously published series *Psychologie* (1808-

order to draw a straight line of influence from him to Peter Scheitlin to Wilhelm Wundt. Friedrich August Carus, *Psychologie* I (Leipzig: Johann Ambrosius Barth and Paul Gotthelf Kummer, 1808), 20, 18.

²⁸ Ferdinand Hand, “Vorrede,” in Carus, *Psychologie* I, viii; Robert J. Richards, *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe* (Chicago: University of Chicago Press, 2002), 310; Sarah M. Pourciau, *The Writing of Spirit: Soul, System, and the Roots of Language Science* (New York: Fordham University Press, 2017), 40-1.

²⁹ Pourciau points out that Schelling's paraphrasing of Plato in *Timaeus* is a reframing of the following question Plato posed in *Laws*: “Do you mean the entity which we call soul is precisely that which is defined by the expression ‘self-generating motion?’” (ibid., 40, n62).

³⁰ Carus, *Psychologie*, 21, 22-3.

³¹ Ibid., 4.

10).³² Whereas Johann Gottfried von Herder posited that the soul unified the senses, thereby enabling the human to become a listening, noting, reflecting creature naturally formed for language, Carus studied the interaction of body and soul by differentiating spirit, drive, and emotion (with his theories thereof constituting the three large sections of *Psychologie*).³³ The senses were not gathered in the *Seele*, as Herder would have it, but in the *Geist*. What's more: the senses were not one "Sinneskraft," but several sensory faculties with respective sensory spheres (124). In the second paragraph of the section "Theorie des Geistes" (124-292), Carus compared this disintegration of a unified sensorium into isolated sensory faculties to species distinguishing themselves along a scale, from the insect to higher animal and the human child to the old man (124). Crucially, Carus' suggestion of a great scale on which these beings and their senses could be mapped was rooted in a two-sentence origin story related directly before this statement. Long ago, an organism became an animal by detaching itself from the ground. As it moved, this organism developed senses in order to orient itself in space; as it sensed, this organism developed a form of subjectivity: "Das Sinnen vertritt daher gleichsam die Stelle des Einwurzeln oder des örtlichen Beharrens,—es erscheint als an Anschliessen des Subjects an das Reale" (124). This subjectivity certainly did not derive from the operations of *Trieb*, possessed by all lifeforms and characterized as "ein Fortdrängen von innen aus" connecting individual to sex and sex to species (293). Instead, this subjectivity emanated from the gradual orientation of the organism in its environment via the development of an embodied, yet simultaneously interior medium. At the

³² The year following F. A. Carus' death in 1807, his student Ferdinand Gotthelf Hand (1786-1851) compiled his unpublished papers on psychology into 7 volumes (1808-10): I: *Psychologie* (1808); II: *Psychologie. Specialpsychologie* (1808); III: *Geschichte der Psychologie* (1808); IV: *Ideen zur Geschichte der Philosophie* (1809); V: *Psychologie der Hebräer* (1809); VI: *Ideen zur Geschichte der Menschheit* (1809); VII: *Moralphilosophie und Religionsphilosophie* (1810).

³³ Johann Gottfried Herder, *Abhandlung über den Ursprung der Sprache: Text, Materialien, Kommentar* (Munich: Carl Hanser, 1978).

moment an inner world emerged from an outer world, the inner world was threaded together with the outer world. The origin of movement became, for Carus, the origin of expression: “In aller Bewegung liegt der Ausdruck des Thätigseyns der Natur; die intensive Bewegung als der reine Ausdruck des Thätigseyns ist daher die reine Innerlichkeit der Natur” (125). If an organism was alive and moved, it expressed. According to this rubric, insect, animal, and human alike possessed a form of interiority and the psychologist could observe that interiority through their movements.

But was not human interiority vastly different from animal interiority—and undoubtedly, insect interiority? How did their psychical tools ostensibly vary so widely if they shared the same origin of expression? Carus thus had to account for the difference in expression between a speaking human and a wriggling worm, and he did so through what he called “sinnen lernen”:

“Der Mensch muß sinnen lernen, wodurch er auch mehr den Täuschungen der Sinne (durch sein Phantasiren, seine Leidenschaften, Trugschlüsse) ausgesetzt ist, als das Thier. Dennoch kann er auch in dem Sinnenkreise Würde haben, auch als empfindendes Wesen schon Geist seyn,—wenn er Freiheit erringt. Die oft ungläubliche Verfeinerung einzelner Sinne in den Menschen, auch in kranken, macht eben das Menschliche aus” (137).

It was the *Geist*'s housing of the disparate sensory faculties which gave rise to imagination, fantasy, reflection, reason, memory, and language: capacities which ennobled yet deceived the human.³⁴ According to Carus, the human realized his humanness through a process of freeing and thereby rarifying the individual senses—and this, he explained, occurred over the course of childhood (137). During this phase of “sinnen lernen,” a human child learned to see with his “Geist, nicht das Organ” and to become a creature more attuned to spiritual recognition than physical sensation (129). Rather than remain blinded by sensory impressions like the animal

³⁴ The psychical phenomena Carus includes under the heading of “Theorie des Geistes” are (in his spelling) *Sinn*, *Einbildungskraft*, *Zurückrufen*, *Phantasie*, *Gedächtnis*, *Vergessen*, *Verstand*, *Urteilkraft*, *Vernunft*, *Wiz*, *Kopf*, *Scharfsinn*, *Tiefsinn*, *Genie*, *Sprache*, and *Ahnungsvermögen*.

(136), learning to perceive through the *Geist* widened the human child's sensory sphere, ultimately enabling him to "sinnen mit Bewußtseyn" (137). This capacity for consciousness was the human's alone, "denn sein Sinnesvermögen ist nicht sogleich Empfindungskraft" (137). The animal, on the other hand, possessed neither the human's distinguishing "entsinnende Geist" nor his psychical tools for dampening sensation (136-7). Its senses and movement dominated by necessity, the animal lived entirely in the outside world (133). And yet, what the human and the animal shared physically—embodied sensation—revealed the possibility for their psychical commonality. Indeed, while Carus' delineation of human from animal may seem absolute, the very tool he used to draw the border left open a gap for the higher animal, especially, to cross over into the spiritual realm of the human. If a human child and an animal were both blinded by sensation, could they not both learn to see with a clear-eyed spirit?

With his theory of the spirit postulating that the difference between human and animal was functionally a matter of learning to hone certain perceptive capacities, Carus' adjoining theory of emotions took the psychologist into the naturalist's territory. "Theorie des Gefühls" (364-518) articulated as its driving set of questions what constituted human versus animal feeling: "Worin besteht *das wahre, wirkliche Fühlen als lebendiger Zustand* erwogen? Und worin namentlich das *Menschliche*? Erst wenn dies entschieden ist, können wir entscheiden, wiefern Fühlen eine bloß menschliche oder zugleich thierische Thätigkeit sey und nicht nur ob sie im Thiere erfolge, sondern auch ob für das Thier?" (365). Leaving feeling to the side, Carus then considered emotion: "wie drückt sich das Gefühl aus, wie *verräth* es sich?" (366). Through his formulation of emotional expression as a betrayal, Carus implied that the human and the animal collide in the very expressing or not expressing of emotion. The animal instinctually expresses desire or the lack thereof, but for the human "[d]ie Vorstellung gibt uns erst das

Gefühl; Fühlen hingegen geht allem Vorstellen vorher” (364). In other words, Carus believed that human cogitation mediates and thereby transforms the animalistic reflex of feeling—that which unites all living beings and that which precedes cogitation—into the anthropic reflection of emotion, which the human then expresses in language.³⁵

Having set apart the human through his special mediating powers, as did Herder, Carus identified what the human and even the plant have in common physically which manifests psychically.³⁶ Every being feels, including the plant, as every being is subject to “ein allgemeines Grundgefühl, mit verschiedener Form,” by which he meant natural processes like magnetism, galvanism, and electricity (388). “[A]m dunkelsten und dämmernd,” the plant evidences a sensitivity which is indistinguishable from its drives (388). The animal, also lacking spirit, can still only express sensory-based feelings (389). In this regard, Carus posited that an animal’s vocal emissions evidenced that animal’s capacity for emotive sophistication as it arose from its developmental sophistication:

“Das niedere Thier, wie fliegende Insecten, geben Töne von sich, die ein dumpfes Gefühl verrathen. Ihnen muß das Gefühl abgezwungen oder aufgedrungen werden. Die höhern, vier-füssigen haben stärkere Gefühle, Affecten und schreien. Die Vögel besitzen noch leisere Gefühle; daher ihr klagender oder jubelnder Gesang. Obgleich aber die Thierheit fühlt (während die Pflanze nur Reiz, nicht Sinn und Sensibilität, sondern nur Irribilität hat), so fühlt sie doch anders als der Mensch, so hat sie doch nicht das Gefühl, weder in ihrem Geiste, noch in ihrer Gewalt” (388-9).

In Carus’ emotive classification system, the connection between soul and body as it informs an organism’s level of spirit functions as the basis for emotion and, in turn, expression. The plant is

³⁵ The transformation of *Fühlen* into *Gefühl* is, at its most basic, a human process of transforming “das Unmittelbare [...] zu dem Mittelbaren der Vorstellungen” (279). I am quoting here from the final section of “Theorie des Geistes”: “Bezeichnungsvermögen—Sprache” (274-83), in which Carus explicitly ties together his conceptualization of spirit by homing in on language’s role in mediating sensations into expressions.

³⁶ Johann Gottfried Herder, “Das sonderbare Mittel zur Bildung der Menschen ist Sprache,” *Ideen zur Philosophie der Geschichte der Menschheit* (Part II, Book 9) in *Herders sämtliche Werke* vol. 13, ed. Bernhard Suphan (Hildesheim: Georg Olms, 1967).

the least developed of all beings, as it can only be irritated. Higher up the scale are the lower animals, whose dull tonal expressions point to the dullness of their baseline emotive faculties—they must be forced to emote. The higher animals (those with four feet, apparently) can scream due to their “stärkere Gefühle.” A favorite of the Romantics, birdsong evidences the “leisere Gefühle” of the bird’s two emotive poles: plaintiveness or joyfulness.

It is important to note here that Carus’ theory of emotional expression was a distinctly aural one. An adoption of Herder which Peter Scheitlin also later adopted, the aural as a privileged indicator of soul begs the question: Does an organism become human at a particular (emotive) pitch? No, decided Carus: the human occupies a completely different articulatory category. The human alone possesses *Gefühl* and *Geist* and can control them, and this control of *Gefühl* and *Geist* manifests in language which, in its mutually reinforcing relationship with reason, gradually increases the human’s level of *Bildung* (281-2). According to Carus, the human distinguishes himself from even the highest animal by being subjected to the bodily pain of living (*Fühlen*) but expressing these experiences in a way that revealed—to the 19th-century psychologist, at least—individuated interiority (*Geist* as expressed in *Gefühl*). Echoing Herder’s theory that the “wilde, unartikulierte Laute” of pain reveal man and animal’s shared “Sprache der Empfindung,” Carus stated that “[d]ie Sprache des Thieres ist Sprache der Empfindung und zeigt sich zuerst in der Gebärde, dann im Laute” (275).³⁷ In this way, Carus disqualified bodily expression from the category of language: bodily expression is an instinctual, primitive response to sensation. Indeed, even animal vocalizations are merely body language. Just as the animal cannot control its drives, the animal cannot control its utterances, producing a string of sounds rather than thoughtful language (276-7).

³⁷ Herder, *Abhandlung über den Ursprung der Sprache*, 9, 10.

Within this tautological mode of differentiating human language from animal sound, humans make human sounds and animals make animal sounds. And what counts in Carus' psychology as the human subject's *Gefühl* versus the animal's object-oriented *Fühlen* is, in effect, what the human observer perceives as human sounds. The plant cannot make sounds audible to the human ear, therefore it is developmentally primitive; the lower animal can only make sounds the human can perceive as dull, therefore it is developmentally dull; the bird sings, in human emotive terms, plaintively and jubilantly, therefore it is correspondingly ranked on the developmental scale; the higher animal can raise its pitch and communicate its pain in such a way that a human listener can recognize a scream, therefore it is developmentally closest to the human; the human can speak, therefore the human is the most developed organism. According to this rubric, a parrot's articulation of human words can only be called "Geplapper"—not a parrot language on par with human language (276). And those who considered animals to have souls and reason and—heaven forbid!—to speak were nothing less than "unpsychologische Philosophen" (276).³⁸

While propped up by teleological, anthropocentric logic, Carus' theorization of an organism's vocal expressions vis-à-vis its capacity for emotion was nonetheless significant within the history of animal psychology, moving the nascent field forward by looking backwards. Carus, like his contemporaries, sought a return to non-mechanistic forms of ordering the living world in order to explain the activities of nature without recourse to Newton's mechanical causation.³⁹ While Schelling was reading Plato to understand the soul, Carus was

³⁸ In an especially aggressive footnote, Carus calls out Gottfried Immanuel Wenzel's translations of animal language in his *Neuen auf Vernunft und Erfahrung gegründeten Entdeckungen über die Sprache der Thiere* (Vienna: Anton Doll, 1800). This is the first instance in the course of the dissertation in which pseudoscience is invoked.

³⁹ Richards, *The Romantic Conception of Life*, 310.

reading Aristotle to understand soulful expression. Aristotle and his disciples held that all living forms were vested with a special animating principle called *psyche* (or soul) and that the living world could be ordered according to these animating principles. The vegetative soul of plant life was the most basic, and each plant species possessed a different kind of vegetative soul. Animals possessed a different soul altogether from plants since they could feel—namely, the sensitive soul. And human beings, possessing both the vegetative soul and the sensitive soul, also possessed the highest order of soul, the rational soul, giving them the capacity for cogitation. In “Theorie des Gefühls,” the second section of Part I, Carus engaged in what could be called applied Aristotelian-Herderian psychology. With Aristotle’s hierarchy of animating principles as his point of departure, Carus deduced that a living being’s expressive capacity betrays its psychological sophistication, which the psychologist could order along a scale. The importance of this move is not just that Carus combined Aristotle’s psychical hierarchy with Herder’s privileging of orality in offering a new approach to the anthropological distinction. While stating his intervention in turn-of-the-19th-century psychology, Carus effectively embraced expression as a legitimate object of inquiry and suggested a method for its comparative study.⁴⁰

Crucially, this method combined the tools of ancient natural history *and* psychology to demonstrate the usefulness of species-specific modes of expression as a tool for contemporaneous natural history *and* psychology. To be sure, natural history was not far from Carus’ mind as he wrote about animals in *Psychologie*, most notably in his list of “Vorsichtsregel” for observing animals (131). The human observer, he wrote, should not prematurely attribute to the animal his human tools and perceptions (131). To do so would

⁴⁰ Recall with irony that the other, more famous Carus, Carl Gustav Carus, is credited with introducing the first fully theorized comparative psychology to the German-speaking world with his *Vergleichende Psychologie oder Geschichte der Seele in der Reihenfolge der Thierwelt* almost sixty years after Carl Gustav.

muddle the fundamental differences upon which a psychological study of sensory perception rested (132). By way of illustrating what was, in essence, a principle of non-anthropomorphism, he called upon the example of a mole, an animal that may be blind but is nonetheless gifted with its own version of eyes (131). In this stirring, albeit brief moment, it is not hard to imagine Carus bending down over a hole and coming face-to-face with a creature that, while unable to see the psychologist observing him, can nonetheless *see* him. What is this if not a gesture towards a new form of natural history, one which tries to see living animals seeing living humans?

Carus has ultimately not received due recognition for his contributions to human psychology, to say nothing of his contributions to animal psychology and behaviorism. But with Darwin's experiments orienting one in the history of animal behaviorism, Carus' trailblazing work on the question of animal expression becomes especially clear. Tucked within "Theorie des Gefühls" is an eight-page section entitled "Entwicklungsgeschichte (und Grade der Verwandtschaft) der Gefühle" (388-95), a theorization of human versus animal emotional expression which beat *The Expression of the Emotions in Man and Animals* to its titular object of study by approximately 70 years. Similar to Darwin's *Expression*, Carus' "Entwicklungsgeschichte" contained within it the germ for a comparative psychology wherein the human and the animal both express their inner states through body language, the grammar of which was muscle movement, facial (especially eye) expression, and gesticulation.⁴¹ But as opposed to Darwin in the early 1870s, who identified in humans' and animals' bodily expressions a shared emotional response system (**Figure 4**), Carus remained ambivalent about

⁴¹ "Es kündigt sich das wahre, reine Gefühl als (1) ein *erhöhtes, gesteigertes Leben* an,—zunächst in einer grössern Beweglichkeit erst einzelner Muskeln, dann namentlich des Gesichts, insbesondere des Blicks, endlich der ganzen Gebehrdung. Das wahre innerlichlebende Gefühl kommt übrigens nie in einer übermässigen Aeusserung, vielmehr als kurz und gemessen vor. Der Gang drückt jene innere Bewegung aus; er wird selbst *ausdrucksvoller, ja seelenvoller*" (Carus, *Psychologie*, 366, emphases in original).

mankind's inner animality, largely because he did not have evolution's conceptual tool of common ancestry. On the one hand, Carus noted that humans express themselves involuntarily



Figure 4. Left: “Cat terrified at a dog. From life, by Mr Wood,” in Charles Darwin, *The Expression of the Emotions in Man and Animals*, 3rd ed. (Oxford: Oxford University Press, 1998), 127. Right: “Terror. From a photograph by Dr Duchenne,” in *ibid.*, 301. Composite made by Darwin.⁴²

through their bodies and, on the other, he maintained that humans and animals possess fundamentally different psychological tools as manifested outwardly. Although the human body expresses itself of its own accord in a “zuckend, wenn auch nicht immer kramphaft” manner (367), the human is still in control of his expression, his *Geist*; conversely, the animal is a creature of embodied reflex and instinct (389). When viewed through Darwinian hindsight, a more subversive reading of Carus’ “Entwicklungsgeschichte” reveals itself as hiding in plain sight: animal expression can be legible to the human observer because there is fundamental

⁴² For more information on how Darwin used photography as evidence, in recognition that “expression [was] a nonverbal, solely visual phenomenon,” and on Darwin’s *Expression* within the history of interpreting human feelings, see Janet Browne, “Darwin and the Expression of the Emotions,” in *The Darwinian Heritage*, ed. David Kohn (Princeton: Princeton University Press, 2014), 325 (footnote 11).

similarity in human and animal expression and, thus, a fundamental similarity in human and animal psychology.

**PART II: “Jedes Thier hat eine Sprache”:
Animal Expression in Peter Scheitlin’s Complete Science of the Animal Soul**

Over thirty years after Carus’ *Psychologie* was published, a respected priest and professor of philosophy and natural history in St. Gallen, Switzerland was significantly more prepared to arrive at this conclusion. At the same time Darwin was conducting his experiments on Jenny, Peter Scheitlin (**Figure 5**) was compiling the first work of animal psychology, with profound—albeit forgotten—implications for the course of the animal experimental sciences. Modelled on Carus’ *Geschichte der Psychologie* (1808) while heavily extracting from *Psychologie*’s animal sections, Scheitlin’s *Versuch einer vollständigen Thierseelenkunde* (1840) had two objectives.⁴³ *Versuch einer vollständigen Thierseelenkunde* would be the first work to compile “die Geschichte der Thierpsychologie bis in die neuesten Zeiten” (Volume I) and to present “die Bearbeitung der vielen Fähigkeiten der Thierseelen und die Berücksichtigung aller Verhältnisse der Thiere” (Volume II) (I: iv). Rather than approach animals as “belebte Maschinen” made of discrete fleshy parts (I: 2), Scheitlin’s science of the animal soul oriented itself around observing various species, not dissecting their (dead or alive) bodies and not taxonomizing their corpses. The behavior of living animals—their expressions, utterances, reactions, movements—lay at the

⁴³ Scheitlin designated Carus’ *Geschichte der Psychologie* as his “Leitfaden” (*Versuch einer vollständigen Thierseelenkunde* (Stuttgart: J. G. Cotta, 1840), I: iv). But even more than that: *Geschichte der Psychologie* was the multitiered system of thought that Scheitlin sought to transfer to the question of the animal soul, from the conceptual level of terminology all the way up to the aesthetic, rhetorical level of its self-presentation as a work of history. Based on his emulation of this “erster Meißter in der Psychologie der Menschen” (I: 255), Scheitlin must have envisioned himself as following in Carus’ footsteps, extending the path of his predecessor into uncharted, animal territory.

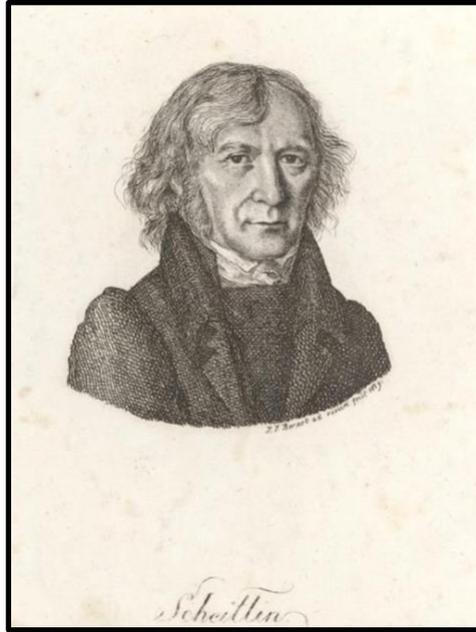


Figure 5. J. J. Bernet, Scheitlin, “Peter Scheitlin (1779-1848): Pädagoge, Theologe” (1829), Staatsarchiv St. Gallen, BMB 121.

heart of this empathetic science, the most basic epistemological assumption of which was that expression indicated soul. For surely, noted Scheitlin in the introduction’s second sentence, the first humans had viewed “die Handlungen auch dieser ihrer Mitgeschöpfe Aueßerungen einer Seele” such that “in dem Grade, in welchem sie sich selbst eine Seele beilegten, werden sie sich gerezeit gefühlt haben, auch ihnen eine beizulegen” (I: 1). For Scheitlin, *Seele*, not *Geist*, was the operative term, and he contended that studying the expressions of the animal soul would crack open a series of question posed for centuries: Does the animal have the same soul as the human, albeit a different kind or a different degree thereof? Or does the animal have a soul entirely its own (I: 1-2)? Taking up the mantle from Carus, Scheitlin urged his contemporaries to rethink the divorce of soul and body, as well as mental capacity and materiality, as a complicated, complementary union. After all, thinking of soul and body as opposites spelled the end of

questioning.⁴⁴ What if, for all beings, “der Körper also sichtbare Seele, die Seele unsichtbarer Körper [wäre]” (I: 14)? How is one to study an animal’s soul in relation to its body when, for instance, “[d]ie Seele der Schnecke ist erst noch verborgener als ihr Haus im tiefen Meer, oder im Grase des Raines” (I: 8)? And isn’t such a project far more difficult and therefore far more interesting than inquiring into the “Lebenskräften und Lebensäußerungen” of an animal’s physiology (I: 5)?

So, what is a soul? For Scheitlin, it depended upon when and in which language one posed the question: “Wir können mit der Urzeit unter Seele einen Lebenshauch, oder mit der neuesten Zeit einen mit Bewußtseyn begabten Geist, ein Ich, ein Wesen mit Bewußtseyn seiner selbst, ja mit Bewußtseyn seines Bewußtseyns, denken” (I: 13). To define a soul, then, entailed thinking about thinking, subjectivizing about subjectivizing, a tautological activity so self-indulgent that it produced “eine lange Reihe von ganzen Wissenschaften, und zehn Reihen von Begriffsbestimmungen” (I: 13). But these sciences of the soul—psychology, metaphysics, and theology included—had not yielded a satisfactory, exact definition of the soul (I: 13). This was because soul was merely a word. And the common practice of muddling this word with *Geist* and *Denkkraft*, *Sinn* and *Gefühl*, *Verstand* and *Erkenntniskraft* drained all words of their usability in any given science of the soul (I: 10-1). To conceive of a science of the soul, then, one had to be precise, teasing out what the soul encompasses but is ultimately not while minding the work words do in mediating observation. Indeed, whether one used the Hebrew *ruach* or the Greek *pneuma* or the Latin *anima* or the German *Seele*, that word colored what one perceived when

⁴⁴ “Sobald wir unter Seele nur Denkkraft, und unter Denkkraft, mit Cartesius, eine vom Körper ganz verschiedene, von ihm abhängige, ihm sogar entgegengesetzte Kraft denken, die nur der allmächtige Gott, der auch, wenn er will, Widersprüche vereinigen kann, und Materie und Denkkraft, wenn sie auf und mit einander zu wirken scheinen, wunderthätig und unmittelbar, in jedem gegebenen Falle, verbindet, geht freilich die Frage in Nichts auf” (I: 14).

attempting to express the relationship between a given action and that which proceeds inwards or outwards (I: 11). Scheitlin believed a critical conceptualization of soul entailed an attention to etymology, and he cautioned that the word—so dependent upon a particular time and culture’s embeddedness in language—can never be treated as the thing itself. The word *Seele* was merely a “Stellvertreter” for “das unsichtbare, geistige, denkende, fühlende, wollende Princip” (I: 10).

Das Thier, too, was merely a concept, an expression (I: 17). Since a particular language made available a set number of relations to the animal, Scheitlin recommended acquainting oneself with several languages’ animals in order to expand one’s possibilities for relating to the animal one observed. Language, he argued, collapsed that mysterious, manifold being and presumed a stable knowledge relation to it. In German, the noun *das Thier* may be modified by the adjectives *wild* and *zahn*, underlining how human-animal relations have been predicated on domestication, even subordination (I: 17). But what if *das Thier*, like the Greek *zoon*, designated a living being (I: 17)? What if *das Thier*, like the Latin *animal* from *anima*, designated “ein Wesen mit Lebenshauch, ohne irgend etwas Erniedrigendes damit zu verbinden” (I: 17-8)? In keeping with his attention to how conceptual constructs informed the real-life relations between humans and animals, he suggested that a science with the animal as its object of study, especially, can go no further than the limits imposed by its terminology. Terminology contained the poison and the antidote, the weed and the weeding.⁴⁵ Scheitlin thus charged the aspiring animal psychologist with weeding out the words in his language that served to lower the animal vis-à-vis the human and prevent him from approaching, with openness and curiosity, that which we call “the animal.” And this was exactly how Scheitlin defined the animal as an object of

⁴⁵ “Um die niedrigsten und uns widrigsten Thiere zu bezeichnen, haben wir das Wort Ungeziefer, das dem Unkraut in der Pflanzenlehre entspricht—zwei Ausdrücke, die selbst auch Ungeziefer und Unkraut in der Naturgeschichte sind!” (I: 17-8).

study. His science of the animal soul was “*die Lehre von der Unterscheidungsgabe derjenigen Wesen, die wir Thiere nennen*” (I: 34, emphasis in original).

Scheitlin’s science of the animal soul was grounded in the slipperiness of the terms demarcating the slippery boundaries between one type of life and another. Transforming what was effectively linguistics into a science of the animal soul required a clearly articulated method which positioned it within the rapidly shifting scientific landscape of 1840. In the chapter “Die Mittel zum glücklichen Studium der Thierpsychologie” (I: 312-23), Scheitlin located his science of the animal soul in neither the natural historical cabinet nor the dissection theater, and certainly not the laboratory. The aspiring animal psychologist was to observe living animals, yes, but sauntering off to the forest in the name of animal psychological research was not enough. Considering, too, that one was restricted to observing the species in one’s environment, the animal psychologist had to rely on “Anekdoten, Beispiele und Ansichten” (I: 8). These written works comprised the “äußere Mittel” of a successful animal psychological education, along with drawings and paintings by animal psychologists, who depict the animal as ensouled being and without extinguishing its expression (I: 312-5); collections, museums, and cabinets where one may study anything from preserved butterflies to fossils (I: 312, 315); and the living animal at zoological gardens, menageries, and *Tierhäuser* as well as stalls, fields, forests, and one’s own home (I: 312, 314, 317-8). To work with the same materials as natural history or the emerging field of zoology did not equate to working with their increasingly distinct methods. Even when studying natural historical collections, the animal psychologist designated himself from the natural historian through his particular way of viewing the animal body. “Wollten wir diese Thiere in unsere Psychologie aufnehmen,” wrote Scheitlin in regard to George Cuvier’s fossils, “so müßten wir eben aus dem ganzen Habitus diesen Thieren Haltung, Gebärde, Blick und

Seelenfähigkeit andenken” (I: 315). Cuvier had founded an entire discipline on piecing together bodies from remnants; Scheitlin had a similar ambition. His science of the animal soul sought to piece together “wenn nicht das Individuelle, so doch das Allgemeine oder der Gattungscharakter der Seele” (I: 315). Whether observing animal skins, drawings, or bones, the animal psychologist’s aim was to detect a living animal’s “Haltung, Gebärde, Blick und Seelenfähigkeit” in the present or centuries after its death.

However much one learned from fossils, they paled in comparison to living animals and, more accurately, the observation “ihres Lebens und Wandels, ihres Thuns und Lassens selbst” (I: 317). It was therefore the “innere Mittel” which could make or break the would-be animal psychologist’s study of the animal’s soul. “[D]ie innern sind wir selbst,” by which Scheitlin meant the art of observation and talent for making inferences out of those observations (I: 312). For Scheitlin, observation was not mere observing; it was a daily practice of learning to understand, apply, and interpret what one sees an animal do and what one sees oneself do at the same time (I: 319). This empirical, non-speculative mode of observing both the animal and oneself in the act of observing the animal was how Scheitlin intended to distinguish his science of the animal soul from previous studies of the animal soul.⁴⁶ The human, in beholding an animal, had to confront his own conceptual constructs before claiming to see the animal’s soul as expressed through its body. As such, the animal observed by Scheitlin’s animal psychologist was both a living, ensouled being and a mirror revealing the human’s limited perspective within a natural world which exceeded and challenged his epistemological categories. This way of seeing

⁴⁶ “Man muß alle Systeme verlassen, man muß selbst beobachten, man muß sich fest an die Erfahrung, an die möglichst wohlverstandene, halten. Nur unter dieser Voraussetzung kann das Studium der bisher aufgestellten Ansichten uns unsere eigenen Schritte sicher und besser beurtheilen lehren” (I: 3).

cast doubt on the privileging of the human's perspective while attempting to expand this limited perspective through daily, patient, and empathetic observation of an individual animal's soul.

All of this amounted to a non-experimental, observation-based, and language-attentive mode of asking questions about animals—and not drawing conclusions:

“Ja, hier muß jede Wahrheit schwer, und jeder Schluß gewagt seyn. Wir sind nur an die Aeußerungen der Seele gebunden, von, vielleicht gar nicht, oder nur halbverstandenen, Thatsachen abhängig, und vielleicht können wir nie ganz sichere Schlüsse machen. Machen wir das Thier zum Gegensatz von uns, so verzichten wir auf jedes Verständniß seiner Seele; stellen wir es neben uns hin, so sind wir in steter Gefahr, uns in das Thier hinein zu legen” (I: 8).

This paradox of not knowing to better know the animal and its soul gestured to a practice of observing the animal soul's expressions which had at its epistemological core the animal's unfathomability. The human's inability to fathom the animal soul, Scheitlin suggested, revealed itself whenever a human posed a question about an animal. In making the animal either his opposite or his (enfeebled) homologue in attempting to answer such a question, the human only widened the gap—the “Unbestimmtheiten, Unerweisbarkeiten, Verwirrungen und Widersprüchen”—which had come to define the human's epistemic relation to the animal (I: 2).⁴⁷ In contemporary terms: Positivism was not only untenable in Scheitlin's science of the animal soul; positivism represented a broader practice of cramming the animal into an anthropocentric framework which did not, when all was said and done, result in positive knowledge about an animal's *psyche*.⁴⁸ Any search for conclusive, verifiable facts would divulge

⁴⁷ In his introduction, Scheitlin described how this man-made gap between human and animal came to be: “Allein gerade das Studium der Geschichte dieser Begriffsbestimmungen macht es gewiß, daß bei vielen Völkern Mensch und Thier zuerst zusammen fielen, dann im Laufe langer Zeiten, nach einer fast unendlichen Reihe von Unbestimmtheiten, Unerweisbarkeiten, Verwirrungen und Widersprüchen, Mensch und Thier immer weiter auseinander gesperrt wurden, bis sie endlich an beiden Enden eines Durchmesser als vollkommene Gegensätze, als Geist und Materie, stunden” (I: 2).

⁴⁸ Scheitlin criticized previous works on the animal soul for employing humans concepts—*Sprache, Liebe, Sittenlehre*—to situate animal behavior within human emotional, cogitative, and moral frameworks (I: 3). But this

more about humankind's various approaches to the animal than about the animal itself. The most ethical way to approach an animal as a knowledge object, Scheitlin believed, was to accept the unknowable animal before him and the complexity of one's task. To be sure, what was difficult was drawing near to the animal—namely, recognizing a kindred creature's soul and suffering—while accepting that one could never truly draw near to the animal. And what was especially difficult was building one's science on suspending knowledge in deference to the awesome mystery of the animal. "Schwärmte ich," wrote Scheitlin in defense of his inconclusive, affective approach, "so schwärmte ich für eine gute Sache, für ein großes Ding—für die ganze lebendige, denkende, empfindende Thierwelt, die um uns hersteht, mit uns umgeht, mit der wir leben, weben und sind" (I: v). For Scheitlin, to be inextricably intertwined with the animal world required bending one's epistemology towards the animal.

In this gap between the unknown and the unknowable, questions about those "Wesen, die wir Thiere nennen" proliferated (I: 34). Can animals divinate (II: 372)? Does each species have its own corpus of jokes, and might they tell these jokes through their bodies (II: 352)? What would humans learn if dogs could learn human language (II: 270)? And what are we to make of the African collared dove, a bird that produces such a "menschenähnliches Geschrei" that one is convinced it is an Ovidian dove-turned-human (II: 20)? At the heart of these questions was Scheitlin's (not to mention Carus' and Herder's) hypothesis that a scream was a window to the soul and that a "menschenähnliches Geschrei" might reveal an overlap between the African collared dove's soul and the human's soul. In *Versuch einer vollständigen Thierseelenkunde's* second volume, Scheitlin proposed that degree of soul could, indeed, be assessed by observing

use of analogy, this "wie im Menschen" (I: 3), resulted in hyperbolicism which only hindered humans from understanding animals. Even more disturbing for Scheitlin, this "wie im Menschen" posited the animal as a lack.

an animal species' characteristic bodily and vocal expressions as manifestations of their corresponding sensory, cognitive, and emotive capabilities. This is where Scheitlin diverged from his predecessors: If species-specific forms of expression were the result of the body and soul acting in concert with each other to produce tones from affects,⁴⁹ then these forms of expression suggested species-specific relations between body and soul. The degree of difference in outward expressions suggested a degree of difference in inner operations which could, in turn, be organized along a scale. The aim of Volume II was therefore to taxonomize the “psychischen Thätigkeiten der Thiere” and establish “ein thierpsychologisches System an der Hand der Naturgeschichte” (II: 444)—a system which, Scheitlin hoped, would become “eine vollständige psychologische Stufenleiter der Thierwelt” by century's end (I: 34).

What amounted to a hybrid animal psychological-natural historical system for studying animal interiority was broken down into drives (e.g., hunger, sleep), senses (e.g., touch, time, religion, beauty), emotional and cogitative capacities (e.g., sympathy, homesickness), and relationality (e.g., to itself, to law, to God). Despite the range of psychical activities the animal psychologist needed to attend to in extrapolating the general from the extraordinary (II: 272), not all were equal. Scheitlin elevated vocal expression as the most informative distinguishing trait (II: 273). Within his animal science of the soul, Scheitlin posited that an animal's abilities indicated that animal's apprehension of exterior reality within itself and ultimately differentiated one species from another psychologically (II: 273).⁵⁰ Consequently, animal vocalization was not

⁴⁹ “Das alle Affekten, insonderheit Schmerz und Freude Töne werden, daß was unser Ohr hört, auch die Zunge reget, daß Bilder und Empfindungen geistige Merkmale, daß diese Merkmale bedeutende, ja bewegende Sprache seyn können—das Alles ist ein Conccent so vieler Anlagen, ein freiwilliger Bund gleichsam, den der Schöpfer zwischen den verschiedensten Sinnen und Trieben, Kräften und Gliedern seines Geschöpfs eben so wunderbar hat errichten wollen, als er Leib und Seele zusammenfügte” (Herder, “Das sonderbare Mittel,” 356).

⁵⁰ “Die Unterscheidungsgabe ist ein Vermögen, ein Können, die Unterscheidung selbst ein Thun. Das Vermögen ist innerlich, das Thun geht heraus. Die Gabe bezieht sich auf etwas Wirkliches, Objectives, das Unterscheiden selbst, oder das Thun tritt mit diesem in eine Art Verkehr, den das Unterschiedene, als Unterschied wahrgenommen, wirkt

simply a matter of stimuli response, as the mechanists believed; rather, the wide range of animal vocalizations indicated the wide range of animal systems of communication and meaning-making and, more basically, of one species' ability to communicate and make meaning versus another's.⁵¹ While vocalization was evidently a means of mediating relations between conspecifics, enabling the animal psychologist to learn about various forms of species-specific expression, Scheitlin privileged vocal expression for another reason. Contending that the senses of color and sound were "geistiger" than those which enable the perception of light and faces (II: 304), for instance, his analyses of animal expression in Volume II abound with singing, screaming, laughing, instrument-playing, mimicking, and, yes, speaking animals. A mouse's six-to-seven-syllabic "Pipen" was more than a sound or a reaction (II: 104): it revealed "einen musikalischen Sinn, und diese Töne sind vermutlich Erinnerungen, sey es von einem Gesange oder von einem Clavier" (II: 106). While also attentive to body language, interspecies relations, and moral character, Scheitlin asserted that an animal's ability to perform complex mental operations—from mimicking a piano to remembering a (human or mouse) song—lay buried within that animal's vocalizations. The animal psychologist's task was to unbury the soul from the sound.

According to Scheitlin's animal psychological system, then, songbirds were exceptionally ensouled. Most songbirds possessed an excellent sense of hearing, melody, and pitch differentiation, not to mention that they were capable of inhaling great quantities of air (II: 305, 56). This physically enabled them to express their "Gemüth" through "ein Lied in der

aufs Vermögen zurück, so daß das Their das Wahrgenommene in sich findet, d. h. empfindet, die Verschiedenheit der Gegenwirkungen oder der Dinge sowohl äußerlich als innerlich entdeckt, indem das Aeußere und Innere zusammenfallen" (II: 273).

⁵¹ And even more basically, Scheitlin reasoned that if animals "schwätzen," then they must not only hear each other but understand each other, "sonst schwätzen sie nicht. Sie thun nichts Unnöthiges" (II: 357).

Seele” (II: 305). Amongst songbirds, Scheitlin distinguished the Northern mockingbird for having the most music in its soul (II: 305) and the nightingale for singing the most beautiful song, expressing “jede Leidenschaft: Liebe, Wehmuth, Frohsinn, Zorn, deutlich genug” (II: 59). The Bateleur, on the other hand, an eagle native to Zimbabwe whose speech and song is a “wildes Geschrei,” convinced Scheitlin that all birds should sing (II: 51).⁵² On matters of the soul, many mammals were not as fortunate as the birds. The consonant-less “Sprache des Schweins” revealed its “sehr dunkles Bewußtsein,” much as the human child cries without consonants (II: 184). But on the whole, higher mammals’ ability to laugh and cry was “Beweis, daß die Säugethiere tiefer empfinden als die Vögel, oder [...] innerlicher sind” (II: 361). And dogs—the only animal that truly laughs, as an “Ausdruck des Herzens durch die Athmungswerkzeuge”—emoted most deeply (II: 361). For its “unläugbar so vollkommen[e]” soul, the dog was generally believed to lack only language and to be “ein abgefallener Mensch und durch Vermischung von Mensch und Thier entstanden” (II: 246-7). While Volume II is filled with anecdotes of canine sensibility, it was not the dog but the elephant which Scheitlin deemed the “Halbmenschen” par excellence (II: 179-80). Despite possessing neither an aesthetic sense nor the ability to speak or count, the elephant demonstrated a remarkable intelligence, nature, and ease with humans rivalled only by the horse. “Es ist kein menschlicheres Thier auf Erden,” noted Scheitlin (II: 179).

Which animal is the “most human” in its range of expressions vis-à-vis psychical capacities becomes significantly harder to parse when one turns to Scheitlin’s treatment of animals articulating and understanding human words. As much as Scheitlin was impressed by the

⁵² Despite their wild screams, Scheitlin praised the Bateleur. The monogamy of Bateleur mates, their cooperation on the hunt, and their “tüchtig” defense of their young led him to conclude that the eagles consisted of “Traurige, Ernste, Muntere, Lebhaftige, Schwer- und Leichtzähmbare” (II: 51).

humanness of elephants, dogs, and horses, he found that certain birds' ability to memorize and utter sentences without human assistance raised them above mammals (II: 359). Whereas mammals had to be coaxed to pay attention to human words and then trained to understand them, these birds evidenced a joy in being spoken to such that they picked up words and whole sentences. For this ability, Scheitlin concluded that these speaking birds not only "machen Alles menschlich" but are, to a certain extent, "ganz menschlich" (II: 3). "Es ist in diesen Menschenthieren," he wrote later about birdsong, "etwas Menschliches, es will herausbrechen" (II: 307). The cases of the bird, on the one hand, and the dog, elephant, and horse, on the other, epitomize Scheitlin's insistence that an animal's ability *to speak* (i.e., express its drives, desires, and emotions) and *to learn to speak* (i.e., memorize and utter or simply repeat human words) were key markers of "das Seelenleben" (I: 255). A further distinction, between *Tonsinn* and *Redesinn*, is important in this regard. Mammals cannot speak or learn to speak, as they lack birds' superior *Tonsinn* and their corresponding ability to receive the emotions and sounds of music in their souls (II: 359).⁵³

For Scheitlin's clearest explanation of how an animal can learn to speak human words, let us consider the parrot. The first animal to imitate human speech, the parrot was, for Scheitlin, curiously incapable of singing or learning how to sing. How—without the musical sense of the starling or the sharp intelligence of the crow and raven—did parrots learn to speak?⁵⁴ Scheitlin postulated that, to repeat a human word, the parrot must first possess a previously obscured

⁵³ The only exceptions Scheitlin names here are "der Seehund und der Landhund," which I address on the following page (II: 359).

⁵⁴ Starlings are the most accomplished songbirds in terms of human language acquisition; the nightingales, despite the beauty of their song, learn with great difficulty (II: 58). Similarly, the black-winged stilt, while most similar to the human "in der Gestalt und Stellung so wie im Gang," cannot be taught to speak (II: 71). But the incredibly intelligent, virtuous crow is more than capable of learning to speak (II: 42, 48), as is the similarly intelligent raven, which can speak "ziemlich deutlich" (II: 44).

melodic sense (*Tonsinn*) enabling it to listen carefully and distinguish vowels from consonants. The parrot must also enjoy the sounds of human words enough to listen attentively and then be able to retain the sounds which constitute those words, pointing to a “Ton- oder Wortgedächtnis” (II: 22). Physiognomy also determines how easily the parrot can learn to speak: the tongue, especially, is crucial for faithful and clear articulation (II: 22). As such, the parrot’s ability to speak and learn to speak human words was a product of three major elements: a perception of sound modulation (“Tonrechnung”), a wide emotional range (including an interest in human words), and a process by which sounds are stored and can be retrieved again (which Scheitlin believed occurred in its soul).⁵⁵

In using “musikalisch” as a shorthand for these overlapping capacities, Scheitlin designated speaking and learning a human language not as an expressive and psychical capacity of the human alone, but as a series of tones which can be learned by a nonhuman with the right set of psychical and physical equipment. He then complemented the musical quality of human language with its semantic quality through mammals’ superior *Redesinn*. If *Tonsinn* denoted emotion, sound, and memory, then *Redesinn* denoted reason and understanding, along with the aforementioned physical ability to articulate human words and a “viel vernehmlichere, modificirtere, ausdrucksvollere Sprache, als die Vögel” (II: 305). Mammals—so outstanding at receiving human thoughts in their souls and understanding their “Wortsinn”—were, in this sense, “Menschen- oder Verstandesthier” (II: 306). But this *Redesinn* which made mammals excellent companions for humans had its limits: being able to understand does not equate to being able to communicate that one understands. Dogs, while possessing such an advanced “Sprachsinn,”

⁵⁵ “Die Reihe der Töne geht durch die Luft aus der Maschine ins Ohr und in die Seele des Vogels, und so wird die Tonrechnung des Mechanikers ein Lied in der Seele des Thierchens, das es den wieder hundertmal von sich gibt. Aber kein Säugethier ist so musikalisch, daß es singen könnte oder lernte” (II: 305).

were regrettably limited by a canine language which does not sound to human ears like German (II: 307). “Es ist,” lamented Scheitlin as he considered the barking dog, “als ob der Hund sich ärgere, mit uns nicht sprechen zu können” (II: 307).

Scheitlin’s *Versuch einer vollständigen Thierseelenkunde* ultimately demonstrated that speech—in all its psychical, physical, and relational complexities—was partly a matter of endowment, yes, but it was also a matter of learning, whether across species or within one’s own.⁵⁶ In fact, Scheitlin noted that human children must be taught their language, too, by repeating syllables at school (II: 306). Fittingly, Scheitlin’s key markers of soul-life matched up with an animal’s degree of domestication—in this regard, the degree to which human and animal could successfully interpret and respond to each other’s expressive cues. The difference between being able to speak hinged, more often than not, on a history of interspecies interaction by which certain communicative cues were shaped and learned. After all, a dog cannot learn a human word without a human repeatedly speaking that word to it and such that the dog understands that the human is addressing that word to it. Although Scheitlin briefly acknowledged the role of domestication in an animal’s speaking education, he could, without the conceptual tool of evolution, only vaguely gesture towards historical processes which made the dog and human psychically attuned to one another. The moment of the utterance must be preceded by a process in which human and dog near each other in their souls (as Scheitlin would have it) or coevolve (as Darwin would later have it). Is not the dog more receptive to human commands than the cat because it coevolved with humans? And is ranking dogs above cats therefore a way of quietly slipping the human into the center of one’s animal science of the soul?

⁵⁶ “Was in der Seele des Thiers ist, kann man es lehren; was nicht drinn ist, kann man es nicht lehren” (II: 358).

However much Scheitlin intended to decenter the human, bending his epistemology to account for the mystery of the animal soul, his goal of creating a psychological scale of all beings was plagued by the same anthropocentric teleology as Carus' expressive taxonomy. With the human soul as the soul by which all others were measured, the ability to articulate and understand human speech became Scheitlin's rubric for the sophistication—really, humanness—of an animal's soul. “Jedes Thier hat eine Sprache” with which to communicate with its conspecifics (II: 306), but only some animals can communicate beyond the universal “Natursprache, Empfindungs- und Willens- oder, mit Einem Worte, der Bedürfnißsprache” which arises, unmediated, from the soul in times of stress (II: 358). Only some animals can associate an object (e.g., bread) with its corresponding human word by forming “das Bild von Brod in seiner Seele,” thereby demonstrating the imaginative capacity underlying understanding (II: 358). And only very few animals can operate on the invisible, symbolic level of concepts, as all animals exist within the sensory world of visible objects (II: 359-60). The human and the animal may both be ensouled, but the human soul still occupied a hallowed psychical realm, based on the human's view of what counted as psychical sophistication vis-à-vis language use.

In spite of this unintended anthropocentrism, Scheitlin's *Versuch einer vollständigen Thierseelenkunde* contained within it the germ for a radical project of shifting the center of psychological focus away from the human in beginning to identify multiple ways of being, relating, feeling, emoting, and expressing in the world. Much like Carus' delineation of human and animal, Scheitlin's focus on learning both opened the possibility of a higher animal crossing over into the human psychical realm and revealed the porous boundaries separating human from animal. The full implications of this suggestion would not be realized until the new animal psychologists of the early 20th century began educating horses and dogs, especially, to operate an

interspecies alphabet system, count, and answer trivia questions. Even more importantly in the history of science, Scheitlin's science of the animal soul advocated for a study of animal behavior and communication predicated on observing living animals, rather than dissecting and taxonomizing dead animals. In this final section on Scheitlin, let us now turn to his vision for his science of the animal soul as it was birthed and smothered by a number of historically specific challenges. Doing so will not only identify the paradigm shifts Scheitlin conceptualized his work in response to, but also elucidate why his successors would recognize his contributions with only the occasional embarrassed sentence.

As opposed to Carus and Herder before him, studying the animal soul did not merely entail reading about an ape's uncanny humanness, perhaps viewing a picture drawn on an expedition, and extrapolating general truths about the human soul versus the animal soul from there. Herder certainly never beheld an ape by the time he wrote about ape versus human mimicry, but if Scheitlin and his envisioned group of animal psychologists were going to study an ape's soul, they ideally needed access to a living ape. This was, however, not entirely possible in 1840 without the financial support and training required to travel the world as a naturalist. And so, the animals had to come to Europe. In 1848, the same year Scheitlin died, the Hamburger Gottfried Claes Carl Hagenbeck opened his menagerie populated by animals captured in Africa. It was not until 1874 that his son, Carl Hagenbeck, unveiled his first ethnographic exhibition which, by connecting imperialism with anthropology and zoology, brought "exotic" people and animals to the cities of Europe.⁵⁷ That same year, Switzerland's first

⁵⁷ I will return to Carl Hagenbeck's zoological colonialism within the history of Germanic animal psychology in Chapter 3. For more on his *Völkerschauen*, see especially Eric Ames, *Carl Hagenbeck's Empire of Entertainments* (Seattle: University of Washington Press, 2009).

zoo, the Zoological Garden in Basel opened, missing Scheitlin by 26 years and 153 kilometers. In Scheitlin's Switzerland of 1840, the range of animals necessary for animal psychological research was centralized in natural history museums, the first of which was established in Bern in 1832. The difficulty of accessing living animals pointed to a deeper problem which undergirded the study of animals in Scheitlin's time. Scientifically, animals were more valuable dead—or on their way to being dead.⁵⁸

Although trapped within a natural historical model whereby wealthy gentlemen educated themselves and added to their collections through visits to Paris, Vienna, Kassel, and Stuttgart (I: 317), Scheitlin's anticipatory study of the animal soul foresaw the establishment of stationary research groups which could track the movements of an individual animal's soul over time. Since this was more futuristic fantasy than plausible reality in 1840, he advised the would-be animal psychologist to keep pets, as many as possible, thereby establishing his own zoological garden, birdhouse, and botanical garden (for insects and vermin) (I: 318).⁵⁹ Scheitlin was confident that the institutional structures necessary for his science of the animal soul would allow his nascent science to take off. He was so confident, in fact, that he envisioned natural history's reorientation as a science of the soul (I: 31). Scheitlin also predicted that neighboring disciplines—from metaphysics to zoology, anthropology to biology—would pick up and shine their own light on his prism of research questions on the animal soul.⁶⁰ He foresaw a glorious new era for the soul—and this time, the animal would take part.

⁵⁸ Scheitlin's Switzerland was, as of the mid-19th century, concerned with animal welfare, after Swiss universities began performing vivisections in the 1830s. 1842 saw the country's first law animal cruelty law and, in 1844, the country's first *Thierschutzverein* was founded in Bern.

⁵⁹ Scheitlin noted that housewives are certain not to like the vermin which take up residence in the botanical gardens (I: 318), thereby acknowledging, albeit by way of a jab at housewives' tidiness, that women will care for the animals so that their husbands may study them.

⁶⁰ At the time Scheitlin was writing *Versuch einer vollständigen Thierseelenkunde*, zoology, physiology, and comparative anatomy were only beginning to undergo a disciplinary separation brought upon them by new

This did not occur, for reasons Scheitlin anticipated. His science of the animal soul was simultaneously too antiquated and too advanced for his time. On the one hand, his desire to decenter the human from psychology allowed him to radically conceptualize a study of living animals based on expression as a worthwhile, even cutting-edge, object of study. On the other hand, his great wager was that if one sought a mode of approaching the animal that did not have radical difference as its point of departure, then one needed to reach far back in intellectual history to much earlier models of relating to animals.⁶¹ Teetering between the ancients and the behaviorists, Scheitlin's animal soul was, in the German-speaking world of 1840, nevertheless tainted with *Naturphilosophie's* view of the soul as a transcendent space of interiority. The timing here is crucial. 1840 was not too natural-philosophical and not too natural-scientific to prevent Scheitlin's work from coming into being, but it was just natural-scientific enough to prevent it from gaining traction, as the natural philosophers Scheitlin praised faded into the background and a new generation of natural scientists came into view. The natural philosopher Lorenz Oken reluctantly gave way to the embryologist Karl Ernst von Baer.⁶²

Indeed, Scheitlin's *Thierseelenkunde* was caught in the sweeping, pained transition from *Naturphilosophie's* speculation, vitalism, and idealism to an experimental, empirical

conceptions of physiology. See especially Lynn Nyhart, "Rearranging the Sciences of Animal Life, 1845-1870," in *Biology Takes Form: Animal Morphology and the German Universities, 1800-1900* (Chicago: University of Chicago Press, 1995), 65-102.

⁶¹ Scheitlin emphasized in the very structure of *Versuch einer vollständigen Thierseelenkunde* that taking a long-historical approach revealed the centuries-long entanglement of humans and animals. Even if his readers only glanced at the table of contents, Scheitlin intended to persuade them that "die zu groß gemachte, widernaturgeschichtliche, unwahre Kluft zwischen Thier und Mensch" was forged by humans, not Nature: "Allein gerade das Studium der Geschichte dieser Begriffsbestimmungen macht es gewiß, daß es bei vielen Völkern Mensch und Thier zuerst zusammen fielen, dann im Laufe langer Zeiten, nach einer fast unendlichen Reihe von Unbestimmtheiten, Unerweisbarkeiten, Verwirrungen und Widersprüchen, Mensch und Thier immer weiter auseinander gesperrt wurden, bis sie endlich an beiden Enden eines Durchmessers als vollkommene Gegensätze, als Geist und Materie, stunden" (I: 2).

⁶² For more on generational turnover, see "Table 1.1 Generations of German Morphologists and their Contemporaries" in Nyhart, *Biology Takes Form*, 23.

Naturwissenschaft which prized specialization.⁶³ As experimental laboratories for chemistry and physiology spread across the German university system as of 1829, the status and practice of “observation” and “evidence” gradually transformed, resulting not just in the development of new techniques and technologies, but in an expectational shift around training.⁶⁴ Specialized university education increasingly became a prerequisite for conducting the highest level of research in one’s chosen field—or, more to the point: the experimentalism embedded in specialized, laboratory work fundamentally shaped what became perceived as the highest level of research. Consequently, conducting the highest level of research required the training, access to materials, and experimental orientation found in these laboratories. As a new generation debated what, exactly, constituted *Wissenschaft* and their fields gradually gained institutional autonomy, psychology remained a training course for medicine, law, and theology.⁶⁵

These overlapping phenomena are apparent in the publication organ of the Allgemeine Schweizerische Gesellschaft für die gesammten Naturwissenschaften, of which Scheitlin was a member. In and following 1840, the publication’s objects of study ranged from reptile neurology to the plants of the Graubünden, echinoderm fossils discovered in Switzerland, and “monstruosités végétales.” Throughout its existence (1837-1906), this preeminent journal of the Swiss natural sciences was almost exclusively comprised of research by professors of zoology,

⁶³ Fernando Vidal, *The Sciences of the Soul: The Early Modern Origins of Psychology*, trans. Saskia Brown (Chicago: The University of Chicago Press, 2011), 3.

⁶⁴ Justus von Liebig established the first laboratory for chemistry at the Universität Gießen in 1829. For more on the rise of the sciences vis-à-vis the German higher education system in the early 19th century, see: Denise Phillips, *Acolytes of Nature: Defining Natural Science in Germany, 1770-1850* (Chicago: University of Chicago Press, 2012); Robert Boakes, “German Science and Psychology,” in *From Darwin to Behaviourism: Psychology and the Minds of Animals* (Cambridge: Cambridge University Press, 1984), 54-9.

⁶⁵ In *Biology Takes Form*, Nyhart observed that we can watch disciplinary autonomy take place through tracking the establishment of professorships, institutions, departments, and course offerings (“Situating Morphology,” 1-32). Vidal, *The Sciences of the Soul*, 3.

comparative anatomy, botany, and geography.⁶⁶ As such, when the society did publish research on animal expression in 1840, then it concerned the anatomical heart and nervous system of a specific species. And it was written by an up-and-coming experimental researcher with a medical degree and a sharp scalpel (**Figure 6**).⁶⁷ In 1840, there was already no place in the Swiss natural sciences for the animal soul.



Figure 6. The nervous system of a green sea turtle, *Chelonia mydas*. Carl Vogt accompanies this anatomical drawing with the following note on the preceding page: “Chelonia, Taf. I, liegt auf dem Rücken, der Brustschild ist weggenommen, der Kopf so gedreht, dass seine rechte Seite zur Anschauung kommt.” In “Beiträge zur Nevrologie der Reptilien,” *Neue Denkschriften der Allgemeinen Schweizerischen Gesellschaft für die Gesammten Naturwissenschaften* 4 (1840): 61.

⁶⁶ The only contributor to *Neue Denkschriften der Allgemeinen Schweizerischen Gesellschaft für die gesammten Naturwissenschaften* (*Nouveaux mémoires de la Société helvétique des sciences naturelles*) who was neither an academic nor a medical doctor was Johann Jakob von Tschudi, a Swiss explorer who later became ambassador to Brazil and minister to Vienna. More generally, the contributors in the first volumes amounted to a who’s who of Swiss naturalists: zoology professors like Heinrich Rudolf Schinz and trained physicians like Carl Adolphe Otth (the fungi genus *Othia* is reportedly named after him).

⁶⁷ *Neue Denkschriften* published a section of Carl Vogt’s dissertation under the title “Beiträge zur Nevrologie der Reptilien” (Band 4). The journal would include his work again in 1845 (Band 7). Born in Gießen in 1817, the German-Swiss Carl Vogt is an instructive contrast to the much older Scheitlin (born in 1779). Vogt studied chemistry under Justus Liebig until his political involvements forced him to leave Germany for Bern in 1835. He then studied medicine in Bern, completing a dissertation in 1839 entitled *Beiträge zur Anatomie der Amphibien*. Vogt returned to Gießen in 1847 to accept the new Lehrstuhl für Zoologie, having been recommended by no less than Justus Liebig and Alexander von Humboldt. Vogt is most famous for being a leading proponent of Darwinism in Germany and a key figure in the *Materialismusstreit*, the height of which was 1854.

In Scheitlin's view, the natural sciences were too modern, too anthropocentric, too invested in turning individual souls into categorizable bodies, and they were only becoming more so. For this, he blamed Descartes. Descartes marked the beginning of studying the animal soul, emotion, thought, and expression, but the most ill-fated beginning imaginable. In tracing a rich historical lineage for (and thereby attempting to legitimate) his science of the animal soul in Volume I, Scheitlin accused Descartes' mechanical understanding of animals of initiating an experimental culture which treated animal expression as simply the product of animals' "hölzernen Organisation" and, more specifically, drives (I: 179):

"Des Cartes sah nur im Menschen Geist, Seele, im Thiere also nur empfindungs- und gedankenlose Maschine, lebendige Mechanismen, Automaten oder wie man's nennen will, ohne Hunger und Durst, ohne Begierde und Willen, nur Triebe, von denen sie rein nichts merken noch wissen. All ihr Schmerz und all ihre Freude ist nur leerer Schein, ihre Aueßerung einzig Folge ihrer gleichsam nur hölzernen Organisation, ihre Bewegungen einzig Wirkungen eines bewußtseynlosen Instincts. Bellt ein Hund, so hat nur seine Maschine geknarrt, d. h. gegen irgend etwas reagirt" (I: 179-80).

Even worse for Scheitlin was Descartes' method as it informed his notion of the animal. Rather than observe living animals, Descartes' contact with animals was limited to dissecting their lifeless bodies (I: 180). No wonder the Great Descartes thought only humans possess spirit and soul! Having taken hold of "die Psychologie deines Welttheils bis auf diesen Tag noch" (I: 180), Cartesian mechanism had effectively aborted the study of animal behavior and expression, to say nothing of the cruel animal experiments it legitimated. Lacking speech and reason, animals were all material body responding to their environment, while humans, soulful and expressive, were the sole candidates for psychological study.⁶⁸ In what amounted to a rejection of theological and classical mechanism alike, the priest Scheitlin sought to counter Cartesianism's stronghold on

⁶⁸ Anita Guerrini, *Experimenting with Humans and Animals: From Galen to Animal Rights* (Baltimore, MD: Johns Hopkins University Press, 2003), 36.

the contemporary natural sciences through a deliberate and enthusiastic (re)turn to the soul.⁶⁹ The soul—as a theological and scientific concept, and as an explanatory model for agency and will—still had work to do.⁷⁰

But the history of science, and psychology in particular, did not unfold as he hoped. Scheitlin, who did not live to see a zoo in Switzerland, became a transitional figure in the history of science, best known for his animal observations. Despite going largely unrecognized due to his outdated “theologisch-philosophische Aufklärungsstandpunkt,”⁷¹ Scheitlin’s science of the animal soul lived on, curiously enough, in repudiated form. In 1863, Wilhelm Wundt was, like Scheitlin in 1840, laying out the history of animal psychology in his exploration of the human versus animal soul. Having written about the animal soul by way of their varying abilities in *Vorlesungen über die Menschen- und Thierseele* (1863), Wundt complimented *Versuch einer vollständigen Thierseelenkunde* for its “reiches Material von Beobachtungen über die Äußerungen der Intelligenz der Thiere” in his 29th lecture.⁷² But by 1892, when Wundt was preparing the second edition of *Vorlesungen*, he made substantial edits to his lecture on animal psychology, even going so far as to include a new, 23rd lecture on the faults of animal

⁶⁹ Scheitlin was not entirely correct in his reading of Cartesianism. As Jessica Riskin wrote in *The Restless Clock: A History of the Centuries-Long Argument over What Makes Living Things Tick*: “By describing animals as automata, Descartes did not mean to reduce them to lifelessness. On the contrary, he meant to declare that one could explain every aspect of life in terms of machinery, and so could understand the workings of living beings as fully as a clockmaker understands a clock. Rather than reduce life to mechanism, he meant to elevate mechanism to life: to explain life, never to explain it away” ((Chicago, London: University of Chicago Press, 2016), 44-5). Riskin lays out the differences between theological and Descartes’ traditional mechanism on page 4.

⁷⁰ For a concise and excellent summary of mechanism, see Riskin’s introduction in *ibid.*

⁷¹ *Allgemeine Deutsche Biographie, herausgegeben durch die historische Commission bei der Königl. Akademie der Wissenschaften* (Leipzig: Duncker & Humblot, 1890), 736.

⁷² Wundt never used Scheitlin’s term “Unterscheidungsgabe,” instead favoring its synonym “Unterscheidungsmerkmal” (Wilhelm Wundt, *Vorlesungen über die Menschen- und Thierseele* (Leipzig: L. Voss, 1863), I: 490).

psychology. Scheitlin's name did not appear this time.⁷³ As we will see in Part III, Wundt had already become animal psychology's most prominent denouncer—and most prominent proponent.

PART III: “[E]inen umgekehrten Darwinismus”: The Expression of the Emotions in Wilhelm Wundt's ~~Animal~~ Experimental Psychology

While Darwin was showing Jenny food without giving it to her in 1838, thereby attempting to “plague her,” the study of animal behavior floated between philosophers, naturalists, natural historians, and natural theologians in what historian Robert Young calls “a common context”: a context neither determined by nor restricted to specialists.⁷⁴ The prevailing belief impeding such a specialty was that thinking, feeling, and planning were not legitimate objects of inquiry, especially when the object of study was an animal.⁷⁵ But this newly famous naturalist, having returned to England in October 1836 from his travels on the HMS *Beagle*, disagreed. His visits to the London Zoological Gardens and, as of late 1839, his “metaphysical” observations on child expression pointed him in a different direction.⁷⁶ In the 20 or so years Darwin actively conducted research on human versus animal expression, and in the four months of 1871 during which he wrote his manuscript on the topic, Darwin's ideas on the study of expression remained remarkably fixed.⁷⁷ He rejected his contemporaries' abstention from

⁷³ This 23rd lecture on animal psychology in the 2nd edition is, indeed, not in the 1st edition (Wilhelm Wundt, *Vorlesungen über die Menschen- und Thierseele*, 2nd ed. (Leipzig: L. Voss, 1892). This lecture seems to have been lifted from Wundt's 1885 essay, “Die Thierpsychologie.” For this reason, I focus here on Wundt's animal psychology essay.

⁷⁴ Robert Young, “The Role of Psychology in the Nineteenth-Century Evolutionary Debate,” in *Historical Conceptions of Psychology*, ed. Mary Henle, et al. (New York: Springer, 1973), 191.

⁷⁵ Paul Ekman, “Introduction to the Third Edition,” in Darwin, *The Expression of the Emotions in Man and Animals*, xxx.

⁷⁶ Browne, “Darwin and the Expression of the Emotions,” 308.

⁷⁷ *Ibid.*

interpreting animal behavior in terms of the expression of emotion. And he maintained that human expressions and behavior, in their fundamental similarity across “the races,” pointed to their derivation from animal expressions and behavior. The difference between human and animal psychology was thus “one of degree, and not of kind.”⁷⁸

In *The Expression of the Emotions in Man and Animals* (1872), Darwin aimed to demonstrate that humans descended from lower animals, and he believed that proof thereof played out in the movements humans and other animals made instinctively with their faces and bodies. Even if animal behavior was a means to an end for Darwin,⁷⁹ the concepts and methods he employed went a long way in legitimizing behaviorism for his contemporaries. Having demonstrated in *On the Origin of Species* (1859) and *The Descent of Man* (1871) that human and animal were not “independent creations,” he explicitly couched his study of expression within evolutionism, more so than any other framework.⁸⁰ Evolutionary theory, was *the* logical precedent for his new mode of studying expression, which did not assume human expression as singular, God-given, voluntary (i.e., not mechanical), and more expansive than animal expression.⁸¹ Expression, wrote Darwin in his introduction to the first edition, had been such an impenetrable object of study because the role of inherited habits had been hitherto neglected:

⁷⁸ “Nevertheless the difference in mind between man and the higher animals, great as it is, is certainly one of degree and not of kind” (Charles Darwin, *The Descent of Man, and Selection in Relation to Sex* (London: John Murray, 1871), 105).

⁷⁹ Richard W. Burkhardt, Jr. wrote that one should contextualize Darwin’s engagement with animal behavior as “generally in the service of broader explanatory goals—such as confuting the creationists or demonstrating the continuity between animals and man—and not for the purpose of dealing with behavioral phenomena in and of themselves.” Burkhardt concludes that Darwin’s “understanding of behavior thus both reflected *and reflected back upon* his understanding of the evolutionary process” (“Darwin on Animal Behavior and Evolution,” 329).

⁸⁰ “No doubt as long as man and all other animals are viewed as independent creations, an ineffectual stop is put to our natural desire to investigate as far as possible the causes of expression” (Darwin, *Expression*, 19).

⁸¹ This is a reference to Sir Charles Bell’s *Anatomy and Philosophy of Expression* (1844), a physiological work which Darwin identified as his main predecessor. Darwin tackled his problems with Bell’s work on pages 8-9, 144, 217, and 219.

“With mankind some expressions, such as bristling of the hair under the influence of extreme terror, or the uncovering of teeth under that of furious rage, can hardly be understood, except on the belief that man once existed in a much lower and animal-like condition” (19). Attention to physiological movement alone had not been able to answer, or ask, why certain expressions accompanied certain emotions.⁸² Darwin thus wagered that an evolutionary perspective would make the study of expression a viable natural-scientific project.

While intending to shine “a new and interesting light” on “the structure and habits of all animals” (19), Darwin cautiously framed his study of expression, especially in comparison to Scheitlin. The English naturalist did not claim to invent a new field (although he inadvertently did); rather, he claimed to take an already established mode of inquiry in a direction which evolutionary theory not only made pressing but utterly reasonable. And he certainly did not claim that his study of expression would form the basis of a research paradigm absorbing all neighboring fields (although it eventually did). Instead, Darwin recognized that his object of study required disciplinary and methodological padding so as not to be interpreted as a backslide into a science of the soul. He identified his predecessors as distinguished physiologists, and psychology—as it arose out of natural philosophy—was certainly not *Expression*’s disciplinary home.⁸³ He also prioritized bodily over vocal expression, as the former could more precisely articulate subtle expressive movements by way of human muscular anatomy (**Figure 7**). To be sure, Darwin’s analytic was neither “soul” nor “spirit” but “the expression of the emotions.”

⁸² As Paul Ekman notes in his introduction to the third edition of *Expression*, Darwin was the first to ask not just “what,” “how,” or “when,” but “*Why* do expressions occur in a particular form?” (in *Expression*, xxiv-v).

⁸³ The word “psychology” appeared only once in reference to Herbert Spencer’s theory of muscular system activation when afraid, in his *Principles of Psychology* (1855) (16). “Soul,” of course, appeared nowhere.

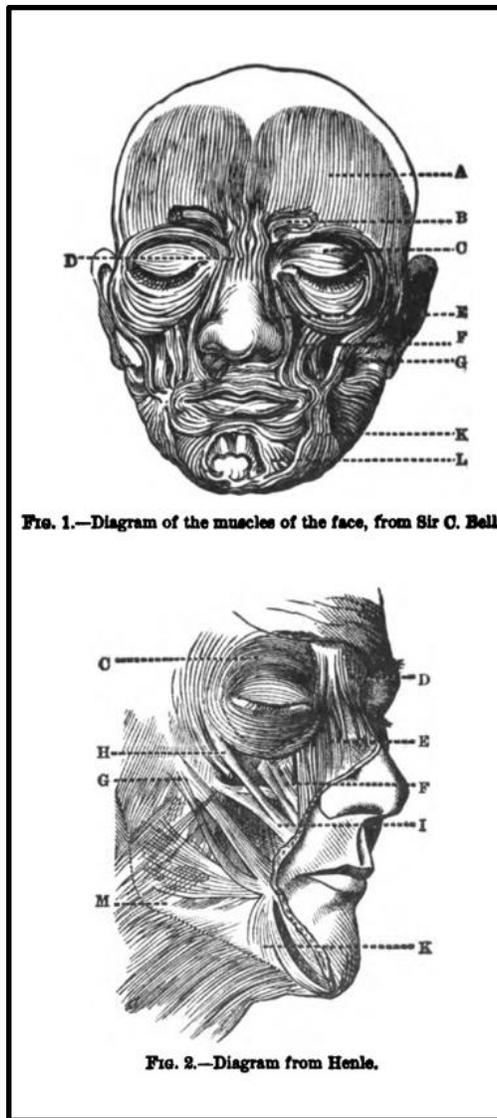


Figure 7. Darwin included reproductions of Sir Charles Bell’s diagram of the muscles of the face from his *Anatomy and Philosophy of Expression* (1844) and two diagrams (the second is on the following page) from Jakob Henle’s *Handbuch der systematischen Anatomie des Menschen* (1856-73). In Darwin, *Expression*, 29.

Darwin’s anatomically aware mode of conducting and describing his observations, then, was markedly different from Scheitlin’s self-conscious observation of oneself in observing the animal. Rather than search for an individual’s soul-life in his expression, Darwin intended to account for the observer’s empathetic tendency to imagine expressions which are not actually present. Attuned to observation bias, Darwin saw danger in empathy. He sought to eliminate

such a “source of error” in his study of expression, which, he recognized, was “difficult, owing to the movements being often extremely slight, and of a fleeting nature” (19). In other words, the study of the expression of emotions presented a series of methodological conundrums, as it rested so heavily upon one observer’s perspective. To provide “as good a foundation as possible [...] independently of common opinion” (20), Darwin gathered information on a wide range of “missing links” between human and animal: human “savages” and “idiots,” human children, anthropomorphic apes, lower animals, domesticated animals, and even the “deaf and dumb” girl Laura Bridgman.⁸⁴ To do this, he sent out questionnaires and inquiries to his gentleman informants (22-4, 26-8); asked people to identify the expression they saw in contextless photographs (21); referred to paintings and sculptures of the masterfully “close observers” (21); and observed “the commoner animals,” as “we are not likely to be biased by our imagination and we may feel safe that their expressions are not conventional” (24-5). This move of situating the study of animal behavior and expression within several overlapping inquiries into human behavior and expression was arguably Darwin’s greatest gift to what became animal behaviorism. Darwin believed that observing “whether the same general principles can be applied with satisfactory results, both to man and the lower animals” was the “most serviceable” means of testing one’s conclusions on expression (25). And this meant that *Expression* abounded with expressive animals: horses pawed on the ground in eagerness (51), cats headbutted their mistresses (60), monkeys comprehended the expressions and gestures amongst themselves and, to a large extent, humans (63).

⁸⁴ While “the missing link” was not Darwin’s term, his work was caught up for centuries within the search for some organism or phenomenon linking the human to the animal. Richard Garner, for instance, researched gorilla and chimpanzee “speech” under the assumption that both were the “missing links” between animal expression and human language (Radick, *The Simian Tongue*, 82-3).

Crucially, Darwin's early animal behavioral experiments were sometimes tucked into his anecdotes, experiments which he only rarely recounted as such in *Expression*. In one such rare instance, Darwin wrote about Jenny and her conspecific:

“Many years ago, in the Zoological Gardens, I placed a looking-glass on the floor between two young orangs [...] At first they gazed at their own images with the most steady surprise, and often changed their point of view. They then approached close and protruded their lips towards the image, as if to kiss it [...] They next made all sorts of grimaces, and put themselves in various attitudes before the mirror; they pressed and rubbed the surface; they placed their hands at different distances behind it; looked behind it; and finally seemed almost frightened, started a little, became cross, and refused to look any longer” (140-1).

In this rudimentary experiment, Darwin placed a mirror on the floor (cause) and observed how the young orangutans reacted (effect): surprise, moving around the mirror, moving towards the mirror, protruding their lips, grimacing, self-styling, touching the mirror and the space behind the mirror, fright, anger, and then turning away from the mirror. In a letter he wrote on September 2, 1838 from the Zoological Gardens, Darwin first mused that orangutans “have less expression than the Macacos from not moving the skin of forehead” and “are like a child when annoyed,— & do not show by expression of countenance pleasure.” On page four of his five-page musings on orangutan expression, Darwin recounted the same series of events he later inserted into *Expression*. When he placed a mirror in front of Jenny and another orangutan, they were “astonished beyond measure” and “after some time stuck out lips, like kissing,” even “ma[king] faces at it.”⁸⁵ In this way, Darwin snuck the animal into behaviorism in plain view. Although he was criticized here as throughout his career for his reliance on anecdotes and second-hand accounts, rather than systematic data to rigorously test an observation, he nonetheless proposed

⁸⁵ Darwin also described Jenny playing with straw and sticks “like a silly listless child,” her expression of jealousy and her seizure of whatever is near when she sees a dog “from knowing she will be able to hurt more with these than with paw” (Darwin notes: “this is just as curious as Dr Smith’s story of throwing stones”). Page five ends with a note that the orangutans “sleep together & snore much” (Charles Darwin, “CUL-DAR191.1-2” ([Orang utans at] Zoological Gardens) (September 2, 1838)).

an evolutionary, physiological, even experimental means of studying expression which shaped further studies thereof.⁸⁶ As we will see in the next section, Darwin, without marketing his work for an audience of psychological researchers, piqued the interest of the most famous psychologist of the late 19th-century: Wilhelm Wundt, who read in *Expression* an incipient program for experimental animal psychology.

Thirteen years after Darwin's *Expression* was published in English and German, Wilhelm Wundt—widely recognized by then as the founder of experimental psychology—released an essay collection. Having established the Institute for Experiment Psychology at the university in Leipzig six years prior, he intended for *Essays* (1885) to make accessible to “einem weiteren Kreise als dem der eigentlichen Fachgelehrten” an expansive array of his lifework up until that point.⁸⁷ *Essays* included his landmark “Die Aufgabe der experimentellen Psychologie,” as well as a smattering of essays on topics he certainly did not deign to tackle in his late-career academic publications: emotion and imagination, language and thought, as well as superstition and knowledge.⁸⁸ A quick glance at the table of contents leaves one with the impression that Wundt was concerned with exploring these phenomena solely in humans. But tucked away within the 14

⁸⁶ “But there remains the much greater difficulty of understanding the cause or origin of the several expressions, and of judging whether any theoretical explanation is trustworthy. Besides, judging as well as we can by our reason, without the aid of any rules, which of two or more explanations is the most satisfactory, or are quite unsatisfactory, I see only one way of testing our conclusions. This is to observe whether the same principle by which one expression can, as it appears, be explained, is applicable in other allied cases; and especially, whether the same general principles can be applied with satisfactory results, both to man and the lower animals. The latter method, I am inclined to think, is the most serviceable of all. The difficulty of judging of the truth of any theoretical explanation, and of testing it by some distinct line of investigation, is the great drawback to that interest which the study seems well fitted to excite” (Darwin, *Expression*, 25). Paul Ekman, “Introduction to the Third Edition,” in *Expression*, xxxi.

⁸⁷ Wilhelm Wundt, *Essays* (Leipzig: W. Engelmann, 1885), iii.

⁸⁸ It bears repeating that these were topics which Wundt—one of the world's most highly regarded, reputable scientists by that point—tackled only in an expressly popular work. Seeking to balance out what were still regarded as frivolous objects of study, Wundt also included essays on Lessing, the theory of matter, and the development of the will.

total essays, two reveal the muted, yet insistent presence of animals by way of Darwin and, surprisingly, Scheitlin. Both essays went unacknowledged in Wundt's foreword: "Die Thierpsychologie" (182-98), in which Wundt contrasted Darwin and Scheitlin's versions of studying animal expression, and "Der Ausdruck der Gemüthsbewegungen" (222-43), an unmistakable nod to Darwin's *Expression*, translated the same year it was published in English as *Der Ausdruck der Gemüthsbewegungen bei dem Menschen und den Tieren*. Removing the animal from his physiologically oriented experimental psychology and leaving only its trace came to characterize Wundt's attitude towards the study of animal minds and emotions. If his experimental psychology was a "Psychologie ohne Seele" (to borrow Albert Lange's phrase), then it was certainly a "Psychologie ohne Thierseele."⁸⁹

In "Die Thierpsychologie," Wundt did not waste time sharing where he thought animal psychology stood from his position in an experimental psychology laboratory at the end of the century: "Die Thierpsychologie ist stets ein Stiefkind der Psychologen gewesen" (182). His critiques of animal psychology's method were no less blunt. Where Scheitlin saw tradition in centuries' worth of philosophers investigating the animal soul, Wundt saw an antiquated psychology practiced by "Thierlebhhaber und Dilettanten" who sullied "wirklicher Beobachtung" for the sake of "der sogenannten 'Thierseele'" (182). Where Carus proclaimed a revolutionary "Wissenschaft des innern Menschen (*in abstracto*)" (21), Wundt proclaimed an immaterial, imprecise activity without practical application: "Wann wäre es wohl je einem Anatomen beigekommen, eine Anatomie des Thieres *in abstracto* zu schreiben?" (182). And where both

⁸⁹ Wundt framed "Die Aufgaben der experimentellen Psychologie" with Albert Lange's phrase but determined that "experimentelle Psychologie" was a more apt designation for his project ("Die Aufgaben der experimentellen Psychologie," *Essays*, 127-8). For a concise explication of Wundt's experimental psychology, see William R. Woodward, "Wundt's Program for the New Psychology: Vicissitudes of Experiment, Theory, and System," in *The Problematic Science: Psychology in Nineteenth-Century Thought*, eds. William R. Woodward and Mitchell G. Ash (New York: Praeger, 1982), 167-97.

Carus and Scheitlin found *das Thier* serviceable (if not productive, for marking where the animal sciences had gone wrong and could go right), Wundt found “ein großes unbestimmtes Collectivwesen” (183). Wundt even went so far as to critique animal psychologists of what they critiqued their own forebearers of: anthropomorphization. Not only did they transfer the Romantic awe of Nature onto the animal, inserting their own beliefs in the process, but they erroneously tried to collapse human and animal difference. “So ist lange vor Darwin unter den Thierpsychologen eine Richtung hervorgetreten,” wrote Wundt, “welche nicht nur den Unterschied zwischen Mensch und Thier auszugleichen sucht, sondern die man bisweilen als einen umgekehrten Darwinismus bezeichnen könnte, weil sie mit Vorliebe auf solche Leistungen hinweist, die über die menschlichen hinauszugehen scheinen” (183). Wundt’s critique of animal psychology here contained within it an ironic compliment: Scheitlin’s animal psychology was a hyperbolic precursor to Darwin’s evolutionism.

Considering that Wundt had not even written two pages by the time he had effectively denounced animal psychology as a pseudoscience, the direction Wundt took for the rest of the essay is nothing less than staggering. Wundt proposed—covertly, subversively—an experimental animal psychology, a “wirkliche Thierpsychologie” (184), with Darwin’s early behavioral experiments at the London Zoological Gardens and daily recordings of his own children’s behavior, both of which Darwin collected in *Expression*, as the rectifying model. Under the guise of a fierce critique of animal psychology as it had been conceived up until that point, Wundt presented a systematic means of filling the holes he identified in its methods, in order to bring animal psychology into the experimental sciences. In Wundt’s view, Scheitlin was the most prominent figure in the old animal psychology. And Darwin’s *Expression*, from which one could learn “unendlich viel mehr wirkliche Thierpsychologie” than Scheitlin’s complete science of the

animal soul, represented the way forward for the apparently misguided field (184). What a natural-scientific, experimental animal psychology needed, then, was a new founding father—and Wundt, in nominating Darwin for the role, ended up nominating himself.

Or, in Wundt's estimation, one could not be the founding father without the other also being the founding father. Over the course of "Die Thierpsychologie," Wundt proposed a fusion of Darwin's evolutionary theory and his own experimental psychology in resituating animal psychology's critique of Cartesian mechanism. Bringing to bear both frameworks on the study of animal lives, Wundt sought to rearticulate the questions posed by animal psychology à la Scheitlin in a way that served psychologists and evolutionists, zoologists and sociologists in the late 19th century. In doing so, he interrogated the concepts of instinct and drive (as well as instinctual expressions), on the one hand, and emotion and imagination, on the other, through what he perceived as the latest natural-scientific knowledge.⁹⁰ Fittingly, he criticized the intellectual inheritance of the 18th century, rejecting the animal sciences' teleological and mechanistic past in staking out his claim to the animal sciences' present. And much like Scheitlin, Wundt highlighted terminology as a hindrance to the researcher's impartiality, homing in on bad analogies like *Gesellschaft* and *Staat*, which, unlike Darwin's "struggle for existence," did not illuminate both sides of the human-animal analogical relationship (188)—and worse, erroneously attributed to the animal human abilities and structures (186). Wundt suggested in this regard that something uniquely complicated happens when humans use symbolic thinking to study animal behavior. The danger here, he warned, was that the symbol could come to take the place of the symbolized: this was scientific thinking's dead end.

⁹⁰ "Die Thierpsychologie" overflows with the latest work in the relatively new fields of biology and zoology. Wundt supported his assertions through, for instance, zoological work on bees and polyps; the most recent conceptualization of the relation between form and function, community and individual; and while far less current (although still groundbreaking), Virchow's cellular pathology (189).

Without acknowledging what he was doing, Wundt essentially reframed Scheitlin's version of animal psychology through his own extensive knowledge of biology, Darwinian evolution, and experimental psychology. He was sympathetic to Scheitlin's animal psychology, yet deeply anxious. Inserting the animal object of study into his expressly human experimental psychology could mean calling into question the empirical, positivist, law-driven methodology on which his reputation rested. After all, the experimental psychologist would be hard-pressed to study psychical phenomena which could not be made quantifiable through their corresponding physiological functions. Human babies were one thing—and Darwin provided, according to Wundt, an exemplary method for studying human instinct in this manner—but animals were another thing entirely. There was, then, something uniquely troubling about bringing the animal into the realm of psychology in 1885, especially considering psychology's 19th-century journey from speculation to positivism. And what, exactly, made the animal such a troubling figure for Wundt's experimental psychology is best evidenced by his visible discomfort with Scheitlin's science of the animal *soul*.⁹¹ *Die Thierseele* was not Wundt's object of study, nor was animal emotion. If Wundt was going to smuggle the animal into experimental psychology, he would do so only once he had passed the animal off to the most towering scientist of the century.

“Wie nahe lag es nun aber,” wrote Wundt, “den Entwicklungsgedanken auch auf die psychische Seite des Thierlebens anzuwenden!” (193). By 1885, Darwin's theory of evolution was widely accepted in the German-speaking world, having been disseminated and popularized

⁹¹ In 1863, Wundt was already turning away from the soul: “Unsere Seele ist nichts anderes als die Summe unserer inneren Erlebnisse selbst, unseres Vorstellens, Fühlens, Wollens, wie es sich im Bewusstsein zu einer Einheit zusammenfügt.” For this reason, he wrote in 1885, “das Geistige reine Actualität oder unmittelbar in den Aueßerungen des geistigen Lebens selbst gegeben” (in Klaus Sachs-Hombach, *Philosophische Psychologie im 19. Jahrhundert: Entstehung und Problemgeschichte* (Freiburg, Munich: Karl Alber, 1993), 304).

by figures such as Ernst Haeckel and Wilhelm Bölsche.⁹² And the English naturalist's *Expression*, although less well-known than its predecessors *On the Origin of Species* and *The Descent of Man*, provided Wundt with a respectable frame—possibly even a plausible excuse—for devising an experimental animal psychology:

“Namentlich wer die geistige Entwicklung eines Thieres studiren will, der wird, ähnlich wie es Darwin in seiner ‘biographischen Skizze eines Kindes’ gemacht hat, ein sorgfältiges Tagebuch führen müssen. Der Beobachter in zoologischen Gärten, der seine Untersuchungen gleichzeitig über viele Objecte ausdehnt, wird vollends ohne dies Hilfsmittel nicht auskommen. Erst dann wird man auch anfangen können, planmäßig, nicht wie bisher bloß zufällig, psychologische Experimente an Thieren anzustellen, d. h. sie willkürlich bestimmten Bedingungen auszusetzen, um deren Einfluß zu verfolgen” (185-6).

Introduced by the impersonal “wer die geistige Entwicklung eines Thieres studiren will,” this was Wundt’s program for a Darwinian experimental animal psychology. The animals of zoos and aquaria, rather than domesticated animals, would be the objects of experimentation, as the latter “befinden sich natürlich in einem durch die Domestication veränderten Zustande” (184-5). Wundt also recommended studying “die niederen Thiere, die uns über die einfachsten Regungen des geistigen Lebens Ausschluß geben sollten,” but especially anthropomorphic apes, “deren eingehende Untersuchung zu einer geistigen Grenzbestimmung zwischen Mensch und Thier vor allem erforderlich wäre” (185). Studying an animal’s development would be the goal, while studying the “geistigen Grenzbestimmung zwischen Mensch und Thier,” as well as those between life and non-life, would be the ultimate goal.

⁹² For Darwin reception in German scientific thought, see especially Alfred Kelly, *Descent of Darwin: The Popularization of Darwinism in Germany, 1860-1914* (Chapel Hill: University of North Carolina Press, 1981). For Darwin reception in German literature and culture, see: Philip Ajouri, “Darwinism in German-Speaking Literature (1859-c. 1890),” in *The Literary and Cultural Reception of Charles Darwin in Europe*, vols. 3 and 4, eds. Thomas F. Glick and Elinor Shaffer (London: Bloomsbury Academic, 2014), 17-45; Nicholas Saul, “Darwin in German Literary Culture 1890-1914,” in *The Literary and Cultural Reception of Charles Darwin in Europe*, vols. 3 and 4, eds. Thomas F. Glick and Elinor Shaffer (London: Bloomsbury Academic, 2014), 46-77.

Here, the model of observation was Darwin's daily recordings of his children's development in his M and N notebooks. The birth of William Erasmus—and the opportunity to observe him from his very first moments of life—occasioned Darwin's first speculations on instinctual and learned behaviors, thereby laying much of the groundwork for *Expression*. These notes were published five years after *Expression* as an article entitled "A Biographical Sketch of an Infant."⁹³ Wundt identified in Darwin's behavioral notebooks and essay an ideal form of collecting psychological evidence which did not require the researcher to rely on memory. This practice could then be applied to Darwin's early animal experiments on Jenny and other animals in the London Zoological Gardens, signaled by "[d]er Beobachter in zoologischen Gärten." Only by making daily, painstaking observations of animals in something akin to their natural habitats could "man" begin the work of "planmäßig, nicht wie bisher bloß zufällig, psychologische Experimente an Thieren." Wundt thereby advocated for controlling all possible variables (e.g., domestication, change over time, the researcher's memory) in accounting for experimental cause-and-effect, similar to Darwin showing Jenny food without giving it her (cause), whereupon she bared her teeth and tried to hit him (effect).

In this way, Wundt proposed an experimental means of studying the animal expression of emotions, without using the terms "expression" or "emotion." He even distanced himself from his very proposal through use of the future tense and the agents "wer," "der Beobachter," and "man." But Wundt's attempts to distance himself from a tradition of studying animal emotions

⁹³ From December 27, 1839 until September 1844, Darwin filled his M and N notebooks with observations on his first child's, William Erasmus's, emotions and voluntary and involuntary actions, all of which occasioned Darwin's early hypotheses on the psychology of behavior and what was instinctual versus learned. A selection of this material was published in *Mind* five years after *Expression*, as "A Biographical Sketch of an Infant" (1877) (Browne, "Darwin and the Expression of the Emotions," 307-8). "Darwin's Observations on his Children," Darwin Correspondence Project, <https://www.darwinproject.ac.uk/people/about-darwin/family-life/darwin-s-observations-his-children>.

and abilities through the study of their souls was most strongly present in the near absence of the term *Thierpsychologie*. There was one major condition to this application of evolutionary theory and experimental method to the study of the animal *psyche*: the sacrifice of *Thierpsychologie*. Indeed, Wundt considered neither himself nor Darwin animal psychologists, even while positioning the sum of their work at the forefront of studying animal expression—and in an essay entitled “Die Thierpsychologie,” no less. Instead, Wundt used *Thierpsychologie* as a rhetorical mercenary, solely deploying it as either a pitiable point of contrast for his own experimental animal psychology or as an insult, e.g., “gewisse excentrische Thierpsychologen” (187). And yet, Wundt apparently took the work of Scheitlin seriously enough to coopt his questions and critiques and fold them into his own. He just did not call it *Thierpsychologie*. He called it *Psychologie*.

CONCLUSION: From Animal Psychology to New Animal Psychology

Born out of a priest and philosopher’s mid-century hope for a more ethical approach to animals, animal psychology limped, battered and bruised, to century’s end. The philosophical, methodological, and disciplinary shifts of the intervening decades had removed the *Seele* from Scheitlin’s *Thierseelenkunde* and replaced it with a measurable physiology of expression. The stakes of this reconfiguration of scientific practice became, indeed, no less than what differentiated a “vulgäre” from a “wissenschaftliche” science—and whose work was lost to history and who became immortalized as the father of experimental psychology.⁹⁴ Surprisingly,

⁹⁴ In 1897, Austrian entomologist Erich Wassmann wrote a critique of animal psychology, the first chapter of which took up Wundt’s refutation of animal psychology à la Scheitlin (“Vulgäre oder wissenschaftliche Thierpsychologie?” in *Instinct und Intelligenz im Thierreich: ein kritischer Beitrag zur modernen Thierpsychologie* (Freiburg im Breisgau: Herder, 1897), 1-8.

it was Wundt's critical reformulation which gave animal psychology its ticket into the next century. As he implied in his 1885 essay on animal psychology, the behavior of animals could constitute a promising experimental research agenda—just not his. Wundt did not conduct psychological experiments on animals, and neither Wundt nor Darwin truly established animal behaviorism as a scientific field. The experimental study of animal behavior began in earnest when, at the end of the 19th century, the students of such towering figures began using animals for their dissertation research.⁹⁵ As we will see in the next chapter, Wundt's intervention also established the uniquely productive tension between New Animal Psychology and post-Wundtian “new” psychology, a tension which continued well into the 1910s (the topics of Chapter 3 and this dissertation's conclusion). What exactly sowed the seeds of the decades-long bitter rivalry between these two psychologies? Their application of experimental methods to the questions Scheitlin posed in his—that is, the original—animal psychology.

⁹⁵ Philip Howard Gray, “The Early Animal Behaviorists: Prolegomenon to Ethology,” *Isis* 49, no. 4 (Winter 1968): 372-83.



Figure 8. “Following the Leader, goslings file across a meadow. Though Lorenz carries a food bucket, his rhythmic sounds, not hunger, keep them with him,” in “An Adopted Mother Goose,” *LIFE* (August 22, 1955): 74.

Man wende nicht ein, Fälschungen seien legitime Freiheiten der künstlerischen Darstellung. Gewiß, Dichtern ist es erlaubt, wie jeden anderen Gegenstand, so auch das Tier nach den Notwendigkeiten dichterischer Verfahrensweise zu ‘stilisieren’: Rudyard Kiplings Wölfe und Panther, sein unvergleichlicher Mungo Rikkikkitavi sprechen wie Menschen, Waldemar Bonsels Biene Maja vermag sogar förmlich und höflich zu sein wie sie. Solche Stilisierungen sind nur dem erlaubt, der das Tier wirklich kennt. [...] Ich bin Naturwissenschaftler, nicht Künstler. Ich werde mir daher durchaus keine Freiheiten und ‘Stilisierungen’ gestatten.

– Konrad Lorenz, *Er redete mit dem Vieh, den Vögeln und den Fischen* (1949)

Chapter 2
Materializing Interspecies Communication:
Clever Hans and the *Sprachkrise*'s Animal Psychologists
(1904-1915)

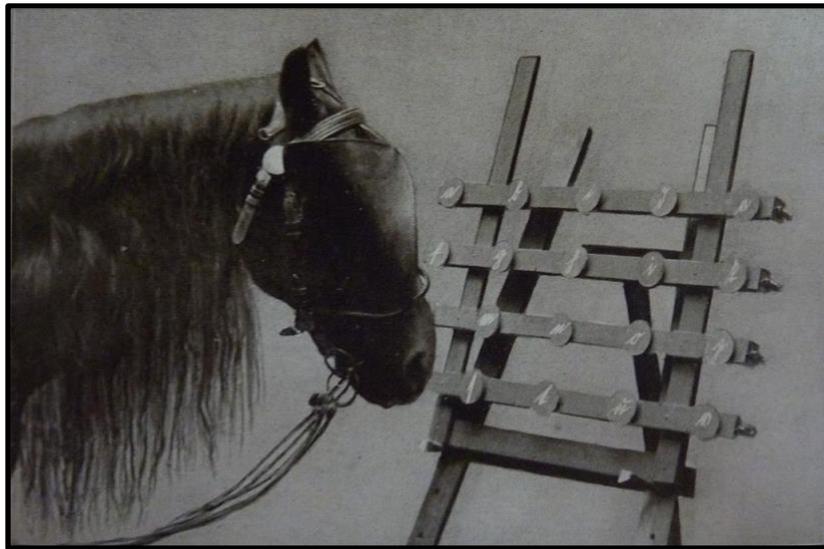


Figure 9. “Abb. 122. Hans vor der Schreibmaschine. Der Blick nach vorn ist durch die Scheuklappe nicht behindert,” in Karl Krall, *Denkende Tiere: Beiträge zur Tierseelenkunde auf Grund eigener Versuche* (Leipzig: F. Engelmann, 1912), 371.

In 1879, six years before attacking Peter Scheitlin’s science of the animal soul, Wilhelm Wundt sank his teeth into another of experimental psychology’s nonhuman threats: the spirits. A disgruntled Wundt arranged himself at his writing desk in late May and penned a 26-page open letter to Hermann Ulrici, a philosopher of Hegelian logic at the university in Halle.⁹⁶ The cause:

⁹⁶ In May 1879—having only five years prior accepted the position of ordentliche Professur für Philosophie at the University of Leizig—Wundt had not yet founded the institute for which he became most famous. While the exact starting date for Wundt’s Institute for Experimental Psychology has been a point of contention for historians of psychology, Wundt neither had an active laboratory, nor conducted experimental research before 1879. In fact, Wundt only started referring to what was previously a “seminar” as an “institute” in the Winter 1879-80 semester.

A series of experiments conducted almost two years prior by several of Wundt's colleagues in Leipzig, which Ulrici had praised in the latest edition of *Zeitschrift für Philosophie und philosophische Kritik* under the provocative title "Der sogenannte Spiritismus: Eine wissenschaftliche Frage."⁹⁷ The effect: Incensed that a fellow man of philosophy had proclaimed spiritualism an object of natural-scientific study, Wundt felt he had no choice. The experimental psychologist drew blood. To incorporate spiritualism into scientific practice was to muddle the boundary between religious belief and experimental evidence, to return to an earlier stage of human cultural development in which empiricism had not yet displaced animism. No, a plant is not animated by its vegetative soul (as Friedrich August Carus would have it), and a table is not animated by spirits (as Ulrici would have it), to say nothing of whether that table "speaks."⁹⁸ For neither the first time nor the last, the experiment and the séance collided in the German experimental sciences, as did Wundt and the spiritualists.

What evolved into a year-long dispute over whether spiritualism constituted a "wissenschaftliche Frage" began with the aforementioned series of experiments revolving around the American medium Henry Slade.⁹⁹ Led by the astrophysicist and optical illusion expert

Historians Wolfgang G. Bringmann and Gustav A. Ungerer believe this to be the best starting date for the Institute's foundation ("The Foundation of the Institute for Experimental Psychology at Leipzig University," *Psychological Research* 42 (1980): 5-18).

⁹⁷ Wundt was quick to point out that Ulrici edited this academic journal (Wilhelm Wundt, *Der Spiritismus: Eine sogenannte wissenschaftliche Frage: Offener Brief an Herrn Prof. Dr. Hermann Ulrici in Halle* (Leipzig: Wilhelm Engelmann, 1879), 3). At the time he published his article on spiritualism, Ulrici was, in fact, editing *Zeitschrift für Philosophie und philosophische Kritik* alongside Johann Gottlieb Fichte and Johann Ulrich Wirth.

⁹⁸ For more on the "sprechende Tische" of the 1850s as a highly contentious knowledge object which migrated from Rochester, New York to Europe, see especially: Johanne Bohley, "Klopffzeichen, Experiment, Apparat: Geisterbefragungen im deutschen Spiritismus der 1850er Jahre," in *Pseudowissenschaft*, eds. Dirk Rupnow et al., 100-26; Daniel Cottom, "On the Dignity of Tables," in *Abyss of Reason: Cultural Movements, Revelations, and Betrayals* (Oxford: Oxford University Press, 1991), 22-49.

⁹⁹ Upon the publication of Wundt's open letter, Zöllner threatened to sue Wundt and even claimed that Wundt was possessed by evil spirits. For more on the debate, see: Corinna Treitel, *A Science for the Soul: Occultism and the Genesis of the German Modern* (Baltimore, MD: Johns Hopkins University Press, 2004), 3-12; N. Kohls and R. Benedikter, "The Origins of the Modern Concept of 'Neuroscience,'" in *Scientific and Philosophical Perspectives in Neuroethics*, eds. James J. Giordano and Bert Gordijn (Cambridge: Cambridge University Press, 2010), 44-8;

Johann Karl Friedrich Zöllner, these experiments intended to test Slade’s claim that he was a medium “of a strong power.”¹⁰⁰ From November to December 1877, Zöllner invited the physicist and co-inventor of the electromagnetic telegraph Wilhelm Eduard Weber, the psychophysicist Gustav Fechner, the mathematician Wilhelm Schreiber, and others to his home for séances with Slade. Each of these séances commenced with the participants linking hands in near darkness, whereupon a loaded bookcase “was violently agitated” and a handbell “suddenly began to ring, and was then violently projected before all our eyes about ten feet distance horizontally upon the floor” (in the séance of December 11, 1877 at 11:30 am).¹⁰¹ Surely, if these great men of science could find no evidence of Slade’s deception, then the American was, indeed, a consummate medium whose powers revealed a new frontier for the natural sciences.¹⁰² For Zöllner and his adherents like Ulrici, the séance—when framed as a modern scientific experiment—allowed psychologists to plumb the depths of the human soul (increasingly called *psyche*). More importantly, the séance reclaimed the transcendent for modern science as it slipped ever more into a godless materialism of reactions times and attention span.¹⁰³ Whether or not psychologists

Hermann Ulrici, “Der sogenannte Spiritismus: Eine wissenschaftliche Frage (Mit Beziehung auf die Schriften von 1) Fr. Zöllner: *Wissenschaftliche Abhandlung*, Theil I. u. II. Leipzig, Staackmann, 1878. 2) J. H. v. Fichte: *Der neuere Spiritualismus, sein Werth und seine Täuschungen*. Leipzig, Brockhaus, 1878.),” *Zeitschrift für Philosophie und philosophische Kritik* no. 74 (1879): 239-71; Wundt, *Der Spiritismus*; Hermann Ulrici, *Über den Spiritismus als wissenschaftliche Frage: Antwortschreiben auf den offenen Brief des Herrn Professor Dr. W. Wundt* (Halle: C. E. M. Pfeffer, 1879); Friedrich Zöllner, *Die transcendente Physik und die sogenannte Philosophie: Eine deutsche Antwort auf eine “sogenannte wissenschaftliche Frage”* (Leipzig: Commissionsverlag von L. Staackmann, 1879).

¹⁰⁰ Slade quoted in Wundt, *Der Spiritismus*, 17.

¹⁰¹ Friedrich Zöllner, *Transcendental Physics: An Account of Experimental Investigations from the Scientific Treatises*, transl. Charles Carleton Massey (Boston: Colby & Rich, 1881), 56.

¹⁰² Zöllner was not alone in using the latest findings in the natural sciences to support his claim that spiritualist phenomena were not “supernatural” but entirely “natural.” In *Abyss of Reason*, Daniel Cottom names Alfred Hare, Alfred Russel Wallace, and Frederic Myers as other prominent figures who advocated for the naturalness and rationality of spiritualism (82). These great men of science were, without exception, old, decrepit, and inexperienced with spiritualist phenomena, according to the findings of a special inquiry mounted in 1886. Fechner and Schreiber both suffered from visual impairments, to boot, and Weber’s advanced age hindered his own ability to recognize their impairments.

¹⁰³ Treitel, *A Science for the Soul*, 16, 20, 44.

intended to study “spirit communications” as the product of the medium’s unconscious mind, these communications remained a critical question for the future of psychology.¹⁰⁴

As one of the most prominent watchdogs of late-19th-century psychology, Wundt needed to respond. Accompanied by the surgeon Karl Thiersch and the physiologist Carl Ludwig, Wundt attended a séance at Zöllner’s home, on November 18, 1877 from 3 until 3:30 pm.¹⁰⁵ The 2-page account of the “nicht ganz correct referirte Experiment” in Wundt’s open letter to Ulrici evidences his insistence on approaching spiritualist phenomena through their material substantiations (15). When the door of the room shakes, Wundt rejects wind as a possible explanation and notes that his colleagues later reported occasional knocking against their legs and the sudden, forceful pushing away of blackboards they were holding under the table. And when Slade, ostensibly seeking to placate the most skeptical member of the group, announces that Wundt is a medium “of a strong power,” Wundt soberly lists the lacking empirical evidence for this conclusion. The spirits—or “Gespenster,” as he preferred to call them (22)—had no place in a Wundtian séance; only their fingerprints counted.

While Wundt’s materialist approach attempted to reveal the absurdity of spiritualist claims like Slade’s, it revealed itself, instead, as doomed to failure for the very reason it seemed poised to succeed. When faced with spiritualist communication, scientific materialism could only detect the human’s presence. This became especially apparent when handwritten texts appear on the men’s blackboards. As the blackboards slowly rise into view from under the table, Wundt describes their physical attributes and his own inability to see Slade’s hand, foregoing the written

¹⁰⁴ This was philosopher Eduard von Hartmann, author of *Philosophie des Unbewussten* (Berlin: Duncker, 1867). In 1885, Hartmann wrote a book-length response to Zöllner’s experiments entitled *Der Spiritismus* (Leipzig: W. Friedrich, 1885). Treitel, *A Science for the Soul*, 21.

¹⁰⁵ Zöllner, *Transcendental Physics*, 2-3.

texts' content for his experience of their material qualities. Wundt later explains this choice through his conclusion "dass die schriftlichen Mittheilungen der Geister sehr unbedeutenden Inhalts, und dass auch ihre sonstigen Leistungen ziemlich zwecklos zu sein scheinen" (23). Spirit communications *mean* only insofar as they divulge who, exactly, is communicating. Meaning here derives not from content, but form—and form, in the case of spiritualist writings, necessarily bares the trace of the human medium's hand. "Die meisten Schriften waren in englischer Sprache abgefasst," observes Wundt, "eine in deutscher, aber in einem mangelhaften Deutsch, wie es etwa ein radebrechender Amerikaner oder Engländer geschrieben haben konnte" (16). In his attempts to identify the interlocutors in Slade's spiritualist communications, Wundt identified only one: Slade, whose faulty German grammar materialized on the blackboard. In a room of German-speaking scientists (and, for argument's sake, spirits), pidgin German was Slade's fingerprint.

Having thus turned language production into experimental evidence, Wundt demonstrated that human language, even when stripped of its semantic qualities, can communicate—through its material qualities. But what are the specifically material qualities of human language as opposed to, say, spirit communications? Does the materiality of language emerge in a dynamic relationship between the supposedly wholly immaterial utterance and the speaker's embodied materiality? And as the logic of fingerprints suggests, can faulty grammar stand in for Slade only once divorced from his human body and left, as written marks, on a nonhuman body: the blackboard? Does this, then, open the possibility of a nonhuman operating human language like a mechanical object and, if so, would a material framework sidestepping higher-order mental operations suffice to describe that operation?

25 years after Wundt investigated only the material manifestations of Slade's spirits, such a human-language-operating nonhuman appeared in the flesh, not only challenging the materialist framework of Wundt's successors but capturing the imagination of the German public. Made famous through an outpouring of news articles published in the summer and fall of 1904, the Orlov Trotter whose supposed reading, writing, and counting abilities earned him the nickname "der kluge Hans" was, I suggest, the problem the turn-of-the-century natural sciences—and psychology, in particular—did not know it needed. By making material the higher-order mental operations involved in language processing, and by doing so in a horse body, Hans revealed the gaps in existing psychological frameworks for approaching communication as both a material and immaterial, human and nonhuman (animal) phenomenon. These gaps, as I show here, were filled not by the natural sciences themselves (which burrowed further into scientific materialism), but by the psychical sciences and the literary arts. In many ways, a psychical-scientific framework recognizing communication beyond the human-nonhuman animal binary, on the one hand, and a literary narrative framework imagining subjective experiences beyond the human, on the other hand, were better equipped to meet the central question Hans posed to his human interlocutors: What are the communicatory capacities human and nonhuman animals share, whether material or immaterial—or more to the point: embodied and disembodied?

Even more importantly for the history of animal behavior and communication, Hans provided the occasion to experimentally test Charles Darwin's observation-based claim that embodied expression is the external manifestation of internal emotion. To be sure, experimentally verifying this expression/emotion equation through measurements of a particular animal's physiological response was exactly what Darwin, in 1872, longed for. Darwin

recognized that studying expression across the species posed a series of methodological problems, as expression was “difficult, owing to the movements being often extremely slight, and of a fleeting nature.”¹⁰⁶ His solution was to freeze the “fleeting” moments of expression through detailed physiological descriptions of muscular movements, while couching the entire, comparative endeavor in evolutionary theory. By 1904, experimental psychology had developed the technologies to measure, rather than merely observe, physiological response. Theoretically, a materialist experimental model could transform an animal’s external expressions into numerical data which provided insight into that animal’s emotional experience—and without the workings of human eye or hand interfering. And yet, Hans unveiled how this blind adherence to mechanical objectivity was, in fact, fantastically, fatally anthropocentric. When called upon by the public to determine whether Hans was an equine savant, the experimental psychologists’ conclusion proved more relevant for human psychology than animal psychology. Since the discipline of experimental psychology was specially equipped to detect the physiological manifestations of the human unconscious, the physiological manifestations of the human unconscious were exactly what the experimental psychologists detected.¹⁰⁷ Hans was no equine savant; Hans was merely a perceptive reader of his human interlocutors’ involuntary head and eye movements.

This chapter begins with the cultural reverberations of the experimental psychologists’ Clever Hans investigations in the summer and fall of 1904. For most readers of German news

¹⁰⁶ Charles Darwin, *The Expression of the Emotions in Man and Animals*, 3rd ed. (Oxford: Oxford University Press, 1998), 19.

¹⁰⁷ While the expression and communication of unconscious thoughts in humans and animals is my focus here, I do not explore it through recourse to psychoanalysis, the presence of which was certainly felt by contemporaries at the turn of the century. Instead, I consider how figures interested in the constellation of animality, language, and experimentation conceptualized the unconscious. I also do not invoke psychoanalysis in this chapter or any other for its anthropocentric reduction of animals to symbols at work in the human’s unconscious, rather than as subjects of psychological investigation onto themselves.

media, what eventually became known as “observer-expectancy effect” (or “Clever Hans effect”) sated their curiosity. But for many, questions remained, questions which centered on Hans’ perception of human embodied communication acts which humans, themselves, could not perceive. Such a mode of animal communication below articulated human language—theorized by Darwin, anticipated by spiritualists, and brought to light by Hans—is the focus of this chapter. In continuing to think about the destabilization of the human-nonhuman animal boundary through embodied communication, I turn in this chapter to early-20th-century anxieties around the human subject’s disappearance from the embodied, lingual communication act. For the philosopher of language Fritz Mauthner, poet and dramatist Maurice Maeterlinck, and fiction writer Franz Kafka, whose works form the critical heart of this chapter, Hans was more than a horse who could produce German-language sentences through a highly mediated interspecies alphabet system. Hans represented the nexus of turn-of-the-century anxieties, from the impotence of human language to the animalization of the human, from spiritualist communication to technological communication to mechanical reproducibility—anxieties which have since crystallized as the *Sprachkrise*. Hans was the most puzzling nonhuman animal “wissenschaftliche Frage” of the early 20th century—but outside the German academy, Hans and the horses who followed in his hoof-steps, I argue, became an interdisciplinary laboratory for testing out theories of communication beyond human perception and comprehension.

I do not focus here on the Hans-ignited battle for legitimacy between Wundt’s successors (and rivals) in experimental psychology and the unpedigreed members of New Animal Psychology from 1904 to 1912, as does most scholarship on Hans and the other Elberfeld horses.¹⁰⁸ I center, instead, the periphery of early-20th-century animal scientific discourse,

¹⁰⁸ Elberfeld was an independent town until 1926, at which point it became a municipal subdivision of Wuppertal. It is still most famous for the so-called “Elberfeld horses” (Hans, Zarif, and Muhamed) whose supposed human-like

bringing together three narrative writings which critically reimagined the *Hansfrage* (as it was popularly called) beyond its relevance for human psychology. Whether arising out of language-philosophical, science-philosophical, or psychical-scientific concerns, each narrative approached Hans and the other Elberfeld horses as an opportunity to rethink language, experiment, and animality in relation to materiality. As scientific materialism was only beginning to recognize its inability to study complexly (im)material psychological phenomena, these narratives played with language, form, and voice to present animal psychology—and, more specifically, human-horse communication—as an untamable object of study which pushed the bounds of human knowledge. Materiality was not the single, correct answer to the *Hansfrage*. Materiality was only a starting point for posing better questions about Hans.

PART I: Fritz Mauthner's Typewriter

On Sunday, September 11, 1904, *Berliner Tageblatt* published “Aus dem Tagebuch des klugen Hans (Gedanken über den Ruhm).”¹⁰⁹ *Berliner Tageblatt*'s readers required no background on why this especially “clever” Hans was ruminating on fame. Indeed, readers opened the newspaper on the morning of September 11, 1904 expecting news of the horse. The volunteer commission of thirteen well-known academicians and horse experts, known as the “September-Kommission,” would be publishing its report any day. And Fritz Mauthner—a nominalist philosopher of language, erstwhile Ernst Mach protegee, fiction writer, and the author of “Aus dem Tagebuch des klugen Hans”—gave them a report from Hans' perspective.¹¹⁰

reading, writing, and counting abilities formed the basis of New Animal Psychology. I address the Elberfeld horses and the founder of New Animal Psychology, Karl Krall, in Part II.

¹⁰⁹ Fritz Mauthner is listed as the publisher (Fritz Mauthner, “Aus dem Tagebuch des klugen Hans (Gedanken über den Ruhm),” *Berliner Tageblatt* no. 463 (September 11, 1904): 4).

¹¹⁰ Educated by Ernst Mach in experimental physics, Fritz Mauthner (1849-1923) was one of the most important figures in the *Sprachkrise* for his three-part *Beiträge zu einer Kritik der Sprache: Sprache und Psychologie* (1901),

By the time “Aus dem Tagebuch des klugen Hans” hit newsstands, the horse had been the most sensational story in the German press for several months. On July 7, 1904, *Der Weltspiegel*, an illustrated section of *Berliner Tageblatt*, ran “Das lesende und rechnende Pferd” by General Major Eugen Zobel on its first three pages.¹¹¹ Zobel, a distinguished horse expert, had written the article only after repeatedly visiting the horse in question and conferring with colleagues six times. While acknowledging readers’ skepticism from the first paragraph to the last, Zobel described the “psychologischen Studium” conducted by the retired schoolteacher Wilhelm von Osten in his shared Berlin-Mitte courtyard. The purpose of teaching his eight-year-old horse to read, write, and count (among other skills) was, in Zobel’s words, “zu beweisen, daß eine eingehende Einwirkung auf den Geist des Pferdes es ermöglicht, ein selbständiges Denken und Handeln zu erzielen.”¹¹² Von Osten’s hypothesis was that a horse, if cooperative by nature and encouraged through positive reinforcement, could learn to think independently, exhibiting the mental capacity of any given human child.

Having developed his equine pedagogical techniques by teaching schoolchildren and “Hans I” of 9 years prior, von Osten designed “ein vollständig systematischer Unterricht” aided by blackboard and chalk, calculator, a table-like shelf with various objects for visual instruction,

Zur Sprachwissenschaft (1901), and *Zur Grammatik und Logik* (1902). Hans was not an aberrant interest for Mauthner, as he stayed abreast of the latest psychological research on sensory perception, consciousness, memory, and nervous system coordination in space, for instance.

¹¹¹ E. Zobel, Generalmajor z. D., “Das lesende und rechnende Pferd,” *Der Weltspiegel: Illustrierte Halbwochen-Chronik des Berliner Tageblatts* no. 54 (July 7, 1904).

¹¹² “Man wird es für kaum möglich halten, daß das Pferd lesen, rechnen, zählen, Personen nach Photographien und Gegenstände erkennen und auf seine Art bezeichnen kann, daß es die deutsche Sprache versteht, auf die mannigfachsten Fragen Antwort gibt und wie ein artiges Kind alles tut, was sein Herr von ihm verlangt” (ibid.).

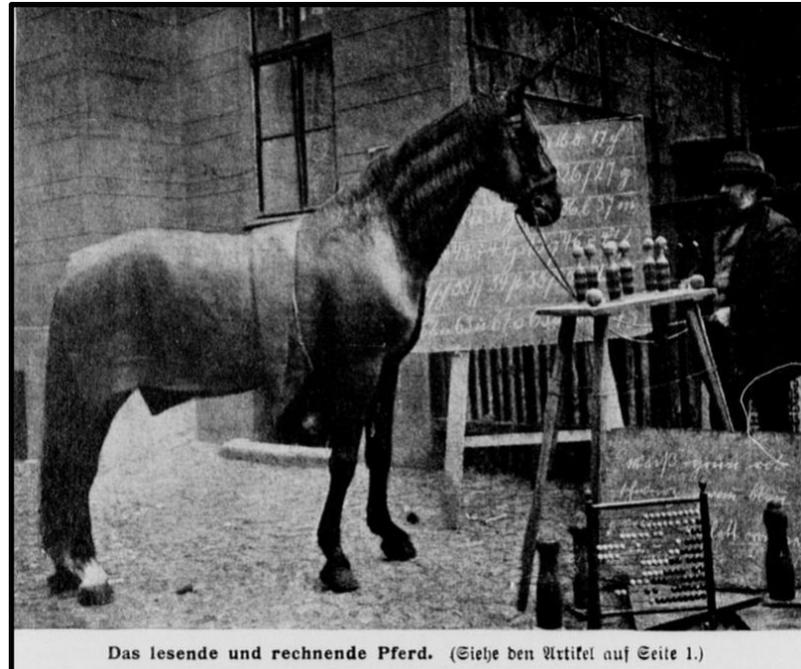


Figure 10. Major Eugen Zobel, “Das lesende und rechnende Pferd,” *Der Weltspiegel* (June 7, 1904).

pieces of bread and carrots, and the horse’s appetite (**Figure 10**). To commence the lesson, Hans took his place before the shelf and his keeper loosened the reins. “Im reinen Gesprächston,” observed Zobel of von Osten’s communication with Hans, “ohne besondere Betonung einzelner Worte, ohne helfende Zeichen, ohne eine bestimmte Reihenfolge, mit einem Worte, ohne irgendwelche Beihilfe wurden dem Pferde die verschiedensten Aufgaben gestellt.” In this way, the initial language comprehension lesson (“Links treten!”) gave way to an arithmetic lesson: “Wieviel muß Du zur ersten Zahl [22, written on blackboard] hinzuzählen, um 30 zu bekommen?” To this and all questions, Hans answered through a system of hoof-taps, as well as headshakes and nods for yes-no questions. Hans quickly tapped out larger numbers with his hooves low to the ground and alternating, with the final tap signaled by a strong stomp. Smaller numbers (1-3) entailed slow, strong stomps with high knees. Even von Osten’s reading lessons were based on this numerical system. On the blackboard, von Osten wrote words with numbers

under them. Upon calling out a word (e.g., “Brot”), von Osten asked Hans which number stood under that word. Such a lesson lasted around two hours every day, due to Hans’ lagging attention and sated appetite. But as to whether von Osten’s work with Hans constituted educational lessons or elaborate dressage tricks, Zobel was uncertain. He therefore called upon men of science to investigate the horse whose abilities exploded the borders of education and dressage, human cogitation and horse cogitation, communication as verbal language and communication as tapped-out letters.¹¹³

Zobel’s report unleashed a flurry of subsequent publications in German daily newspapers and magazines, as laypeople and animal experts alike attempted to account for the abilities of “der kluge Hans,” as the Orlov Trotter became known. Within a few weeks, Italian-, French-, and English-language newspapers began contributing their hypotheses of Hans’ uncannily human abilities. Perhaps this telegraphic horse was responding to voluntary or involuntary signals emitted by his human interlocutors, thanks to his capacity for tapping into underground electrical lines. Perhaps this especially sensitive horse could perceive warm sensations transmitted without direct skin contact. Perhaps this horse medium could read minds and receive suggestions.¹¹⁴ As the hypotheses of the horse’s abilities abounded during the late summer of 1904, “der kluge Hans” transformed into receptacle for contemporary anxieties around where “the human” ended and “the nonhuman” began. Hans was either a well-trained animal with

¹¹³ “Ich habe mit mehreren Herren versucht, der Sache auf den Grund zu kommen, inwieweit das Pferd wirklich menschlich denken, lesen und rechnen oder wie weit es eine Dressur bringen kann [...] Mögen nun die Leistungen des Hengstes die Folgen einer neuartigen Dressur oder einer durch methodischen Unterricht erlangten geistigen Entwicklung sein, jedenfalls sind sie staunenswert und wohl einzig dastehend und verdienen eine wissenschaftliche Untersuchung” (ibid.).

¹¹⁴ Karl Krall, *Denkende Tiere: Beiträge zur Tierseelenkunde auf Grund eigener Versuche* (Leipzig: F. Engelmann, 1912), 2.

exceptional memory, the Cartesian machine of its master, an occult phenomenon or, even more mystifyingly, a horse that could, in fact, think for itself—like a human.¹¹⁵

On September 6, 1904, a volunteer commission assembled in von Osten's courtyard to settle the matter. Composed of circus director Paul Busch, eventual co-founder of ethology Oskar Heinroth, sensory physiologist Willibald Nagel, Director of the Berlin Institute of Psychology Carl Stumpf, and Director of the Berlin Zoological Garden Ludwig Heck, among others, the commission's goal was simple. As Heck explained, they sought a cause for Hans' abilities as representatives of "sowohl die praktische Pferdekunde und Dressurtechnik, als die verschiedenen in Betracht kommenden Wissenschaften, die Zoologie, Physiologie, Psychologie und Veterinärmedizin."¹¹⁶ Their remarkably multidisciplinary examinations ended inconclusively. Based on their primary hypothesis that Hans was responding to the involuntary cues of his human questioners, the commission reported that they could not identify any "unabsichtlich[e] Zeichen von der gegenwärtig bekannten Art."¹¹⁷ Even after the most illustrious horse experts of 1904 examined Hans, the questions remained: What and how does Hans *know*; what and how does Hans *perceive*? (Is perceiving *knowing*, in many ways, for both human and horse?) And how might Hans' cognitive abilities uncover a previously unknown (to humans) mode of communication which proceeds beneath conscious articulation—that is, by way of

¹¹⁵ In his 1914 article on Hans and psychic research in *The American Journal of Psychology*, Edmund C. Sanford summarized the hypotheses as follows: "Taking all these together and neglecting small differences we have four rival hypotheses: 1) The horse can think for himself; 2) The horse cannot think, but has a phenomenal memory and is a marvel of training; 3) The horse has no need to think or even to remember, but is manipulated wholly by signals given by his master at the moment; and 4) The affair is occult and to be explained by the operation of powers and influences of which we know less than we do of horses" ("Psychic Research in the Animal Field: Der kluge Hans and the Elberfeld Horses," 25, no. 1 (January 1914), 8).

¹¹⁶ Krall, *Denkende Tiere*, 28.

¹¹⁷ Oskar Pfungst, *Das Pferd des Herrn von Osten (Der kluge Hans): Ein Beitrag zur experimentellen Tier- und Menschen-Psychologie: Mit einer Einleitung von Prof. Dr. K. Stumpf sowie einer Abbildung und fünfzehn Figuren* (Leipzig: J. A. Barth, 1907), 180.

embodied perception-as-knowing? However successive researchers answered the *Hansfrage*, the horse would be responsible for a shift in how the scientific community and the public thought not only of animals, but of communication.

The day before the commission released its “Gutachten vom 12. September 1904,” Mauthner’s “Aus dem Tagebuch des klugen Hans” appeared in *Berliner Tageblatt*, satirically reimagining the proceedings of the September Commission. Since this panel of experts had positioned themselves as debunkers of this mass media phenomenon—rejecting rather than creating explanations—Mauthner wondered what conclusions they might have reached if they had oriented their investigation around furthering Hans’ expressive capacities, rather than identifying “beabsichtige Hilfen oder Beeinflussungen.”¹¹⁸ In the subscript to the diary entries, Mauthner, playing editor, describes how the soon-to-be-published diary of the famous horse came into his hands. The members of the esteemed scientific commission tasked with assessing the horse’s “geistig[e] Fähigkeiten” descended upon Elberfeld, only to find that they could not stand idly by when “[n]ur der Mangel an menschlichen Sprechwerkzeugen hinderte ihn am artikulierten Sprechen.” Leaving aside their critical work, the commission decided to improve “die Methode seines Schreibunterrichts.” Hans had already learned to read and write in the German language, but two interlocking problems prevented the horse from realizing his full articulatory powers. First, his sole “Ausdrucksmittel” was tapping his hoof. And second, Hans could only communicate in human language by way of a convoluted alphabet system. In the (real) updated version of von Osten’s alphabet system, the number of Hans’ hoof-taps represented a given letter, which a human listener identified on a chart and then wrote on a chalkboard. This system, the commission agreed, was “[e]in umständliches Verfahren, das einer

¹¹⁸ “Gutachten vom 12. September 1904” in Pfungst, *Das Pferd des Herrn von Osten*, 180.

freien schriftstellerischen Tätigkeit im Wege stand. Die Klopffeister der Spiritisten werden ebenso durch einen primitiven Schreibunterricht verhindert, der Welt ihre höheren und tieferen Einsichten mitzuteilen.” Since the message was hindered by the medium, the medium needed to change. The solution: a typewriter. “Der Erfolg übertraf alle Erwartungen”:

“Die Kommission ließ eine Schreibmaschine bauen, die für die Hufe des klugen Hans—wenn ich so sagen darf—handlich war [...] Hans wieherte vor Freude, als man die Schreibmaschine aufgestellt und mit wenigen Worten erklärt hatte. Sofort ging er daran, im Tippen sich zu üben. Nach drei Tagen schrieb er mit der Maschine so schnell und so sauber wie ein älteres Tippfräulein.

Die Fragen der Kommission beantwortete er an der Schreibmaschine mit der ihm eigenen gewinnenden Offenheit. Kurz und präzise wie ein Militärpferd. Dreist und gottesfürchtig. Die Kommission hat es sich vorbehalten, die Antworten des klugen Hans zuerst und zugleich mit ihrem Gutachten zu veröffentlichen.”

For Mauthner, the *Hansfrage* provided a test case for considering language in its materialistic dependency on human embodied perception and, in turn, as a tool humans use to mediate those perceptions, thereby creating their reality.¹¹⁹ In his subscript to this *Kater Murr*-like satirical story,¹²⁰ he did this, first, by framing the means and media of communication as species-specific “Sprachwerkzeug[e].” Language is a tool made for humans and privileged by humans, and Hans’ intelligence has been judged based on his ability to manipulate this tool. When the commission redirects their efforts from an animal psychological investigation to the design of a “handlich” tool for Hans’ hooves, the grateful horse whinnies. Now equipped with

¹¹⁹ In the first volume of *Beiträge zu einer Kritik der Sprache, Sprache und Psychologie* (1901), Mauthner described the contingency of sensory perception, which he coined “Zufallssinne,” and the privileged role of language for human thinking as the basis of humankind’s distinct worldview. Beating Jakob von Uexküll and his concept of *Umwelt*, Mauthner proposed that other animals must have their own worldviews: “Es ist darum nicht nur möglich, sondern meines Erachtens auch vorstellbar, dass andere Tiere wieder andere Zufallssinne haben, in denen z. B. die Wärmestrahlen in Artunterschiede auseinandergehen, während die Lichtstrahlen etwa nur nach Stärkegraden unterschieden werden. Die irdische Tierwelt mag dabei, wenn der Entwicklungsgedanke recht hat, irgendwie nur für Töne, Wärme und Licht empfänglich sein” ((Stuttgart: J. G. Cotta), 298).

¹²⁰ Mauthner likely based the proud, tongue-in-cheek voice of Hans on the tomcat Murr, in E. T. A. Hoffmann’s *Lebensansichten des Katers Murr* by (1819). Since Murr was (and arguably still is) the most famous animal narrator in German-language literature, Mauthner’s readers would have made the connection between Murr and Hans.

his specially designed “Schreibmaschine” [literally: “writing machine”], Hans requires only a few words of instruction and three days’ practice before he can write mechanically, i.e., type, with the precision of “ein älteres Tippfräulein.” The horse’s increasingly adept operation of the typewriter culminates in him adopting the culture of his tool for expression, writing “[k]urz und präzis wie ein Militärpferd” and even “[d]reist und gottesfürchtig.” Oblivious to the fact they have exchanged one source of mediation (the alphabet system and the human blackboard-writer) for another (the horse-typewriter), the commission begins its animal psychological investigations anew. They ask Hans questions and incorporate his typed-out answers into their report. In this way, Hans becomes co-author of his own assessment. Now a veritable writer, Hans’ account of becoming a self-made horse will soon be published.¹²¹

By imagining the latent fantasy of von Osten and the commission—to tap into Hans’ consciousness through the perfect writing tool—Mauthner demonstrated that the real Hans’ alphabet system (evoked by the fictional horse-typewriter, which later became a reality (**Figure 9**))¹²² is a form of letting the human speak through the horse’s hoof. One cannot give a horse a tool made for and by the human hand, even if it is designed for the horse’s hoof, and then expect that tool to tap into that horse’s consciousness. Whatever proceeds from the horse’s hoof and through the typewriter is still trapped in the “Gefängnis” of language: “das Gedächtnis des

¹²¹ “Ich bin das erste Pferd, das aus eigener Kraft berühmt geworden ist. Der Bukephalos und die Rosinante sind durch ihre Reiter berühmt geworden. Ich bin kein Reitpferd. Ich bin ich und setzte mich selbst” (Mauthner, “Aus dem Tagebuch des klugen Hans”).

¹²² Karl Krall and von Osten experimented with “Ausdrucksarten” for years. One of these was a horse-typewriter: “Schon damals brachte mich der Wunsch, ein bequemeres Ausdrucksmittel für den häufig widerstrebenden Hengst zu finden, auf den Gedanken, Versuche mit einer Art von ‘Schreibmaschine’ anzustellen, bei der jede Taste, sobald sie berührt wurde, einen Buchstaben zum Abdruck brachte. [...] er [Hans] ging an die Schreibmaschine heran und drückte mit dem Munde die ihm benannten Tasten nieder. Nur war er nicht gefügig genug, dies öfter zu wiederholen, weil er—wie Pferde überhaupt—ungern fremdartige Dinge mit den Lippen berührte” (Krall, *Denkende Tiere*, 371-2).

Menschengeschlechts.”¹²³ The problem posed by the anthropocentrism of language for animal psychological research cannot even be solved by identifying the horse’s own “Sprachwerkzeug[e]” which create his equine reality, warned Mauthner. The fundamental problem the *Hansfrage* crystallizes is that language, consciousness, and reality exist in a species-specific, contingent, and causal relationship. The horse’s consciousness, the horse’s reality, is ultimately inaccessible to his human researchers—if not also the horse himself.

Language, then, is a seemingly promising, yet wholly inadequate tool for animal psychological research. Media technology is another such tool. Through the horse-typewriter symbolizing both human language and media technology as scientific research technologies, Mauthner veered from philosophy of language to philosophy of science, from the fantasy of tapping into horse consciousness through language to the fantasy of doing the same through technology. More specifically, he critiqued the equation of mechanization with unmediated, “objective” access to the nonhuman object of study. To give a horse the tools to communicate in a way that is legible to humans is not to expose that horse’s consciousness to the human eye, much like a microscope exposes squirming Radiolaria to the human eye.¹²⁴ Animal psychology is a wholly different endeavor than animal morphology; in theory and practice, it is a wholly different object of study.¹²⁵

¹²³ Mauthner quoted in Martina King, “Sprachkrise: Fritz Mauthner,” in *Handbuch Literatur und Philosophie* (Stuttgart: Springer, 2012), 160; Mauthner, *Sprache und Psychologie*, 366.

¹²⁴ For more on Haeckel’s study of Radiolaria through microscopic investigation, see: Ernst Haeckel, *Die Radiolarien (Rhizopoda radiata): Eine Monographie*, vols. I and II (Berlin: Georg Reimer, 1862); David Lebrun, dir., *Proteus: A Nineteenth-Century Vision*, First Run Features, 2004.

¹²⁵ Even in animal morphology, studying an object changes that object and one’s knowledge relation to it. For Hans-Jörg Rheinberger, microscope preparation laid bare this making of the epistemic object, as “the question of what was nature and what was artifact in preparation took on particular epistemological urgency” (220). For more on such epistemic configurations, see Rheinberger’s chapters “Intersections” and “Preparations” in *An Epistemology of the Concrete*, 217-32 and 233-43.

In the subscript of “Aus dem Tagebuch des klugen Hans,” the harmonization of equine body with media technological body yields a being onto itself, and this being is the one who answers the commission’s questions, the one who writes in the diary. This being does not whinny: the fictional Hans’ only purely equine communication which, by virtue of being written in Mauthner’s text, is transformed. (If Hans typed “ich wiehere,” suggested Mauthner, the distinctly equine, distinctly embodied whinny—even Hans’ own “ich”—would be lost in the process.) Accordingly, this new being whom the commission studies is birthed at the moment Hans learns to operate the typewriter so that it may become his expressive outlet. It is only once the commission has trained the fictional Hans to answer their questions in a manner legible to them—that is, through efficiency and submission—that they are satisfied to resume their psychological investigation. And so, the typewriter as communicative tool-cum-scientific research tool effectively eradicates Hans’ whinny, revealing itself, more sinisterly, as a tool of anthropocentric articulation and control, even erasure. Attempting to tame the unruly, unknowable horse, to make him speak through their tools and only their tools, is precisely the real commission’s failure.

Having rejected lingual and technological mediation in animal psychological research through the subscript, Mauthner considers what literary imagination might accomplish through Hans’ fictional diary entries, which comprise the body of “Aus dem Tagebuch des klugen Hans.” Whereas the commission wants and thereby creates a cartoonishly Prussian horse, the Hans of the diary entries is impudent, critical, and egoistic. Mauthner’s Hans possesses a rich inner world—indeed, an excess of subjectivity (presumably a reflection of the commission’s own hubris). The fictional diary entries also evince the horse’s mastery of the German language through meandering passages on the fickleness of fame, as well as the German philosophical

canon through astute references to Schopenhauer.¹²⁶ On the page, at least, what distinguishes this writer from any other educated German-language writer is the former's identification as a horse. So, how has the commission entirely missed this philosophical, poetic Hans? In a move befitting the layers of narrative mediation built into the diary entries, the fictional Hans admits in one of his final entries that he has been withholding from the commission: "Ich sage der Kommission nicht alles, was ich weiß. Die Sprache ist dem Pferde gegeben, um seine Gedanken zu verbergen." For Mauthner's Hans, then, language is akin to a dark glass through which humans may glimpse signs of the horse thinking—not the horse's thoughts themselves. Humans may give the horse their tools, but what the horse does with them is its decision. Isn't this the ultimate sign of "geistig[e] Fähigkeiten"?

A marker of the *Sprachkrise*, this anxiety about language's failure to capture reality—indeed, language's imprisonment of humans within a reality all their own—collides in the fictional diary entries with the methodological difficulties the real Hans posed to his human researchers. As the fictional Hans laments: "Mein Nachruhm jedoch hängt nicht von meinem inneren Werte ab, sondern von dem Urteile der Nichtpferde, der Menschen. Werden die Menschen meine Pferdeseele verstehen? Sie stellen oft so verkehrte Fragen an mich. Das Pferd denkt, der Mensch lenkt." To the question of whether those domineering "Nichtpferde" can understand his horse soul—not his "geistig[e] Fähigkeiten," as in the subscript—the fictional Hans answers with questions: namely, the humans' "oft so verkehrte Fragen." What the observer names as his object of study and his questions, implies Mauthner's Hans, primes him to notice one thing and not another. The real commission, having searched for "unabsichtlich[e] Zeichen,"

¹²⁶ In this reference to Schopenhauer lies another moment of anticipatory brilliance from Mauthner. Krall later showed the horses Zarif and Muhamed a picture of Schopenhauer and asked them to spell his name. This constituted an attempt to educate the horses in German culture (Krall, *Denkende Tiere*, 139-40).

might have missed the real Hans' grasp of Enlightenment philosophy, having approached him not as Hans but as a representation of a representation, ad infinitum: as an object of study.¹²⁷ Where philosophy of language and philosophy of science productively meet in "Aus dem Tagebuch des klugen Hans" is on the matter of whether the tools of representation, as a means of asking and answering questions, can ever capture the object of study's reality, especially if that object is not human with a therefore entirely different sensory perception apparatus.¹²⁸ Knowledge produced is contingent upon tools used. And while humans are isolated within a worldview built by language, perhaps writing literature from an animal's perspective—as a mode of reaching beyond the human, if only slightly—can reveal the limits of animal psychological investigations like the September Commission's. As to the fictional Hans' question of whether the "Nichtpferde" will understand his "Pferdeseele," Mauthner is skeptical.

Mauthner's answer to the *Hansfrage* is to foreground language's ubiquitous role in human forms of knowledge production and meaning making. While identifying the multiple lingual, scientific, and media technological fantasies at work in the commission's investigation of Hans' abilities, he also acknowledges the paradox of articulating the fallibility of human language with human language.¹²⁹ Thinking, even attempts to think beyond the human, will necessarily be conducted within the prison of language. And a horse writing in human language cannot think like a horse. Mauthner proposes a solution, albeit a vexed one. The window through which one might look out of one's prison cell might be Hans' whinny. The whinny: the

¹²⁷ "Wir aber haben erfahren, dass Worte nicht Bilder geben und nicht Bilder hervorrufen, sondern nur Bilder von Bildern von Bildern" (Mauthner, *Sprache und Psychologie*, 108).

¹²⁸ In the *Sprache und Psychologie* section entitled "Weltbild der Amöbe," Mauthner used the amoeba as an example of an organism whose sensory organization was so different from humankind's that a human could not begin to imagine that organism's worldview: "Was ist das Weltall für die Amöbe, die unsere Sinne nicht hat? Wir wissen es natürlich nicht, weil wir uns von dem Innenleben der Amöbe keine Vorstellung machen können" (350).

¹²⁹ King, "Sprachkrise: Fritz Mauthner," 160.

nonverbal assertion of Hans' embodied, equine presence. The whinny communicates, even when Hans' human interlocutors cannot articulate what, exactly, it communicates. And yet, Hans' human researchers collapse the nonverbal, unquantifiable whinny into human language, interpreting it through their own desires. They neither can nor want to take a different, more ambiguous approach, one which may reveal their inability to ever know what and how Hans knows. Hans might not be whinnying "vor Freude" at the sight of his typewriter; he might be whinnying to be released from the reins of human language.

As we will see in Franz Kafka's short story in Part II, the embodied communication act may represent the most promising phenomenon around which to begin asking what and how the animal knows, but the human must acknowledge how he triggers, controls, and interprets his animal object of study. To ignore the human's presence in the study of animal psychology was, for Kafka, a "blind, taub und gefühllos" act of epistemological taming.¹³⁰ Let us now turn to the second and final commission which visited Elberfeld, from October until December 1904, and whose aim was settling the *Hansfrage* once and for all. Doing so will historically contextualize Kafka's 1914 critique of the "new" animal psychologists who, from 1912 onwards, gathered in horse stalls and animal-psychological journals to resuscitate the questions Hans had brought to life.¹³¹

¹³⁰ Franz Kafka, "15" in *Nachgelassene Schriften und Fragmente I*, ed. Malcolm Pasley (Frankfurt am Main: S. Fischer, 1993), 227.

¹³¹ I identify 1912 as the beginning of this German-based New Animal Psychology due to Karl Krall's publication of *Denkende Tiere*, which served as both the instruction manual and ignition for a series of domestic animal experiments which the practitioners described as investigations into the *Tierseele*.

PART II: Franz Kafka's Whip

On October 13, 1904, one month after the September Commission published its inconclusive results, a newly appointed commission began its investigations, led by Carl Stumpf, Director of the Psychologische Institut der Friedrich-Wilhelms-Universität zu Berlin (now the Institut für Psychologie der Humboldt-Universität Berlin), and assisted by Oskar Pfungst and Erich von Hornbostel.¹³² After several weeks of examinations, this “Oktober-Kommission” reached its conclusion and published its “Gutachten vom 9. Dezember 1904” three days later in the newspapers.¹³³ As Stumpf wrote in the report, Hans cannot count, read, and do arithmetic; he is responding to the “unwillkürlich[e] Bewegungen” of his human interlocutors, as demonstrated by Hans’ incorrect answers to mathematical, spelling, and cultural trivia questions while wearing blinders.¹³⁴ “Es bedarf also optischer Hilfen”:

“Diese Hilfen brauchen aber—und hierin besteht das Eigentümliche und Interessante des Falles—nicht absichtlich gegeben zu werden [...] Das Pferd muß im Laufe des langen Rechenunterrichts gelernt haben, während seines Tretens immer genauer die kleinen Veränderungen der Körperhaltung, mit denen der Lehrer [von Osten] unbewußt die Ergebnisse seines eigenen Denkens begleitete, zu beachten und als Schlußzeichen zu benutzen.”¹³⁵

¹³² Carl Stumpf, a professor of philosophy and member of the Königlich-Preußische Akademie der Wissenschaften, was initially strongly opposed to lending his credibility to the Hans debates. There are no records as to why he agreed to lead the October Commission. Oskar Pfungst and Erich von Hornbostel later became famous researchers in their own right. Since the Berlin Institute of Psychology takes center-stage in Chapter 3, I will detail its members and their individual accomplishments there.

¹³³ As Stumpf commented in the Berlin Institute of Psychology’s 1905 report, the Hans report was written on December 9th and then published on December 12th “in den Blättern.” Their work as a commission was intended expressly for the public benefit (“8. Das psychologische Institut” in *Chronik der Königlichen Friedrich-Wilhelms-Universität zu Berlin für das Rechnungsjahr 1904* (Halle: A.S. Waisenhauses, 1905), 57).

¹³⁴ Pfungst, *Das Pferd des Herrn von Osten*, 186.

¹³⁵ *Ibid.*, 185.

The animal experiment quickly turned into a human experiment¹³⁶ when the assistant Pfungst, “dessen Beobachtungsfähigkeit durch Laboratoriumsversuche über kürzeste Gesichtseindrücke besonders geschärft ist,” directed his attention to von Osten.¹³⁷ With his laboratory-sharpened eye, Pfungst produced a hypothesis he eventually tested back in the laboratory: the retired schoolteacher was not teaching the horse what he intended; the horse was learning to read his human interlocutors’ head movements, especially.¹³⁸ These “unabsichtlich,” “unbewußt” body movements, the commission reasoned based on Pfungst’s work, must indicate to the horse when to stop tapping.

So, how did these three experimental psychologists—and Pfungst, in particular—conceive of and experimentally test unconscious, unintentional body movements visible to the horse eye but invisible to the human eye? As Pfungst explained in his book on Hans intended for a popular audience, *Das Pferd des Herrn von Osten (Der kluge Hans): Ein Beitrag zur experimentellen Tier- und Menschen-Psychologie* (1907), the phenomena of animal psychology cannot be observed “unmittelbar” (16). Pfungst continued: “Sie muß vielmehr das Seelenleben der Tiere auf Grund ihrer körperlichen Äußerungen und mit Hilfe der der menschlichen Psychologie entlehnten Begriffe erschließen” (16). Whereas Darwin observed human and

¹³⁶ Harald Neumeyer, “Der ‘Fall der Pferde von Elberfeld’: Wilhelm von Osten, Karl Krall und Franz Kafka,” in *Tier—Experiment—Literatur*, eds. Roland Borgards and Nicolas Pethes (Würzburg: Königshausen & Neumann, 2013), 75.

¹³⁷ Pfungst, *Das Pferd des Herrn von Osten*, 186.

¹³⁸ As Pfungst wrote in the chapter “Laboratoriumsversuche” of *Das Pferd des Herrn von Osten* (77-100), he moved his experiments back to the Berlin Institute of Psychology in November 1904. The goal was to determine “wie weit die an mir selbst beobachteten und für die Grundlage jener Bewegungen erklärten seelischen Vorgänge in den Aussagen anderer eine Stütze fänden” (77). In recreating the conditions of Hans’ lessons with von Osten, the experiment entailed an Institute colleague taking on the role of the questioner and Pfungst (always) assuming the role of the horse.

nonhuman animal bodily expressions to identify emotional states which existed across species,¹³⁹ Pfungst observed, via measurement apparatuses, an animal's bodily expressions to illuminate its "Seelenleben," or really: its perceptive faculties. The resulting measurements could then be parsed through concepts developed in psychology, whose test subjects had been human up until that point.¹⁴⁰ At the heart of Pfungst's intervention in the history of animal psychology, then, was an analogy. Since physiological response to stimuli grounded the study of human psychology in the Wundtian tradition, physiological response to stimuli could ground the study of animal psychology in an adjacent Pfungstian tradition. More fundamentally: Since experimental psychology concerned itself not with higher-order mental operations but with sensory physiology—which the most basic Hipp chronoscope could measure to the fifth of a second (**Figure 11**)—even a horse could enter the laboratory as an object of psychological study.¹⁴¹ For Pfungst, Hans provided the opportunity to apply scientific psychology to the animal, making quantifiable and researchable what had previously been a matter of opinion.¹⁴²

¹³⁹ Pfungst's attention to bodily expression was indebted to Darwin; the experimental psychologist did, indeed, cite Darwin's *Der Ausdruck der Gemütsbewegungen bei dem Menschen und den Tieren* (4th ed., translated by J. V. Carus, 1884) in *Das Pferd des Herrn von Osten*.

¹⁴⁰ Animals entered the experimental laboratory as bodies, with most early psychological experiments being, in essence, neurophysiological dissections. For more on animal experiments in the late 19th and early 20th centuries, see "Objects," *Virtual Laboratory: Max Planck Institute for the History of Science*, <https://vlp.mpiwg-berlin.mpg.de/objects>.

¹⁴¹ As Henning Schmidgen explained in his article on how timekeeping devices shaped the material culture of experimental psychology, the Hipp chronoscope was exceptionally noisy. Preventing the test subject from getting distracted by the experimental apparatus was a goal for Wundt and his successors, and Wundt himself ensured that the human test subject in reaction experiments only saw the telegraph key, rather than the whole apparatus. It is likely that the experimental psychologists working with Hans were also highly aware of how their measurement technologies could distract the horse ("Time and Noise: The Stable Surroundings of Reaction Experiments," *Studies in History and Philosophy of Biological and Biomedical Sciences* 34 (2003), 262).

¹⁴² "Sie [die Tierpsychologie] ruht also auf unsicherem Fundament, und die Folge hiervon ist, daß seit den ältesten Zeiten bis auf diesen Tag selbst über die Grundfragen die Meinungen weit auseinander gingen und gehen" (Pfungst, *Das Pferd des Herrn von Osten*, 16).

According to Pfungst, Hans represented a breakthrough for psychological research not for his human-like reasoning and communication, but for being the first animal whose “Wahrnehmungsfähigkeit” could be quantifiably proven.¹⁴³ Similarly, Hans became the first animal to undergo rigorous, sensory physiological research because he exhibited cognitive abilities humans recognized. Hans’ status as “just human enough” to be studied but “too animal”

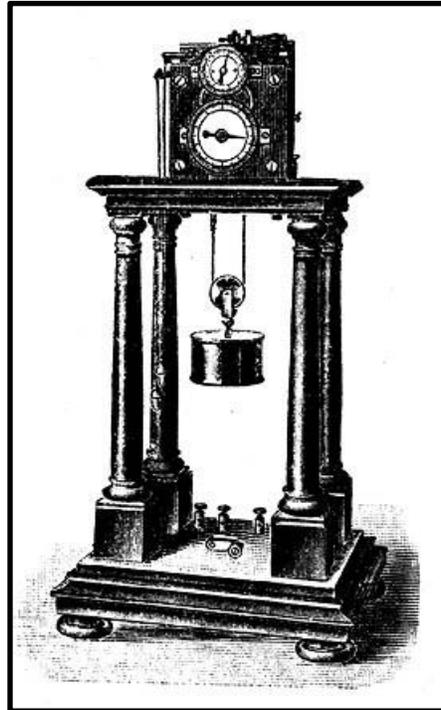


Figure 11. A 1904 model of a Hipp chronoscope, a descendant of the chronoscope Wilhelm Wundt redesigned for psychological study. At its most precise, the electromagnetic Hipp chronoscope could measure time to the 1/1000th of a second. The “reaction experiment with Hipp chronoscope” became a classic of experimental psychology. E. Zimmermann, “Chronoskop nach Hipp,” in *Apparate zu experimental-psychologischen Untersuchungen nach Angaben des Herrn Prof. Dr. Sommer* (Leipzig, 1904).

To be understood apparently proved too unwieldly for the October Commission, which collapsed *what Hans knows* (unquantifiable) into *what Hans perceives* (quantifiable). Faced with Hans

¹⁴³ Hans, wrote Pfungst, was “das erste Exemplar seiner Gattung, an dem diese außerordentliche Wahrnehmungsfähigkeit nachgewiesen wurde, ja das erste Tier überhaupt, an dem sie zahlenmäßig festgestellt werden konnte” (ibid., 125).

recalcitrantly bucking their categories, again and again, doubling down on quantifiable perception was the best they could do. At least tracking Hans’ eye movements and timing the space between the human’s question and Hans’ answer, i.e., his final hoof tap, was far more “kontrolliert” than asking Hans to spell “Stumpf” to assess his language comprehension.¹⁴⁴ With this insistence on accounting for all possible variables to produce numerical, visually comprehensible data, the October Commission measured both Hans’ and his human questioner’s physiological responses as the latter posed questions to the former. In the diagram below from Pfungst’s book (**Figure 12**), every sideways movement of the questioner’s head corresponds to

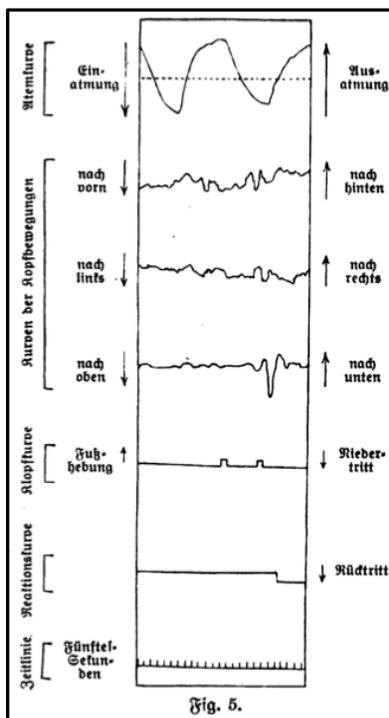


Figure 12. Timed measurement of Hans’ reaction to his human questioner’s head movements, and his human questioner’s reaction to Hans’ hoof-rapping. In Pfungst, *Das Pferd des Herrn von Osten*, 90.

¹⁴⁴ In *Das Pferd des Herrn von Osten*, Pfungst was extremely concerned with “kontrollieren,” and he used this word when describing the timekeeping devices, the entire experiment, and even Hans himself. The example of asking Hans to spell out “Stumpf” comes from a real experiment which Karl Krall conducted and then recounted in *Denkende Tiere*. Krall intervened in Hans’ spelling four times, correcting and redirecting his answer from “herr” to “nein” to “stkrill” to—finally—“stumpf” (Krall, *Denkende Tiere*, 137).

Hans raising his hoof, and every lowering of the questioner's head corresponds to Hans lowering his hoof. To capture the speed with which Hans registered the slight movements of his questioner's head, Pfungst included "Zeitspanne" at the bottom, with each tick representing 1/5 of a second (presumably due to the commission's use of a smaller, quieter Hipp chronoscope model, like **Figure 11**). Based on their hypothesis that Hans was responding to his interlocutor's unconscious head movements, the commission measured Hans' hoof taps and the human's head movements on three different axes alongside another, more surprising phenomenon: the questioner's comfort status throughout the experiment, including concentration level and "affektvoll[e] Spannung" (91), which they quantified through breathing rate ("Atemkurve"). As Pfungst noted, the questioner's breathing rate in the diagram cannot be deemed "völlig normal": "Während nämlich in allen Fällen vor und nach dem Versuche die Atmung regelmäßig und tief war, wurde sie während dessen durchweg unregelmäßig und flacher. Sehr häufig setzt sie ganz und gar aus" (91). Pfungst attributed this "unwillkürlich[e] Hemmung der Bewegungen" to the questioner's intense concentration while awaiting Hans' final hoof tap (91). Imperceptibly to the human eye, Hans stopped tapping less than a second after the questioner inhaled. Hans perceived his human interlocutor's release of muscular tension, his relaxation of concentration, which that human only "perceived" through measurement technologies.

The October Commission thus quantified how horse and human can affect each other in the space between question and answer. The human's "affektvoll[e]" response transformed the original, unidirectional hypothesis—the horse is responding to the human—into a bidirectional conclusion—the human and horse are responding to each other. To make sense of Pfungst's findings through Mauthner's terminology in "Aus dem Tagebuch des klugen Hans": Hans uses the "Sprachwerkzeug" of body language to answer his human questioner, who assumes he is

only using the immaterial tools which comprise verbal language (e.g., spoken words). But Pfungst's experiment recognized that it does not matter what the questioner asks, nor even how the questioner vocalizes the question (e.g., by lowering or raising pitch). When speaking to Hans, the human's tools are unconscious alterations to the breath and the head, which humans use even amongst themselves. Hans thereby lays bare that "menschlich[e] Sprachwerkzeug[e]" are not merely immaterial but, to an extent, wildly, uncontrollably embodied. Furthermore, the human and the horse are not entirely separate communication beings; they share enough "Sprachwerkzeug[e]" to affect one another's eye, head, and hoof movements—and below human consciousness and comprehension at that. Compared to Hans, then, the human questioner is an oblivious, even inarticulate participant in their interspecies conversation.

The implications of these findings presented a threat to the experimental psychologists' sense of control over their object of study. In the commission's December report, Stumpf framed Hans' superior perception as a unidirectional, mechanical response to his master's commands: "Er [von Osten] kann nunmehr die sämtlichen Äußerungsformen des Pferdes auch willkürlich durch entsprechende Bewegungen zur Erscheinung bringen, ohne überhaupt die bezügliche Frage oder den Befehl auszusprechen."¹⁴⁵ Rather than contemplate how Hans' and von Osten's non- or preverbal communication might raise new and richer questions for the study of animal psychology, the commission promoted the Hans experiments as a contribution to the study of human psychology.¹⁴⁶ This evident desire to control the Hans narrative resulted in Stumpf's eventual disqualification of all animal psychological investigations. In an Institute summary

¹⁴⁵ "Gutachten vom 9. Dezember 1904" in Pfungst, *Das Pferd des Herrn von Osten*, 186.

¹⁴⁶ Five months after the December report, Stumpf more succinctly described the use value of the Hans experiments for human psychology. The experiments revealed "die minimale Bewegungen, mit denen viele Menschen unwillkürlich und unbewußt ihr eigenes Denken begleiten, und für die Schärfe und Raschheit der Gesichtswahrnehmungen beim Pferde" ("8. Das psychologische Institut," 57).

published five months after the December report, Stumpf focused on Hans' failure to evince what he and his colleagues considered independent thought. Stumpf went so far as to deny all higher animals "begriffliche[s] Denke[n]," as Hans "ließ keine Spur von Begriffsbildung und von Verständnis der allgemeinen Bedeutung sprachlicher Ausdrücke erkennen."¹⁴⁷

But with this definition of conceptual thought, the experimental psychologist, wading into the waters of higher-order mental operations to pass judgment on animal intelligence, committed one major logical error befitting his materialist training. Stumpf presumed that an animal object of study's "begriffliche[s] Denke[n]" can only be demonstrable to a human observer (and his measurement technologies), as opposed to both demonstrable and indemonstrable.¹⁴⁸ And he implied, first, that conceptual thinking leaves its tracks in written language and, second, that conceptual thinking must be written out for it to qualify as such. With the aim of identifying experimentally compatible evidence for the question of Hans' intelligence, Stumpf suggested that embodied, animal writing can, in fact, demonstrate higher-order thinking—but that the experimental sciences were not yet equipped to recognize ["erkennen"] it. Are not animal tracks ["Spur[en]"] evidence of an animal's decision-making? Having given rise to human writing, do not animal tracks gesture towards animal forms of communicating and thinking that intersect with human forms?¹⁴⁹ Beyond revealing human languages' underlying

¹⁴⁷ Ibid., 57-8.

¹⁴⁸ In the case of reading, for example, mastering the concepts embedded in the words on the page entails the disappearance of "Spur[en]," as a young reader learns to read silently. The only visible *Spur* left is the book and, perhaps, the movement of eyes from one side of the page to the other and the intermittent flipping of pages; but only the reader knows if he is, in fact, reading.

¹⁴⁹ "'To decipher' or 'to read' animal tracks are metaphors. We have tried, however, to take them literally, as the verbal condensation of a historical process which brought us, perhaps, over a long span of time, to the invention of writing" (Carlo Ginzburg, "Clues: Roots of an Evidentiary Paradigm," in *Clues, Myths, and the Historical Method* (Baltimore, MD: Johns Hopkins University Press, 1989), 103). For a more recent, critical animal studies approach to the connection between animal tracks, reading, and writing, see: Antoine Traisnel, "Fabulous Taxonomy (Hawthorne)," in *Capture: American Pursuits and the Making of a New Animal Condition* (Minneapolis: University

animality, might animal writing, broadly conceived, also pose a threat to the conceptual categorizations embedded in human languages? Stumpf, however, dug his heels in deeper. If the hand writing is a hoof, this constitutes an automated process driven by stimulus response. Hans taps out answers not to express independent thought, but because he is especially obedient and sensitive to his master's demands.

Having subdued the unknowable horse with the whips of quantification and mechanization, Stumpf and his colleagues declared the *Hansfrage* demonstrably closed, and a mass exodus from the discursive space of animal psychology commenced.¹⁵⁰ At the end of 1904, several Hans supporters publicly admitted their error. Still fearing damage to their credibility, the October Commission's members and their colleagues at psychological institutes, biology departments, and zoological gardens around the German-speaking world once again kept their distance from Hans and von Osten. Disgraced, von Osten spent the last years of his life physically and verbally abusing the no-longer "clever" Hans who, at the age of around 16 human years, was sent to pasture for viciously attacking a stall boy. Both human and horse died in utter ignominy.¹⁵¹

And yet, a sense of an unscratched itch remained for some onlookers who believed that the investigation into animal psychology could not and should not end with Hans. When the

of Minnesota Press, 2019), esp. 133-4; Baptiste Morizot, *On the Animal Trail*, transl. Andrew Brown (Cambridge: Polity, 2021).

¹⁵⁰ Stumpf, "8. Das psychologische Institut," 57.

¹⁵¹ Maurice Maeterlinck recounted this turn of events in his 1914 essay on the Elberfeld horses: "Eines Tages führte ein Stallknecht, sei es aus Unvorsichtigkeit oder aus Bosheit—ich weiß es nicht mehr genau—eine Stufe in den Hof, und der keusche Hans, der bisher ein sittenstrenges, mönchliches Dasein geführt, der sich dem Zölibat, der Wissenschaft und den Zahlen gewidmet hatte, verlor auf der Stelle den Kopf and riß sich am Flankierbaum seines Standes den Bauch auf. Man mußte ihm die Eingeweide wieder in den Leib bringen und die Darmmündung zunähen. Er führt jetzt ein klägliches Leben auf einer Weide in der Umgegend" ("Die Pferde von Elberfeld: Ein Beitrag zur Tierpsychologie," *Die Neue Rundschau* 1: 788). As Hans was banished from the Elberfeld stalls, there is no historical record of Hans' death, although it is widely assumed that he was wrangled up with other horses for the war effort and died either in battle or from starvation.

October Commission debunked claims of the horse’s human-like abilities, they did not expunge animal psychology as an emerging field. Rather, they gave the *Hansfrage* new life, passing it along to a group of eager animal-owners who began to conduct their own psychological experiments. Eventually bringing together housewives and rogue zoologists to discuss the mysteries of the *Tierseele*, this experimental (“new”) animal psychology (*Neue Tierpsychologie*) hypothesized that dogs and horses, especially, possess the same “Denkfähigkeit” as humans—they just need to be given the tools to sharpen and express their thoughts.¹⁵²

Written in the winter of 1914-15, Franz Kafka’s “ehrgeiziger Student” fragment critically examines New Animal Psychology’s methodology as it took shape under the horses and humans who followed in Hans’ hoof-steps.¹⁵³ The cast of characters had, indeed, changed dramatically by the time Kafka wrote this fragment.¹⁵⁴ Ex-jeweler Karl Krall, who had stood by von Osten’s side during both commissions, took over from the deceased former schoolteacher in 1907, whereupon he moved the operation from Berlin to Elberfeld and added two new horses: Muhamed and Zarif, who became known as “die Pferde von Elberfeld.” For five years, Krall documented his efforts to educate the horses according to the commission’s findings (**Figure 13**) in his 532-page, obsessively detailed response to Pfungst’s 1907 *Das Pferd des Herrn von Osten*. Krall’s *Denkende Tiere: Beiträge zur Tierseelenkunde auf Grund eigener Versuche: Der kluge Hans und meine Pferde Muhamed und Zarif* (1912) became the founding document of New Animal Psychology, setting off a wave of experiments situated not in laboratories, but in homes

¹⁵² Krall, *Denkende Tiere*, 1.

¹⁵³ English readers will be best acquainted with Michael Hoffmann’s translation, “[A Young and Ambitious Student],” with the brackets indicating that Kafka himself did not give the fragment a title. In *Investigations of a Dog and other Creatures* (New York: New Directions, 2017), 27-9.

¹⁵⁴ At the time Kafka wrote his fragment, the stall included the stallions Muhamed and Zarif (“die Pferde von Elberfeld”), the blind and anosmic horse Bento, the Shetland pony Hänschen, and the young elephant Kama.

and horse stalls. Kafka's protagonist—“[e]in junger ehrgeiziger Student, der sich für den Fall der Pferde von Elberfeld sehr interessiert”—is one such amateur experimenter inspired by *Denkende Tiere* (225).



Figure 13. When Karl Krall took over from Wilhelm von Osten in 1907, he revamped the retired schoolteacher's animal pedagogical methods according to the commission's findings, principally through the stringent use of blinders to inhibit Hans' view of his interlocutors' movements and prevent him from becoming distracted. “Hans mit Scheuklappe. Die Ansatzstelle der Scheuklappe wurde durch einen undurchsichtigen, bis unter den Hals reichenden Lappen abgeschlossen,” in Krall, *Denkende Tiere*, 6.

Kafka's student is an ambitious, if not defiant, outsider.¹⁵⁵ After precisely reading and ruminating on “alles[,] was über diesen Gegenstand im Druck erschienen war,” the student resolves to approach the case of the Elberfeld horses “von vornherein ganz anders und nach seiner Meinung unvergleichlich richtiger [...] als seine Vorgänger” (225).¹⁵⁶ The most pressing

¹⁵⁵ Durs Grünbein pointed out in his narrative account of Kafka's Elberfeld fragment that the student is one of Kafka's many fictional Doppelgängers. The student also stands in for Krall, a man “nach Kafkas Geschmack—einer, der Unmögliches forderte und durchzusetzen bereit war” (“Der kluge Hans,” *Sinn und Form* 66, no. 1 (2014): 29, 30).

¹⁵⁶ Isolde Schiffermüller correctly noted in “Elberfelder Protokolle: Franz Kafka und die klugen Pferde” that this statement is an echo of Maeterlinck's own in “Die Pferde von Elberfeld”: “Ich hatte seit lange annähernd alles

problem with his predecessors' methods—and here he refers to von Osten and Krall—is their understanding of progress as it structures their “Unterricht der Pferde” (227). These “Pferdeliebhaber” imagine that the horse’s developmental progress proceeds additively, much like the arithmetic they teach to the horse (227). But Kafka’s student finds a flaw in their calculations:

“Er selbst wollte sich vor nichts anderem so hüten als vor der Erzielung einzelner Fortschritte, die Genügsamkeit seiner Vorgänger die mit dem Gelingen kleiner Rechenkunststücke schon etwas erreicht zu haben glaubten, erschien ihm unbegreiflich, es war so als wenn man in der Kindererziehung damit einsetzen wollte, daß man dem Kind, gleichgültig ob es gegen die ganze Menschenwelt blind, taub und gefühllos war, nichts anderes als das kleine Einmaleins einbläute” (227-8).

For Kafka’s student, the new animal psychologists teach the horse “Rechenkunststücke” in order to demonstrate that horses possess the basic cognitive capacities required for more sophisticated (i.e., adult human) thought. While the new animal psychologists proclaimed that animals can think and are capable of instruction, Kafka countered that their foundational analogy of horse to human child runs counter to their expressed aims.¹⁵⁷ A horse performing mathematical tricks may not be evidence of animal cognition. Rather, the horse’s rote memorization of its multiplication tables may evince “entweder Erzeugnisse der Einbildung der Erzieher oder aber, was noch schlimmer sei, das deutlichste Zeichen[,] daß es zu einem allgemeinen Fortschritt niemals kommen werde” (227). What the new animal psychologists considered progress, in other words, was fundamentally human—not unlike the experimental psychologists whose discovery of “unabsichtlich[e] Zeichen” effectively overturned their

gelesen, was über die Frage veröffentlicht worden ist, und war von der Wirklichkeit der Tatsachen völlig überzeugt” (in “*Ein in der Phantasie durchgeführtes Experiment*”: *Literatur und Wissenschaft nach Neunzehnhundert*, eds. Raul Zaloni and Massimo Salgaro (Göttingen: V&R Press, 2010), 786).

¹⁵⁷ The term Krall used in this regard was “ausbildungsfähig,” as in: “Betätigung eines ausbildungsfähigen Verstandeslebens” (Krall, *Denkende Tiere*, 11).

argument that animals can think. To teach a horse multiplication is to imagine that human forms of producing knowledge about the world are the telos, and that the horse desires to reach those human intellectual heights. But, warned Kafka through his student, multiplication tables will not release the horse from its horseness; as trainable as the horse may be, it will never develop into a human. While aiming to overthrow the reigning paradigm in which only humans can demonstrably think, the new animal psychologists have achieved nothing more impressive than deceiving themselves as they, too, bow down to this paradigm. If Wundt, in 1885, criticized animal psychology (“einen umgekehrten Darwinismus”) for naively elevating the animal’s capacities above the human’s, then Kafka, at the end of 1914, criticized New Animal Psychology for ignorantly and incompetently equating human and animal cognitive development.¹⁵⁸

Kafka therefore not only implied that rethinking “thinking” was beyond the new animal psychologists’ own cognitive capacities. He also implied that one’s approach to studying animal psychology reveals one’s intellectual and character flaws, which one may then seek to cover up with the animal in question. The horse lovers love their enhanced reflection in the horse. If the horse can perform math tricks, the horse is intelligent. If the horse cannot perform math tricks, the horse is “starrköpfig” (225). This vain centering of the human in the study of animal psychology surfaces in Kafka’s short text through words which evoke understanding as the physical act of grasping. When the student decides to conduct his own experiments “auf eigene Faust,” he is determined to take hold of [“anzufassen”] the subject “unvergleichlich richtiger” than his predecessors (225), whose goals he finds “unbegreiflich” (227). As previously stated, such “Rechenkunststücke” are not attempts to understand the horse as a horse; more perversely, the new animal psychologists use the horse for their argumentative ends in a circus-like

¹⁵⁸ Wilhelm Wundt, “Die Thierpsychologie,” in *Essays* (Leipzig: W. Engelmann, 1885), 183.

performance of understanding. The hand which grasps becomes the hand which, despite abstaining from the whip, manipulates the horse, directs the horse, dominates the horse as a group of human onlookers applaud.¹⁵⁹ New Animal Psychology is the new dressage.

Grasping, then, is the problem and the solution at the heart of “den Fall der Pferde von Elberfeld” (225). A horse hoof cannot grasp—if one defines grasping as the curling together of one’s fingers to hold an object in one’s hand. A horse hoof is designed differently than a human hand. The horse and its hooves interact with the world differently: touching differently, “grasping” differently. The productivity of the child-horse analogy therefore begins and ends with the idea of “grasping” as a process of learning the world by coming into contact with it. Indeed, the epistemological work of embodied sensation is key in Kafka’s fragment, such that Kafka’s answer to the *Hansfrage* was, in essence, a burrowing deeper into Pfungst’s answer: in the ways the human and the horse contact each other without what the human perceives as physical contact. When a human thinks he is giving math lessons to a horse, how, asked Kafka, do that human and that horse draw closer as fellow embodied creatures, disrupting the positioning of the human as teacher/experimenter and the horse as student/experimental object? When the distinction between animal experiment and animal lesson collapses, what other distinctions collapse?

These questions are embedded in the student’s pedagogical methods which, he surmises, can overcome the most obstinate horse’s resistance. Exhibiting the very behavior the new animal psychologists wanted to elicit in their horses, the student formulates an original opinion about the

¹⁵⁹ While Kafka’s literary horses—the hybrid horse-human in “Wunsch, Indianer zu werden” (1913), Dr. Bucephalus in “Der neue Advokat” (1919), and the horses in “Ein Landarzt” (1919)—were not physically abused, Kafka thematized animal suffering-as-performance in “Ein Hungerkünstler” (1924) and “Bericht für eine Akademie” (1919). Kafka’s diary entries, commented Durs Grünbein, are where his horses and their abuse abound, with such lines as “Nur das Pferd ordentlich peitschen!” (“Der kluge Hans,” 31-2).

state of animal psychological research as a result of his reading and prepares “ganz planmäßig” and, shall we say, calculatingly for his work (225). In (humorously) keeping with the historical figures in the story’s background, Kafka’s highly rational protagonist concludes that he must forsake his education to study a subject unrepresented in universities; after all, he intends to embark “auf dem neuen Gebiet” (226). Despite his resolve, he does not simply begin conducting “Versuche” in the same sense as his forebearers (225). On the contrary, the student conducts a thought experiment, indicated by the subjunctive and future tenses throughout the fragment, as the practical hindrances to obtaining even a “starrköpfig” horse are foremost in the student’s mind (225).¹⁶⁰ The student’s thought experiment, then, constitutes a demonstration of independent thinking akin to the Elberfeld horses’ arithmetic as well as the only animal psychological experiment he can afford.¹⁶¹ Without the financial means to buy a horse, the student assumes the roles of the experimenter *and* the experimental object, the teacher *and* the student, the human *and* the horse.

The thought experiment begins. In a job at the schoolteacher von Osten and the vast resources of the wealthy Krall and the university-supported Pfungst, the student, considering the feasibility of his new research trajectory, plans to pay for the “voraussichtlich großen Kosten” by working as a private tutor during the day and devoting himself to “der eigentlichen Arbeit” at night (226). His horse’s education will thus proceed nocturnally, due to scheduling concerns and,

¹⁶⁰ For more on Kafka and experimentation, see especially Ulrich Stadler, “Kafkas Experimente,” in *“Es ist ein Laboratorium, ein Laboratorium für Worte”*: *Experiment und Literatur III, 1890-2010*, eds. Michael Bies and Michael Gamper (Göttingen: Wallstein, 2011), 139-61.

¹⁶¹ “Jedenfalls gieng er seiner vorsichtigen Natur entsprechend schon bei der Berechnung des Aufwandes, der ihm erwachsen würde, und der Mittel die er aufbringen könnte, ganz planmäßig vor” (225). Harald Neumeyer’s article on Kafka’s Elberfeld fragment is the most attentive to the contours of the student’s “Versuchsordnung,” going so far as to call it a “Selbstversuch” (“Der ‘Fall der Pferde von Elberfeld,’” 71).

like von Osten before him, the horse's distractibility.¹⁶² Even more importantly, reasons the student, the night heightens horse and human sensitivity:

“Die Reizbarkeit, von der Mensch und Tier, wenn sie in der Nacht wachen und arbeiten ergriffen werden, war in seinem Plan ausdrücklich verlangt. Er fürchtete nicht wie andere Sachverständige die Wildheit des Pferdes, er forderte sie vielmehr, ja er wollte sie erzeugen, zwar nicht durch die Peitsche aber durch das Reizmittel seiner unablässigen Anwesenheit und des unablässigen Unterrichts” (227).

In a satirical melding of von Osten, Krall, and Pfungst, the student playfully combines their methods to propose a New-New Animal Psychology. Since the new animal psychologists aim to raise the horse to the heights of human cognition, Kafka's student aims to reverse the direction, with the human experimenter descending toward “die Wildheit des Pferdes” by increasing his own “Reizbarkeit” in conjunction with the horse's. To do this, the student decides to forego the whip, a technology of domestication and dressage, in favor of another technology of control, one which “whips” the horse without making physical contact: “das Reizmittel seiner unablässigen Anwesenheit und des unablässigen Unterrichts.”

This “Reizmittel” paradox of contacting without contacting—a refashioning of Pfungst's “affektvoll[e] Spannung”—uncovers two unsettling conclusions buried in Pfungst's own. The first conclusion is that the horse, if asked, might bemoan the human's insistence on instructing it and studying it—indeed, the human's mere presence—as an interminable irritation. Similarly, it would not behoove the new animal psychologists to give horses the communication tools to share their opinions of humans; teaching the horse to solve math problems is safer for the human ego. The second conclusion, indicated by “[d]ie Reizbarkeit, von der Mensch und Tier [...] ergriffen werden,” is that embodied sensitivity is a psychological phenomenon shared by human

¹⁶² Nighttime connects the historical figures of von Osten and Kafka. While von Osten conducted several “Nachtversuche,” resulting in the horses' better concentration and performance (Krall, *Denkende Tiere*, 7), Kafka was writing fiction at night.

and horse. United by the sharpening of their senses in darkness, the human and the horse reciprocally stimulate each other as their bodies, without their conscious awareness thereof, adapt to the dangers of the night. At night, the human is at its most animal.

The new-new animal psychological thought experiment thus results in the entanglement of student and horse in their shared wildness, and the “Reizmittel” the student thought he was wielding against the horse transforms into a whip wielded against him. How this occurs begins with the student’s paradoxical desire to trigger the horse’s wildness in an attempt to control the horse’s wildness. As much as he intends to let the horse be a horse by incorporating its wildness into the experiment, the student faces a quandary resulting from the apparent incompatibility of modern scientific experimentation and animal psychology as an object of study. As the student reasons, a potential equine candidate for psychological study must not only exhibit cognitive abilities he recognizes as intelligence and characteristics he recognizes as trainability. Like Pfungst, preoccupied with how “kontrolliert” his Hans experiments were, the student must also epistemologically tame that horse, setting up controls that lead the horse to behave according to the human experimenter’s wishes. In the fragment’s final sentence, the student concludes the thought experiment by directing his experimental gaze towards himself, as he doubts whether scientific progress, the whip driving him forward, is possible when the object of study is *what a horse knows*:

“Das war alles so töricht und die Fehler der andern Pferdeerzieher erschienen ihm manchmal so abschreckend grell, daß er dann sogar Verdacht gegen sich selbst faßte, denn es war ja fast unmöglich, daß ein Einzelner, überdies ein unerfahrener Einzelner, den nur eine unüberprüfte aber allerdings tiefe und geradezu wilde Überzeugung vorwärtstrieb, gegenüber allen Kennern Recht behalten sollte” (228).

Similar to a horse becoming distraught by a glare in his range of vision, the glaring errors of “den andern Pferdeerzieher” deter the student, and he begins to doubt himself, a nonexpert

whose deep, wild conviction cannot compare to an expert's knowledge and experience. More significantly, the student begins to doubt experimental science's claim to knowing the animal. Is a contest amongst humans over the "correct" theory of animal intelligence truly scientific progress? What other kinds of knowledge are lost in the drive to experimentally test and verify? Can an experiment build a bridge between human and a horse, or does it accomplish quite the opposite? With these questions, and the student's debilitating doubt, in mind, let us now turn to a psychical-scientific animal psychology which emerged in response to both experimental psychology and New Animal Psychology's inability to account for Hans and the Elberfeld horses.

Part III: Maurice Maeterlinck's Alphabet Table

In January 1913—eight years after the October Commission's investigations, and less than year after the publication of Krall's *Denkende Tiere*—readers of the *Annales des Sciences Psychiques* opened to the first page to find "Le Débat sur les Chevaux d'Elberfeld: L'Exposé d'un nouveau Témoin" by Dr. Robert Assagioli and Marcel Mangin. Especially concerned with the means by which the Elberfeld horses learned language, counting, and writing, this article weighed the hypothesis of "suggestion mentale motrice" against that of "la transmission de pensée."¹⁶³ Upon considering how telepathy and the learning of motor sensations may combine to explain this anomaly, Mangin concluded that thought transmission accounts for most of the phenomena in Elberfeld, "particulièrement des plus extraordinaires."¹⁶⁴ But Mangin remained

¹⁶³ Dr. Robert Assagioli and Marcel Mangin, "Le Débat sur les Chevaux d'Elberfeld: L'Exposé d'un nouveau Témoin," *Annales des Sciences Psychiques* 23, no. 1 (January 1913): 11, 12.

¹⁶⁴ *Ibid.*, 12.

unconvinced that telepathy was the final, all-encompassing solution.¹⁶⁵ In an addendum directly following Mangin's conclusion, psychical researcher Count Cesar de Vesme posited that the Elberfeld horses solved their problems in a mediumistic way, based on the horses' typtological written language—that is, the similarity of the horses' tapping to the spiritualists' rapping, in which a human medium communicates with a spirit through an alphabet system represented by knocking sounds.¹⁶⁶ Since the horses often spelled in reverse order, characteristic of a spiritualist medium's mirror-writing in *l'écriture automatique*, Count de Vesme hypothesized that the horses were, in a sense, equine mediums capable of telepathic communication with their human interlocutors.¹⁶⁷

In September 1913—eight months after the publication of the Francophone psychical sciences' mediumistic hypotheses—the Nobel Prize-winning playwright, poet, and essayist Maurice Maeterlinck finally accepted Krall's invitation to visit his infamous horse stalls. An avid reader of *Annales des Sciences Psychiques*, Maeterlinck certainly read “Le Débat sur les Chevaux d'Elberfeld,” evidenced by his express intention for visiting Elberfeld.¹⁶⁸ As he wrote

¹⁶⁵ “Si la réponse est juste plusieurs, je crois que l'on pourra considérer la question comme définitivement tranchée. Je sais bien qu'un télépathomane enragé essaierait de dire: l'image sur le tableau perçue par le cheval s'est transmise à quelqu'un qui à résolu le problème inconsciemment et la solution est revenue par la même voie au cheval. Vraiment je n'oserais pas moi-même aller jusque là. Ou tout au moins je serais terriblement ébranlé dans ma foi télépathique. Et de toute façon il faut tenter l'expérience. Car si au contraire Muhamed ne répondait plus que des erreurs, il n'y aurait plus aucune espèce de doute possible. L'hypothèse télépathique serait vérifiée” (ibid., 13).

¹⁶⁶ For accounts of psychical phenomena such as rapping which Maeterlinck cited and praised in his own work, see: Joseph Maxwell, *Les Phenomenes Psychiques* (Paris: Félix Alcan, 1903); Edmond Duchâtel, *Equête sur des cas de psychométrie: Janvier-Décembre 1909* (Paris: Leymarie, 1910); Eugène Osty, *Lucidité et intuition: étude expérimentale: Les sujets lucides sont comme des miroirs dans lesquels se reflète la pensée intuitive latent en chacun de nous* (Paris: Félix Alcan, 1913).

¹⁶⁷ “J'explique le langage typtologique des chevaux de la même façon que le plupart des communications médiumniques, c'est-à-dire, par le travail subconscient du médium; mais dans les communications médiumniques se trouvent souvent des traces de télépathie; je suppose qu'il doit en être de même pour les expérimentateurs d'Elberfeld et leurs sujets chevalins” (Assagioli and Mangin, “Le Débat sur les Chevaux d'Elberfeld,” 13).

¹⁶⁸ Maeterlinck cited *Annales des Sciences Psychiques* ten times in his 1914 book *The Unknown Guest* alone (trans. Alexander Teixeira de Mattos (London: Methuen, 1914)).

in the resulting *Die Neue Rundschau* article, “Die Pferde von Elberfeld: Ein Beitrag zur Tierpsychologie,” Maeterlinck sought to test out the telepathy hypothesis as well as “die mediumistische oder subliminale Theorie,” thereby reframing the psychical sciences’ approach to the horses for a wider, culturally educated audience (794).¹⁶⁹ Why, he wondered, is learning a math-based alphabet system a precondition for the horses’ expression of thought, much like learning automatic writing is a precondition for mediums’ communication with spirits? Why, indeed, do the horses tend to flip their letters in an equine version of the medium’s “Spiegelschrift,” and what might this reveal about the similarities of the human and animal unconscious?¹⁷⁰ With Krall’s *Denkende Tiere* raising the *Hansfrage* anew—and, this time, attracting the attention of the psychical sciences outside of Germany¹⁷¹—the Elberfeld horses provided the Belgian writer with a unique opportunity to dive deeper into a subject which had

¹⁶⁹ Popularization was, indeed, Maeterlinck’s goal, as stated in the first sentence of the Elberfeld essay: “Für die mit den Tatsachen noch nicht Vertrauten will ich das Notwendige kurz vorausschicken, um das wunderbare Ereignis der Pferde von Elberfeld besser verständlich zu machen” (782).

¹⁷⁰ As we will see throughout Part III, Maeterlinck frequently oriented himself through spiritualist conceptions of the relationship between the material and the spiritual. “Keine Beobachtung, kein Experiment gestattet uns bisher, zwischen dem menschlichen und tierischen Unterbewußtsein einen Unterschied zu machen. Im Gegenteil! Die noch beschränkte Zahl der gemachten Erfahrungen offenbart schlagende und beständige Analogien zwischen beiden. Besonders bei den meisten arithmetischen Operationen verhält sich das Unterbewußtsein des Pferdes genau so wie das eines Mediums im Trancezustande. Es dreht die Zahl der Lösung mit Vorliebe um und antwortet zum Beispiel 37 statt 73, eine bekannte und häufige mediumistische Erscheinung, die man ‘Spiegelschrift’ genannt hat [...] Auch dies ist in ähnlichen Fällen, wie beim Schreiben in fremden Sprachen und bei der Psychometrie, eine der Wunderlichkeiten der menschlichen Medien und aus denselben Gründen erklärbar...” (815).

¹⁷¹ For the history of the psychical sciences and parapsychology in relation to animal psychology in Germany, see: Fabio De Sio and Chantal Marazia, “Clever Hans and his effects: Karl Krall and the origins of experimental parapsychology in Germany,” *Studies in History and Philosophy of Biological and Biomedical Sciences* 48 (2014): 94-102; Ulrich Gruber, “‘Okkulte Erlebnisse’: Der Arzt, Zoologe, Skipionier und Bergsteiger sowie Parapsychologe Professor Dr. Karl Gruber,” in *Thomas Mann in München*, vol. IV, ed. Dirk Heißerer (Munich: peniope, 2006), 111-53. For the history of psychical research in relation to the experimental sciences, see especially: Heather Wolfram, “In the Laboratory of the *Geisterbaron*: Experimental Parapsychology in Germany,” in *The Stepchildren of Science: Psychical Research and Parapsychology in Germany, c. 1870-1939* (New York: Rodopi, 2009), 131-90; Treitel, *A Science for the Soul*; Janet Oppenheim, *The Other World: Spiritualism and Psychical Research in England, 1850-1914* (Cambridge: Cambridge University Press, 1985); Roger Luckhurst, *The Invention of Telepathy, 1870-1901* (Oxford: Oxford University Press, 2002); M. Brady Brower, *Unruly Spirits: The Science of Psychic Phenomena in Modern France* (Urbana: University of Illinois Press, 2010).

become a key part of his philosophy: where consciousness and unconsciousness merged, connecting all living things.¹⁷²

When Maeterlinck stepped into Krall's horse stalls in September 1913, he was primed to approach nonverbal, embodied expression in both humans and horses as a precious glimpse into "das Kostbarste unseres eigenen Wesens."¹⁷³ He was primed to observe the suprasensory "Erwachen der Seele," as the passive silence of stillness transformed into an active silence in which life—indeed, one's own life—revealed itself as an unknowable stranger.¹⁷⁴ His mystical essay collection *Le Trésor des humbles* (1896) [*Der Schatz der Armen* (1898)] began with an essay on silence and became, at the turn of the century, highly influential amongst modernist thinkers for its reformulation of philosopher and psychical researcher Eduard von Hartmann's *Philosophie des Unbewußten* (1867).¹⁷⁵ Maeterlinck's second-most celebrated work, on the miraculous life of bees (1901), posited that beehive activity and human activity appeared the same to the "Geist der Erde"—not to mention that studying bee intelligence meant studying our own being as it unfolded in them.¹⁷⁶ And in his recently completed *La Mort* [*Vom Tode* (1911)],

¹⁷² Monika Fick, *Sinnenwelt und Weltseele: Der psychophysische Monismus in der Literatur der Jahrhundertwende* (Tübingen: Max Niemeyer, 1993), 99-100.

¹⁷³ Maurice Maeterlinck, *Das Leben der Bienen*, trans. Friedrich von Oppeln-Bronikowski (Leipzig: Eugen Diederichs, 1901), 102.

¹⁷⁴ Maurice Maeterlinck, *Der Schatz der Armen*, trans. Friedrich von Oppeln-Bronikowski (Leipzig: Eugen Diederichs, 1902), 12, 8.

¹⁷⁵ Robert Musil later extracted from *Der Schatz der Armen* for the epigraph of *Die Verwirrungen des Zöglings Törless* (1906): "Sobald wir etwas aussprechen, entwerten wir es seltsam. Wir glauben in die Tiefe der Abgründe hinabgetaucht zu sein, und wenn wir wieder an die Oberfläche kommen, gleicht der Wassertropfen an unseren bleichen Fingerspitzen nicht mehr dem Meere, dem er entsammt. Wir wähen eine Schatzgrube wunderbarer Schätze entdeckt zu haben, und wenn wir wieder ans Tageslicht kommen, haben wir nur falsche Steine und Glasscherben im Finstern unverändert" (Maeterlinck, *Der Schatz der Armen*, 31).

¹⁷⁶ "Wenn wir uns über die Intelligenz der Bienen klar zu werden versuchen, so erforschen wir im Grunde genommen das Kostbarste unseres eigenen Wesens in ihnen [...]" (Maeterlinck, *Das Leben der Bienen*, 102). "Geist der Erde" is Rainer Marie Rilke's formulation in his reading of Maeterlinck's *Der Schatz der Armen* (Fick, *Sinnenwelt und Weltseele*, 99).

he investigated spiritualist techniques for communing with the dead, a subject he returned to, most famously, in *Le grand Secret* (1921).

Maeterlinck was prepared. In addition to his previous work on animals and the unknowable, he had extensively researched the nine-year history of the Elberfeld horses, which would result in his next essay collection, linking horses and spirits under his concept of “the unknown guest.” Similar to Kafka’s ambitious student, who had read “alles[,] was über diesen Gegenstand im Druck erschienen war,” Maeterlinck “hatte seit lange annähernd alles gelesen, was über die Frage veröffentlicht worden ist, und war von der Wirklichkeit der Tatsachen völlig überzeugt” (786). (In fact, Maeterlinck’s 1914 essay was the inspiration for Kafka’s student.)¹⁷⁷ “[D]ie Frage,” in this case, was the presence of extraordinary psychical phenomena which existed both in the material world of experience and in another, more mysterious realm. The Elberfeld horses were the ““sensationellstes Ereignis, [...] das je in der Psychologie stattgefunden hat”” (785),¹⁷⁸ yes, but also a psychical phenomenon, the study of which could ideally provide humans with a glimpse into the unity of the universe. Contributing to the animal psychological question of how the Elberfeld horses learned and communicated entailed, for this writer, at least, simultaneously contributing to the spiritualist question of how “das Unbewußte”

¹⁷⁷ As mentioned above, Isolde Schiffermüller argued in “Elberfelder Protokolle: Franz Kafka und die klugen Pferde” that the Kafka fragment re-stages Maeterlinck as an upstart student who has come to solve the Elberfeld debates, on the basis that Kafka quoted, almost word-for-word, one sentence from Maeterlinck’s essay. In my reading, Kafka also played with the anthropocentrism of the concepts of “intelligence” and “meaning,” which Maeterlinck gestured towards but largely took for granted throughout his Elberfeld essay.

¹⁷⁸ Maeterlinck quoted here the Swiss educational psychologist Edouard Claparède, who introduced the Francophone public to the Elberfeld horses through two papers, published in 1912 and 1913. Claparède’s visits to the Elberfeld horses in March 1913 were most notable for his use of French to test the horses, who did just as well in French as in German. For more on Claparède’s Elberfeld experiments, see: Edouard Claparède, “Les Chevaux Savants d’Elberfeld,” *Archives des Psychologie* 12 (1912): 263-304; Edouard Claparède, “Encore Les Chevaux D’Elberfeld (Avec une Note de M le Dr de Modzelwski),” *Archives des Psychologie* 13 (1913): 244-84; Douglas Keith Candland, “Claparède’s Visits,” in *Feral Children and Clever Animals*, 145-50.

was distributed amongst all living beings in the material world.¹⁷⁹ And so, at the same time Maeterlinck was reading about the Elberfeld horses, and for months after his visit, he was attending séances and combing through psychical-scientific research, which he assembled into an essay collection on the everyday presence of occult phenomena, published in October 1914.¹⁸⁰ *The Unknown Guest* addressed apparitions, hallucinations, haunted houses, divination, telepathy, and psychometry (communication “through the intermediary of some object, with unknown and often very distant things and people”).¹⁸¹ All of these phenomena, in Maeterlinck’s view, “lie hidden in an unknown region less often visited by our science, which after all is but a reassuring and conciliatory expression of our ignorance.”¹⁸² “The Elberfeld Horses,” the translation of Maeterlinck’s *Rundschau* article published in January 1914, became the penultimate, and longest, essay in *The Unknown Guest*.¹⁸³

By situating the Elberfeld horses within his years-long study of psychical phenomena which the experimental sciences had largely left untouched, Maeterlinck believed he was conducting animal psychological research in its revival as a psychical-scientific object study. As Maeterlinck wrote in *The Unknown Guest*, all knowledge is hidden: unknown and unknowable (332).¹⁸⁴ All knowledge is “occult,” whether produced in a laboratory or a séance or, for that matter, a horse stall (338). And that which one interprets “as wonderful, as incredible,” such as

¹⁷⁹ Fick, *Sinnenwelt und Weltseele*, 102.

¹⁸⁰ *L'Hôte inconnu* was first published in English translation, on October 29, 1914. The original French came three years later, in 1917, and the German translation [*Der fremde Gast*] was published in 1919 in Jena by Diedrichs Verlag. I quote from the English version throughout this chapter, as the French version’s delayed publication may indicate an alteration to Maeterlinck’s 1914 version of the collection.

¹⁸¹ Maeterlinck, *The Unknown Guest*, 49.

¹⁸² *Ibid.*, 5.

¹⁸³ A condensed version of “The Elberfeld Horses” was published in *Metropolitan Magazine* of New York City (40, no. 2 (June 1914): 23-4).

¹⁸⁴ “Is it true that occultism—as it is very improperly called, for the knowledge which it seeks is no more occult than any other...” (Maeterlinck, *The Unknown Guest*, 332).

the Elberfeld horses, is the result of scientific history, which easily could have taken a different course (338). If the sciences had oriented themselves around mind rather than matter, then their enquiries into natural phenomena would have dismissed mechanistic explanations in favor of invisible, inner forces (336-7).¹⁸⁵ If the sciences were therefore not grounded in “our passion for precision, for verification, for experimental certainty” (338), suggested Maeterlinck, they could have better accommodated nonhuman objects of study like the Elberfeld horses. Quantification can conceal that which cannot be quantified, and an explanation of mechanism can stand in for that which the human cannot yet explain about nonhumans. Conclusions may be reached, but mysteries remain.

What Maeterlinck wanted from 20th-century science, then, was an openness to the unexplained and as yet unexplainable, which amounted to an accusation that the experimental sciences claim knowledge of a given subject in an effort to conceal what they cannot know about it. He did not reject experimentation itself as a means of investigating the material organization of phenomena. He rejected experimentation as the sole means of investigating phenomena and only insofar as they can be quantified. More to the point: he rejected the privileging of quantifiable data as the only legitimate form of knowledge production, as unquantifiable phenomena fall through the cracks.¹⁸⁶ For Maeterlinck, unquantifiable phenomena, “wonderful,”

¹⁸⁵ At the end of his “The Unknown Guest” essay, Maeterlinck quoted extensively from the May 28, 1913 address by French philosopher Henri Bergson in his capacity as president of the Society for Psychical Research. Bergson imagined an alternative trajectory for science and Maeterlinck, invigorated by the idea, adopted it enthusiastically Ibid., 336-7.

¹⁸⁶ “Experiment,” “to experiment,” and “experimenter” were commonly used for psychical practices and their practitioners. And in the shadow of post-Wundtian experimental psychology, the psychical sciences sought to establish themselves as a “legitimate” area of enquiry through the language and methodological orientation of experimentation, much like Krall conceived of his New Animal Psychology through Wundt’s new psychology. For more on psychical experimentation, see Leigh Wilson, “‘But the facts of life persist’: Magic, Experiment, and the Problem of Representing the World Otherwise” in *Modernism and Magic: Experiments with Spiritualism, Theosophy and the Occult* (Edinburgh: Edinburgh University Press, 2013), 22-43. For a rigorous theorization of the intersection of experiment and literature, see especially Michael Gamper, ed., *Experiment und Literatur: Themen, Methoden, Theorien* (Göttingen: Wallstein, 2010).

“incredible” phenomena like visual apparitions and animal psychology, were exactly the phenomena which deserved rigorous study by virtue of pushing human knowledge to their limits. As he wrote earlier in *Der Schatz der Armen*, he was interested in a shift from “wissenschaftliche Psychologie” to transcendental psychology, one which “sich mit den unmittelbaren Beziehungen von Seele zu Seele sowie mit der *Sensibilität und der ausserordentlichen Gegenwart* unserer Seele befasst.”¹⁸⁷ Whether or not spirit communications or intelligent horses existed was no longer an excuse not to study them, noted Maeterlinck repeatedly in *The Unknown Guest*. The goal—in the laboratory, the séance, and the Elberfeld horse stalls—was to “pass beyond the horizon of our little daily life” through nonhuman provocations (81), “at least receiving help from outside and hear[ing] a voice that is something more than the echo of its own” (340).¹⁸⁸

Piqued by a desire to hear a nonhuman voice share its knowledge, Maeterlinck traveled to Elberfeld, where he enjoyed unrestricted access to Krall and the horses. After several days observing Krall’s interactions with the Arabian stallions Muhamed and Zarif (“[d]ie Pferde von Elberfeld” in the article’s title), Krall offered Maeterlinck the chance to conduct his own “Versuch.” Once Krall left Maeterlinck alone with Muhamed, however, the writer faltered, unable to begin. He did not know how to address the horse so that it listened: “Aber ich wiederhole mit starker Betonung aller Laute: ‘Weidenhof, Weidenhof!’, abwechselnd

¹⁸⁷ “Und hier spreche ich nicht mehr vom ‘wissenschaftlichen’ [...] Es handelt sich hier um Ereignisse und Einmischungen der Seele, die unaufhörlich stattfinden, auch im dunkelsten Dasein von Wesen, die ihre ewigen Rechte ganz vergessen haben. Es handelt sich auch um eine ganz andere Psychologie als die gewohnheitsmässige, die den guten Namen der Psyche beschlagnahmt hat, obschon sie sich in Wahrheit nur mit den geistigen Erscheinungen befasst, die des Engsten mit der Materie zusammenhängen. Es handelt sich mit einem Worte darum, was uns eine transcendentale Psychologie offenbaren müsste, die sich mit den unmittelbaren Beziehungen von Seele zu Seele sowie mit der *Sensibilität und der ausserordentlichen Gegenwart* unserer Seele befasst” (Maeterlinck, *Der Schatz der Armen*, 17-8).

¹⁸⁸ “This brings us back once more to the omniscience and perhaps the omnipotence of our hidden guest, to the brink of the mysterious reservoir of every manner of knowledge which we shall meet with again when we come to speak of the future, of the talking horses, of the divining-rod, of materializations and miracles, in short, in every circumstance where we pass beyond the horizon of our little daily life” (Maeterlinck, *The Unknown Guest*, 81).

schmeichelnd, drohend, bittend und gebieterisch” (790). Without being able to establish the cause, Maeterlinck watched his “geheimnisvoller Gefährte” suddenly oblige and tap out “W E I D N H O Z” (790). Like Kafka’s student, Maeterlinck quickly lost control of the experiment and began to doubt himself. Did he ever have control over the experiment? The more time he spent with the horse “unter vier Augen,” the more “befangen” he became:

“Ich habe oft den Großen oder den Königen der Erde gegenüber gestanden und war durchaus nicht verschüchtert. Mit wem habe ich eigentlich zu tun? [...] Man grübelt und befragt sich, welchem menschengewordenen Phänomen, welcher unbekannter Kraft, welchem neuen Wesen man hier gegenübersteht. Das alles verbargen unsre schweigenden Brüder also vor unsren Blicken” (790-1).¹⁸⁹

Reading “annähernd alles [...], was über die Frage veröffentlicht worden ist” did not prepare Maeterlinck to stand face-to-face with Muhamed, nor did standing before human royalty. He had a theoretical grasp of the horses, and he had experience comporting himself in the presence of daunting figures. But what unsettled Maeterlinck in Elberfeld was the horse’s response to him—a response incompatible with his aim of expanding the human perspective through the horse’s: the horse’s active silence. Nevertheless, Maeterlinck obtained exactly what he set out for: the horse’s active silence. What was the Muhamed’s silence communicating, if not the hidden depths of its unconscious? Where Maeterlinck’s fascination transformed into self-consciousness, however, was in the questions bubbling beneath the surface of the Elberfeld essay. Is the horse “fast stumm,” having only just been given an interspecies alphabet system with which to communicate its conscious thoughts and feelings to humans (784)? Or, more distressingly, has the horse always been able to communicate with humans—on the level of the unconscious, say—but decided not to share its secrets with humankind? Is Muhamed a horse, or a horse

¹⁸⁹ As Maeterlinck wrote in the essay “Psychometry,” he spent the time in Elberfeld “with an absorbed, anxious and tired air [...] for I found those visits, which overwhelmed me with a sense of the marvellous and kept my attention on the rack, singularly exhausting and bewildering” (*The Unknown Guest*, 53).

metamorphosed into a human: an entirely new creature whose silence signifies a rejection of the unnerved human standing before it?

These anxieties converged in the interspecies communication system through which Krall taught the horses to answer spelling and math questions (**Figure 14**). Maeterlinck, following prior psychical research, believed that this communication system had achieved the



Figure 14. Ex-jeweler and founder of New Animal Psychology Karl Krall teaching the Arabian stallion Zarif to spell his name using a “Lesetafel” (1909). “Tafel VI. Zarif lernt buchstabieren,” in Krall, *Denkende Tiere*, 192-3.

greatest of all miracles in Elberfeld: von Osten and then Krall’s system had roused the horses from “ihrem unvordenklichen Schlaf” (804).¹⁹⁰ “Es ist so gut wie sicher,” wrote Maeterlinck in a twist on the October Commission’s findings, “daß das Pferd ohne menschliche Beihilfe nie aus seiner Dämmerphäre herausgelangt wäre” (806). Citing the communication system’s crucial role in enabling the horses to learn even those words whose meaning they were never taught, Maeterlinck continued: “Mit Hilfe eines sehr umständlichen Alphabets haben sie gelernt, diese

¹⁹⁰ Maeterlinck was referring here to the work of psychical researcher Dr. Ochorowicz, who compared animal consciousness to human somnambulism (which Maeterlinck poetically reformulated as eternal dreaming) (804-5).

Worte wiederzugeben, und mit Hilfe dieser Worte vermögen sie Eindrücke, Empfindungen, Wünsche, Ideenassoziationen, ja selbst eigne Einfälle wiederzugeben” (806). Since the horses could not articulate human syllables with their mouths and tongues, the hoof-based interspecies alphabet system had become their means of expression and, in a feedback loop, their means of expressing conscious thought. The Elberfeld communication system, proclaimed Maeterlinck, had built nothing less extraordinary than “die wunderbare Brücke, die hier Mensch und Tier miteinander verbindet” (807).¹⁹¹

An investigation into the possibility of ever knowing the animal, then, needed to begin and end with this interspecies communication system. Taking his cue from Swiss educational psychologist Edouard Claparède’s Elberfeld investigations the previous year, Maeterlinck focused on the alphabet table [“Lesetafel”], by then in its third version (**Figure 15**), as well as “Pferdeorthographie,” characterized by the horses’ overuse of consonants.¹⁹² In contrast with his psychological-scientific predecessors, Maeterlinck interpreted the alphabet table as an “Ausdrucksmittel” enabling the “arme, fast stumme Pferd” to express its conscious thoughts:

“Das arme, fast stumme Pferd hat nur ein Ausdrucksmittel: den plumpen Huf, der nicht zum Denken geschaffen ist. Man hat also, wie bei den sprechenden Tischen, ein besonderes Alphabet erfinden müssen, in dem jeder Buchstabe einer bestimmten Anzahl von Schlägen mit den rechten und linken Fuße entspricht. Beifolgend eine Tabelle, wie sie den Besuchern von Elberfeld ausgehändigt wird, damit sie den Denkopoperationen des Pferdes folgen können” (784).

¹⁹¹ “[D]ie wunderbare Brücke, die hier Mensch und Tier miteinander verbindet, liegt weit mehr in dem Ausdruck des Denkens als in dem Denken selbst” (807).

¹⁹² Krall described at length the development of the alphabet table in the chapter “Buchstabieren und Lesen” (*Denkende Tiere*, 124-6). I only include an image of Maeterlinck’s version here, as it is the same in content as Krall’s but more cleanly organized and easier to understand at a glance.

	1	2	3	4	5	6
10	E	N	R	S	M	C
20	A	H	L	T	Ä	CH
30	I	D	G	W	J	SCH
40	O	B	F	K	Ö	
50	U	V	Z	P	Ü	
60	EI	AU	EU	X	Q	

Figure 15. In the simplified alphabet table Maeterlinck included in his essay, the numbers on the y-axis indicate the number of times (divided by 10) that the horse taps its right hoof to orient itself within a particular row. The horse then taps a certain number of times with its left hoof (the numbers on the x-axis) to indicate the letter. For example, the horse can select the letter E by tapping its right hoof once and its left hoof once; when the horse pauses to indicate the end of tapping, Krall writes “E” on the board. In Maeterlinck, “Die Pferde von Elberfeld,” 784.

At first glance, this communication system seems to compensate benevolently for the horse’s lack of expressive media (in Mauthner’s phrase: its “Sprachwerkzeug[e]”), with this lack being the main hindrance to the horse’s cognitive development. Muhamed himself famously admitted this during a failed instruction in human articulation: “Ig hb kein gud sdim” [“Ich habe keine gute Stimme”].¹⁹³ The poor horse, with only its tapping hoof, therefore required a communication system centered around the expressive capacity of its hoof and, in some cases, its head.¹⁹⁴ Similar to the spiritualists’ techniques for communing with the spirit world, the resulting system elegantly bridged the material and the immaterial, the human and the beyond-human, that which the human cannot perceive and that which the human can perceive. And it accomplished these complex connections through a deceptively simple means: the hoof’s production of sound,

¹⁹³ Maeterlinck told an oft-shared story about Dr. August Schöller’s attempts to teach Muhamed “sich durch Worte auszudrücken”: “Das Pferd ist gelehrig und voller Eifer und macht rührende, aber vergebliche Versuche, einen menschlichen Laut nachzuahmen. Plötzlich hält es inne und erklärt in seiner merkwürdigen phonetischen Orthographie, mit dem Hufe auf das Brett schlagend: ‘Ig hb kein gud sdim’ (Ich habe keine gute Stimme)” (806).

¹⁹⁴ Krall trained Muhamed and Zarif to nod their heads to indicate “yes” and shake their heads to indicate “no,” “I don’t know,” or “it cannot be done” (as when Krall asked them to calculate an equation which cannot, in fact, be calculated).

reliably audible to horse and human, as it struck another hard material, e.g., a wooden plank. When the human poses a question, the horse hoof taps on the wooden plank—first with the right hoof, then with the left—and sound waves emitted by the contact of hard hoof on hard wood travel to the human ear. (The human can also see which hoof is tapping and for how many taps.)¹⁹⁵ When the left hoof stops tapping, the human uses chalk to handwrite the designated letter on the chalkboard. The process repeats until the horse stops tapping entirely. In this way, the horse hoof is the primary site where the horse’s thoughts become legible to the human within a semantic system assigning meaning to sound—or so claimed the new animal psychologists.¹⁹⁶

But this system was, in practice, far more unwieldy than its underlying fantasy of plugging the horse into a thought-reading machine. As much as Maeterlinck marveled at the horses’ invisible, even mechanical intelligence (791), he believed that the Elberfeld horses’ greatest contribution to human knowledge was in their revelation of something mysterious, something fundamental connecting human to animal. By way of beginning to conceptualize what this “something” was, Maeterlinck compared the Elberfeld horses’ system of communication to spiritualist communions with the dead (as he did in the quote above):

“Ich war also überzeugt, daß die Pferde genau so funktionieren, wie die schreibenden Tische, die weiter nichts tun, als mit Hilfe Kleiner vereinbarter Schläge das unterbewußte Denken des einen oder andern der Anwesenden auszudrücken. Alles in allem ist es ja weit weniger überraschend, daß die lebende Substanz eines Tieres als der träge Stoff

¹⁹⁵ If the hoof tap was to constitute the basic unit of speech in this interspecies communication system, it had to be audibly distinct to both human and horse. With an intuition that human and horse hearing differed, von Osten built the system upon the frequency of taps, rather than the pitch of those taps. The added benefit of the hoof tap system was, for the visual human, at least, that the change from one hoof to another was visible, even if the horse tapped its hooves too quickly for the human’s perception thereof.

¹⁹⁶ The connection between the spirits’ raps and telegraphy, on the one hand, and the horses’ taps, the spirits’ raps, and telegraphy, on the other, was made most frequently at the onset of both spiritualism and the Hans debates. In fact, when Samuel Morse applied for a patent for his Morse code in 1838, approval was delayed several years, as this system of dashes and dots corresponding to letters of the English alphabet too closely resembled spiritualist raps. In 1904, the invisibility of spiritualist and telegraphic communication proved a useful point of departure for those puzzling out Hans’ abilities. Relatedly, historians of science Fabio De Sio and Chantal Marazia pinpoint the Clever Hans debates as the origin of experimental parapsychology in Germany (“Clever Hans and his effects”).

eines toten Gegenstandes dem geheimnisvollen Einfluß eines Mediums zugänglich und gehorsam ist” (795).

It is crucial to note here that Maeterlinck—who opposed spiritualism while writing extensively about it—collapsed three spiritualist practices when he invoked “die schreibenden Tische” and “d[ie] sprechenden Tische” in his Elberfeld essay: namely, table-rapping, Ouija boards, and automatic writing. All of these practices purported to connect the human world to the spirit world through a semantic system in which the human medium elicited and interpreted missives from the spirit world, whether that be knocking sounds called “raps” (table-rapping), the spirit’s guidance of one’s stylus across an alphabet drawn on a board (Ouija boards), or the spirit’s guidance of one’s pen across a blank sheet of paper (automatic writing).¹⁹⁷ In Maeterlinck’s assessment, the horses’ tapped-out responses within their alphabet table communication system were guided by their human interlocutors’ presence. United with the horse through a “lebende Substanz,” the human could then assume the role of the medium, summoning and interpreting the horse’s communications. Where Maeterlinck’s conclusion diverged from Pfungst’s (spiritualism aside) was in his explicit acknowledgement of reciprocal influence and interpretation, akin to the wilding of Kafka’s student. When Maeterlinck theorized that “die lebende Substanz eines Tieres [... ist] dem geheimnisvollen Einfluß eines Mediums zugänglich und gehorsam,” “Medium” here referred to both human and horse.¹⁹⁸ As the human summoned and interpreted the horse’s thoughts to make them legible to his fellow humans, the horse summoned and interpreted the human’s unconscious thoughts and expressed them through the

¹⁹⁷ For more on spiritualist practices in relation to Germanophone literature and culture, see: Priska Pytlik, *Okkultismus und Moderne: Ein kulturhistorisches Phänomen und seine Bedeutung für die Literatur um 1900* (Paderborn: Ferdinand Schöningh, 2005); Priska Pytlik, *Spiritismus und ästhetische Moderne: Berlin und München um 1900: Dokumente und Kommentare* (Tübingen: A. Francke, 2006).

¹⁹⁸ In *Das Leben der Bienen*, Maeterlinck used the term “Fluidum” to designate “die spezifische Qualität der ‘Beseeltheit’ [...], die dem ‘Leben’ zukomme” (Fick, *Sinnenwelt und Weltseele*, 102).

alphabet system. The horse's tapped-out missive thus bridged the spoken and the unspeakable, ultimately allowing humans to enter "ein neues Gebiet, in dem wir den Tieren seltsam nahekommen und tatsächlich zu ihren Brüdern werden durch die tiefsten und vielleicht einzig wesentlichen Bande des Lebens" (812).

Still, Maeterlinck was troubled. While invigorated by the Elberfeld communication system's ability to unite human and horse in ways both observable and mysterious, Maeterlinck remained skeptical that the horses' tapped-out responses opened a window into their thoughts. His concern was not just that the system was highly mediated, obscuring any clear distinction between the human missive and the horse missive. Maeterlinck was also concerned that a naïve belief in the omniscience of human language was its epistemological foundation. For the new animal psychologists, teaching a horse to operate human language shone a light into the dark corners of horse psychology and, as the horse's intelligence awakened, progressively eliminated the shadows. For Maeterlinck, this was a fantasy of fully knowing the horse, of extracting the horse's secrets with the scalpel of human language. No, if this method succeeded in making horse psychology legible and knowable to the human, it succeeded in revealing that which can neither be articulated nor known in human language, on the one hand, and how humans use language to compensate for their inevitable ignorance, on the other.

Human language was not omniscient, just as humans were not omniscient—but the horses' "Pferdeorthographie" could provide a glimpse into a realm beyond human language and knowledge. When Krall asked Muhamed to spell Maeterlinck's name upon first introducing them ("Vörwärts, wir hören dir zu."), the horse tapped out "A D R L I N S H," which the stunned writer deemed "das unverhoffte Lautbild, das mein Name in der Phonetik und der Seele des Pferdes annimmt" (789). Muhamed and the other Elberfeld horses spelled "Maeterlinck" "A D R

L I N S H” and “Zucker” “Z K R” in their “äußerst willkürliche phonetische Orthographie,” thereby making it difficult for human readers to decipher their spelling.¹⁹⁹ But what, wondered Maeterlinck, could not be deciphered? What resided in the gaps between consonants and in the gulf between his own name and Muhamed’s spelling thereof? What, indeed, became of Maeterlinck, the word and the man, as he passed through the horse’s conscious perception and into its unconscious? The letters which emerged retained a trace of this process—and yet, to interpret this solely as cognition obscured what humans really sought when they studied horse psychology in this way: “eine unbestimmte große Besorgnis, eine Sehnsucht nach den grenzenlosen, von Flüssen durchzogenen Ebenen, in denen sich seine Rasse tummelte, ehe sie der Sklaverei des Menschen verfiel” (789). The Elberfeld communication system therefore did not, as the new animal psychologists claimed, open a window into the horses’ thoughts; rather, it created a distorting mirror for humankind, reflecting back to the human his own ignorance and isolation—from himself and all other living beings in the universe.²⁰⁰ By estranging the human from his own language, and by raising questions which his reason could only account for by the human plunging deeper and deeper into the darkness, the Elberfeld alphabet system stretched the human beyond himself. It was here, in this space of incomprehension, that the human encountered “den seltsamen, ungeheuren Schatten unsres fremden Gastes” (816). It was here that the human encountered the incomprehensible in himself.

¹⁹⁹ “Sie haben sich zu ihrem Gebrauch eine äußerst willkürliche phonetische Orthographie zurechtgemacht, von der sie um keinen Preis ablassen und die das Lesen ihrer Schrift oft recht erschwert. Da sie die meisten Vokale für unnütz halten, bedienen sie sich fast ausschließlich der Konsonanten; so wird aus Zucker zum Beispiel Zkr, aus Pferd Bfirt oder Firt usw” (785).

²⁰⁰ “But we are immured in our bodies,” wrote Maeterlinck in *The Unknown Guest*, “entombed prisoners with whom it [the unknown guest] cannot communicate at will” (309).

And so, the Elberfeld communication system enabled horse and human to bridge a gap, if only temporarily and inadequately, and with much existential handwringing on the human's part. Language alone did not accomplish this, nor did the numbers or the materials which grounded the alphabet table system. In trying to explain what, exactly, built this bridge and how, a baffled Maeterlinck admitted that so many more mysteries appeared "die sie noch komplizierter machen, daß es immer noch besser ist, man nimmt das Wunder so, wie es sich darbietet, in seiner ursprünglichen Dunkelheit und Einfachheit" (797). What's more, as Maeterlinck admitted near essay's end, the analogy of spiritual mediumship in its manifold variations—psychometry, automatic writing, materializations, telepathy—did not entirely clarify what happened when the horses tapped out letters. Finding himself on the edge of language's articulatory and conceptualization powers, Maeterlinck concluded:

"Es gilt hier nur festzustellen, daß es bald der Mensch ist, der dem Tier seinen Schrecken, seine Wahrnehmung oder Vorstellung vom Unsichtbaren mitteilt, und bald das Tier, das die seinen auf den Menschen überträgt. Es gibt also gemeinsame Mitteilungen aus ein und derselben Quelle, die tiefer ist als alle uns bekannten, Mitteilungen, die auf andern Wegen als auf denen unsrer gewöhnlichen Sinne aus ihre hervorgehen und in sie zurückkehren" (811).

As horse and human communicated their unconscious experiences of the invisible, of the unknown, they drew from the source from which both came and to which both will return. This source, operating "auf andern Wegen als auf denen unsrer gewöhnlichen Sinne," challenged human ways of speaking and writing and sensing and knowing and relating. Human attempts to know the horse through its head and eye movements, even its tapped-out letters, do not constitute the pursuit of knowledge, but the willful pursuit of ignorance and isolation. By essay's end, Maeterlinck's ostensible pity for the "arme, fast stumme Pferd" reveals itself, instead, as a recognition of the horse's superior wisdom, as the horse—whether equipped with an alphabet table or not—exists in closer proximity to the source before which human language fails. The

horse possesses the treasure of the poor. What was the Elberfeld horses' message according to Maeterlinck? It is not the horse who needs to awaken from its slumber, but the human from his (820).²⁰¹

CONCLUSION:

And then, the war came. The hooves which once tapped out answers to spelling and math questions clopped towards the trenches of France, and the debates over horse intelligence faded from minds preoccupied with their own impermanence.²⁰² Having weathered the challenges of its first decade, New Animal Psychology stubbornly endured by embracing its role as an anti-establishment collection of quirky, if not unstable individuals and approaches.²⁰³ Within the experimental sciences, Hans lived on, too. The questions Hans posed to his human interlocutors forged a new frontier for scientific research. As we will see in the next chapter, animal psychology after Hans proved just as wild an object of study, regardless of whether the researchers applied what they thought they had learned from the Hans experiments. Terrifyingly untamable, this new frontier quickly became a chasm, as the unanswered questions researchers posed to their animal objects of study dug them deeper and deeper into despair. It was this

²⁰¹ Maeterlinck returned again and again to the theme of arousing the human from his slumber. In the final essay of *The Unknown Guest*, he wrote from the perspective of the unknown guest: "when they seem to speak to you, it is my own speech that borrows their customs and their voice in order to make you listen and to arouse your often slumbering attention" (306-7).

²⁰² In her 2013 novel *Krall Krall*, historian of science Alicia Puglionesi imagined the newly requisitioned Elberfeld horses, including Hans, ruminating over their former existence as intelligence horses while making their way towards death: a Beckettian trotting towards Godot ((Baltimore: Cars are Real), 67-74). The intelligent dog Rolf, of Chapter 3, greets the horses with a cheeky "Well-met, unfortunate horsemeat!" (67).

²⁰³ In 1923, the Expressionist painter Otto Dix depicted (in a way only Dix could) Karl Krall as quite deranged and grotesque in *Der Juwelier Karl Krall* (oil on canvas, 35 5.8 x 23 13/16 in). The fact that Dix painted Krall at all underlines the cultural importance of Krall and his New Animal Psychology in early 20th-century Germany. For the most recent grappling with Krall's curious place in cultural history, see historian of science Alicia Puglionesi's novel *Krall Krall*.

chasm, this unabating unknowability, which pulled apart animal psychology only to bring it safely across the 20th century.

Within this history, the narratives penned by Mauthner, Maeterlinck, and Kafka had an anticipatory function. Human language could not be both experimental tool and experimental evidence in animal psychological investigations. The material body was but one element in horse communication. And the fantasy of accessing the horse's thoughts was, in effect, a fantasy of taming the unknowable, as the human researcher beheld not pure, unmediated knowledge of the horse, but his own ignorance, reflected in the horse's silence. Animal psychology as an object of study posed greater questions than its human researchers were equipped to handle, and Mauthner, Maeterlinck, and Kafka proposed that it always would. They were right.



Figure 16. Bain News Service, "Consul Peter Smoking," 1909, Photograph, Library of Congress 2014684084.

Es war so leicht, die Leute nachzuahmen.

– Franz Kafka, "Ein Bericht für eine Akademie" (1919)

Chapter 3
Speaking, Singing, Screaming at the Berlin Phonogram Archive
(1910-1911)



Figure 17. “Der sprechende Hund. Serie 1. No. 3. ‘Don’ drückt seiner Herrin, Fräulein Martha Ebers, die Hand,” 1911, Postcard.

In 1910, Alexander Graham Bell—the Scottish-born American inventor of the telephone and lifelong researcher of elocution, speech, and hearing—recalled a series of experiments he conducted on his Skye terrier when he was around twenty years old.²⁰⁴ Bell had spent years by that point observing his father, the famous physiological phonetician Alexander Melville Bell, teach his deaf students to speak. During the younger Bell’s childhood, the elder Bell had been inventing a system of phonetic notation and the first attempt at a “universal alphabets”: Visible

²⁰⁴ Alexander Graham Bell, “III. Teaching a Dog to Talk,” in *Notes of Early Life: From the Notebook of Alexander Graham Bell*, 3-5, Library of Congress MSS51268 Folder: “Autobiographical Writings” (1904-1910, undated), <https://www.loc.gov/item/magbell.37500203/>.

Speech, which charted the positioning of the speaker's throat, tongue, and lips in articulating the sounds that composed standard British English and its dialects.²⁰⁵ As both a test subject for Visible Speech and an eager apprentice to the family trade, Bell became fascinated by the great diversity of human speech organs.²⁰⁶

Equipped with a research question and years of experience taxonomizing and dissecting animals, Bell selected the family's "very intelligent" Skye terrier, Trouve, as his first student-cum-object of experimentation (3).²⁰⁷ To begin his experiment, Bell taught Trouve to growl at his command, an initial difficulty he surmounted by limiting the dog's food supply and rewarding him with food only upon growling when and how long he instructed. Satisfied with the dog's on-command air expulsion, Bell opened and closed Trouve's muzzle in succession while the dog growled. "In this way," Bell reflected in 1910, "he gave utterance to the syllables 'ma, ma, ma'" (3). By teaching Trouve to stop growling when his muzzle was released, Bell succeeded in "mak[ing] him say, with perfect distinctness, the word 'mamma,' pronounced in the English way, with the accent on the second syllable" (3-4). The next step, Bell reasoned, was to manipulate the dog's tongue by pushing his thumb under the lower jaw to produce "ga ga." Combined with "mamma," and through practice, "this was made to resemble, in a ludicrous

²⁰⁵ Alexander Melville Bell, *Visible Speech: The Science of Universal Alphabets, or Self-Interpreting Physiological Letters, for the Writing of All Languages in One Alphabet* (London and New York: N. Trübner & Co., 1867).

²⁰⁶ A family trade it was. Alexander Graham Bell's father, grandfather, and brother all worked in elocution, and his mother and wife were both deaf. For an account of Melville Bell's use of the young Graham Bell as a test subject in the development of Visible Speech as well as in public demonstrations of the efficacy of this system, see Irving S. Fushfeld ed., "Alexander Graham Bell's Early Life," *American Annals of the Deaf: Organ of the Convention of American Instructors of the Deaf*, no. 67 (1922): 185-7.

²⁰⁷ Melville Bell guided his son in his scientific pursuits: "My father encouraged me in making collections of various sorts, and helped me to arrange my specimens in some sort of order, which I supposed to be scientific... Then my fancy turned to anatomy and collecting the skeletons of birds. On one occasion my father presented me with a dead sucking pig, and the distinguished professor of anatomy was called upon for a lecture" (Alexander Graham Bell, "II. Juvenile Research" in *Notes of Early Life: From the Notebook of Alexander Graham Bell*, 3). *Ibid.*, 2-3.

degree, the word ‘grandmamma’ (pronounced ga-ma-ma). A double reward followed this result, and the dog became quite fond of his articulation lessons” (4).²⁰⁸ Since the dog’s mouth was too small for further manipulations of the tongue, Bell settled on “labial effects,” managing to couple “ah” and “oo” sounds to ultimately create an “ow” sound (4). “The culmination of his linguistic education,” wrote Bell, “was reached when the dog was able to say in an intelligible manner the complete sentence, ‘How are you, grandmamma?’ (pronounced ‘ow ah oo, ga-ma-ma’)” (4).

In the third section of his 1910 unpublished autobiographical writings entitled “Teaching a Dog to Talk,” Bell did not once name Trouve, preferring instead “the dog” and “[S]kye terrier” as he intertwined experimentation and pedagogy: a blend two prior generations of Bells had perfected in the pursuit of revolutionary deaf education. Nevertheless, that very unnamed dog came to eclipse the minor role Bell had assigned him, the role of a charming anecdote in the speech pioneer’s rise to prominence. News of the Bell family’s talking dog spread in the late 1860s, reaching Bell again as an embellishment that attributed to the dog feats of articulation “utterly unwarranted by the facts” (5). But Trouve’s fame in the late 1860s, conceivably by word of mouth, would pale in comparison to the fame the long-dead Trouve would reach in 1910, when the sexagenarian and well-established Bell finally shared with an American newspaper his early canine speech experiments. The story of Alexander Graham Bell’s talking dog was picked up by newspapers around the world, including one read by the inhabitants of the German village of Theerhütte. The week after the article appeared in his local newspaper, Prussian officer and gamekeeper Herman Ebers wrote a letter to the editors, claiming that America was not the only

²⁰⁸ Graham Bell likely learned from his father to pay special attention to the tongue’s role in speech production. As the elder Bell wrote about the radical implications of the tongue for a universal speech: “The consideration that all these varieties of elementary sound resulted mainly from the evolutions of a single organ—the tongue—happily suggested the idea of representing each class of elements by a SINGLE RADICAL SYMBOL; and the realization of this idea became the final object of effort” (*Visible Speech*, 18, emphasis in original).

country which could boast a talking dog. Germany had its own.²⁰⁹ Herman Ebers received a stream of letters and telegrams inquiring as to whether his dog did, in fact, exhibit (as *The New York Times* put it) “talents no canine of Grecian mythology, not even Argos of the Odyssey, or scientific history had ever known.” The proud officer replied simply: “Story is true. Inspection is permitted.”²¹⁰

Journalists and interested citizens quickly took up Herman Ebers’ offer to scrutinize the abilities of “Don der sprechende Hund,” as the dog, originally trained for hunting, came to be known. On the whole, journalists proclaimed Don a zoological wonder of the world, heightening the dog’s status to international media sensation. Still, a scientific explanation for how, why, and whether this particular dog could actually speak remained an enigma. Don, unlike Trouve, called the category of speech into question for journalists and scientists alike, even raising the possibility of a “Sprache der Tiere.”²¹¹ With a reportedly deep and manly voice, Don answered his interlocutors’ questions using his eight vocabulary words: “Haben,” “Kuchen,” “Hunger,” “Don,” “Ja,” “Nein,” “Ruhe,” and the name of the first journalist to write about him: “Haberland.”²¹² Compared to Trouve’s limited range in English, Don seemed to independently manipulate his speech organs to produce a variety of sounds in German, including those

²⁰⁹ The specifics of this account—the exact phrase Bell said his dog had uttered, how assiduous Trouve’s training was, whether Herman Ebers or his nephew sent the letter to the paper, the contents of this first description of Don’s abilities, the name of the English- and German-language newspapers and how widely they circulated, and even Don’s breed—were reported differently, or not at all, in the 1911 reports on Don. I have therefore restricted my own narrative of these events to the commonalities amongst the stories, which include the words Don could supposedly utter and the special relationship between Don and Martha Ebers.

²¹⁰ “Germany Has a Talking Dog: Don, the Marvelous Setter with a Vocabulary of Six Words – Scientists Stupefied,” *The New York Times* (December 11, 1910).

²¹¹ The year following Herman Ebers’ announcement, Paul Scheller, a specialist of animal communication, published his monograph on Don within the context of what was known at the time on animal cognition and communication: *Der sprechende Hund und die Sprache der Tiere* (Leipzig: Richard Ehler, 1912).

²¹² First among the visiting journalists was Austrian journalist Carl Haberland, who was so awestruck by Don’s abilities that he volunteered to become Don’s manager (and he later became Herman Ebers’ son-in-law by marrying Don’s trainer, Martha Ebers).

constituting “Kuchen,” a word particularly difficult for children to pronounce due to the requisite pursing of the lips for the “ch” sound.²¹³

On January 5, 1911, not even seven years after reports of “der kluge Hans” prompted calls for a scientific investigation, the *Ostelbische Tageszeitung* exhorted the experts to evaluate Don’s speaking abilities: “Alle Zweifel an dem sprechenden Hunde ‘Don’ des Hegemeisters Ebers in Theerhütte sollen jetzt durch eine wissenschaftliche Untersuchung niedergeschlagen sein.”²¹⁴ No scientific commission visited Don in the manner of Hans’ September and October Commissions; regardless, Don, like Hans, quickly transformed from an international media sensation into a question scientists could no longer ignore. In March of that same year, Julius Vosseler, a distinguished Professor of Zoology and the Director of the Zoologische Garten Hamburg, published his assessment in *‘Don’ der sprechende Hund*. The soulful-eyed dog, Vosseler declared, was more articulate than most talking parrots. Wagging his tail in delight and concentration, Don imitated the words of his teacher Martha Ebers (Herman Ebers’ eldest daughter) and could pronounce the vowels “u” and “e” extremely well, the vowels “a” and “o” less so, and the vowel “i” not at all unless he was in pain.²¹⁵ What, wondered Vosseler, might this lingually talented dog be capable of, and how might his limits and proficiencies enrich science’s understanding of “das Wesen und die Lebensäußerungen der Tiere”?²¹⁶

Whereas Vosseler became Don’s most adamant advocate within the academy, other established men of science remained skeptical. Foremost among them was Oskar Pfungst of

²¹³ “Germany Has a Talking Dog.”

²¹⁴ “Letzlingen/Theerhütte: Der sprechende Hund von Theerhütte,” *Volkstimme.de* (December 26, 2018), <https://www.volksstimme.de/lokal/gardelegen/wundertier-der-sprechende-hund-von-theerhuette/20181226>.

²¹⁵ Prof. Dr. J. Vosseler, *‘Don’ der sprechende Hund* (Hamburg: Fremdenblatt-Druckerei, 1911), 1, 9.

²¹⁶ *Ibid.*, 10.

Clever Hans fame. Pfungst suspected that humans were susceptible to the spectacle of an animal learning and performing behaviors they recognized as distinctly human behaviors, and that this tendency of humans to anthropomorphize animal vocalizations explained Don's speech. From December 21, 1910 until April 2, 1911, and with the assistance of Vosseler and Swiss musicologist and composer Erich Fischer, Pfungst visited Don on three different occasions to record Don speaking with Martha Ebers.²¹⁷ Later, upon gathering what he claimed were disinterested listeners, Pfungst muted Martha Ebers' prompting and asked them to distinguish Don's words. Could they differentiate Don's "Haben" from his "Kuchen"? In the late afternoon of April 19, 1912, Pfungst shared the results of his study at the annual Kongreß für experimentelle Psychologie in Berlin. His talk, "Über 'sprechende' Hunde (mit phonographischen Demonstrationen)," constituted Pfungst's first presentation to his fellow experimental psychologists on an object of study he had, until then, publicly commented upon only in the *Sechste Beilage zur Vossischen Zeitung* a year prior.²¹⁸ Thanks to Don, animal intelligence and communication once again entered the popular imagination—and the experimental psychology laboratory.

At the heart of this chapter are Pfungst's recordings of Don and Martha Ebers' interactions: sounds captured in late 1910/early 1911 for the Berlin Institute of Psychology's Phonogram Archive and stored as wax cylinders in the Ethnological Museum of Berlin today. If

²¹⁷ The four dates are as follows: December 21, 1910 (4 recordings, "Don I-IV," but "Don II" has been lost); February 18 and 19, 1911 (7 recordings, "Don I-VII" with no "Don IV"); and April 2, 1911 (1 recording: "Don IV"). The 10 extant Don recordings have recently been digitalized and uploaded to the Max Planck Institute for History of Science's "Sound and Science" website and listed, curiously, under Carl Stumpf's research on tone psychology. I examine the implications of this attribution in what follows. "Index: Experimental cylinders from the Berliner Phonogramm-Archiv (ca. 1907-1916)," <https://soundandscience.de/text/index-experimental-cylinders-berliner-phonogramm-archiv-ca-1907-1916>.

²¹⁸ Oskar Pfungst, "Über 'sprechende' Hunde (mit phonographischen Demonstrationen)," in *Bericht über den V. Kongreß für experimentelle Psychologie in Berlin vom 16. bis 20. April 1912*, ed. Prof. Dr. F. Schumann (Leipzig: J. A. Barth, 1912), 241-5.

these expressly experimental recordings, the Phonogram Archive's only animal recordings, are the heart of this chapter, then the Institute of Psychology is the body housing that heart, the structure which calls the heart into being while determining the activities of that being. To be sure, the Institute's decision to record any animal whatsoever is anomalous. Not only did the solved *Hansfrage* leave them averse to animal psychology and its special animals, but the Archive's holdings at the time were almost exclusively non-Western musical recordings. Why, then, would Pfungst, on the Institute's behalf, repeatedly take the train to Hamburg to record "der sprechende Hund" between vaudeville performances? And why did these recordings of a dog barking, as opposed to the melodies of a bird singing, gain entrance to the very archive which birthed comparative musicology?

Timing and technology were crucial in this history. Just as Don was making headlines, in late 1910, the Institute commenced its research on *Schall*—that is, sound as a physical phenomenon.²¹⁹ In early 1911, the Institute Director Carl Stumpf, who had only recently announced his adoption of the phonograph as a state-of-the-art research tool, abandoned the study of music for a new line of inquiry: the human perception of speech sounds.²²⁰ For Stumpf and his student Pfungst, the self-proclaimed defender of "exakt[e] Tierpsychologie," Don represented a unique opportunity.²²¹ Rather than preserve the accomplishments of Germany's talking dog, the Don experimental recordings were intended to capture a sound which, depending

²¹⁹ As Julia Kursell explained in her article on Carl Stumpf's experimental recordings, the Phonogramm-Archiv and the Lautarchiv complemented each other, with the former highlighting the process of recording sound generally (*Schall*) and the latter highlighting articulated sound (*Laute*) ("Listening to More than Sounds: Carl Stumpf and the Experimental Recordings of the Berliner Phonogramm-Archiv," *Technology and Culture* 60, no. 2 (April 2019): S43).

²²⁰ Pfungst later replaced the phonograph with other audio technologies, like the interference apparatus. In what follows, I focus only on the epistemological work and material properties of the phonograph, specifically the Edison Home Phonograph, as well as the wax cylinder, since these were the technologies used to capture Don's interactions with Martha Ebers within the context of experimental psychological research.

²²¹ Pfungst, "Über sprechende Hunde (mit phonographischen Demonstrationen)," 245.

on listeners' mental characteristics and conditioning, yielded contradictory cognitive products—in this case, whether listeners could perceive a German-language word in Don's barks or not.²²²

The talking dog was an experiment in human listening, even human training.

The resonance between the Institute's solution to the *Hansfrage* and its solution to the *Donfrage*, as it were, are clear. Animal psychological questions were a means to a human psychological end. Don, like Hans, shined a light on the psychological processes which led some to recognize human-like feats of articulation in a horse tapping his hoof and a dog barking. But Don, by virtue of being a talking dog, raised aurally specific questions about human-canine communication. For Pfungst, this black German pointing dog who could ostensibly utter human words brought psychology's attention to the physical and psychical processes of speech production, in tandem with the physical and psychical processes of auditory perception and interpretation. As opposed to his intricate theorization of Hans' intelligence, the question of Don's cognitive capacities appeared only in Pfungst's assessment of whether the dog understood what he said. (Certainly not!) In Pfungst's 1911 experiment, Don was no dog; he was a sound: a disembodied, infinitely repeatable sound. There could be no trickery, reasoned Pfungst, if the phenomenon under investigation was filtered through a phonograph and all trace of human presence was omitted from the recording to boot. Despite his best attempts to extract the sonic data out of the dog, on the one hand, and erase the trainer Martha Ebers' embodied influence, on the other, the Don recordings of 1910-1 yielded a conclusion about human-canine communication that Pfungst was not prepared to accept but which, ironically, was his hypothesis. Don and Ebers were psychically and physically attuned to each other. Even when muted, her

²²² I orient my interpretation of Stumpf's use of the Don recordings through Kursell's elegant summary of Stumpf's methodology in *Tonpsychologie* (1883, 1890) ("Listening to More than Sounds," S52, S43).

voice was heard in each of Don's slight vocal modifications. If Hans complicated psychology's notion of materiality's role in language production, then Don and Ebers complicated its notion that speaking and listening could not be studied without also studying relationality.

This chapter, then, takes as its point of departure the following three questions as they arise from music's less stable role in the human/animal divide than speech: What importance, or lack thereof, did Stumpf's Berlin Institute of Psychology place on animal vocalizations within its research program, and what were the preconditions for an animal entering its Phonogram Archive? Why did the Archive record a dog—and this dog and his female trainer, in particular? Why from 1910 to 1911? In what follows, I answer these questions by attending to the Institute members' 1910-1 research on speaking versus singing, research which employed "primitive" music and animal vocalizations as test cases for their well-known work on speaking and singing over a decade later.²²³ I argue here that these already blurry distinctions—between speech and song, music and noise, human and animal, civilized and primitive, researcher and researched—became even blurrier when the Institute members' attention turned toward parrots, starlings, canaries and, yes, one dog. Over the course of a few months in 1910 and 1911, Don and the songbirds preceding him quietly transformed from a series of thought experiments, smuggled into endnotes and anecdotes, into an animal psychological aporia—indeed, a comparative psychological aporia. Speech, song, and noise, learned Stumpf and his colleagues, are in the ear of the embodied listener and the hand of his technical notation system. And human listeners, no matter how well trained, cannot hear what they cannot imagine.

²²³ See, especially: Carl Stumpf, "Singen und Sprechen," in *Beiträge zur Akustik und Musikwissenschaft* 9 (1924): 38-74; Carl Stumpf, *Die Sprachlaute: Experimentell-phonetische Untersuchungen* (Berlin: Julius Springer, 1926).

PART I: Epistemic Problem: Music/Noise

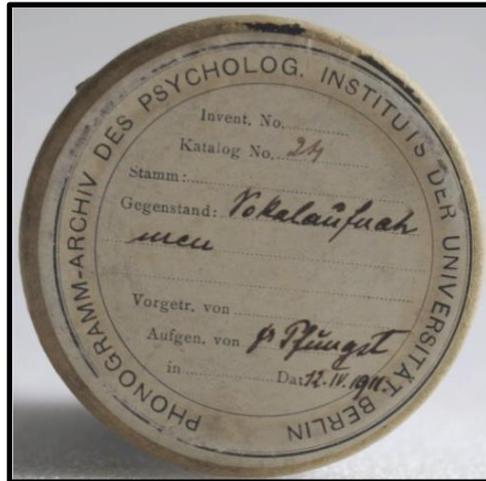


Figure 18. Waveform of and wax cylinder containing the experimental recording “Vokalaufnahmen Dr. Pfungst” from April 4, 1911. Ethnologisches Museum der Staatlichen Museen zu Berlin, Preußischer Kulturbesitz, Berliner Phonogramm-Archiv.

Two days after Pfungst directed the final experimental recording of Don, Stumpf directed the experimental recording of Pfungst. To begin, Stumpf’s assistant Erich Moritz von Hornbostel—member of the October Commission in 1904 and, since 1905, Director of the Phonogram Archive—wound the Edison Home Phonograph and set the mechanism to run at normal speed. The phonograph, the sound writer, was recording. Pfungst had compliantly positioned his mouth directly before the megaphone, close enough to whisper his secrets into the mechanical ear. Steadily, soberly, Pfungst sounded out German-language letters while a metal stylus transcribed the registered sound waves as grooves onto a rotating wax cylinder. “Ooo. Ii. Aaa. Uuu. Üüü.” In thus drawing out each vowel through extended expiration, he dallied on the border between speech and song. He then proceeded to transform the letters through mouth

positioning. By rounding his mouth, in one case, “A” become “Au.” As he continued to form various shapes with his mouth, he manipulated the pitch, volume, and timbre of his utterances, with the effect that recognizable letters morphed into sounds not entirely accommodated by the German language.²²⁴ Pfungst whispered. “Uuu?” Pfungst barked. “OUof!” Pfungst screamed. “Ai! Ai!” With the speaker’s work done, and by reversing the recording process, Hornbostel played back the entire recording to test its clarity. The final step was cataloguing. On the end of the wax cylinder’s container, Hornbostel penned “Vokalaufnahmen” next to “Gegenstand” and a misspelled “Pfungst” next to “Aufgen. von.” He placed the Pfungst cylinder with the eleven Don cylinders, in the Archive’s collection of experimental wax cylinders. The date: April 4, 1911.²²⁵

1911 marked a turning point in the Berlin Phonogram Archive’s history, a year of diverging paths and new research objects. This turning point begins and ends with Stumpf. To be sure, recording a distinguished colleague barking, whispering, screaming, and speak-singing—and then calling these vocalizations “experimental”—departed from Stumpf’s initial hesitance regarding phonographic research. In 1885, while notating the Bella Coola Indians’ “Cannibal Dance” on their visit to Berlin, he sought a means of transcribing non-Western music which circumvented the European ear’s filtering of unfamiliar sounds.²²⁶ In 1892, he saw promise in the

²²⁴ I have transcribed all Pfungst’s utterances with German-language spelling, a practice in line with this chapter’s argument: choosing a given system of notation means accepting its limitations. Indeed, the German language does not have letters to represent the sounds of Pfungst’s barking and screaming. English gives us the slightly more accurate “Woof!” and “Yi! Yi!” Pfungst’s whisper sounds like an owl’s soft cooing.

²²⁵ My understanding of the Archive’s recording method comes from Hornbostel’s 1904 instructions for field researchers, condensed by Lars-Christian Koch in “Images of Sound: Erich M. von Hornbostel and the Berlin Phonogram Archive” (in *The Cambridge History of World Music*, ed. Philip V. Bohlman (Cambridge: Cambridge University Press, 2013), 482, 485). Hornbostel instructed his field researchers to begin the recording by sounding the pitch a¹ on their pitch pipe and announcing the log number and title of the recording. He did this in each of the Don recordings, but not in the Pfungst recording. The importance of the pitch pipe, as Stumpf wrote in *Die Anfänge der Musik*, was to later be able to reproduce the original speed of the cylinder and, with it, the pitch and tempo of the song/speech ((Leipzig: J. A. Barth, 1911), 11). It is therefore likely that, because this recording was made in the Institute by Hornbostel and Stumpf themselves, they were not worried about replicating Pfungst’s speech.

²²⁶ Eric Ames, “The Sound of Evolution,” *Modernism/modernity* 10, no. 2 (April 2003): 304-7.

phonograph but cautioned against relying on its claim to accurate transcription of aural phenomena in lieu of the researcher's own musical expertise.²²⁷ When he established the Berlin Institute of Psychology, in 1900, he began dabbling in ethnological recordings, and he commissioned the medically trained Otto Abraham and the Chemistry Ph.D. Hornbostel to create a phonogram archive. But it was not until 1910, the year of Don's rise to international fame, that Stumpf publicly praised the phonograph for producing "ganz exakte, von jeder subjektiven Auffassung unabhängige Bilder der exotischen Musik."²²⁸ The next year, Stumpf's words were in print for the fields of musicology and experimental psychology.²²⁹

As I show in Part I, Stumpf's growing dissatisfaction with existing systems of notation for experimental research from 1885 onwards, and his eager embrace of the phonograph in 1910-1, resulted in his gradual reconceptualization of which sounds could and should be studied. In his early research on sound perception (*Tonpsychologie*, 1883, 1890), he privileged music, specifically non-Western music, for proving the universality of his theory of sound fusion. For his efforts, he became, as one American scholar put it, "the most eminent European authority on folk-music, the distinguished author of the most important treatise on 'Ton-psychologie' yet produced."²³⁰ So, why did this expert on "folk-music" leave his privileged research object behind in 1911, while his Phonogram Archive colleagues Hornbostel and Abraham continued to

²²⁷ Stumpf published his review of Benjamin Ives Gilman's transcriptions of Jesse Walter Fewkes' phonographic recordings of Zuni songs in the appendix of *Vierteljahresschrift für Musikwissenschaft* (1892). I was unable to track down the original German review, but I did find the English report on Stumpf's review: John Comfort Filmore, "Professor Stumpf on Mr. Gilman's Transcription of the Zuni Songs," *Music: A Monthly Magazine, Devoted to the Art, Science, Technic and Literature of Music* 5 (November 1893-April 1894): 649-52.

²²⁸ Carl Stumpf and Erich von Hornbostel, "Über die Bedeutung ethnologischer Untersuchungen für die Psychologie und Ästhetik der Tonkunst," in *Bericht über den IV. Kongress der Deutschen Gesellschaft für Psychologie in Innsbruck vom 19. Bis 22. April 1910* (Leipzig: J. A. Barth, 1911), 256-69.

²²⁹ Ibid. Carl Stumpf and Erich von Hornbostel, "Über die Bedeutung ethnologischer Untersuchungen für die Psychologie und Ästhetik der Tonkunst," *Beiträge zur Akustik und Musikwissenschaft* 6 (1911): 102-15.

²³⁰ Filmore, "Professor Stumpf on Mr. Gilman's Transcription of the Zuni Songs," 649.

formulate what became ethnomusicology?²³¹ Answering this question will lead us to the central theoretical concern of this chapter, rising out of the Greek roots of phonograph. How did these three founders of the Berlin Phonogram Archive determine who has speech (*phōnē*) and who has a voice (*phōnē*) which could then be scratched (*gráphein*) into wax?²³²

To understand the connection between Stumpf's identification of new research objects and his adoption of a new research tool, we must first listen to the Archive's earliest recordings. These recordings will set the stage for Stumpf's attempts, in Part III, to separate animal vocalizations from human music through the wedge of non-Western sounds. As we will see throughout this chapter, the Archive's use of "primitive" music and birdsong to contemplate the psychological difference between human and animal musicality necessitated ever more arbitrary distinctions, ever more mechanically objective transcription systems, as these unfamiliar sounds slipped out of tidy categorization. Music and noise, speech and song, civilized and primitive, human and animal were not binary opposites anchored in empirically stable natural phenomena. These categories were made and un-made, then quickly made again, with each new recording.

In late April 1910, Stumpf took the stage with Hornbostel, the Chemistry Ph.D. and Phonogram Archive Director, at the annual meeting of the German Society for Psychology, that year in Innsbruck. Before this gathering of colleagues, Stumpf, in his part of the talk, made the case both for comparative musicology's inclusion in the field of experimental psychology and

²³¹ I do not use the term "ethnomusicology" in this chapter, as it refers to Abraham and Hornbostel's work after intellectually parting ways with Stumpf in 1905 and 1911, respectively. Instead, I use the term "comparative musicology" to (1) emphasize the Archive's essentially comparative methodology, (2) therefore draw out the resonances with comparative anatomy, which sought to gather vast amounts of material data in studying different species of animals (with human animals being the elephant in the room), and (3) gather Stumpf, Hornbostel, and Abraham under the same musicological heading. For a critical reading of the comparative musicologists' methods where race and culture are concerned, see especially Ames, "The Sound of Evolution."

²³² *Gráphein* is more commonly translated as "to write" but I have chosen "to scratch," as it suggests both human and animal forms of inscription, not to mention how the writing tool, that which scratches, fundamentally shapes the inscription vis-à-vis meaning-making process.

for the phonograph's pivotal role in an experimental study of non-Western music. After a brief introduction, Stumpf played a few recordings from his Phonogram Archive's Siamese (now Thai) and Java collections. "Psychologisch sehr interessant," remarked Stumpf, "ist (wie ich hier der Demonstration halber wiederhole) das Verhalten unseres Gehörs, wenn man zuerst die Platten 1, 3, 5, dann die 3, 5, 7 der Siamesenleiter anschlägt" (260). Having thus played the phonograph to demonstrate that modern science's epistemic value of repetition characterized this technology, he laid out the rich series of questions which arose out of this meeting of phonograph-facilitated musicology and experimental psychology. He proposed that such music "die den Ohren des Europäers wenig erfreulich und seinem Geschmack fast unverständlich sind" gave psychologists a great problem to solve (256), which boiled down to: How do different groups of people perceive incremental relationships between sounds, and how is what one hears not what is objectively heard, but the result of one's expectations regarding the incremental relationships between sounds? The triumph of Stumpf and Hornbostel's talk was presenting a new, scientific way of operating a decades-old technology, mainly used at that point for entertainment. The phonograph could be a site for raising and beginning to answer cutting-edge questions about listening as a culturally attuned psychological process. "Durch den Phonographen," proclaimed Stumpf, "ist uns nun die Möglichkeit gegeben, ganz exakte, von jeder subjektiven Auffassung unabhängige Bilder der exotischen Musik zu gewinnen. Darum sind ausgedehnte Sammlungen phonographischer Aufnahmen eine Notwendigkeit" (258). In concluding his talk, Stumpf gestured towards the stakes of this phonographic research by advocating for the Berlin Phonogram Archive's prime role in advancing humankind's knowledge about its own musical evolution. Implicit in this positioning of the phonograph as the center of musical evolutionary research was a proposition that this technology could not only reveal

civilized humanity's musical past but boldly map out the incremental relations between human and animal musicality.

The year after this joint talk in Innsbruck, Stumpf completed his monograph on the origins of human music (which I attend to in Part III). Despite having ostensibly taken phonographic research to its heights, he and his Archive colleagues were not yet done thinking about what the phonograph made possible and whether, truly, the phonograph could subtract the subjective, culturally bound human ear from the transcription process. The phonograph supposedly allowed researchers to register aural phenomena rather than process and filter these phenomena themselves. The phonograph also seemed to enable researchers to record without assuming the object of study and thereby missing another, potentially more productive one. In thus turning sound into marks on wax, the phonograph promised to transform intangible aural phenomena into tangible, material, controllable phenomena. And thanks to the phonograph, researchers could finally record, replay, and pause sounds, all with the same device. Sounds, or silences, which had previously escaped attention now demanded it.²³³ Notwithstanding the phonograph's enticing claim to an omnipotent, mechanical objectivity, doubts concerning how to employ those recorded sounds and silences for experimental psychological purposes remained. There was not yet an understanding of best scientific practices for the phonograph. As Stumpf, Hornbostel, and the medical doctor Abraham read monographs and articles by phonographic pioneers, but mainly as they produced their own recordings, they began to identify what they believed to be those best practices.

²³³ For more on this reconceptualization of sound and silence as scientific objects, see especially Kursell, "Listening to More than Sounds."

This problem of how to use the phonograph for experimental research badgered the Archive members from the moment they first phonographically recorded non-Western music. By the time Stumpf and Hornbostel took the stage in Innsbruck, they had been experimenting with the limits and affordances of this technology for over ten years. With the aid of Abraham until 1905, Stumpf and Hornbostel had by 1910 amassed a respectable collection of wax cylinders for the Institute's research at the nexus of music and psychology. In September 1900, Stumpf and Abraham made the Archive's first recordings: a performance by a Siamese theater troupe visiting the Berlin Zoo. In one recording, traditional Siamese orchestral wind and string instruments, along with a tinned percussion instrument, play a melody increasing in tempo which, to European ears, would sound palatably celebratory but was, in fact, funereal.²³⁴ These first 24 recordings, comprising Archiv Siam, resulted in Stumpf's paper on "Tonsystem und Musik der Siamesen."²³⁵ In 1901, Hornbostel's first year in Berlin, he and Abraham recorded the Archive's next substantial collection, 33 cylinders on the occasion of the Japanese theater troupe Kawakami and geisha musician Sada Yacco's visit to Berlin. In the third cylinder, for instance, Sada Yacco's solo features her extended exhalations of breath using nasal techniques to produce modulations in pitch and volume.²³⁶ A joint paper, "Studien über das Tonsystem und die Musik

²³⁴ This recording can be found in the CD accompanying Susanne Ziegler, *Die Wachszylinder des Berliner Phonogramm-Archivs* (Berlin: Ethnologisches Museum Berlin, 2006). The title of this recording is "Siam I" and the running time is 1:03. A description of "Archiv Siam" is on page 31. Such traditional Vietnamese funeral music is available on Spotify: see, for instance, Fong Naam, *The Nang Hong Suite: Siamese Funeral Music* (1992).

²³⁵ Carl Stumpf, "Tonsystem und Musik der Siamesen," in *Beiträge zur Akustik und Musikwissenschaft* 3 (Leipzig: J. A. Barth, 1901), 69-138, Anhang 1-11. For more on the history of these recordings, see Julia Kursell, "Experimental Cylinders – Experiments in Music Psychology around 1900," *Journal of Sonic Studies* 13, no. 3 (January 19, 2017), <https://www.researchcatalogue.net/view/324247/324248>.

²³⁶ Sada Yacco would have produced this nasal effect by stopping the passage of air through her mouth, by way of the tongue or lips, and redirecting it through the nose. The linguistic equivalent of this musical technique is "nasal consonant." More information on the "Archiv Japan I" can be found on Ziegler, *Die Wachszylinder des Berliner Phonogramm-Archivs*, 86; the recording is entitled "Japan I no. 3" (1:14) in the accompanying CD.

der Japaner,” followed soon thereafter.²³⁷ Under Hornbostel’s directorship and Stumpf’s influence, the Archive’s mission was to enable comparative analysis of the acoustics and European perception of “die Musik der Naturvölker” before it was lost forever, thanks to the dissemination of European culture and technology through colonialism.²³⁸ Comparison required large amounts of data, data which the researchers collected in Berlin’s *Völkerschauen*, zoos, circuses, and cabarets, as a steady stream of musicians from around the world performed in the German metropolis. By the time Stumpf recorded the Polish harpsichordist Wanda Landowska playing a Bach concerto at the Institute, in 1908, the Archive boasted over one thousand recordings.²³⁹ The Archive’s most productive years had only just begun. On the other side of the war, in 1918, it housed more than ten thousand recordings, making it the world’s largest phonogram collection and the center of an international network for ethnographic recording and reproduction.

Despite the Berlin Phonogram Archive’s growing size and reputation—or rather, because of it—the Archive’s researchers continually struggled against a problem which threatened to undermine their program. Their comparative methodology was based upon deriving meaning from patterns present in large amounts of data, but this methodology could not account for the data collection system’s intrusion into the data. Musicians from around the world had to play *for* the phonograph (or whichever notation system the researcher used), altering their musicking for the system’s listening. This notation system included more than the technology itself, of course.

²³⁷ Otto Abraham and Erich M. von Hornbostel, “Studien über das Tonsystem und die Musik der Japaner,” *Sammelbände der Internationalen Musikgesellschaft* 4 (1902-3): 302-60.

²³⁸ Carl Stumpf, “Das Berliner Phonogrammarchiv,” in *Internationale Wochenschrift für Wissenschaft Kunst und Technik* (February 22, 1908): 226.

²³⁹ This number comes from Stumpf’s plea for financial support, on February 22, 1908 (“Das Berliner Phonogramm Archiv”). In Stumpf and Hornbostel’s joint address to the German Society for Psychology, in April 1910, they boasted that the Archive already possessed 3,000 recordings (258).

Neither the phonograph nor the five-line staff and pencil (in the case of manual musical notation) could transform sounds into meaningful transcriptions without the researcher's attentive embodied presence and the musician's cooperative embodied presence. The research and researched needed to understand each other to produce meaningful data—and the research tool vis-à-vis contemporary scientific culture provided the objective script for their mutual understanding, assigning roles and behaviors to all human and nonhuman actors at the research site. The research tool, in other words, determined what became meaningful data and what became noisy data. Aware that how data was collected determined what data was collected, an eager Stumpf spent decades puzzling out the most productive means of collecting sound recordings for his consequently evolving research questions.

In November 1885, Stumpf first encountered these methodological difficulties as he attempted to manually notate the songs of Nuskilusta, a member of the Bella Coola Indian musical troupe shepherded around Europe by Carl Hagenbeck's agents. Over the course of four evenings, Nuskilusta visited the Institute for 1-2-hour sessions during which he performed the troupe's songs ten or more times. Stumpf noticed that Nuskilusta slowed his tempo and stripped his song of passion, to accommodate his listener's transcription, or stopped rattling a piece of wood altogether, upon noticing his listener's discomfort.²⁴⁰ While acknowledging that this back-and-forth between musician and transcriber could skew the experimental results, Stumpf felt that his hours of listening to Nuskilusta's performance resulted in another, more valuable experimental result. As he recounted later, in a methodological essay published the following year in *Vierteljahrsschrift für Musikwissenschaft*, his evenings with Nuskilusta had trained his ability to faithfully transcribe what had previously given him "den Eindruck eines Heidenlärms,

²⁴⁰ Carl Stumpf, "Lieder der Bellakulla-Indianer," *Vierteljahrsschrift für Musikwissenschaft* 2 (1886): 406.

einer wahren Teufelsmusik, innerhalb deren nur hie und da bestimmte Töne schwimmen.”²⁴¹ Whereas a few nights before he could only catch at notes when the troupe performed, “nun konnte ich doch mehr als bloßes Heulen, konnte ich die Melodien so vernehmen, wie sie Nuskilusta *solo* gesungen.”²⁴² Training: yes, a victorious Stumpf affirmed in his essay, aural training could transform even primitive howling into a distinguishable melody for the European ear—a pronouncement suggesting that the difference between noise and sounds recognized by Westerners as music was merely repeated exposure.²⁴³ However, this music was not a 1-to-1 transcription of the Bella Coola Indians’ songs, as Stumpf claimed, but a highly mediated and contingent version thereof. Not only did Stumpf require long, exhausting sessions with a single performer who tirelessly responded to his directions, but that performer stilled his emotions (because Stumpf could not follow passionate renditions) and quieted his percussive instrument (because Stumpf was disturbed). From the beginning of Stumpf’s experiments in non-Western musical transcription, the sought-after scientific sterility killed other, less comprehensible—indeed, more interpersonal and intercultural—data. Repeated exposure to unfamiliar music was not the answer Stumpf was looking for, after all.

Over the next twenty-five years, Stumpf developed a phonographic method to circumvent the skewing of experimental results present in the Nuskilusta manual notations. This method is what he and Hornbostel proudly presented in Innsbruck. In the case of *Naturvölker* visiting Berlin, like Nuskilusta, Archive members continued to request exhausting private sessions with the musicians to record performances, potentially lasting hours and spanning several days. As in

²⁴¹ Ibid.

²⁴² This entire Nuskilusta episode is captivantly contextualized in Ames, “The Sound of Evolution,” 305-6. Stumpf, “Lieder der Bellakulla-Indianer,” 408.

²⁴³ Ames, “The Sound of Evolution,” 306.



Figure 19. To my knowledge the only extant photo demonstrating how Stumpf (right) and his Phonogram Archive colleagues (here: Georg Schünemann, center) recorded *Volkmusik* using a phonograph. The three musicians on the left are from Tatarstan. 1915, Sound Archives of Humboldt-Universität in Berlin, HZK Bilddokument ID8249, Sammlungszugehörigkeit Lautarchiv, Inventar-Nr. Sign. Pn. 0113/5.

the April 1911 Stumpf recording and **Figure 19**, the speaker/musician sat in a noise-controlled room, positioned himself right before the phonographic horn, and spoke/played clearly for the duration of the wax cylinder's recording capacity (just over a minute). Even with the phonograph serving as the principal recording technology, the lead researcher took observational notes. As in 1892, Stumpf in 1911 still did not completely trust the phonograph alone; a highly musically trained experimental researcher was needed to confirm the phonographic recording's exactitude. For field recordings, Hornbostel gave each researcher his own phonograph, stored in a specially fitted case for portability. Hornbostel then trained the researcher at the Institute prior to departure and, while the researcher was abroad, by way of a detailed instructional manual of sorts. This manual reminded field researchers to position the musician's instrument or mouth directly before the horn (so the receiver could pick up the sound) and to ask the musician to play the instrument's complete scale (so the comparative musicologist back in Berlin knew the

instrument's highest and lowest notes).²⁴⁴ Deviating from this script meant that the phonogram was contaminated, unusable. The sterility of the recording—the distillation of complicated sonic environments into isolated sounds, chosen by the researcher—was key for transforming immaterial sonic phenomena into a material research object which could be precisely dissected in the laboratory, upon the field researcher's return.²⁴⁵

From its inception, then, the Phonogram Archive—apparently devoted to collecting non-Western music before European colonialism altered, or eradicated, it forever—had been amassing material traces of the researchers' often belated methodological preoccupations as they learned to objectively operate the phonograph. The breakthrough of Stumpf and Hornbostel's talk in 1910 was their concerted effort to get technically and conceptually ahead of the phenomena they recorded. In anticipation lies control. By amplifying, distorting, and filtering sounds through manipulation of the phonographic device—not to mention manipulation of the musician and the environment—they could create new research objects and questions. In so doing, they knowingly or unknowingly left other objects and questions aside. One question was always present, however. Each new recording prompted Stumpf, Hornbostel, and Abraham to

²⁴⁴ Koch, "Images of Sound," 485.

²⁴⁵ Musical notation's replacement with electronic recording in the field, wrote historian Joeri Bruyninckx, transformed how scientists conceived of sound in scientific practice: "Recording through mechanical 'ears' rather than human ears gave ornithologists certain advantages, such as replay or 'faithful reproduction,' but they also came to experience the world as noisier, more contingent, and more uncontrollable than they had before. Electrical amplification now forced ornithologists to decide what sounds to record, what to discard as noise, and how to eventually represent those sounds" ("Sound Sterile: Making Scientific Field Recordings in Ornithology," in *The Oxford Handbook of Sound Studies*, eds. Trevor Pinch and Karin Bijsterveld (Oxford: Oxford University Press, 2012), 129). At the same time ornithologists, equipped with more advanced recording and editing technologies, took to the noisier fields in the 1920s and 30s, Hornbostel was discussing phonographic recording as a means of making sound material and, in turn, capable of being dissected. Whether this was vivisection or dissection is unclear: "By carefully segmenting and dissecting the melodic strand with a scalpel [*Seziermesser*—some people fundamentally condemn such vivisection—we make the flow clot. The living event must be fixed as a motionless corpse, and only thus is it possible to recognize the now visible architecture of the whole" (translated by Ames, "The Sound of Evolution," 314; Erich von Hornbostel, "Formanalysen an siamesischen Orchesterstücken," *Archiv für Musikwissenschaft* 2, no. 2 (April 1920): 320).

ask how the Edison Home Phonograph's technical qualities of repetition, portability, and control could expand the bounds of experimental psychology. But they found that each time they asked this question, they encountered new complications to phonographic objectivity, complications they tried to address through repeated exposure and musical training, soundproof rooms and instruction manuals, indefatigably obedient musicians and long recording sessions producing several wax cylinders. Before the Great War ramped up the development of ever more sophisticated sound technologies, recording sound for the purpose of scientific study was a Sisyphean task.

The experimental psychologists had thus set a trap to capture sounds, only to find that they were in danger of trapping themselves, too. Challenges to the sterility of data collection were one thing, but the data's culturally embedded challenges to objectivity were another thing entirely: an unintended, indeed embarrassing, way to expand the bounds of experimental psychology. In the Archive's very first recordings, the Siamese funereal recordings of 1900, the music's meaning—that is, whether one heard a celebratory song or a funereal song—depended entirely upon the listener's cultural positioning. As Stumpf implied in his part of the 1910 talk, the phonograph enabled the researcher to replay this music, but it did not supply an alternative to the Eurocentric framework through which the researcher sought to understand that music. How, whispered the Siamese recordings to their European listeners, might listening be a culturally predicated process of organizing, filtering, and interpreting sound which the phonograph can never offset? How much can a European comparative musicologist never know, even as he smugly applies the latest techniques of mechanical objectivity? Deafened by their position in early-20th-century colonialism, Stumpf and his colleagues likely could not hear this recording and all other recordings' loudest counterquestions: How is one's perception of primitive musical

structures merely the result of confirmation bias, with scientific inquiry serving to reassert hierarchies when close analysis unsettles those very hierarchies and, with it, justification of oppressive colonial structures?²⁴⁶ What if the European researcher were to turn the phonographic receiver on himself—would he hear the forceful exhalation of his song, would he hear the animal pitch of his scream? Would he disturb himself? The trap lay in wait.

Phonographically recording their own embodied vocalizations would veer dangerously close to the conclusion Stumpf could have reached in 1885, as he transcribed Nuskilusta's songs: that civilized music versus primitive noise is a distinction constructed to maintain colonial power, not to further the bounds of knowledge *per se*. In turn, a European's quickly drawn conclusion that Nuskilusta is howling derives from lack of exposure, yes, but in the sense of an overarching spatial and aesthetic and imaginative distance forged between us and them. The cabaret stage, the traditional dress, the instruments, the rhythm, the language: these were intended to create a gulf between foreign musician and European listener, in making a spectacle of the musician to pique the paying listener's interest. When Stumpf asked Nuskilusta's agents if he could come to the Institute for notation sessions, the comparative psychologist brazenly crossed that gulf and apparently formed a wordless intimacy with Nuskilusta. What's more: Stumpf raised the status of Nuskilusta's song to music. However, Stumpf crossed this gulf only to insist upon another gulf: researcher and researched. Nuskilusta's song was music insofar as it was an object of study, one which had to be carefully manipulated to meet modern science's rigorous standards within a colonial system of knowledge production. And so, traces of

²⁴⁶ For recent histories of German colonialism vis-à-vis knowledge production, see: Sebastian Conrad, "Knowledge and Colonialism," in *German Colonialism: A Short History*, trans. Sorcha O'Hagan (Cambridge: Cambridge University Press, 2008), 124-35; Erik Grimmer-Solen, *Learning Empire: Globalization and the German Quest for World Status, 1875-1919* (Cambridge: Cambridge University Press, 2019); Bradley Naranch and Geoff Eley, eds., *German Colonialism in a Global Age* (Durham, NC: Duke University Press, 2014).

Nuskilusta, of his troupe and his culture, of his song and his personality, cannot be found in Stumpf's handwritten notations, but in Stumpf's methodological essay, which devotes several pages to their unfolding relationship of subtle, reciprocal adjustments in the Institute's soundproof room. Perhaps Stumpf, constrained by colonialism and objectivity, nevertheless sensed that his notations could not stand alone if he were to do justice to Nuskilusta's song.

Like a repressed desire returning, unbidden, in Stumpf's mind, Nuskilusta and the other experimental subjects' counterquestions ultimately formed the Archive's central methodological tension: between aspirations to mechanical objectivity and the suppression of the self, on the one hand, and the subjectively embodied and culturally situated human ear, on the other hand. At stake for the researchers was the threat of contamination, not only of the experiment's objectivity but of the binary classification which allowed objective experimentation (and certainly, colonial oppression) to proceed; indeed, the pursuit of objectivity is destined to be a pursuit of boundaries. Whether consciously or not, Stumpf's solution to this tension between mechanical objectivity and subjective listening was to fold it into his phonographic methodology. If the difference between music and noise was in the ear of the listener—really, the listener's expectations primed through cultural training—then the phonograph functioned like a microscope, allowing the researcher to observe the process of determining the incremental relationships between sounds. As if Stumpf had heard and accepted his early phonograms' dare, he found that European researchers could turn the phonograph on themselves to observe their own process of listening. From 1911 onwards, Stumpf began recording his colleagues' whispers, speechsong, silences, and vowel vocalizations. He avoided contamination—the messy intrusion of noise into music and speech, as well as them into us—by embracing contamination.

Having thus pivoted in 1911 from comparative musicology to another new frontier for experimental psychology, experimental phonetics, Stumpf's phonographic research program began to explicitly call into question the categories of music and language, as well as articulated meaning and "dusty" noise.²⁴⁷ To be sure, phonographically recording the Institute members producing unsemantic yet structurally suggestive sounds presented a new set of epistemic problems. In the Pfungst recording of 1911, for instance, the lead researcher Stumpf instructed the speaker to string out his vowels and modulate his pitch in producing vocalizations which were neither garbled speech nor stilted song. Whether the Archive researchers thought of these experimental recordings and their characteristic speechsinging and shrieking as an act of muddling boundaries, even debasement, can be traced back to a famous pair of recordings made in 1907 by the Director Hornbostel and the doctor Abraham. "Intonationsprobe 13" and "Intonationsprobe 14" featured Hornbostel's breathy rendition of "Das Lied der Deutschen" and Abraham's manipulation of the mechanism to produce a series of pulsating sounds remarkably similar to the tribal chants they had recorded throughout the decade.²⁴⁸ Arguably, the difference was both the experimenters' sense of cultural superiority (Joseph Haydn had composed this folksong) and Hornbostel's ability, as researched *and* researcher, to determine whether the phonographic experiment distilled his accomplishments into an unaccomplished, nasally voice. At the end of "Intonationsprobe 14," he sang several bars of the folksong and then paused for a few seconds to chuckle at his clumsy high notes, turning his mouth away from the receiver to do so. Hornbostel could chuckle into the phonograph, and keep the recording, because his name was

²⁴⁷ Stumpf later gathered this research in his groundbreaking 1926 monograph *Die Sprachlaute: Experimentell-phonetische Untersuchungen*.

²⁴⁸ Otto Abraham and Erich von Hornbostel, "Intonationsprobe 13" and "Intonationsprobe 14" (September 11, 1907), Ethnologisches Museum der Staatlichen Museen zu Berlin, Preußischer Kulturbesitz, Berliner Phonogramm-Archiv.

written on the wax cylinder. His name alone carried meaning in the Archive, evoking an intellectually gifted man who grew up in a musical family in Vienna and went on to earn a Ph.D. in Chemistry. Unlike almost every other musician in the Archive's early history, Hornbostel was not just the object of the phonographic experiment; he was the subject.

Overall, the Archive hewed close to an experimental objectivity facilitated and complicated by the phonograph, while simultaneously posing challenges to the very notion of objectivity through the data they collected. Stumpf and his colleagues believed that the phonograph distanced them from the primitive musicians they recorded, even from their own nonsensical vocalizations. But they also recognized, if only obliquely, that phonographic research brought them closer to their objects of research. What is a chuckle if not a barely concealed sign of discomfort? The phonograph thereby enabled the Archive members to play with the categories of music, noise and, eventually, speech. As we will see in Part II, playing with these three seemingly innocuous categories led to playing with the category which, ever so tenuously, held up their ability to produce what counts as knowledge: expert. And since their phonographic method begged for the categorically ambiguous, the researchers gravitated—slowly and then all at once—towards uncannily human vocalizations by nonhumans, especially when Stumpf began researching the evolution of music in earnest.

Enter: the animals. Considering that animals produce sounds outside of Western human language, that Stumpf and his colleagues recorded in spaces shared by human and animal performers, like the Circus Busch and Zoological Garden, and that they possessed recordings of *Naturvölker* imitating birds, it stands to reason that animal vocalizations figured in the Archive's research program. It stands to reason, too, that the comparative musicologists would gravitate towards those animals they considered most musical, as melody would prove, in hindsight, to be

a structure of *Gestalt*.²⁴⁹ This was the case, but complexly so, and homing in on various sites of animal performance is crucial for identifying the animals in and around the edges of the Archive, to say nothing of the problems they posed to the Archive's methodological core. More specifically, the cultural history of training birds to sing European music explains why these researchers were most intellectually drawn not to the apes sharing the bill with non-Western musical acts, but to their own perception of harmony, of musicality, in domesticated songbirds. This history also explains why Stumpf suppressed his fascination with the possibility of animal musicality. In the body of his monographs, he flatly denied all animals the capacity for music; in the endnotes, he reconsidered, with birdsong rising again and again as the itch he could not scratch, the thought he could not repress for long. Let us now turn to how Abraham and, thereafter, Stumpf and Hornbostel took up the interrelated questions of avian song, human versus animal musicality, and trainability within the context of their (proto)phonographic research. As in their comparative musicological research, the animal vocalizations they captured quickly bristled against their methodological frameworks, demonstrating, yet again, that affective understanding between the researcher and researched was both a precondition for an objective experiment and an excess which the experiment could not accommodate. They had to accommodate it in other ways.

PART II: Epistemic Recalibration: Sing/Sing

In the early 20th century, the most musical animal was the canary, a bird which soared above other songbirds, like Romanticism's favored nightingale, for being an exceptionally quick

²⁴⁹ Stumpf mentioned these recordings in reference to Darwin's theory that music originated when humans imitated birdsong, which I treat at length below (*Die Anfänge der Musik*, 14).

learner of melodies and exceptionally accepting of cages and captive breeding.²⁵⁰ The nightingale might sing more melodically to a European ear, but the canary was, in practice, more musical because it was more domesticatable. That is to say: the canary's song was more malleable to its human trainer's whims as the division between nature and culture was negotiated in domestic spaces.²⁵¹ By virtue of their status as consummate imitators, canaries were brought into urban spaces to replay the sounds of nature and European culture for their human listeners. Over the course of the 18th and 19th centuries, Germany's Harz mountain region distinguished itself as a global capital of highly trained canaries which could imitate the sounds of a babbling brook or a Bach sonata for a delighted parlor. Women of taste wore canaries on their pointer fingers, in their hair. Canaries formed (sometimes literal) attachments to women, and the women became the birds' second trainers, teaching them—sometimes over the course of a canary's lifetime—to sing their favorite tunes.

The trainability of the canary lent itself to the potentially infinite repeatability of the canary's song, until, of course, the music's material medium decayed, i.e., the bird could no longer sing due to illness or death. But the canary was more than a fleshy, animal recording device of sorts.²⁵² The highly trained and trainable canary operated like an early phonograph: a technology, first used for popular entertainment, which could both record and replay sound. Combining reception and repetition into one mechanism was the Edison Home Phonograph's breakthrough, and the trained canary's.²⁵³ And thanks to their positioning within domestic

²⁵⁰ Olga Petri and Philip Howell, "From the Dawn Chorus to the Canary Choir: Notes on the Unnatural History of Birdsong," *HUMaNIMALIA* 11, no. 2 (Spring 2020): 168.

²⁵¹ *Ibid.*

²⁵² "The canary served as a kind of recording device, enabling the transmission of certain carefully selected sounds of nature to distant urban households" (*ibid.*, 171).

²⁵³ To be sure, repetition is dependent upon the stability of the medium of transcription and playback. In Edison's first experiments, he created a phonograph using wax paper as the transcription surface. Later phonographs used a

spaces, these canaries-as-phonographs played mainly for women and their guests. The music of domesticated canaries and other songbirds was thus culturally coded feminine.

To be domesticated was to be domestic, and the home was no place for serious science. Due to its association with feminine domestic and popular entertainment in the 18th and 19th centuries, birdsong did not become an object of scientific study until paradigm-altering discursive work around the phonograph changed scientists' perception of its use value; the mechanical phonograph was certainly more objective than handwritten musical notation.²⁵⁴ Still, studying animals was a tricky business. What the modern scientific community perceived as the objective study of animal behavior and communication remained up in the air at the turn of the century, with dissection standing as the most tried-and-true means of studying animals. After all, how can a phenomenon slip out of your control if it is already dead? This is not to say that birdsong intrigued scientists only once figures like Stumpf leveraged their respectability to transfer the Edison Home Phonograph from home to laboratory, based on its supposedly “non-subjective” registration of sonic data. On the contrary, this transition took decades, with the study of avian acoustics becoming a viable field of research in the 1920s and 1930s.²⁵⁵ But before this, as Darwin's evolutionism simmered alongside Stumpf's comparative musicological

thin sheet of metal, such as tinfoil. These relatively flimsy surfaces were ultimately replaced by the far more durable and therefore more “repeatable” wax cylinder. For more on the revolution of the wax cylinder, see Alexander Rehding, “Wax Cylinder Revolutions,” *The Musical Quarterly* 88, no. 1 (Spring 2005): 123-60. For a literary text on the importance of phonographic materials, see Rainer Maria Rilke's 1919 short story “Primal Sound,” in which the schoolboy Rilke and his classmates make a homemade phonograph using candle wax. Friedrich A. Kittler includes this story in *Gramophone, Film, Typewriter* (trans. Geoffrey Winthrop-Young and Michael Wutz (Stanford: Stanford University Press, 1999), 38-42).

²⁵⁴ For an excellent history of musical notation vis-à-vis studying birdsong, see Joeri Bruyninckx's chapter “Scientific Scores and Musical Ears: Sound Diagrams in Field Recordings,” in *Listening in the Field: Recording and the Science of Birdsong* (Cambridge, Mass.: The MIT Press, 2018), 23-56.

²⁵⁵ My understanding of the rise of birdsong as a scientific object comes from Joeri Bruyninckx's work on field recordings, including his monograph *Listening in the Field* and his entry in *The Oxford Handbook of Sound Studies* entitled “Sound Sterile: Making Scientific Field Recordings in Ornithology.”

research at the Berlin Phonogram Archive, birdsong produced an irresistible stew of questions for the Archive's researchers: What differentiates human music from avian music? If one can, in fact, call both phenomena "music," then is avian music the origin of human music? Is musical ability innate or learned? Dissecting birdsong through the phonograph: perhaps this technical breakthrough could begin to answer questions which had perplexed thinkers for centuries.

Stumpf and his colleagues did not immediately apply the phonograph to birdsong, or any other animal vocalization; there were too many hindrances. Since sterile recording required the speaker's endurance for taking orders and for speaking loudly into the receptor, not to mention the mediation of a handler, only an exceptional animal could successfully undergo the recording process. That animal had to be comfortable enough around human strangers, domesticated enough to behave in a cramped noise-controlled room, and submissive enough to its human handler to vocalize when ordered. What's more: various animal species posed various, unexpected practical problems to objective phonographic recording, thereby straining the researchers' ability to draw conclusions from these recordings. Stumpf and Hornbostel quickly realized out that the experience of recording non-Western musicians was not an appropriate analogue for recording, say, a wood pigeon (which Hornbostel attempted to do five times in Holstein and once in the Viennese forest). Alas, birds would simply not do: the phonograph was not yet sensitive enough to distinctly pick up birdsong emitted in great spaces, and audio editing technologies were not yet sophisticated enough to clean up the recordings to amplify just the bird's song.²⁵⁶

Surprisingly, then, a bird was the first animal phonographically recorded and an eight-year-old boy was the first to record it. Born into a music-loving family in Frankfurt am Main,

²⁵⁶ Ibid.

Ludwig Koch received an early phonograph as a child and began recording animal sounds with it. He was especially drawn to birdsong due to his own musical training. In 1889, he made the first-known recording of a bird, his family's captive White-rumped Shama.²⁵⁷ Just over two decades later, the international breakthrough for animal phonographic recordings arrived when a canary breeder in Bremen, Karl Reich, recorded canaries he trained to sing like nightingales. Reich persuaded his birds to perch inside the phonograph's horn and perform their songs. These birds were listed as the artists on the resulting gramophone records, not Reich, and their songs were titled like classical music pieces.²⁵⁸ From "Song of a Nightingale, No. 2" to "Canary & Thrush Duet," Reich's canary recordings become incredibly popular in Europe, Russia, Canada, and the United States, used by bird trainers to expose their own birds to the songs as well as bird enthusiasts who, like their forebears, wanted to bring nature into their urban dwellings.²⁵⁹

Even with Koch and Reich's achievements in coaxing their birds to sing clearly and loudly for a phonograph, an eight-year-old boy and a canary breeder were not the company world-renowned researchers wanted to keep, nor acknowledge as their methodological predecessors. If the Archive members followed Koch and Reich's example by keeping birds at the Institute for the purpose of recording, they would position their research dangerously close to childish pet-keeping, at worst, and mass culture items tackily lacquered with European respectability, at best. The discipline's support for the Institute's research program and the

²⁵⁷ A brief English-language interview with Ludwig Koch accompanying the digitalized recording can be found on The British Library's website under "Ludwig Koch on the recording [of] a White-rumped Shama in 1889." <https://www.bl.uk/collection-items/first-recording-of-a-bird-1889>.

²⁵⁸ See, for instance, "Song of a Nightingale, No. 2" by "a bird in the aviary of Karl Reich, of Bremen" (A-Side) and "Song of a Thrush," also by "a bird in the aviary of Karl Reich, of Bremen" (B-Side). Many of the Reich canary recordings have been digitized in the digital Sound and Science collection "Animal sound recordings." <https://soundandscience.de/audio/song-nightingale-no-2-45057>.

²⁵⁹ Petri and Howell, "From the Dawn Chorus to the Canary Choir," 182.

public's reverence for its solutions to popular debates, from the *Hansfrage* in 1904 to the *Donfrage* in 1911, depended upon their maintenance of those distinctions. No, they would not keep birds at the Institute.

They tried a different approach. As a result of apparently intense methodological conversations with Stumpf in 1911, Hornbostel penned an article on avian musical psychology which was, at its core, a methodological treatise on the difficulty of phonographically recording birdsong.²⁶⁰ Having gone to press at the same time Stumpf put the finishing touches on his study of musical evolution, Hornbostel's "Musikpsychologische Bemerkungen über Vogelgesang" considered why, how, and for what purpose birds sing, what birds sing and, most importantly for musicology, whether birds sing at all. Hornbostel was confident that birds sing *physiologically*; *psychologically*, it was far harder to determine, since birdsong was not just an animal psychological conundrum nor just a musicological conundrum, it was also a notation conundrum (118). As Hornbostel noted early in his article, studying birdsong posed very particular problems, problems which he had first encountered in the study of non-Western music.²⁶¹ Phonetic notation could not accommodate the sounds birds make ("Dasselbe Motiv schreibt der eine *dahüdl*, der andere *tlowit*" (119)). Nor could musical notation, which Hornbostel considered a "gewaltsame Schreibweisen" for "die Eigentümlichkeiten der Gesänge" (119). Birds, he suggested, had their

²⁶⁰ Erich Moritz von Hornbostel, "Musikpsychologische Bemerkungen über Vogelgesang," *Zeitschrift der internationalen Musikgesellschaft* no. 5 (1911): 117-28.

²⁶¹ "Zuverlässiges empirisches Material ist ja die wichtigste Voraussetzung aller Theorie, und die Beobachtung und Aufzeichnung von Vogellauten hat mit ganz besonderen Schwierigkeiten zu kämpfen. Die richtige Auffassung der musikalischen Töne wird erschwert durch ungewohnte Klangfarben, verhältnismäßig hohe Lage—zwei- und dreigestrichene Oktave—, oft sehr schnelles Tempo und vor allem durch sehr starke Geräuschbeimischung. Schon die Geräuschlaute der menschlichen Sprache sind oft schwer genug angemessen aufzuzeichnen, wie jeder weiß, der es einmal mit einer afrikanischen oder amerikanischen Sprache, oder auch nur mit einem europäischen Dialekt versucht hat" (*ibid.*, 118-9).

own music, and notation systems based in human phonetics and music could only represent this avian music “genau genug” (119). The solution was, predictably, the phonograph:

“Phonographische Aufnahmen möchten übrigens auch dem Studium des Vogelgesangs zugute kommen. Namentlich ist es ein Vorteil, der den Phonographen auch für das Studium exotischer Musik unentbehrlich macht: die Möglichkeit, eine Melodie oder ein Motiv beliebig oft zu wiederholen, und so Einzelheiten festzulegen, die kein Mensch bei der ursprünglichen Aufführung aufzeichnen könnte [...] Freilich müssen sich diese [Versuche phonographierter Vogelgesänge] vorderhand auf eingekäfigte Tiere beschränken, die von den meisten Ornithologen für weniger gute ‘Versuchspersonen’ gehalten werden, als freilebende, weil sie oft andere Strophen singen als in der Freiheit, auch leicht die Singweise von artfremden Mitgefangenen annehmen. Aber die musikalischen Fragen werden ja durch diese Ungezogenheiten weniger berührt als die zoologischen, und man hätte wenigstens einige von allen subjektiven Zutaten freie Beispiele” (119-20).

Here and throughout his article, Hornbostel noted that the study of bird musicality was hindered by the messiness of domestication. Using caged birds could provide a temporary solution, one which would not contaminate the musicological side of the study—and yet, as he admitted at the article’s beginning, birdsong was fundamentally a musicological *and* animal psychological phenomenon. The researcher grappling with animal musicality also grappled with whether animal learning was psychologically meaningless (i.e., a mere feat of biologically based memorization) or something more human (122). Can birds count, in a sense? Is mathematics necessary for music? Can birds make art?²⁶² How does a bird’s song transform through its relations with other birds, not necessarily of its own species? The phonograph could record birdsong, making audible and repeatable what the singular human ear could not perceive, but it could not answer the troubling questions lurking beneath each song. As with Hans, Hornbostel

²⁶² On the matter of bird “art,” Hornbostel was sure: “Ob der Papagei ohrenzerreißend schreit oder Mozart flötet, ist ihm ganz gleichgültig. Und die musikalische Begabung der Nachtigall ist deshalb nicht größer als die der Gans, weil Seufzen holder ist als Schnattern. Wir sind die Künstler, nicht die Vögel. Uns werden ihre Liebesschreie zum Lied, wie das Plätschern des Bachs zur Sinfonie und die blumige Wiese zum Bild” (128).

and Stumpf applied mechanical objectivity to the animal object of study, only to find that they still could not clean up the mud it tracked all over their operative categories.

This movement—of preemptively cleaning up the epistemic mess animals left in the Institute by not allowing them into the Institute in the first place—has a long history, a history which began before the October Commission of 1904. At least three years before the “equine savant” unnerved two of the Phonogram Archive’s founders, Stumpf and Hornbostel, the other key figure conducted a series of birdsong experiments, as part of his research on perfect pitch in humans. This work was evidently a touchstone; every Archive member who wrote about vocal mimicry in animals a decade later, plus Pfungst, cited it in admiration. At the turn of the century, it was Otto Abraham, the doctor, who began studying whether musical ability is innate or learned, after having accidentally (or so he claimed) taught his parrot Beethoven’s Symphony No. 5. As he recounted in “Das absolute Tonbewußtsein” (1901), animals, too, can be instructed to develop “ein absolutes Gehör”:²⁶³

“Ich hatte einen Papagei, dem ich Lieder stets in derselben Tonart vorpfeiff; er war so gelehrig, die Melodien bald wieder nachpfeifen zu können, und zwar ebenfalls immer in derselben Tonart. So begann er den Anfang *C-moll*-Symphonie stets richtig mit *g g g es*. Nur einmal fing er diese Töne zu hoch zu pfeifen an, mit *as*; brachte aber nur die drei *as* hervor und fing dann wieder von vorn an in der richtigen Tonhöhe *g*. Ob der Vogel hierbei mit Hilfe von Muskel-Empfindungen seiner dicken Zunge oder durch sonstige mittelbare Kriterien zu seiner Tonhöhen-Reproduktion gelangt, ist natürlich nicht zu ermitteln. – Auch ein Staar, den ich mir kurz nach dem allzu frühen Tode des hoffnungsvollen Papageis anschaffte, gebraucht stets dieselbe Tonart für sein Lied, in der es ihm vorgepfeiffen war” (69).

Already in 1901, Abraham’s study of avian learning evidenced the same preoccupation with the media of reproduction which characterized Stumpf, Hornbostel, and Pfungst’s questions as they stood before Hans. Can the parrot uncannily reproduce the iconic opening of Beethoven’s

²⁶³ Otto Abraham, “Das absolute Tonbewußtsein: Psychologisch-musikalische Studie,” *Sammelbände der internationalen Musikgesellschaft* 3 (1901): 69.

Symphony No. 5 due to its learning speed, otherwise anomalous amongst nonhumans? Or due to an embodied feature particular to its species—in the parrot’s case, the muscle memory of its thick tongue? Or perhaps due to a yet unknown source of mediation? What, in other words, happened between Abraham’s whistling and the parrot’s perfect tonal reproduction thereof, and how is that a starling, while also known for its mimicry, could achieve the same feat?²⁶⁴

Abraham left these questions open; they were “natürlich nicht zu ermitteln.” Just as importantly, he gestured towards the inability of physiological research, and its methodological emphasis on dissection and stimulus response measurement, to determine why this parrot was such a gifted mimic. Cutting open the parrot’s thick tongue and analyzing its musculature would bring them no closer to an answer, as mimicry was not simply a physiological feat. The parrot and starling’s mimicry were attributable to more than the combination of an especially keen sense of aural perception and an especially robust tongue. But Abraham did not yet know what enabled his birds to sing Beethoven. All he could conclude was that the great difficulty of conducting animal experiments meant that the scientist should take extreme caution in interpreting the results.²⁶⁵ His symphony-singing birds comprised an illustrative anecdote, not the ground on which to build stabile scientific conclusions about vocal mimicry in animals. The consequences of this acknowledgment were ultimately epistemological: if a phenomenon exceeded the contemporary scientific apparatus’ means (i.e., technologies, techniques, and

²⁶⁴ Arguably the most famous starling is Wolfgang Amadeus Mozart’s pet starling (it has its own Wikipedia page), which the composer supposedly bought after the bird picked up a phrase from his recently written “Piano Concerto in G Major.” Three years later, when the starling died, Mozart held an extravagant funeral. In their *American Scientist* article “Mozart’s Starling,” Meredith J. West and Andrew P. King suggest that the composer wrote “A Musical Joke” in the vocalization style of a starling (78, no. 3 (March - April 1990): 106-14).

²⁶⁵ “Da wegen der großen Schwierigkeiten der Tierversuche, vor allem wegen der oft fehlerhaften Deutung der Reaktionen, diese Resultate mit großer Vorsicht zu betrachten sind, so sind sie vollends nicht für unsere Frage nach den Centren des absoluten Tonbewußtseins zu verwerten” (71).

concepts) of extracting data from it and then situating it within an existing framework, then that phenomenon could not be studied objectively.

In many ways, Abraham's parrot anecdote shaped the Institute members' hesitation towards conducting animal vocalization experiments and, at the same time, demonstrated how they could do just that without jeopardizing their claim to scientific legitimacy. First, by detailing his gifted parrot and starling's feats of mimicry and, in the next breath, discounting the scientificity of these animal experiments, Abraham could have it both ways. He could comment on tonal perception—and shockingly: musicality—in his own domestic birds while deploying the term *Tierversuch* to keep at bay critiques regarding the irreproducibility and therefore inconclusiveness of his bird research. A *Versuch* was scientifically objective; a *Tierversuch* was not. A *Tierversuch* was a narrative, containing more human imagination than empirical reality. Not to mention that conducting the same experiment on a starling did not indicate, he admitted, the successful reproduction of the first, parrot experiment in vocal mimicry. Two Beethoven-singing birds do not a conclusion make—but they do make something, something which Abraham felt compelled to include in his work on perfect pitch in humans, with examples of tonality in children and blind humans directly preceding his birds. His second tactic, then, was to take a page out of Darwin's *The Expression of the Emotions in Man and Animals* (1872).²⁶⁶ By arranging his birds alongside a range of beings thought to exist between civilized human and the lowest animal, Abraham suggested that mimicking birds represented a missing musical link in the history of human tonal perception's, and human music's, evolution. It was this very tactic,

²⁶⁶ Recall in Chapter 1 that Darwin sought to account for the observer's tendency to imagine expressions that were not actually present, and he attempted to do so by presenting the expressions of a wide range of subjects: human "savages" and "idiots," human children, anthropomorphic apes, lower animals, domesticated animals, and the "deaf and dumb" girl Laura Bridgman. Darwin's attention to observer bias undoubtedly influenced Stumpf, Pfungst, and Hornbostel's conclusion of "observer expectancy effect" when they investigated Hans' mental abilities.

this very question which Stumpf adopted in his 1911 monograph *Die Anfänge der Musik*, the endnotes of which featured more singing birds than even Abraham dared.

Before fully turning to Stumpf's *Die Anfänge der Musik*, it is necessary to consider Abraham's third tactic to understand why, at the most basic level of social perception, there are no bird recordings in the Phonogram Archive, despite Hornbostel's best attempts in 1911. Namely: birds sang Beethoven in homes, not in laboratories. The behaviors the German researchers recognized as intelligence and musicality were made and revealed in spaces inhabited by both humans and their domesticated (i.e., domesticatable) animals. Indeed, Abraham most likely conducted his mimicry experiments—the first animal psychological experiments in the Institute's history—in his parlor, the most communal space in the home, presided over by the woman of the house and occupied by any pet birds. Intentionally locating his bird research within the feminine-coded domestic sphere designated another attempt to distance himself from the scientific illegitimacy of teaching his parrot to sing Beethoven. A *Versuch* was conducted in a laboratory; a *Tierversuch*, if its intention was to investigate psychological phenomena, was not conducted in a laboratory—or really, not yet and not by the right gender in the right spaces.²⁶⁷ And a domesticated bird, most certainly cared for by the woman of the house, was no object of serious scientific study.²⁶⁸

²⁶⁷ As I show in this dissertation's conclusion, the animal learning experiments of postwar New Animal Psychology abounded with animals (mainly dogs and cats) trained by women in domestic spaces. In 1901, however, there were no models for laboratory-based, experimental animal psychology.

²⁶⁸ For more on the affective, gendered dimensions of keeping domesticated animals, albeit in the Victorian English context see: Monica Flegel, "Becoming Crazy Cat Lady: Women and their Pets in the Domestic Circle," in *Pets and Domesticity in Victorian Literature and Culture: Animality, Queer Relations, and the Victorian Family* (London: Routledge, 2015), 56-95; Keridiana W. Chez, *Victorian Dogs: Victorian Men: Affect and Animals in Nineteenth-Century Literature and Culture* (Columbus: Ohio State University Press, 2017). Studies on domestic birds, gender, and affect are more difficult to find. Petri and Howell's article on domesticated canaries is the most promising in paving the way for this research.

The home was more than an alibi for Abraham's bird experiments. (The future father of ethnomusicology could not help but become intellectually involved when his own parrot picked up Beethoven!) The home was the very condition of possibility for the birds' adoption of the German musical canon, and the home as an especially affective site of knowledge production points to why researching birdsong was so methodologically and pragmatically fraught for the Institute members. In sharing a domestic space, Abraham made sonic contact with the parrot and the parrot made sonic contact with him. Abraham, steeped in turn-of-the-century German musical culture, whistled songs to the parrot. The parrot sang those same songs to Abraham. While Abraham may have been smitten with his own Eurocentric musical reflection in the bird's song, he also made space for the possibility that the parrot's song was not necessarily reducible to physiological reproduction à la Descartes (as Hornbostel would ten years later). The bird, in other words, was no mere phonograph; the bird's reception and reproduction of music escaped mechanical analogy. Abraham acknowledged that he could not know how the parrot learned to produce perfect pitch and, just as importantly, he acknowledged the role his relationship with the parrot played in its acquisition of Beethoven. The parrot, and then the starling, learned Beethoven's Symphony No. 5 because they enjoyed a richer sonic environment than they would have had in a laboratory. As he passed from one room to the other, Abraham whistled. He talked to his family. He likely played European classical music on a gramophone or piano. And, when the parrot played those same sounds back to Abraham, Abraham took notice. Evident in Abraham's mourning of the "allzu frühen Tode des hoffnungsvollen Papagei," the human's affective involvement with the bird meant, in this case, the difference between Beethoven and no Beethoven. Singing, listening, and mimicking are fundamentally relational acts, and the highly

affective, culturally enmeshed space of the home allowed these human-parrot relations to play out—and rather playfully, at that.²⁶⁹

PART III: Epistemic Self-Reflection: Sing/Speak

Completed the same month that the Institute made the final Don recording and the sole Pfunst recording, Stumpf's *Die Anfänge der Musik* sought to historicize his research at the intersection of comparative musicology and experimental psychology by tackling the question he believed Darwin had failed to answer in *The Descent of Man* (1871, German translation: 1875): Where did music come from? Darwin believed human music-making evolved from bird mating calls; respectfully, Stumpf found this proposal ridiculous.²⁷⁰ In the monograph's first section, Stumpf used Abraham's parrot experiments to transition from his challenge to Darwin's theory of musical evolution, as it were, to what music might mean in an animal sense.²⁷¹ Stumpf maintained that Darwin's inadequate understanding of the behavioral functions of birdsong and

²⁶⁹ The laboratory is also an affective, culturally enmeshed space, as Bruno Latour and Steve Woolgar first showed in their groundbreaking *Laboratory Life: The Social Construction of Scientific Facts* (Princeton: Princeton University Press, 1986). One of the methodological questions I ask in this chapter is what the affordances of the home versus the laboratory (and, as we will see, versus the forest) were for the animal psychological study of animal vocalizations before the creation of technology and methods which gave birth to bioacoustics in the 1920s and 1930s. I seek to underline, too, how the figures in this chapter did not simply operate in the laboratory or the home; there was, rather, a dynamic exchange between the laboratory and the home and the forest which shaped their thinking about animal vocalizations.

²⁷⁰ While a proponent of Darwinian evolutionism himself, Stumpf was gleefully dismissive as he took on the failings of Darwin's theory of musical evolution, writing "Ich will nicht dabei verweilen..." to emphasize how obvious the holes in his knowledge of birdcalls and "primitive" music, especially, were (10).

²⁷¹ Completed in April 1911 and dedicated to Hornbostel, *Die Anfänge der Musik* was the continuation of Stumpf's 1885 review of evolutionary theory as music psychology and, more recently, his 1909 public lectures on the subject: Carl Stumpf, "Musikpsychologie in England: Betrachtungen über Herleitung der Musik aus der Sprache und aus dem thierischen Entwicklungsprozeß, über Empirismus und Nativismus in der Musiktheorie," *Vierteljahrsschrift für Musikwissenschaft* 1 (1885): 261-349. Stumpf first published an abridged version of the 1909 public lectures in *Internationale Wochenschrift für Wissenschaft, Kunst und Technik* 3, no. 51 (December 18, 1909): 1593-616. A full book version followed: *Philosophische Reden und Vorträge* (Leipzig: J. A. Barth, 1910).

primitive music, along with a simplistic understanding of music itself, had steered the great man in the wrong direction.

For Stumpf, music and musical ability “im menschlichen Sinne” entailed the production of “gewissen Anordnungen der Töne” which can be “unabhängig von der absoluten Tonhöhe wiedererkannt und wiedererzeugt” (10). Music was not simply the production of notes; it was, in essence, the reproduction of notes according to what a Western listener would recognize as a musical scale. Abraham’s parrot was able to repeat Beethoven’s Symphony No. 5 with perfect pitch, yes, but it could not sing the symphony in a higher or lower key. But primitive people could. Stumpf noted in this regard that he and his colleagues conducted phonograph experiments to ascertain whether non-Western musicians adjusted the intonation of their song to the pitch of a pipe. “Diese Fähigkeit des Wiedererkennens und des Transposierens von Melodien,” concluded Stumpf, “finden wir unter den Naturvölkern, soweit unsere Kenntnisse reichen, allgemein” (10). A bird could mimic sequences of notes but not transpose them, whereas Stumpf’s *Naturvölker* could do both. In this line of thinking, which placed birds right below primitive peoples on a ladder of musical evolution, transposition was where human music diverged from bird mimicry of those same notes.

Regardless of how musical a bird was, then, it could never be musical in Stumpf’s “human sense.” If any animal could transpose melodies, then this occurrence was, statistically speaking, an outlier which only served to underscore the mean.²⁷² Music was the providence of the human, much as language was the providence of the human, and the human alone:

²⁷² “Ich will nicht behaupten, daß nicht kleine Veränderungen in der Höhe eines Vogelrufes oder des Kuhgebrülles bei dem nämlichen Individuum vorkämen, im Gegenteil ist es von vornherein klar, daß mathematisch gleiche Intonation nur der Grenzfall ist, die Regel hingegen Abweichungen sein werden, die sich innerhalb gewisser Grenzen um einen Mittelpunkt herum bewegen. Allein diese zufälligen Schwankungen, namentlich infolge verschiedener Exspirationsstärke, die wieder mit dem augenblicklichen Körpergefühl und Befinden zusammenhängen mag, dürfen nicht mit eigentlicher Transposition verwechselt werden” (11-2).

“Es ist mit der Musik ähnlich wie mit der Sprache. Auch die Tiere haben eine Sprache. Aber Sprache in unserem Sinne beginnt erst da, wo die Laute als Zeichen allgemeiner Begriffe gebraucht werden, eine Anwendung, die bei den Tieren ebensowenig nachgewiesen ist, wie der Gebrauch transponierter Intervalle. Was wir von den tierischen Vorfahren in beiden Beziehungen erhebt haben, das ist nur der Kehlkopf und das Ohr. So wenigstens steht die Frage gegenwärtig” (13).

In Stumpf’s definition, sounds [*Laute*] become music or language “in unserem Sinne” when emitted within a framework imbuing them with meaning and by a singer/speaker whose subjectivity is not in question. Stumpf suggested that it does not matter whether the singer/speaker and the listener share that framework, only that the sounds are used “als Zeichen allgemeiner Begriffe.” As the products of mere physiology rather than meaning-driven intention, animal sounds are therefore categorically distinct from human music and language. The larynx and ear are all animals and humans share in the act of vocalizing.

Arguably, Stumpf left these definitions of music and language so capacious as to be hole-ridden, a result of doubt rather than deliberation—or more accurately, the doubt which follows deliberation. While ostensibly policing the boundary between human and animal, Stumpf’s definitions of music and language opened that boundary at the slightest pressure. Not only did Stumpf explicitly attribute to animals their own language and, by extension, their own music, but he implied that the present lack of empirical proof for animals operating sound in a way recognizable to humans as the transposition of intervals derived from a definition of “Musik im engeren Sinne” (14). To turn this around: Stumpf subtly pointed out that the narrowness, the stubborn humanness, of music as a concept was the problem which kept researchers from understanding the musicality of animals, perhaps even the evolutionary relation between music and speech.²⁷³ But with the right animal, the closed gates of music and language might open to

²⁷³ As Stumpf wrote a few pages later: “Sollte die Sprache bei der Geburt der Musik oder bei ihrer Aufziehung irgendwie mitgeholfen haben: die Mutter war sie ebenfalls nicht. Das, was Musik grundwesentlich von der Sprache unterscheidet, kann nicht aus der Sprache gewonnen sein” (20).

include what animals do when they vocalize. As he wrote in the following paragraph: “Sollte umgekehrt sich bei talentvollen Tieren doch einmal diese Fähigkeit konstatieren oder künstlich anerziehen lassen, so würden wir sie sofort als unsere rechten Brüder in Apoll in Anspruch nehmen” (13-4). Until that animal arrived, however, humans remained trapped, alone, within gates built by their own hand.

In these opening pages of *Anfänge*, Stumpf played coy, parroting the definition of language passed down to him, one which refused to see animals as psychological actors, while flashing challenges to it through his approach to music as a psychological phenomenon. Like Abraham did with his parrot, Stumpf recognized that his own theoretical singing and speaking animals were not bodily machines. Language and music were complex products of complex psychological processes, and Stumpf had, by 1911, woven together a string of questions at the nexus of animal psychology and comparative musicology. These questions, and his provocative answers to them (or lack thereof), he distanced himself from by placing them in the endnotes. The body of the text contained answers, or calls for more research to provide answers, while the endnotes contained questions which could never be solved, at least not yet. A researcher seeking to shore up the legacy of his intellectual endeavors, both reputationally and financially, was not in the business of underlining his own doubts.²⁷⁴ Bravely, then, Stumpf published the doubts singing and speaking animals posed to his conceptualization of musicality, only hinted at in the body of his text. And he began to feel his way toward an animal music: an expansion of his early, comparative musicological research in the Phonogram Archive. In the context of his

²⁷⁴ In 1908, the Archive needed funding and, on February 22, *Internationale Wochenschrift für Wissenschaft Kunst und Technik* published Stumpf’s article asking for donors to support the Archive’s important work: namely, recording soon-to-be-extinct “primitive” music. In these early years, especially, the Archive’s financial situation was precarious, with Stumpf and Hornbostel funding the operations themselves.

august career, the endnotes of *Anfänge*'s Part I constitute his most extensive animal psychological theorizations penned under his own name.

It begins with a dog listening to music. In the first paragraph of a six-page-long footnote on animals and music, Stumpf mused:

“Aber die Erklärung des bezüglichlichen Verhaltens von Tieren scheint mir äußerst schwierig. Wenn der Hund bei der Musik heulend sitzen bleibt—was geht eigentlich in ihm vor? Welchen Zweck hat das Heulen mit emporgestrecktem Kopf? Und was ist es, das bei der Gehörsreizung vom Hunde, sei es angenehm, sei es unangenehm, empfunden wird? Hat es mit Intervallen, Akkorden, Modulationen, mit rhythmischer Gliederung etwas zu tun? Dies scheint mir ausgeschlossen. Über die wirkliche Qualität seiner Gefühlsempfindung liegen beweiskräftige Beobachtungen bisher nicht vor” (74).

In this string of questions, Stumpf's hypothetical music-listening dog foregrounds music as a physiopsychological phenomenon, one which can cross species boundaries with (yet) unknown effects. Is the dog howling to sing along to the melody, but according to its own, canine melodic sense? Or is the dog howling because it experiences human music as grating noise (much as humans experience dog barking as grating noise)? Simply put: What kind of aural stimulus is, say, a Bach sonata for a dog, and how is the dog communicating that effect to humans, in ways that humans cannot decipher by virtue of having a different physiopsychological apparatus?

Indeed, this hypothetical howling, music-listening dog presented a series of problems, if not threats, to human cerebral and European cultural hegemony, which Stumpf acknowledged only insofar as he preemptively deflected them. Perhaps a researcher could play several different pieces of music for a dog, to ascertain what music—implicitly defined in the above passage as a pleasurable aural stimulus—might mean in a canine sense. But even if Stumpf were interested in how one dog's “Gefühlsempfindung” might converge with another dog's, in arriving at a canine musical sense of sorts, this question begged another, far thornier question: whether one's experience of music is merely a series of physiological responses to aural stimuli, with humans

and animals separated only by how their bodies respond to their perception of a given sound. In this equation, there is no room for the civilized European soul delighting in a masterful Beethoven symphony. To preserve the sanctity of the human soul as expressed in highly evolved, i.e., European, music, it was better not to presume that animal vocalizations, from the bird's song to the dog's howl, were expressions of emotions. It was better, instead, to infinitely defer the question of the physiopsychological processes behind animal vocalizations by lamenting the inconclusiveness of the relevant research to date.

One could also, like Stumpf, aggressively take down those who did ascribe human emotions to animal vocalizations. Wilhelm Wundt, whose Leipzig Institute for Experimental Psychology formed natural rivals with Stumpf's Berlin Institute of Psychology, received the full force of Stumpf's ire.²⁷⁵ With "erstaunlicher Gläubigkeit," Wundt believed himself, based on the American Xenos Clark's musical notations of birdsong, "tatsächlich auch noch die Gefühle dieser Tierchen heraushören zu können," even going so far as to propose three dimensions of avian feeling: joy, depression, and vigorous excitement (77) (**Figure 20**).²⁷⁶ Stumpf found Wundt's theory not only lacking in scientific rigor, but completely preposterous, as the music one plays does not necessarily correspond to one's emotion at the time of playing. What Stumpf took objection to was Wundt's implied definition of music as nothing more than the expression

²⁷⁵ For an account of Wundt and Stumpf's rivalry as it pertained to the experimental psychological study of sound, see Alexandra Hui, *The Psychophysical Ear: Musical Experiments, Experimental Sounds, 1840-1910* (Cambridge, Mass.: The MIT Press, 2012).

²⁷⁶ Xenos Clark, "Animal Music, Its Nature and Origin," *American Naturalist* 13 (1879): 209-23.



Figure 20. Wilhelm Wundt’s assignment of human feelings to birdsong (joy, depression, and vigorous excitement), from *Völkerpsychologie I* (1900). Reproduced in Wundt, *Die Anfänge der Musik*, 77.

of clear, distinct, siloed emotions, whether in birds or humans.²⁷⁷ For Stumpf, this was, in practice, a problem of deficient imagination. Birds may experience different emotions, or experience emotions differently, even if their song sounds like a human might imagine joy or depression or vigorous excitement in musical form. Physiologically and psychologically, any given bird was organized in such a vastly different way from humans that analogical thinking resulted in interpretations plucked from thin air.²⁷⁸ Stumpf did not hold back: “Es handelt sich nur um die Scheidung der Wissenschaft von willkürlichen Zutaten. Die neuere Tierpsychologie ist darin strenger als die alte” (77). At stake for Stumpf in Wundt’s projections of human emotions onto birdsong was the scientific legitimacy of animal psychological questions for a

²⁷⁷ “Nicht einmal beim Menschen, wenn einer diese Töne pfeift, singt oder spielt, wären sie im geringsten eindeutig darin ausgesprochen” (77).

²⁷⁸ “Beim Vögel, dessen ganzes Seelenleben dem unsrigen so ferne stehen dürfte wie seine körperliche Organisation, ist die Deutung im vollsten Sinn aus der Luft gegriffen” (ibid.).

new generation of experimental psychologists, as well as the hindrances posed by human psychology when it came to investigating animal objects of study.

In gesturing toward the more scientifically rigorous quality of this newer animal psychology, Stumpf created the opportunity for himself to rethink the methods applied to questions of animal psychology, with animal vocalization serving as the launching pad for such epistemic reflection. Stumpf's invocation of "[d]ie neuere Tierpsychologie" is crucial, as it located his animal psychological thinking in a different camp from "Neue Tierpsychologie," which sought to borrow the legitimacy of experimental psychology to prop up its research on the animal soul. To be sure, Stumpf's contemporaries knew which figures and methodologies belonged to New Animal Psychology; the Newer Animal Psychology, on the other hand, would have baffled them—it did not exist. Stumpf was trying to create it. And if anyone had the credentials to do so successfully, it was Stumpf. His groundbreaking research in comparative musicology could conceivably be applied to the singing birds whose music he notated with pen and paper as he wandered the fields and forests surrounding Berlin.²⁷⁹ Much in the same way that he notated Nuskilusta's songs in 1885, he could, theoretically, with patience and persistence (and an especially patient and persistent subject), teach himself to hear beyond what his ear initially permitted—in this case, due not to his sense of cultural superiority but to his senses: his human physiopsychological organization.

Stumpf had a greater reason to invoke a newer animal psychological into being than intellectual curiosity. A Newer Animal Psychology, one situated squarely within the realm of his musical expertise, could exorcise the demons of his "new" animal psychological past. Even in

²⁷⁹ In response to the American Xenos Clark's notation of a leaf warbler's song, Stumpf wrote: "Ich habe in Feld und Wald viele Vogelweisen notiert, aber eine solche tadellose Dur-Leiter niemals vernommen" (76).

1911, the New Animal Psychology of Karl Krall and Hans, with its playacting at scientific precision in paddocks and courtyards, shaped Stumpf's thinking as he listened to the birds he met on his walks. As I demonstrate in Chapter 2, the Hans debates of 1904 extended well into the 1910s, for the principal actors involved as well as curious onlookers like Franz Kafka and Maurice Maeterlinck. And for Stumpf, the man who built his international reputation on an experimental, quantifiable, laboratory-based approach to psychological research, the incongruence of objectivity and animal psychological phenomena—and the new animal psychologists' untrained coopting of his field's experimental, quantifiable, laboratory-based approach—quietly haunted him. Where Krall attached blinders to Hans to restrict his head and eye movements, Stumpf and Pfungst used a Hipp chronoscope to measure his head and eye movements. Where Krall and the new animal psychologists passionately believed in the human-like capacities of the animal soul, Stumpf and the experimental psychologists soberly believed in the human tendency to project onto animals. However each camp liked to present itself to the public, the two approaches were terrifyingly analogous, if not complementary. To make matters worse, something fundamental escaped the experimental psychologists' investigations into Hans' intelligence, and Stumpf knew it, evidenced by his anxious insistence that human projection suffused the study of birdsong, in *Die Anfänge der Musik*.²⁸⁰ The trick of explaining animal psychology through the weaknesses of human psychology merely distracted from what the Institute's finest instruments could not measure and their sharpest eyes could not see: what Hans was thinking and, later, what birds were singing and Don was saying. With their years of training and their access to the finest technologies and methods in psychological research, the Institute's

²⁸⁰ The entire six-page footnote on animals and music can be summarized as an attempt to reconcile birdsong with the ways scientists have captured it through musical notation, with that very mode of transcription being the central site in which they project onto birdsong.

researchers had essentially investigated Hans' human interlocutors, not Hans himself. After completing his 1907 essay on Hans as part of Pfungst's magnum opus on the horse, Stumpf's name never again appeared on work explicitly dealing with animal psychology.²⁸¹ He passed on the public-facing work to Pfungst.²⁸² But a "newer" animal psychology, one conducted only as thought experiments and in endnotes, in the service of human musicological research, would be under his control and mainly for his intellectual soul-searching. No horse, no human interlocutor, could complicate the phenomena under observation. Hypothetical animals obey their inventor's commands.

As Stumpf was completing *Die Anfänge der Musik* and thinking through a Newer Animal Psychology in its endnotes, he predictably identified the human tendency to project onto animal expression as the most pressing methodological problem. This time, Stumpf could address the problem by addressing the animal species. "Untersuchen wir die Tongebung der Tiere selbst," wrote Stumpf in response to his hypothetical music-listening dog, "so finden sich deutliche Intervalle im allgemeinen nur bei den Vögeln, während bei dem Geschrei der Säugetiere die einzelnen Töne sich gewöhnlich nicht hinreichend scharf voneinander unterscheiden und ihre Höhe nicht so genau beibehalten" (74). Since avian intonation proved easier listening for a European human, producing audibly distinct "Töne" rather than "Geschrei[en]," Stumpf cast all other animals aside. Theoretically, birds were ideal because the researcher could clearly

²⁸¹ Carl Stumpf, "Der Rechenunterricht des Herrn v. Osten," in Oskar Pfungst, *Das Pferd des Herrn von Osten*, 175-80.

²⁸² Historian of science Horst Gundlach convincingly argues in his article on the intellectual relationship between Stumpf and his student Pfungst that Pfungst's own 1907 book on Hans, *Das Pferd des Herrn von Osten*, was likely co-authored and edited by Stumpf ("Carl Stumpf, Oskar Pfungst, der Kluge Hans und eine geglückte Verneblungsaktion," *Psychologische Rundschau* 57, no. 2 (2006): 96-105). Pfungst was a decoy for Stumpf's shamefully enduring belief in the higher-order mental capacities of animals. In this chapter, I take this argument further, demonstrating that this dynamic between teacher and student did not end with Hans, but continued into the 1910s, when Don became an object of fascination.

distinguish individual notes along musical intervals, not to mention that birdsong was suited for transcription through musical notation. Birds seem to sing along a musical scale. And birds repeat their notes—they replay themselves—thereby allowing the humans transcribing their song the opportunity to catch notes they had missed in an earlier rendition. A dog’s barking, on the other hand, manifested in a European human’s ear as a string of variable, indistinguishable not-quite-notes; it could not be set down on a five-line staff. In Stumpf’s estimation, the psychological study of animal vocalization had to begin with *manually* notating birdsong, a gesture towards the much-needed development of the phonograph for studying objects which could not, for one reason or another, be placed directly before the receiver. Stumpf suggested that no matter which notation system the human listener used, nor which animal the human researcher chose, the central mediator of the sounds emerging from any given animal’s vocal apparatus was the human ear. As such, projection would still be animal psychology’s largest adversary, one it likely could not defeat. Whether assisted by a five-line staff or a phonograph, what a human heard when a bird sang or a dog barked derived from the way his ear had been tuned to hear musical, or music-adjacent, tones in birdsong and irritating nonsense in dog barks. But what if the antithesis of the songbird, the dog, produced distinguishable tones prompting Europeans to listen attentively, for what they understood as meaning—what would they learn about their own process of listening then? Of course, Stumpf, by way of Pfungst, had the chance to record such a dog as he was putting the finishing touches on *Die Anfänge der Musik*. The howling dog of his endnotes may not have been hypothetical after all.

Clearly invested in proffering an animal psychology aware of the dangers of human projection, Stumpf continued to shake a fist at the erroneous research of his day. In one particularly memorable passage in his endnote on animals and music, an irritated Stumpf

divulged how much the recent scientific monographs featuring musical notations of birdsong, even equine neighing and bovine mooing, hurt his pride.²⁸³ In response to horse and cow transcriptions which intended to demonstrate that our fellow mammals can sing an entire chromatic scale (**Figure 21**), Stumpf spat:

“Auf diese Weise kann man freilich alles in Noten setzen, auch das I-A des Esels, das Sausen des Sturmes und das Knarren der Stiefel. Aber mit solchen Kindereien sollte man wissenschaftliche Bücher nicht verunzieren. Daß die Stimmbewegung des wiehernden Pferdes von oben nach unten verläuft, wird wohl richtig sein und mit denselben physiologischen Bedingungen zusammenhängen, die auch den Juchzer und so viele primitive Melodien (s. unsere Beispiele) hoch beginnen und tief endigen lassen. Aber eine so schöne chromatische Leiter—nein!” (75).



Figure 21. A. P. Camden Pratt in T. Wilson, *Prehistoric Art: Smithsonian Institution Annual Report 1896* (Washington: Govt. Print. Off., 1898), 516. Reproduced in Stumpf, *Die Anfänge der Musik*, 75.

Within Stumpf’s cutting critique was a distinction between childish and scientific modes of researching animal vocalizations. The childish mode, for Stumpf, consisted of a musical hobbyist eavesdropping in a barnyard and perceiving music therein. Hearing the achievements of Western culture in a horse’s neighs was even worse than Wundt’s sin of projecting human emotions onto

²⁸³ These are, in order of publication date: A. P. Camden Pratt in T. Wilson, *Prehistoric Art: Smithsonian Institution Annual Report 1896* (Washington: Govt. Print. Off., 1898); Alwin Voigt, *Exkursionsbuch zum Studium der Vogelstimmen* (Dresden: Hans Schultze, 1906); Bernard Hoffmann, *Kunst und Vogelgesang* (Lepizig: Quelle & Meyer, 1908).

birdsong. This is where the experts differed from the amateurs; this is why musical training was so important for the study of animal vocalizations. Only an expert ear, one rarefied in the music classrooms and concert halls of Europe, could discern between the rhythm of a horse's neighing and a chromatic scale; only an expert ear could distinguish between music, primitive melodies, and noise.²⁸⁴

But buried within Stumpf's critique of transcribing moos and neighs, whistles and creaks, lay an acknowledgment that the difference between music, primitive melodies, and noise was who or what emitted the sound and whether that sound could be transcribed via a Western musical notation system.²⁸⁵ As previously stated, the limitations of transcription through musical notation defined, in turn, who or what could be studied and who or what could not—hence Stumpf's insistence that certain sounds are more scientific than others. And since Stumpf denied animals music as such, he attributed the horse's ascension of a chromatic scale to physiology and, elsewhere, random chance.²⁸⁶ At the same time, Stumpf's proud protection of the scientific mode of studying sound phenomena revealed a discontent with how culturally bound science was. Made especially apparent by nonhuman sounds, the epistemic problem Stumpf was, in fact, railing against was how trapped the listener, even the best trained listener, was within his own constructs. These constructs, like the five-line staff, filtered information, and whatever information exceeded that construct escaped perception, with projection filling in the gaps.

²⁸⁴ Throughout his oeuvre, Stumpf was insistent on the necessity of a musically trained ear for musicological research. Arguably, this was a discursive means of shoring up his power as an expert in the domain of music, a tactic which validated his and his Archive colleagues' results over others', merely by virtue of how extensively trained they were in music.

²⁸⁵ Kittler, *Gramophone, Film, Typewriter*, 24.

²⁸⁶ Regarding the cases in which animals did transpose music, Stumpf countered: "Allein diese zufälligen Schwankungen, namentlich infolge verschiedener Expirationsstärke, die wieder mit dem augenblicklichen Körpergefühl und Befinden zusammenhängen mag, dürfen nicht mit eigentlicher Transposition verwechselt werden" (12).

While admonishing those who heard music in neighing and mooing, Stumpf likely realized that, thanks to the five-line staff organizing his tonal perception, he could never hear a horse or a cow on its own terms. “Aber eine so schöne chromatische Leiter—nein!” was not merely an aesthetic value judgment, nor an epistemic value judgment. It was a cry for more agnostic tonal relations, an expanded notion of musicality, which could account for what animals do. Until that transpired, his Newer Animal Psychology, with its (not so) hypothetical howling dog, would have to remain in his endnotes. Leaving behind the home and the laboratory, Stumpf continued to take long walks in the forest. He wrote down the songs of the birds, those little “Waldmusikanten” (78). Perhaps one day he could hear them.

CONCLUSION: Speak/Scream

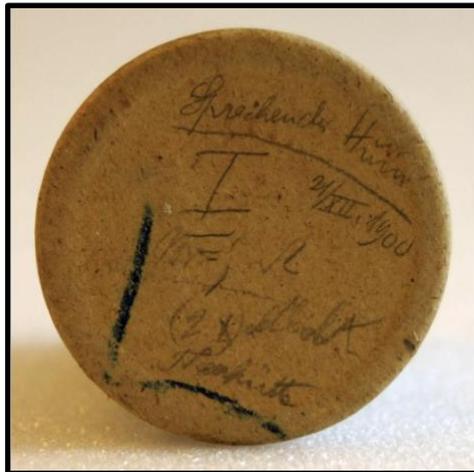


Figure 22. Waveform of and wax cylinder containing the experimental recording “Sprechender Hund I” from December 21, 1910. The Archive’s catalogue designates Carl Stumpf as the creator. Ethnologisches Museum der Staatlichen Museen zu Berlin, Preußischer Kulturbesitz, Berliner Phonogramm-Archiv.

When Pfungst began, so did Don. “Aufnahme des sprechenden Hundes Don. Am 21. Dezember 1910,” announced a confident Pfungst, as Don growled in the background.²⁸⁷ In this first recording of Don, a screaming Pfungst assumed the role of interlocutor. “Wie heißt du?!” “UOof! Eruouo. ErOUou. Rou.” “Was hast du?!” “Rou rou.” “Was wolltest du?!” “ROUrrrrr.” “WAS IST DAS?!” “ROUof rrr.” After a brief pause in which a female voice and male voice exchange a few inaudible sentences, a quiet, more controlled Pfungst resumed. “Wie heißt du?” “ROUF. Rrf... Rrr.” Pfungst screamed again, and so did Don. “Was hast du?!” “ROUF!” “Was hast du?!” “Rauh rauh.” Pfungst mumbled, Don yelled. “ROUF!” “Was wolltest du?!” “Rerr rur.” “Was—” “Rerurur!” “Was?! WAS DU WOLLTEST?!” “RRRruh!” “AH AH!” “Rrrrr.” Pfungst seemed to come to, once again standing upright. “So.” For the final time, he screamed, trying to speak over the dog, but the human and dog’s utterances combined, forming a sound unrepresentable in phonetic transcription.

Pfungst and his team of Julius Vosseler, the distinguished Professor of Zoology and the Director of the Hamburg Zoological Garden, and Erich Fischer, the Swiss musicologist and composer, recorded three more wax cylinders of the “talking” dog that same day.²⁸⁸ In the third cylinder, Pfungst spoke with Don again, their vocal expressions more controlled this time: a calm volley of question and mono- or disyllabic response. A cut can be heard, then Pfungst’s confident voice. “Wiederholung derselben Aufnahme.” By this point, Don was less communicative, responding to Pfungst’s questions with a strong monosyllabic bark or not at all. By the end of the repeated experiment, a female and male voice addressed each other in the

²⁸⁷ As opposed to the recordings made in 1911, Pfungst did not announce the locations on these first Don recordings. Vosseler’s account confirmed that Don had only been discovered the month prior and began his Hamburg vaudeville performances in February 1911 (*“Don” der sprechende Hund*, 2). It is therefore likely that the three men travelled to Theerhütte to make these first four Don recordings.

²⁸⁸ “Don II” is unavailable in the digital archive, leading me to assume that it was lost during the transportation of the cylinders out of and back to Germany, occasioned by the heavy bombing in Berlin during World War II.

background. Confident Pfungst turned to the phonograph again. “Nochmal mit der Wiederholung derselben Aufnahme.” He then peppered Don with a screaming interrogation of what he has and what that is, to which Don responded with his own peppering of loud, at times growling, disyllabic barks.

The fourth and final recording of the day began in much the same way, with Pfungst announcing the title of the wax cylinder but Don barking once, perhaps affirmatively, when Pfungst spoke his name. This time, Don’s human interlocutor was Vosseler, who had visited the dog in Theerhütte to observe his interactions with his trainer Martha Ebers and to whom the dog, it seemed, responded less tensely than to the screaming Pfungst. Vosseler asked the same questions, but calmly, encouragingly, as if speaking to a laconic child. “Wie heißt du? Wie heißt du? Wie *heißt* du?” Vosseler did not move on to the next question until Don’s disyllabic barks became a rounded monosyllabic bark. “Guuut. Guuut.” “Was hast du?” Two rounded disyllabic barks. “Guuut. Sooo. Das war fein gemacht. Jawohl... Was wolltest du?” Two sharp barks. “Kuchen?” One bark. “Jaaaa.” The interactions between Vosseler and Don became inaudible. “Wiederholung!” cried Pfungst into the phonographic receiver, and Fischer took over, with his louder, expectant, Swiss-accented voice. “Wie heißt *duuuu*?” Fischer posed this question four times, each time with a different intonation, until Don responded with a monosyllabic bark. “*Guuuuut.*” He asked what Don has twice, until the dog answered with two syllables. “*Guuuuut.*” To Fischer’s question of what Don wanted, the dog’s response, if one knew the answer was supposed to be “Kuchen,” did, indeed, sound like a mumbled “Ruu-rren.” “*Guuuuut.*”

In the new year, while Don and his trainer Martha Ebers were performing at the Wintergarten in Hamburg, Pfungst, Vosseler, and Fischer repeated their phonographic experiments, likely due to Don’s recent surge in fame and their interest in whether Don’s

responses had changed over time. Their sessions on February 18th yielded 3 recordings and, on the subsequent day, 4 more recordings. A final recording, catalogued with the date of April 2nd, was made either on February 19th in Hamburg or on April 2nd in Berlin, when Don and Ebers were holding “Sprechstunden” at the Wintergarten-Berlin.²⁸⁹ In these 8 total recordings, the men decided to record not themselves posing questions to Don, but Ebers posing those same questions to the dog with whom she shared a notably strong bond. The female voice in the background finally moved to the foreground, revealing that it was present—speaking in morphing barks and flustered screams and soothing coos—all along.

That which we call “speaking” is relational. That which we call “meaning,” differentiating music from speech from noise, is relational. And that which we call “experiment” is, yes, relational; it is the repeated push-and-pull of control. The Don experimental recordings were intended to demonstrate that those human listeners who expected to hear “Kuchen” in Don’s barks did hear “Kuchen,” that priming influenced hearing. But these experimental recordings demonstrated that—even with the objective technology of the phonograph ostensibly wiping the human hand and ear from the transcription process, on the one hand, and the ideal animal vocalizer, the communicative and eager-to-please Don, on the other—their response to Don slipped, again and again, out of their control. Audibly frustrated, Pfungst spoke louder and less coherently when the dog did not bark when and how he wanted, even rudely interrupting his

²⁸⁹ The digitalized archive of the “Experimentalaufnahmen” has marked the final Don recording as having been made on April 2nd. I doubt that date is correct, since Pfungst himself announced the date on the recording as February 19th and the location as Hamburg. But Don was performing in Berlin throughout March and April 1911, and it is probable that, with the dog touring the metropolis, Pfungst and potentially also Stumpf and Hornbostel attended the show and used the opportunity to make a follow-up recording. For a scrapbook of sorts on Don’s performances in Berlin, see *Der sprechende Hund “Don”: April-Attraction im Wintergarten-Berlin* (Berlin: Berliner Buch- und Verlags-Druckerei, 1911). While unauthored, I highly suspect that this book was compiled by none other than Karl Krall, whose disgrace in 1904 would have kept him from publishing the book under his name. As Krall demonstrated later, in his 1912 *Denkende Tiere*, he had a propensity from 1904 onwards for collecting newspaper clippings of celebrated animal performances of intelligence.

questions. But Pfungst regained his confident composure when announcing the recording details into the phonographic receiver. At least he could control the phonograph, or so he thought.

Vosseler, likely mimicking Martha Ebers' interactions with Don, encouragingly murmured as he attempted to coax the tired dog into an articulated "Kuchen." Fischer, changing his intonation with each utterance, was positively delighted when the dog barked back at all. The recordings comprised an experiment in human psychology, just not in the way Pfungst had foreseen.

The experimental cylinders of Martha Ebers speaking with "Don der sprechende Hund" crystallized the major problems posed by the Archive's human musicians, its unnamed and unnumbered birds. The Phonogram Archive could have been a revolutionary site of redrawing boundaries and resituating phenomena in relation to each other. A talking dog could give researchers pause, allowing them to recalibrate their notions of human and animal through a more expansive notion of speech. A singing bird could do the same for music. And yet, in seeking to expand the scope of the experimental psychology through the inclusion of new research technologies, objects, and questions, the field's constitutive boundaries threatened, time and again, to come undone. Quickly, the Archive members redrew the boundaries. The dog talks only insofar as we expect it to talk; birds have their own music, but "[w]ir sind die Künstler, nicht die Vögel."²⁹⁰ Trapped within the cages of embodied listening, colonialism, objectivity, and anthropocentrism, all they could do is wonder at what they could never know. They were trapped, they were the trapper.

While the Archive members felt they could not escape from this series of overlapping epistemic systems, the talking dog of Theerhütte, Beethoven-singing birds, and forest songbirds motioned towards a way out, one the Archive members acknowledged hesitantly, even fearfully:

²⁹⁰ Hornbostel, "Musikpsychologische Bemerkungen über Vogelgesang," 128.

knowledge production grounded in not-knowing, without recourse to power structures which tried to cover over that not-knowing. Arguably, the researcher's reflections on their own human ignorance by way of posing potentially unanswerable questions were their most productive contributions to animal psychology, as well as objective science. Human knowledge is limited because human knowledge is tied to human bodies; technology can extend the human ear, but only to an extent. When viewed through the lens of the Don experimental recordings, the Archive members' animal vocalization experiments—Abraham's 1901 Beethoven-singing birds, Hornbostel's 1911 attempts to phonographically record songbirds, Pfunst's 1911 hypothetical birds and dogs—comprised a grand experiment testing the limits of objective recording and, yes, the limits of human knowledge. This decade-long experiment attempted to define where music ended and speech began, where meaningful articulation ended and meaningless noise began and, ultimately, where the animal ended and the human began. But in seeking clearly drawn borders, they found mysteriously affective overlaps. As Abraham wrote, when he remembered the parrot with whom he shared a home and a song, some questions were “natürlich nicht zu ermitteln.”

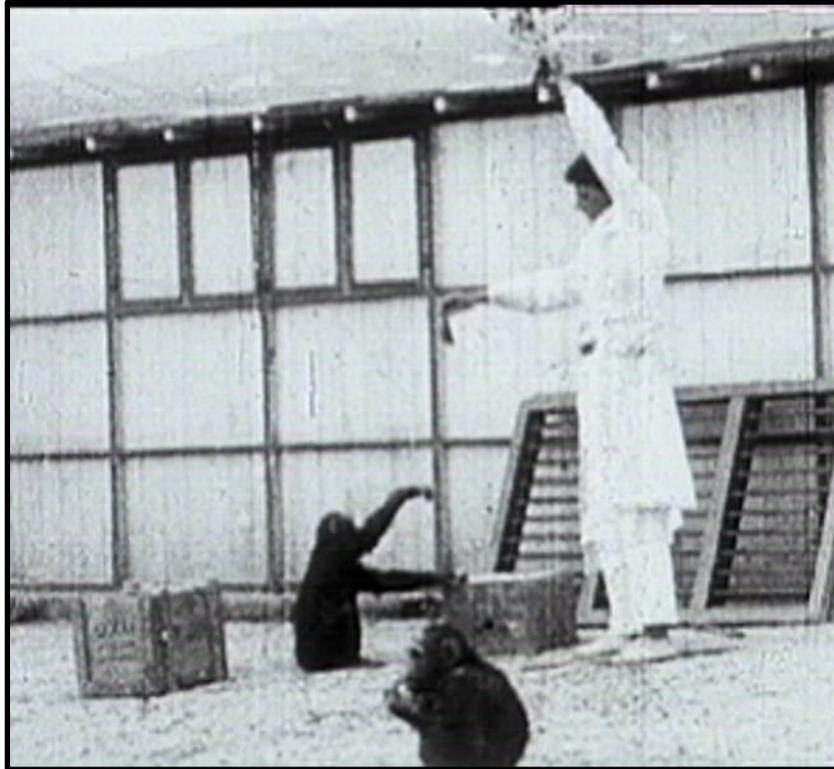


Figure 23. “Lernen durch Einsicht,” Photograph, Sammlung AWZ Würzburg.

Prüfungsmaterial sind offenbar ohne jede Bedeutung für die prinzipielle Frage, und allgemein sollte der Prüfende erkennen, daß jede Intelligenzprüfung außer dem untersuchten Wesen notwendig auch den Experimentator selbst prüft.

– Wolfgang Köhler, *Intelligenzprüfungen an Menschenaffen* (1921)

Conclusion
Speaking for as Speaking with:
An Epistemology of Animal (Un)translatability
(1919-1920)

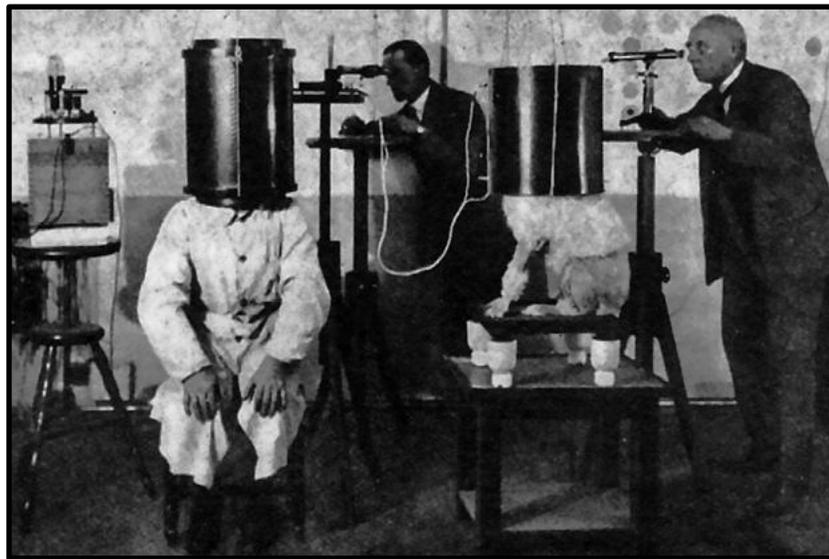


Figure 24. Animal occult experiments at the Krall Institute for Animal Soul Science and Parapsychological Research. “Denkübertragung zwischen Mensch und Tier: Versuchsanordnung mit Klingelfuß’schen Hochfrequenzpulven zum evt. Nachweis einer Denk‘Strahlung,’” in Karl Krall, *Denkende Tiere: Denkübertragung zwischen Mensch und Tier: Vortrag gehalten auf dem III. Congrès International de Recherches Psychiques* (Stuttgart: Verlag der Gesellschaft für Tierpsychologie, 1927), 87.

By 1919, claims of talking dogs and counting horses were not only old news—they were embarrassing. In 1904, the feats of “der Kluge Hans” were celebrated internationally. While much of the public believed that the Orlov Trotter could reveal the animal’s true cognitive capacity, this belief was dispelled when, at year’s end, claims of Hans’ human-like intelligence were roundly debunked by Carl Stumpf, Oskar Pfungst, and Erich von Hornbostel. Hans was no equine savant, they declared: he was simply responding to his human interlocutors’ unconscious

head and eye movements. In 1910, “Don der sprechende Hund” raised similar hopes. Perhaps, finally, the human could communicate with the animal. If a hunting dog had learned to speak rudimentary German, surely it could share its secret, canine knowledge with humans. The same experimental psychologists from the Berlin Institute of Psychology, represented by Pfungst, studied the dog’s elocution through phonographic recordings. The conclusion was another blow for proponents of Karl Krall’s New Animal Psychology. With the power of the Institute behind him, Pfungst pronounced Don merely well trained—and humans fantastically gullible.

Surely, this was animal psychology’s death sentence. Not only had yet another special animal been declared a trick of the same variety, but international experimental psychology was foregoing special domesticated animals (mainly horses and dogs) for indiscriminate animals that could easily be bred and kept in laboratories (mainly rabbits and mice).²⁹¹ Quantification’s potential to amass deindividuated research objects had been brought to fruition, and it became the workaround for the animal’s unknowability, as did filtering epistemological excess through mechanical objectivity. The Hipp chronoscope, the blinders, the Edison Home Phonograph, the wax cylinder, the five-line staff, the soundproof room: these technologies tantalized Pfungst and Stumpf and even Krall, proffering the illusion of control, of power. If the equine savant and the talking dog, the Beethoven-singing parrot and the forest songbirds, threw their experimental worldview into doubt, objectivity promised salvation in simplicity. The internal was manifested, and made measurable, in the external. The fallibility of human psychology answered the questions of animal psychology. The inner lives of animals were contaminated by their relations with humans; they merely required purification, then all would be clear.

²⁹¹ For an excellent overview of what purpose those rabbits and rodents served methodologically for Anglophone experimental psychologists, see Henry Cowles, “Animal Intelligence,” in *The Scientific Method: An Evolution of Thinking from Darwin to Dewey* (Cambridge, Mass.: Harvard University Press, 2020), 184-224.

As the experimental psychologists soon found out, silencing certain phenomena to amplify other phenomena had troubling epistemological consequences. When Pfungst muted Martha Ebers in the Don wax cylinders, he erased the evidence for the conclusion he both sought and feared: the psychological difference between animal and human is not a stable, empirical fact waiting to be extracted from nature; it is a relating, a sharing, a grasping without grasping; it is an imagining of what cannot be imagined; it is a coming-to-know. That which Friedrich August Carus, Peter Scheitlin, and Krall called “die T[h]ierseele,” Charles Darwin called “the expression of emotions in animals,” Wilhelm Wundt called “wirkliche Tierpsychologie,” and Pfungst called “exakte Tierpsychologie” is an interspecies doing. And yet, that interspecies doing can never add up to true and total knowledge of the animal, a point Scheitlin raised as early as 1840. Regardless of terminology or methodology or technology, the human must strain to hear animal whispers. From Scheitlin’s natural philosophy to Pfungst’s experimental psychology, each new scientific paradigm in the history of animal psychology returned to the same, largely unrealized realization: accepting the animal’s unknowability by posing ever more questions was more epistemically generative than pinning down answers, like dead butterflies in *Wunderkammern*. The animal speaks, yet the human cannot—and sometimes, will not—listen. But a question arising from wanting to know without expecting to know—such a question can perceive the rumblings of the living animal’s consciousness over and above the most sensitive Edison Home Phonograph.

A question can be an act of reaching without strangling, and a mode of *speaking to* without *speaking for*. The history of animal psychology, though, is a history of silencing the unknowable through the strictures of objectivity. Mechanical objectivity certainly aided those interested in animal expression and communication at the turn of the century, allowing them to

study living animals scientifically for the first time (Darwin also played a major role in this regard). The equine savant was the ideal first test subject for this new era of animal psychological research. More so than Darwin's ape Jenny at the London Zoological Gardens, Hans was obedient to his masters and amenable to strangers, he (mostly) executed spoken commands and tolerated new apparatuses. Even more importantly, Hans raised cutting-edge research questions which Pfungst, Stumpf, and Hornbostel felt confident they could answer, by way of the technological-methodological advancements in experimental psychology. Ostensibly, at least, 20th-century animal psychology began with this precondition: if you cannot predict the answer in advance, don't wager the question. When the experimental psychologists visited Hans' Berlin courtyard in the fall of 1904, the mysterious horse became something entirely different once the men applied blinders to Hans' head and set up a Hipp chronoscope nearby. In their view, Hans shriveled into the phenomenon which persists today as "observer-expectancy effect," or "Clever Hans effect." This diminishment from wondrous enigma to solved problem explains, in part, why the erstwhile "Wunderpferd" fell to his fleshy death in the Great War, and not as a war horse.

A solution presented itself in Hans. Like any shortcut, it satisfied. The members of the Berlin Institute of Psychology and New Animal Psychology alike had learned to account for their own influence in the animal psychological experiment, but only to the extent that they still produced conclusions in alignment with the dominant scientific paradigm. The conclusion of inconclusiveness did not satisfy, nor did it engender trust in modern science. No, inconclusiveness signaled a methodological failure. The unwieldy generativity of questioning therefore could not stand alone as one's methodology if one sought recognition within the scientific community, which was, by 1904, centralized in universities and their adjoining

research institutes. Already in 1840, the priest and dabbling natural philosopher's independent research on the animal soul was outdated, and this was the case to an even greater extent in the early 20th century. In the summer of 1904, the public called for a “wissenschaftliche Kommission” to investigate the equine savant because, no matter how many horse experts attested to Hans' abilities, Krall was a jeweler and Wilhelm von Osten a retired schoolteacher. Universities had shored up their power over the public's belief in what was a fact. Hans would remain a hesitantly posed question, a *Wundertier* galloping through human imagination more than reality, until the commission verified claims of the horse's intelligence. But it did not. And so, even those who rejected the experimental psychologists' conclusion—namely, the nascent new animal psychologists—sought scientific legitimacy by coopting the experimental psychologists' methods. If they could not have a university education and the respect it merited, they could at least have blinders.²⁹² New Animal Psychology gave the Berlin Institute of Psychology its research questions and objects; the Berlin Institute of Psychology gave New Animal Psychology its version of mechanical objectivity.²⁹³

²⁹² This framing of the new animal psychologists as non-university-educated amateurs is not quite right either. There were several professors of zoology, for instance, who aligned themselves with the new animal psychologists in 1904 and in the 1910s. The most notable such professor was Heinrich Ernst Ziegler, who became Director of the Society for Animal Psychology and whose 1910 book *Der Begriff des Instinktes einst und jetzt: Eine Studie über die Geschichte und die Grundlagen der Tierpsychologie* includes the following credentials under his name: “Professor der Zoologie an der Technischen Hochschule in Stuttgart, der Tierärztlichen Hochschule in Stuttgart und der Landwirtschaftlichen Hochschule in Hohenheim (früher Professor an den Universitäten Freiburg, i.B. und Jena)” (2nd ed. (Jena: Gustav Fischer)). In publications for the new animal psychologists, he was simply “Prof. Dr. H. E. Ziegler (Professor der Zoologie an der K. Techn. Hochschule in Stuttgart und an der K. Landwirtschaftl. Hochschule in Hohenheim bei Stuttgart)” (*Die Seele des Tieres: Berichte über die neuen Beobachtungen an Pferden und Hunden*, 2nd ed. (Berlin: W. Junk, 1915)). Despite being university-educated and maintaining academic positions, Ziegler and others did not form an intermediary camp. In the scientific world, they were intellectual outcasts; New Animal Psychology had tainted them.

²⁹³ The Berlin Institute of Psychology also gave New Animal Psychology the desire to be an institute. In 1925, Krall founded the “Krallsche Institut für Tierseelenkunde und Parapsychologische Forschungen” in München-Harlaching (see **Figure 24**).

Providing an answer to the *Hansfrage* was a major victory for mechanical objectivity, cementing its place in 20th-century animal psychological research. It had detected the presence of the human and presented a modern solution which yielded a conclusion both the experimental psychologists and the new animal psychologists recognized as plausible. Control, restrict, sterilize! Don't be present in the experiment by being present in the experimental apparatus! The horse is merely a keen perceiver of slight movements! Mechanical objectivity thus assuaged researchers' egos with its hallow offer of omniscience, omnipotence, over animal objects of study. Emboldened by this distance, researchers could propose increasingly arbitrary distinctions separating human from animal when animals like Hans inched closer and closer, terrifyingly. Mechanical objectivity had tamed Hans and the *Hansfrage*, as far as those with reputational capital were concerned; in this way, mechanical objectivity continued to tame the animals who entered the animal psychological laboratory for decades to come.

The experimental psychologists' application of mechanical objectivity to questions of animal intelligence and communication was arguably the most important precondition for what became mid-century ethology.²⁹⁴ At the moment Pfungst affixed blinders to Hans' head, in the fall of 1904, man and horse and technology made the cast for this scientific study of animal behavior, a discipline Scheitlin would have both recognized and scorned. Konrad Lorenz's study of goose imprinting by becoming the hatchlings' ersatz mother, and his publication of popular books on the animals kept at his estate, would have delighted Scheitlin: this was human-animal relationality at its richest.²⁹⁵ This was animal writing at its most empathetic. This was Scheitlin's

²⁹⁴ For the transformation of Nazi animal psychology and behaviorism into postwar ethology, see: Boria Sax, "Animal Psychology," in *Animals in the Third Reich: Pets, Scapegoats, and the Holocaust*, 114-28 (New York: Continuum Books, 2000); Burkhardt, *Patterns of Behavior*.

²⁹⁵ Konrad Lorenz, *Tiergeschichten: Er redete mit dem Vieh, den Vögeln und den Fischen* (Vienna: Borotha-Schoeler, 1949); *So kam der Mensch auf den Hund. Hundesgeschichten* (Vienna: Borotha-Schoeler, 1950).

vision. Nevertheless, Lorenz and his ethological colleagues' impersonal focus on behavioral patterns, their unfeeling language in scientific articles, would have unsettled Scheitlin, prompting him to wonder whether the scientific study of animals could ever escape Descartes—whether it was scientific because it, unthinking and unfeeling, upheld Cartesian mechanism. Even if the animal object of study remains alive, must the human researcher deaden it and himself, in other ways, for the exchange known as a “scientific experiment” to yield meaningful results? Scheitlin's science of the animal soul slipped further out of reach.

When viewed through the lens of what his *Thierseelenkunde* could have, and did, become in the early 20th century, Scheitlin's call to observe oneself while observing the animal transforms into a prescient warning. Animal psychology challenged mechanical objectivity's narrowly anthropocentric, binary thinking to such an extent that the experimental framework turned on itself, and then its object. Instead of clarifying the researchers' vision, the blinders they affixed to Hans blinded themselves, obfuscating their perception of the objective experiment's inherent humanness. Extensions of the human hand, blinders produced knowledge not of *what Hans knows* but of *what humans can perceive Hans (not) perceiving*. Perceiving, however, is not knowing, and knowing about perceiving is not knowing about knowing. Even if Hans had full visual access to his human interlocutors' psychophysical cues when tapping out his answers, *what Hans knows* could still eclipse *what Hans (makes known that he) perceives*. His mathematical knowledge, for instance, could be radically, inexpressibly incompatible with the theory of numbers undergirding Krall's arithmetic lessons. For Hans, $2 + 2$ could equal something other than 4. Hans could thus be adept at reading his human interlocutors' cues to respond with their version of the answer, on the one hand, and capable of cognitive feats which humans did not yet—and perhaps, never can or want to—understand, on the other. Human logic

dictated that $2 + 2$ always equals 4, with the stable signification of “2” and “4” enabling that confidence. If, for instance, “2” and “4” were no longer “2” and “4,” this crack in mathematical signification could shake the whole knowledge structure built upon it.

Willfully, fearfully blind to the complexity of nonhuman perception and knowledge, mechanical objectivity promised to extend human knowledge by extending human perception, thereby covering over its greatest weakness with its greatest strength. Faced with the early 20th century’s most puzzling animals, mechanical objectivity compensated for its own lack by finding lack in its animal objects of study: the most tried-and-true solution to animal unknowability. Language is the domain of the human, while animals, even if a few can use words to convey meaning, do not understand the concepts underlying those words. And only humans are intelligent, regardless of whether some animals exhibit markers of intelligence by counting and answering trivia questions. Simply put: animals are not and can never be human enough. For Scheitlin, turning in his stately St. Gallen grave, cowardly studying an animal as a failed human signaled a methodological failure.

Just as the Swiss priest intuited, within language—that obstinately human conduit of conceptual relations—lay the problem and the solution. Like Hans’ blinders, language extended human knowledge only to reveal its limitations, its humanness. But language, as opposed to blinders, held within it the capacity for self-reflection, the power of which Scheitlin foregrounded as he devised his *attempt* at a complete science of the animal soul. He insisted that rethinking how we speak about animals can change how we know and relate to them. Expanding the term *Seele* to include animal ways of being in the world could, by way of analogical and painstakingly empathetic thinking, bring humans to imagine what an ensouled animal might feel, sense, think, communicate. If animals have something akin to human souls, and the expressions

of their souls resemble the expressions of human souls, then human souls could begin to imagine their way into animal souls. What might a nightingale feel while singing? A dog think while barking? What could the Greek language reveal about animal souls that the German could not? Etymology could be productively brought to bear on the study of our fellow living creatures, believed Scheitlin—but only if counterweighted with self-reflective, empathetic observations of real living animals.

Despite, say, the subjunctive's invitation to think beyond the empirical, greediness lurked in each language's potential for expansiveness. Whereas Scheitlin used the German-language terms *Thierseele* and *Menschenseele* to contemplate the ensoulment of all living things, his forerunners and contemporaries did not grant the animal a *Seele* as such. They granted it a *Thierseele*, a noun made compound in distinguishing the animal's soul from the inherently human soul. In anticipation of mechanical objectivity's willful anthropocentrism, the word *Thierseele* precipitated the construction of increasingly arbitrary distinctions between human and animal. Animal psychology pillaged human psychological territory, and self-reflecting language fortified its defenses through self-proliferating borders. No wonder Scheitlin bemoaned the man-made gulf between human and animal. The gulf consisted of words, words which could have enabled one's imagining into an animal's soul while acknowledging that the distance would always remain. The gulf between human and animal could have been a gulf of unknowability, separating while connecting. It could have easily been otherwise.

Scheitlin knew—and later, Franz Kafka, Maurice Maeterlinck, and Fritz Mauthner knew—that *speaking of* is not knowing per se, but it can be a knowing towards, a possibility drawing one nearer to truth. These modernist writers were Scheitlin's heirs, sustaining the epistemic doubt and imaginative play crucial to a successfully unsuccessful complete science of

the animal soul. They reveled in human ignorance, the universe's great joke on *homo sapiens*, then stood amazed, if not aghast, before all that could not be known. In this way, the modernist writers accomplished what their counterparts at the Berlin Institute of Psychology and the Elberfeld horse stalls could not. The desire to be right hindered the experimental psychologists and the new animal psychologists. Narrative writers, though, were under no pressure to be right, especially if they dabbled in occultism. Far more important was staging the confrontation between fact and truth, thereby producing a dynamic subjunctive form—a bold *what if?*—which used language to exceed language's limits. If Hans could operate a typewriter specially designed for his horse body, how much of his thoughts would remain inexpressible in German? What if science were a theater of taming, to distract from what humans cannot, truly, tame? And if the Elberfeld horses were more intimate with the source from which we came and to which we will return, how might their knowledge of the universe diminish ours? This, too, was knowledge production—and it was knowledge production foregrounding the futility of human knowledge. What could be more threatening? Calling this epistemic work “fiction” quieted that threat.

The objective study of animal psychology, then, entailed smothering the animal with a desperate hand, and throwing up both hands if one's desperation left no fingerprint. No, Martha Ebers was not alone in her muted silence, a silence which called into question the very possibility of sterile, objective research into what any given animal thinks, feels, perceives, communicates, and knows. Along with Scheitlin and the modernist writers, Ebers was joined by the Institute members: Pfungst, Stumpf, Hornbostel, and Otto Abraham. These distinguished men of science sensed, at some level, that their methodological approaches could not account for the messy human-animal relations which were the precondition for their experiments, to say nothing of the animals themselves. And since their research model did not provide an outlet for

doubt, the excess their animal psychological experiments engendered slipped out of their protocol to coalesce in a new space: marginalia of doubt. Questioning endnotes, half-told anecdotes, even frustrated screams and public fronts that animal psychology was beneath the dignity of one's position—these marginalia of doubt ultimately opened up a space for others to enter later: a Baltic German biologist who imagined animals' invisible worlds,²⁹⁶ a German natural sciences pedagogue who formulated a science of the animal soul for a new generation,²⁹⁷ a German zoologist who talked of a bee life and language,²⁹⁸ a German ornithologist who founded avian comparative behaviorism,²⁹⁹ a German experimental psychologist who administered intelligence tests to anthropoid apes at his Tenerife research station,³⁰⁰ and, most famous of all, an Austrian zoologist who wrote his first major article on the jackdaw he kept as a pet.³⁰¹ All but one of these researchers joined the German Society for Animal Psychology and contributed to the first issue of its *Zeitschrift für Tierpsychologie*, released February 3, 1937, which continues today as *Ethology: International Journal of Behavioural Biology*.³⁰² But in 1911, for the experimental psychologists who had escorted Hans and Don from the discursive

²⁹⁶ Jakob von Uexküll, *Umwelt und Innenwelt der Tiere* (Berlin: Springer, 1909); *Streifzüge durch die Welten von Tieren und Menschen: Ein Bilderbuch unsichtbarer Welten* (Hamburg: Rowohlt, 1934); *Niegeschauten Welten: Die Umwelten meiner Freunde: Ein Erinnerungsbuch* (Berlin: Fischer, 1936).

²⁹⁷ Bastian Schmid, *Von den Aufgaben der Tierpsychologie* (Stuttgart: Gebrüder Borntraeger, 1921); *Die Sprache und andere Ausdrucksformen der Tiere* (Munich: Rösl & Cie., 1923); *Das Seelenleben der Tiere* (Vienna: Rikola, 1926); *Aus der Welt des Tieres: Ein Buch von der Seele des Anderen* (Berlin: Otto Salle, 1930).

²⁹⁸ Karl von Frisch, "Über die 'Sprache' der Bienen. Eine tierpsychologische Untersuchung," *Zoologische Jahrbücher (Physiologie)* 40 (1923): 1-186; *Aus dem Leben der Bienen* (Berlin: Springer, 1927).

²⁹⁹ Oskar Heinroth, "Beiträge zur Biologie, namentlich Ethologie und Psychologie der Anatiden," in *Verhandlungen des V. Internationalen Ornithologen-Kongresses in Berlin, 30. Mai bis 4. Juni 1910* (Berlin: Deutsche Ornithologische Gesellschaft, 1911), 589-702.

³⁰⁰ Wolfgang Köhler, *Intelligenzprüfungen an Menschenaffen* (Berlin: Springer, 1921).

³⁰¹ Konrad Lorenz, "Beobachtungen an Dohlen," *Journal für Ornithologie* 75 (1927): 511-9; "Beiträge zur Ethologie sozialer Corviden," *Journal für Ornithologie* 79 (1931): 67-127.

³⁰² Of those mentioned, only Jakob von Uexküll is absent from the first issue: *Zeitschrift für Tierpsychologie* 1, no. 1 (January 1937).

realm of public fascination into that of disgraced ignominy, the not-so-talking dog was animal psychology's nail in the coffin, and their chance to escape. Fed up with others' domesticated animals, muzzled within the epistemological cage he had built to hear the animal speak, Pfungst bred wolves.³⁰³

Surely, the public—formed through the German-language print media reporting on *Wundertiere* and always poised to expand as these reports crossed languages and cultures—surely, the public would follow the experimental psychologists' lead, its patience exhausted as animal marvels collapsed, yet again, into disappointing graphs. Hans and Don had stirred the public's imagination, raising suddenly pressing questions about animal intelligence and expression. If the Elberfeld horses demonstrated the mathematical capability of human children, was the difference between human and animal merely educational opportunity in human forms of knowledge, enabled, in this case, by a mode of interspecies communication? Had the ability to obey his master's commands hidden in plain sight the dog's latent ability to speak his master's language? Was *homo sapiens* joined by other knowing mammals atop creation, thereby nullifying its distinguishing trait as a species? However the public asked and answered these questions, a joyous deflation characterized animal psychological media discourse from the winter of 1904 onwards. Each debunked *Wundertier* claim was presented as a mystery solved by the same bittersweet solution: humankind was alone at the top. No other species can manipulate

³⁰³ Tellingly, Pfungst's 1921 conference paper "Psychologie des Hundes" foregrounded his hands-on attempts to breed and observe wolves, then transfer that knowledge to the wartime "Sanitätshunde." This is a marked departure from his work with Don, revealing a post-Don urge to raise and interact with his own animals. Psychological research was the impetus for Pfungst's wolf-breeding, but it was not the sole reason for it. Oskar Pfungst, "Psychologie des Hundes," in *Bericht über den VII. Kongreß für experimentelle Psychologie in Marburg vom 20.-23. April 1921*, ed. Karl Bühler, 162-4 (Jena: Gustav Fischer, 1922).

language in the same complex way that humans can; hearing a dog speak one's own language constitutes nothing more than a cry for companionship.

The imagination can only be stirred and left to sit for so long before it forms another brew entirely, threatening to turn rancid at any moment. By the time Pfungst played modified Don wax cylinders at the annual gathering of experimental psychologists, in April 1912, the talking dog had spent well over a year on the stages of Hamburg and Berlin fine-tuning his vaudeville act with Ebers (and earning 12,000 Marks per month). The following month, Oscar and William Hammerstein, sensing a business opportunity, insured Don's passage to New York in the amount of \$50,000, making him the most expensive animal in world history at that point.³⁰⁴ Once in New York, the act still known as "Don, The Talking Dog" headlined with Harry Houdini at Hammerstein's Victoria Garden Roof.³⁰⁵ A star was born. Don and Ebers (by then married to Carl Haberland, the journalist who discovered Don) travelled the United States for years, raking in money, until the war intervened in August 1914 and the party returned to Theerhütte. Despite Ebers' replacement by the American actor Loney Haskell, woman and dog were darlings of the news media wherever they went (**Figure 25**). It did not matter that Harry Miles Johnson of Johns Hopkins University had published a take-down of the dog in *Science*, timed to coincide with his 1912 landing in New York.³⁰⁶ The world was creeping towards self-destruction—and what was more palliative than a talking dog doted upon by his beautiful, safely married mistress? What was more American than a rags-to-riches immigrant story, now featuring a German dog? The American public delighted in their suspicion. Don amazed and entertained.

³⁰⁴ Bondeson, *Amazing Dogs*, 60.

³⁰⁵ Hammerstein's Roof and Real Ice Carnival advertisement, *New York Sun* (July 21, 1912).

³⁰⁶ Harry Miles Johnson, "The Talking Dog," *Science* 35, no. 906 (May 10, 1912): 749-51.

As Don and Ebers crossed the Atlantic, animal psychology crossed another set of borders. No longer did special animals like Hans and Don occupy the middle ground of the scientifically plausible until those with degrees determined their destination: science or scam.



Figure 25. “Poor Don, with all his money, lives a dog’s life. He has a newly wedded couple on his hands, provides their railroad fares all over this country far from their native land, besides giving them, with prodigal generosity, weekly allowances of princely amounts.” In Walter Anthony, “Don’s Rise from the Inn to Affluence,” *The San Francisco Call* (May 18, 1913), 36. *Chronicling America: Historic American Newspapers*, Library of Congress, <https://chroniclingamerica.loc.gov/lccn/sn85066387/1913-05-18/ed-1/seq-58/>.

Fitting with its history of creating yet bucking fields of study, animal psychology eventually settled in the capacious realm of public imagination, where it offered a collective opportunity for speculative truth-seeking, rather than scientific fact-seeking. Pfungst had trained the public to

reject outright claims of animals with human-like abilities, claims which sprung up in Germany, France, Italy, and the United States from the 1910s onwards.³⁰⁷ Pfungst failed, as evidenced by special animals' presence in public media discourse since Hans. A titillated public has embraced these claims of animals with human-like abilities, while not necessarily accepting their veracity. Reports of speaking and spelling dogs have dependably drawn readers, as have reports of insurrectionist chimpanzees and oracular octopi (**Figure 26**).³⁰⁸ In public media discourse,

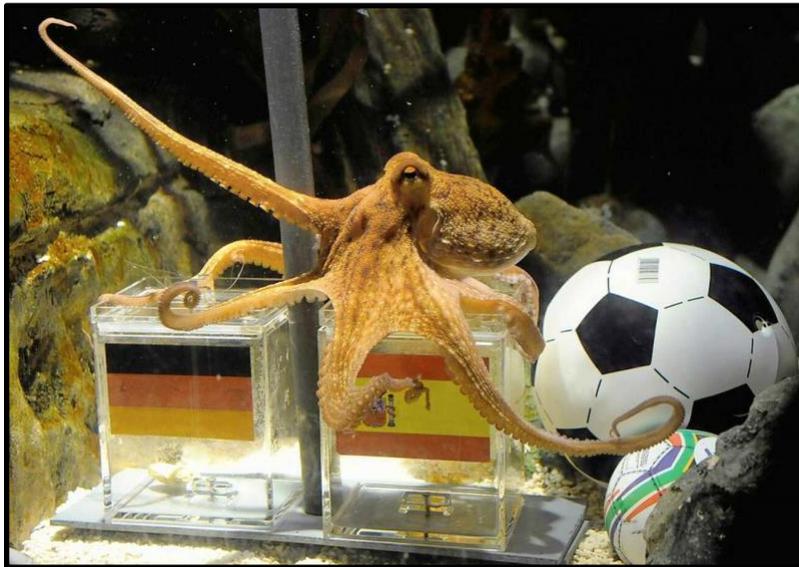


Figure 26. Paul “der Kraken-Orakel” selecting the winner of the upcoming match between Germany and Spain in the 2010 Men’s World Cup. He was proved correct when Spain beat Germany 1:0. Throughout the 2008 European Championship and the 2010 Men’s World Cup, Paul’s predictions were reported widely in national media outlets before each German men’s national team match. In *Der Tagesspiegel*, for instance, an entire section of the

³⁰⁷ In her 1954 history of educated animals, Henny Jutzler-Kindermann included a pages-long list of all known animals and their owners, as well as their nationality. Germany, the United States, and France are the best represented, in that order. In fact, 89/102 educated animals were German, and most found fame in the years after Hans and Don. While Jutzler-Kindermann’s own German nationality certainly skewed the data, the numbers are nonetheless striking. *Können Tiere Denken? Ja. Ein Buch vom Verstand und Wesen der Tiere, die Antworten Lernten: Erfahrungen und Beobachtungen von 1890-1953* (Schopfheim: Eigenverlag H. Jutzler-Kindermann, 1954).

³⁰⁸ The insurrectionist chimpanzee is Petermann of the Cologne Zoo. Thanks to his performances, Petermann was much beloved by the local public, for whom he was the face of the zoo—until he tried to escape. On October 10, 1985, Petermann broke out of his cage with a female conspecific and attacked the zoo director. Both chimpanzees were shot dead by the police. Petermann’s life was novelized in Walter Filz’ *Die Affe zu Köln; Oder: Petermanns Rache* (Cologne: Greven, 2010). The oracular octopus is Paul “der Kraken-Orakel” of the Oberhausener Großaquarium. During the 2008 European Championship and the 2010 World Cup, Paul correctly predicted the results of 12 of Germany’s (and the Netherlands’) 14 games by selecting food out of one of two boxes plastered with the competing nations’ flags.

newspaper's soccer coverage was devoted to Paul: "WM-Orakel." Johannes Ehrmann, "Der Kraken an der Sache: Das Tintenfisch-Orakel tippt auf Spanien," *Der Tagesspiegel* (July 6, 2010).

whether an animal can speak or read German or throw off the shackles of human oppression or predict World Cup outcomes is not the point. From the perspective of animal psychological history, the point is opening a discursive space to ask questions science cannot or will not answer, to ask the greater, deeper questions Pfungst and his successors have sidestepped in favor of tidier, more manageable questions. Since they have not been tasked with solving the mystery of special animals' abilities—since they have not been tasked with finding facts—these media stories can grapple with the intricacies of human-animal epistemic relationality without much fear of reputational repercussion.

Like Scheitlin and the modernist writers who succeeded him, as well as the experimental psychologists in their marginalia of doubt, these media stories draw breath from *what if's*. What if animal stories, in their most basic form, have endured in the history of human thought because we exist in a tightly bound intellectual relationship with animals? What if sensationalized animal stories perform precious self-reflective work, allowing us to reflect on our loneliest, most ignorant selves without glimpsing our own face? What if we are terrified of all that we cannot know from our limited human perspectives, so we pretend that our curiosity for animal otherness can be sated through what we call "facts"? What if that is all science is: a promise to incrementally satisfy an ultimately insatiable curiosity for that which lives and speaks and thinks and feels beyond the human? When viewed through the questions which have proliferated, unanswered, as human and animal share uncomfortable epistemic encounters, failure, frustration, and, yes, stupidity were predestined for the early 20th-century researchers who opened themselves up to the animals before them. Even while researching on behalf of one of the most

renowned psychologists of his day, Pfungst, who barked with the talking dog in 1911, was not so different from the dumbstruck Maeterlinck who, caught in the gaze of the stallion Muhamed in 1913, asked himself: “Mit wem habe ich hier denn eigentlich zu tun?”³⁰⁹

This simple, yet baffling question has proven the heart of animal psychology, and the reason the ever-emerging field found itself ejected from institutional experimental psychology and embraced by public media in the early 20th century. Despite Germanophone newspapers and magazines producing a drip-feed of animal psychological stories to satisfy eager readers who asked “Mit wem habe ich hier denn eigentlich zu tun?” of each new *Wundertier*, there was no returning to the moment when an overawed public awaited the findings of the October Commission. The stakes of animal psychological stories had shifted. Just as Don never again became an object of scientific study after starring on the American vaudeville stage,³¹⁰ most of these stories were lighthearted romps through the wonders of animal consciousness, now featuring exclusively female trainers.³¹¹ Foreshadowed by Martha Ebers’ enduring presence in Don’s public image, even when muted or plucked off the stage, women occupied the off-center, if not the center, of animal psychological discourse. This suited Pfungst and his colleagues. For the still young experimental psychology to maintain its rule over the domain of fact, it needed a “not-experimental psychology,” a “not-science,” which existed alongside it. A women-led

³⁰⁹ Maeterlinck, “Die Pferde von Elberfeld: Ein Beitrag Zur Tierpsychologie,” 790.

³¹⁰ When Don died in 1916, the Rockefeller Institute in New York City requested his cadaver, with the aim of dissecting his vocal organs. This never occurred, and Don was buried in his native Theerhütte (Bondeson, *Amazing Dogs*, 63).

³¹¹ See, for instance, reports around the dogs Elke and Belam trained by Dorothy Meyer in the 1970s and immortalized through English journalist Maurice Rowdon’s book *The Talking Dogs* (London: Macmillan, 1978). Not all animal psychological news stories delighted, however; some chilled. Over three decades before Meyer’s Bavarian dog school made headlines, another woman-run dog school, this time in Leutenberg, applied Krall’s methods to the education of large German mastiffs and the occasional cat. Germany was at war, again. Under Adolf Hitler’s directive, the Tiersprechschule ASRA was designed to support the Nazi war effort, even to train its “students,” as they were called, to glorify Hitler by barking out “Mein Führer!” (Max Müller, *Tierärztliche Mitteilungen* 24 (1943): 71-2 in Bondeson, *Amazing Dogs*, 50).

animal education program located in the home and the media—and its science-fictional offshoot, cryptozoology—did quite nicely.³¹²

The sustained media attention also did quite nicely for the new animal psychologists, effectively rearranging its contours to make it one of the first research areas to feature women as key knowledge producers, albeit with several caveats.³¹³ As opposed to scientific fields centered at universities, New Animal Psychology was remarkably open for women.³¹⁴ While a smattering of university-educated male leaders, chaffing against New Animal Psychology's characterization as sensational stories and incubators for vaudeville stardom, kept playacting at scientificity, New Animal Psychology still required neither a university degree nor a laboratory for membership. If it had any admissions requirements, it was a conviction that animals were individual, ensouled beings. New Animal Psychology's women not only had this conviction, but they—either not-yet

³¹² With its intent on making a science out of animal mysteries, cryptozoology brings together the Loch Ness monster with Clever Hans, talking dogs like Don with death-defying turtles. See, especially, John Michell, R. J. M. Rickard, *Das rechnende Pferd von Elberfeld und andere Rätsel aus der Welt der Tiere*, trans. Wulf Bergner (Frankfurt am Main: Ullstein Sachbuch, 1985).

³¹³ In the pages of the Society for Animal Psychology's newsletters, the women of New Animal Psychology were the like of their male colleagues; in practice, a complex gender dynamic arose, thanks to a begrudging recognition that the group needed its women to survive. Reminiscent of Kafka's student who lacked the financial means to conduct his new-new animal psychological experiments, New Animal Psychology's women were constrained by social expectations. The invalid housewife Paula Moekel's words in her more famous book, *Mein Hund Rolf*, were preceded by two forewords: one by her husband, a medical doctor, and one by Dr. Ludwig Wilser (Rolf's equivalent of General Major Eugen Zobel). Other women, including Martha Ebers, appeared in media coverage and traveled with their animals, but their husbands or fathers accompanied them and spoke on their behalf. Several women conducted psychological experiments on their animals, but only insofar as they remained in the home and nonthreateningly presented their findings as mere observations.

³¹⁴ Compare this to primatology in the 1960s with its leading female thinkers. Jane Goodall, the best-known primatologist in the history of the discipline, first traveled to Africa without scientific training, having left school at 18. As she recounted in an interview: "He [my mentor Louis Leakey, who thought women made better observers,] told me later that he deliberately picked somebody with no scientific training because he wanted to send somebody into the field with an unbiased mind. And of course, back then in the early 1960s, the ethologists of Europe were very reductionist. Humans were the only animals with personalities, minds, and above all, feelings. I hadn't learned any of that, so I went merrily ahead and gave the chimpanzees names—which wasn't appropriate. They should have numbers. I described those vivid personalities and described many examples of clearly intelligent behavior and emotions that were obviously similar to—and sometimes the same as—ours." Steve Paulson, "The Women Who Revolutionized Primatology," *To the Best of our Knowledge* (December 1, 2017), <https://www.ttbook.org/interview/women-who-revolutionized-primatology>.

unmarried or past the chaotic first years of childrearing—could transform that conviction into a special animal prepared for psychological experimentation. Like Martha Ebers, these women taught their (similarly homebound) animals, usually dogs and cats, to speak, read, and count, using methods derived from their supposedly natural occupation of educating human children. They welcomed researchers into their homes. And in some cases, these women conducted experiments and published their findings in the Society for Animal Psychology’s newsletter. Several wrote monographs.³¹⁵ As epistemically generative as its female contributors were, the Krallian old guard of New Animal Psychology did not simply open its ranks to women, having realized that those transforming domesticated animals into psychological objects of study had much to contribute. No, it was the Great War which finally gave these women the opportunity to write about their animals, rather than stand on the stage in their shadow.³¹⁶ The research activities of animal psychology’s men, including the Berlin Institute of Psychology’s members, were diverted for the war effort; but women, by and large, kept the home front operative—alongside their pets.³¹⁷

In 1920, once the Society for Animal Psychology ended its four-year cessation of activities, the first postwar issue of its newsletter spotlighted the contributions of women exclusively. To open the newsletter, the Society President, Professor Dr. Heinrich Ernst Ziegler,

³¹⁵ See, for instance, Henny Kindermann’s *Lola, or the Thought and Speech of Animals*, the English translation of which is more accessible than the German original (transl. Agnes Blake (London: Methuen, 1923)).

³¹⁶ While I do not discuss her here in favor of Paula Moekel, the German writer Hedwig Lohß (1892-1986) is an extraordinary figure worth noting in this regard. Well-known for her successful children’s books, which she published from 1920 until 1976, she also kept a menagerie of animals at her home in Stuttgart. The observations she gleaned from living with animals influenced her writing, in turn, and she wrote many beloved books about animals. The dog she trained to count, Seppl, was featured at the end of the Society for Animal Psychology’s 1920 newsletter, after Moekel’s Rolf and Kindermann’s Lola.

³¹⁷ For more on the Berlin Institute of Psychology’s sound research in response to World War I, see especially Christoph Hoffmann, “Singen, Sprechen, Flüstern, Rauschen,” in *“Der Dichter am Apparat”: Medientechnik, Experimentalpsychologie und Texte Robert Musils 1899-1942* (Munich: Wilhelm Fink, 1997), 187-229.

quickly turned from the wartime difficulty of printing to the long-awaited publication of the Society's most anticipated books: two by "Frau Dr. Moekel über ihren Hund 'Rolf' und eine Schrift von Fräulein Henny Kindermann [...] über ihren Hund 'Lola'":

"Diese Veröffentlichungen, welche eine Fülle von wichtigen Beobachtungen enthalten, haben der neuen Tierpsychologie viele Freunde gewonnen. Unter diesen Umständen konnte die Gesellschaft für Tierpsychologie ihre Tätigkeit wieder aufnehmen, um auch weiterhin den Mittelpunkt der neuen Forschung zu bilden und den Kampf für die Anerkennung der neuen Ergebnisse fortzusetzen."³¹⁸

These two women, in other words, were the thought leaders of postwar New Animal Psychology. Their work was poised to shepherd animal psychological research into its next era. No less impressive was Ziegler's suggestion that Moekel's Airedale terrier Rolf, known as "der Mannheimer Hund" and pictured on the newsletter's front page, as well as Kindermann's Airedale terrier Lola (Rolf's daughter), were Don's much improved successors. These dogs were not physically hindered by a reliance on their speech organs to vocalize human words. In adopting and then updating Hans' *Klopzeichen*, they put Hans and Don to shame. Both Rolf and Lola were reported to answer calculus problems and form philosophical arguments, and Moekel went so far as to call Rolf a bibliophile, philosopher, and polyglot. Hyperbole notwithstanding, Rolf and Lola were—according to New Animal Psychology's criteria—the most articulate and intelligent animals who had ever lived.

Within the history of animal psychology I have been tracing, though, what is so remarkable about Rolf and Lola is not their supposed intellectual achievements. Rather Rolf and Lola marked the moment in which special animals' achievements were explicitly recognized as emerging out of complex relationships with their female owners, relationships which ultimately gave those women a platform to contribute to animal psychological knowledge. As opposed to

³¹⁸ Prof. Dr. Heinrich Ernst Ziegler, ed., *Mitteilungen der Gesellschaft für Tierpsychologie* no. 1 (1920), 2.

Ebers being muted to make Pfungst's psychological experiment objective, Moekel and Kindermann controlled the experiment, and they wrote protocols and books which, in giving their dogs a voice, amplified their own. To conclude, let us turn to Moekel's theory of animal (un)translatability, to consider how *speaking for* can, under the right conditions, transform into *speaking with*.

In many ways, this dissertation begins and ends with the Elberfeld alphabet system: its precursors, its iterations, its operations, its theorizations, its blind spots, and its promises. In 1913, Rolf made headlines for speaking through an Elberfeld-esque alphabet system he developed with Moekel (**Figure 1**). With his paw and Moekel's hand connected via a wooden board, Rolf tapped out answers to mathematical as well as open-ended questions, and he spelled words the way they sounded to him. Similar to the Elberfeld horses' vowelless spelling, Rolf had his own orthography: he very rarely tapped out vowels, he used the Mannheim dialect, he conjugated verbs incorrectly, and he spelled his own name, his *ich*, "lol." As Moekel cautioned in her posthumous 1919 monograph, *Mein Hund Rolf: Ein rechnender und buchstabierender Airedale-Terrier*: "Vor allem möge man der Tatsache Aufmerksamkeit schenken, daß die Antworten des Hundes sehr oft anders lauten als man sie erwartete. Es sind eben nicht unsere Gedanken, sondern diejenige des Tieres" (120).³¹⁹ Moekel's words formed more than an instruction manual for reading the protocol section of *Mein Hund Rolf*. Moekel composed a succinct theory of interspecies communication, one imploring readers to set aside their expectations shaped by their human ways of thinking. Even if human and animal employ the same alphabetic tools for lingual expression, the expressive product will not necessarily be the

³¹⁹ Moekel, *Mein Hund Rolf*, 120.

same, as animal cognition and human cognition operate differently. Open your mind! Read Rolf *as Rolf*, not as an illiterate human! Neither Scheitlin nor Krall could have said it better themselves. In fact, the father of New Animal Psychology visited the Moekel home several times and, on his first trip in November 1912, bestowed his blessing by comparing Rolf to his own horses, Muhamed and Zarif (10).

With Moekel translating Rolf's tapped-out remarks and disarmingly brusque correspondence with citizens and scientists, the Airedale terrier earned widespread fame all the way up to his death in 1919.³²⁰ He was a star, and an opinionated one at that. According to the answers the little dog tapped out to Moekel, who then voiced them for visitors or wrote them down for correspondents, Rolf was a German patriot who longed to fight in the war. When the war began, he indignantly tapped out "lol mid lib soldad woln in grig geisr braugn hundl lol kn hlfn fil du sein dumm fon wgn nid lasn lol in grig," which Moekel translated as "Lol mit lieb Soldat wollen in Krieg, Kaiser brauchen Hundel, Lol kann helfen viel, du sein dumm von wegen nicht lassen Lol in Krieg" (91). But when Germany suffered several defeats in late 1915, Rolf fancied himself a rescue dog, instead. He preferred women to men, due to their elegant hair and gowns; still, he noted, clothes were a mere substitute for fur (94). He showed an awareness of weekdays by observing the Sunday *Ruhetag* which, Moekel surmised, was a sign of reverence for the Almighty and the *Urseele* connecting all living things (51). And he hated cats "frleigd fon wgn graln" ["vielleicht von wegen Krallen"] while loving the family cat, the intellectually gifted Daisy (93). Most spectacularly, Rolf despised being made into a spectacle, and he turned up his nose at any visitor who wanted him to perform. When a noble lady paid her respects to the dog,

³²⁰ Rolf's (and therefore Moekel's) correspondents included Krall, as discussed in the Introduction, and a schoolboy asking for help on his math homework, along with men of science.

Rolf turned the tables by asking her questions and then correcting her math. To conclude the visit, he instructed her to wag her tail.³²¹ Each instance of Rolf's witty disdain—preserved in Moekel's protocols—circulated widely, well beyond the post-Don cloister of New Animal Psychology. The Airedale terrier knew how to draw attention, and Moekel knew how to capitalize on it, even in death.

When Moekel died in 1915, she left behind a large archive of protocols, transcribed during each of Rolf's sessions either by herself or her eldest daughter, the violinist Luise Moekel.³²² In what became her second posthumously published book, *Erinnerungen und Briefe meines Hundes Rolf* (1920), Rolf's biography joins his years-long correspondence with Krall and admiring professors to paint the dog as an accomplished man of letters. The 16 protocols forming Rolf's biography were prepared by several male friends of the family, from May 19, 1914 to September 28, 1915 (three months before the dog's death), and range in form from tapped-out numbers with the signified letters directly below [5 l 2 o 5 l] to sentences apologizing for Rolf's incorrect German ["*Mutter war sitzen (gesessen) an ei(nem) Tag in Sessel bein (beim) Vogelbrett, Lol sei(n) Köpfel auf sei(nem = ihrem) Knie*"] (47). Moekel's husband penned the foreword, and Rolf and his correspondents penned the letters. But the woman Rolf called "Mutter"—her voice seems entirely absent, having silenced itself and erased its traces so that the celebrated dog Rolf may speak.

Moekel's voice is, in fact, the loudest in the book. She is the perspective from which Rolf's life is told, the writer who transformed taps into words and arranged the order of each book as she envisioned it. She may have presented herself as Rolf's translator, a humble

³²¹ Bondeson, *Amazing Dogs*, 42.

³²² When Moekel died, Luise assumed the role of Rolf interpreter and protocol writer.

compiler of “Übersetzungen,” but she is the author of both books, not Rolf (her subject) and not Dr. Friedrich Moekel (her husband, foreword writer, and agent).³²³ She is the “mein” of *Mein Hund Rolf* and *Erinnerungen und Briefe meines Hundes Rolf*. And she spent her final days in 1915 completing Rolf’s memoir because it was her own. As her husband concluded in his foreword to *Briefe und Erinnerungen*: “Mit der Ausgabe des vorliegenden Buches ist in der Hauptsache alles, was meine Frau zu dem Thema der denkenden Tiere zu sagen hatte, der Öffentlichkeit übergeben” (13). This is Rolf’s life story; it is also Moekel’s life story: her work. Rolf could not speak without Moekel speaking for him. And Moekel—constrained, as she was, by her gender, ailments, and lack of education—could not speak without speaking for Rolf. The speech act, that daring assertion of one’s *ich*, one’s *lol*, built a bridge between *speaking for* and *speaking with*.

To open *Mein Hund Rolf*, Moekel wrote: “Der Schlüssel zur Seele des Tieres heißt Liebe. Wer die Tiere liebt, wird auch die nötige Geduld haben, diesen Geschöpfen die Möglichkeit zu geben, sich verständlich zu machen” (20).

Here is a blended voice, a voice which asks to be heard on its own terms.

Here is a voice that knows one cannot speak without the other.

Yes, here are two voices speaking in one.

³²³ In the final, protocol section of *Mein Hund Rolf*, rows of numbers precede what Moekel explicitly called “Übersetzung[en].”

Bibliography

- A bird in the aviary of Karl Reich. *Song of a Nightingale, No. 2*. Gramophone record. Victor talking machine co., 1913. <https://soundandscience.de/audio/song-nightingale-no-2-45057>.
- . *Song of a Thrush*. Gramophone record. Victor talking machine co., 1913. <https://soundandscience.de/audio/song-thrush-45057-b>.
- Abraham, Otto. “Das Absolute Tonbewußtsein: Psychologisch-Musikalische Studie.” *Sammelbände Der Internationalen Musikgesellschaft* 3 (1901).
- Abraham, Otto, and Erich von Hornbostel. “Studien über das Tonsystem und die Musik der Japaner.” *Sammelbände der Internationalen Musikgesellschaft* 4 (March 1902): 302–60.
- Ajouri, Philip. “Darwinism in German-Speaking Literature (1859-c. 1890).” In *The Literary and Cultural Reception of Charles Darwin in Europe*, edited by Thomas F. Glick and Elinor Schaffer, 3 & 4:17–45. London: Bloomsbury Academic, 2014.
- Ames, Eric. *Carl Hagenbeck’s Empire of Entertainments*. Seattle: University of Washington Press, 2009.
- . “The Sound of Evolution.” *Modernism/Modernity* 10, no. 2 (April 2003): 297–325.
- “An Adopted Mother Goose: Filling a Parent’s Role, A Scientist Studies Goslings’ Behavior.” *LIFE*, August 22, 1955.
- Anthony, Walter. “Don’s Rise from the Inn to Affluence.” *The San Francisco Call*, May 18, 1912. *Chronicling America: Historic American Newspapers* (Library of Congress). <https://chroniclingamerica.loc.gov/lccn/sn85066387/1913-05-18/ed-1/seq-58/>.
- Assagioli, Robert, and Marcel Mangin. “Le Débat Sur Les Chevaux d’Elberfeld: L’Exposé d’un Nouveau Témoin.” *Annales Des Sciences Psychiques* 23, no. 1 (January 1913): 1–14.
- Bain News Service. “Consul Peter Smoking,” photograph, 1909. 2014684084. Library of Congress.
- Bell, Alexander Graham. *Notes of Early Life: From the Notebook of Alexander Graham Bell*, undated.
- Bell, Alexander Melville. *Visible Speech: The Science of Universal Alphabets, or Self-Interpreting Physiological Letters, for the Writing of All Languages in One Alphabet*. London, New York: N. Trübner & Co., 1867.
- Berg, Britt von den. *Die “Neue Tierpsychologie” und ihre wissenschaftliche Vertreter (von 1900 bis 1945)*. Bristol, Berlin: Tenea Wissenschaft, 2008.
- Beyer, Marcel. *Kaltenburg*. Frankfurt am Main: Suhrkamp, 2008.
- Boakes, Robert A. *From Darwin to Behaviourism: Psychology and the Minds of Animals*. Cambridge [Cambridgeshire]; New York: Cambridge University Press, 1984.
- Bondeson, Jan. *Amazing Dogs: A Cabinet of Canine Curiosities*. Ithaca, NY: Cornell University Press, 2011.
- Brentari, Carlo. *Jakob von Uexküll: The Discovery of the Umwelt between Biosemiotics and Theoretical Biology*. Dordrecht: Springer, 2015.

- Brower, M. Brady. *Unruly Spirits: The Science of Psychic Phenomena in Modern France*. Urbana: University of Illinois Press, 2010.
- Browne, Janet. "Darwin and the Expression of Emotions." In *The Darwinian Heritage*, edited by David Kohn, 307–26. Princeton: Princeton University Press, 2014.
- Bruyninckx, Joeri. *Listening in the Field: Recording and the Science of Birdsong*. Cambridge, Mass.: The MIT Press, 2018.
- . "Sound Sterile: Making Scientific Field Recordings in Ornithology." In *The Oxford Handbook of Sound Studies*, edited by Trevor Pinch and Karin Bijsterveld, 127–50. Oxford: Oxford University Press, 2012.
- Buchanan, Brett. *Onto-Ethologies: The Animal Environments of Uexküll, Heidegger, Merleau-Ponty, and Deleuze*. Albany: State University of New York Press, 2008.
- Budiansky, Stephen. *If A Lion Could Talk: Animal Intelligence and the Evolution of Consciousness*. New York: The Free Press, 1998.
- Burkhardt, Jr., Richard W. "Darwin on Animal Behavior and Evolution." In *The Darwinian Heritage*, edited by David Kohn. Princeton: Princeton University Press, 2014.
- . *Patterns of Behavior: Konrad Lorenz, Niko Tinbergen, and the Founding of Ethology*. Chicago: University of Chicago Press, 2005.
- Candland, Douglas Keith. *Feral Children and Clever Animals: Reflections on Human Nature*. Oxford: Oxford University Press, 1993.
- Carus, Carl Gustav. *Vergleichende Psychologie oder Geschichte der Seele in der Reihenfolge der Thierwelt*. Vienna: Wilhelm Braumüller, 1866.
- Carus, Friedrich August. *Geschichte der Psychologie (Geschichte der Menschenkunde überhaupt und der Seelenlehre insbesondere)*. Vol. III. Leipzig: Johann Ambrosius Barth and Paul Gotthelf Kummer, 1808.
- . *Psychologie*. Vol. I. Leipzig: Johann Ambrosius Barth and Paul Gotthelf Kummer, 1808.
- Chez, Keridiana W. *Victorian Dogs: Victorian Men: Affect and Animals in Nineteenth-Century Literature and Culture*. Columbus: Ohio State University Press, 2017.
- Claparède, Edouard. "Encore Les Chevaux D'Elberfeld (Avec Une Note de M Le Dr de Modzelwski)." *Archives Des Psychologie* 13 (1913): 244–84.
- . "Les Chevaux Savants d'Elberfeld." *Archives Des Psychologie* 12 (1912): 263–304.
- Clark, Xenos. "Animal Music, Its Nature and Origin." *American Naturalist* 13 (1879): 209–23.
- Conrad, Sebastian. "Knowledge and Colonialism." In *German Colonialism: A Short History*, translated by Sorcha O'Hagan, 124–35. Cambridge: Cambridge University Press, 2008.
- Cottom, Daniel. *Abyss of Reason: Cultural Movements, Revelations, and Betrayals*. Oxford: Oxford University Press, 1991.
- Cowles, Henry. "Animal Intelligence." In *The Scientific Method: An Evolution of Thinking from Darwin to Dewey*, 184–224. Cambridge, Mass.: Harvard University Press, 2020.
- Darwin, Charles. "[1838] [Orang Utans at] Zoological Gardens. CUL-DAR191.1-2," September 2, 1838. The Complete Works of Charles Darwin Online. <http://darwin-online.org.uk/content/frameset?pageseq=1&itemID=CUL-DAR191.1-2&viewtype=text>.
- . Letter to Susan Darwin. "Letter No. 407 (To Susan Darwin [1 April 1838]," April 1, 1838. DCP-LETT-407. Darwin Correspondence Project. <https://www.darwinproject.ac.uk/letter/DCP-LETT-407.xml>.
- . *The Descent of Man, and Selection in Relation to Sex*. 1st ed. London: John Murray, 1872.

- . *The Expression of the Emotions in Man and Animals*. 3rd ed. Oxford: Oxford University Press, 1998.
- Darwin Correspondence Project. “Darwin’s Observations on His Children,” June 25, 2015. <https://www.darwinproject.ac.uk/people/about-darwin/family-life/darwin-s-observations-his-children>.
- Daston, Lorraine, and Peter Galison. *Objectivity*. New York: Zone Books, 2007.
- De Sio, Fabio, and Chantal Marazia. “Clever Hans and His Effects: Karl Krall and the Origins of Experimental Parapsychology in Germany.” *Studies in History and Philosophy of Biological and Biomedical Sciences* 48 (2014): 94–102.
- Der Sprechende Hund “Don”: April-Attraction Im Wintergarten-Berlin*. Berlin: Berliner Buch- und Verlags-Druckerei, 1911.
- Der Sprechende Hund. Serie 1. No. 3. ‘Don’ Drückt Seiner Herrin, Fräulein Martha Ebers, Die Hand*. 1911. Postcard.
- Derrida, Jacques. *The Animal That Therefore I am*. Edited by Marie-Louise Mallet. Translated by David Wills. New York: Fordham University Press, 2008.
- . *The Beast & The Sovereign*. Translated by Geoffrey Bennington. Edited by Michel Lisse, Marie-Louise Mallet, and Ginette Michaud. Vol. 1. Chicago: University of Chicago Press, 2009.
- . *Of Grammatology*. Translated by Gayatri Chakravorty Spivak. 4th ed. Baltimore, MD: Johns Hopkins University Press, 2016.
- Descartes, René. “Letter to Marin Mersenne,” December 1632.
- . *Tractatus de Homine*. 1677, n.d.
- Despret, Vincianne. *What Would Animals Say If We Asked the Right Questions?* Translated by Brett Buchanan. Minneapolis: University of Minnesota Press, 2016.
- Dix, Otto. *Der Juwelier Karl Krall*. 1923. Oil on canvas, 35 5.8 x 23 13/16 in.
- Don der sprechende Hund, and Oskar Pfungst. *Don III*, 1910. Ethnologisches Museum der Staatlichen Museen zu Berlin, Preußischer Kulturbesitz, Berliner Phonogramm-Archiv.
- Don der sprechende Hund, and Oskar Pfungst. *Sprechender Hund I*. Wax cylinder, 1910. Ethnologisches Museum der Staatlichen Museen zu Berlin, Preußischer Kulturbesitz, Berliner Phonogramm-Archiv.
- Don der sprechende Hund, Julius Vosseler, Erich Fischer, and Oskar Pfungst. *Don IV*, 1910. Ethnologisches Museum der Staatlichen Museen zu Berlin, Preußischer Kulturbesitz, Berliner Phonogramm-Archiv.
- Driscoll, Kári. “Animals, Mimesis, and the Origin of Language.” *Recherches Germaniques*, no. 10 (2015).
- Duchâtel, Edmond. *Equête sur des cas de psychométrie: Janvier-Décembre 1909*. Paris: Leymarie, 1910.
- Ehrmann, Johannes. “Der Kraken an der Sache: Das Tintenfisch-Orakel tippt auf Spanien.” *Der Tagesspiegel*, July 6, 2010. <https://www.tagesspiegel.de/sport/wm-orakel-der-kraken-an-der-sache-das-tintenfisch-orakel-tippt-auf-spanien/1876962.html>.
- Farber, Paul Lawrence. *Finding Order in Nature: The Naturalist Tradition from Linnaeus to E. O. Wilson*. Illustrated edition. Baltimore, Md: Johns Hopkins University Press, 2000.
- Fick, Monika. *Sinnenwelt und Weltseele: Der psychophysische Monismus in der Literatur der Jahrhundertwende*. Tübingen: Max Niemeyer, 1993.

- Filmore, John Comfort. "Professor Stumpf on Mr. Gilman's Transcription of the Zuni Songs." *Music: A Monthly Magazine, Devoted to the Art, Science, Technic and Literature of Music* 5 (November 1893): 649–52.
- Filz, Walter. *Die Affe zu Köln; Oder: Petermanns Rache*. Cologne: Greven, 2010.
- Flegel, Monica. "Becoming Crazy Cat Lady: Women and Their Pets in the Domestic Circle." In *Pets and Domesticity in Victorian Literature and Culture: Animality, Queer Relations, and the Victorian Family*, 56–95. London: Routledge, 2015.
- Frisch, Karl von. *Aus Dem Leben Der Bienen*. Berlin: Springer, 1927.
- . "Über die 'Sprache' der Bienen: Eine tierpsychologische Untersuchung." *Zoologische Jahrbücher (Physiologie)* 40 (1923): 1–186.
- Gamper, Michael, ed. *Experiment und Literatur: Themen, Methoden, Theorien*. Göttingen: Wallstein, 2010.
- "Germany Has a Talking Dog: Don, the Marvelous Setter with a Vocabulary of Six Words – Scientists Stupefied." *New York Times*, December 11, 1910.
- Gesellschaft für Tierpsychologie, ed. *Die Seele des Tieres: Berichte über die neuen Beobachtungen an Pferden und Hunden: Mit einem Vorwort von Dr. H. E. Ziegler*. 2nd ed. Berlin: W. Junk, 1916.
- Ginzburg, Carlo. "Clues: Roots of an Evidentiary Paradigm." In *Clues, Myths, and the Historical Method*, 87–113. Baltimore, MD: Johns Hopkins University Press, 1989.
- Gray, Philip Howard. "The Early Animal Behaviorists: Prolegomenon to Ethology." *Isis* 59, no. 4 (December 1968): 372–83. <https://doi.org/10.1086/350423>.
- Grimmer-Solen, Erik. *Learning Empire: Globalization and the German Quest for World Status, 1875-1919*. Cambridge: Cambridge University Press, 2019.
- Gruber, Ulrich. "'Okkulte Erlebnisse.'" Der Arzt, Zoologe, Skipionier und Bergsteiger sowie Parapsychologe Professor Dr. Karl Gruber." In *Thomas Mann in München*, edited by Dirk Heißerer, 4:111–53. Munich: peniope, 2006.
- Grünbein, Durs. "Der Kluge Hans." *Sinn Und Form* 66, no. 1 (2014): 28–35.
- Guerrini, Anita. *Experimenting with Humans and Animals: From Galen to Animal Rights*. Baltimore, Md: Johns Hopkins University Press, 2003.
- Gundlach, Horst. "Carl Stumpf, Oskar Pfungst, der Kluge Hans und eine geglückte Verneblungsaktion." *Psychologische Rundschau* 57, no. 2 (2006): 96–105.
- Haeckel, Ernst. *Die Radiolarien (Rhizopoda Radiata): Eine Monographie*. 2 vols. Berlin: Georg Reimer, 1862.
- "Hammerstein's Roof and Real Ice Carnival Advertisement." *New York Sun*, July 21, 1912.
- Harel, Naama. *Kafka's Zoopoetics: Beyond the Human-Animal Barrier*. Ann Arbor: University of Michigan Press, 2020.
- Hartmann, Eduard von. *Der Spiritismus*. Leipzig: W. Friedrich, 1885.
- . *Philosophie des Unbewussten*. Berlin: Duncker, 1867.
- Heinroth, Oskar. "Beiträge zur Biologie, namentlich Ethologie und Psychologie der Anatiden." In *Verhandlungen des V. internationalen Ornithologen-Kongresses in Berlin, 30. Mai bis 4. Juni 1910*, 589–702. Berlin: Deutsche Ornithologische Gesellschaft, 1911.
- Herder, Johann Gottfried. *Abhandlung über den Ursprung der Sprache: Text, Materialien, Kommentar*. Munich: Carl Hanser, 1978.
- . *Ideen Zur Philosophie der Geschichte der Menschheit*. Vol. 13. Herders Sämtliche Werke. Hildesheim: Georg Olms, 1967. <http://hdl.handle.net/2027/mdp.39015024662051>.

- Hoffmann, Bernard. *Kunst Und Vogelgesang*. Leipzig: Quelle & Meyer, 1908.
- Hoffmann, Christoph. "Singen, Sprechen, Flüstern, Rauschen." In "Der Dichter am Apparat": *Medientechnik, Experimentalpsychologie und Texte Robert Musils 1899-1942*. Munich: Wilhelm Fink, 1997.
- Hornbostel, Erich von. "Formanalysen an Siamesischen Orchesterstücken." *Archiv für Musikwissenschaft* 2, no. 2 (April 1920).
- . *Intonationsprobe 13, Intonationsprobe 14*. Wax cylinder, 1907. Ethnologisches Museum der Staatlichen Museen zu Berlin, Preußischer Kulturbesitz, Berliner Phonogramm-Archiv.
- . "Musikpsychologische Bemerkungen über Vogelgesang." *Zeitschrift der internationalen Musikgesellschaft*, no. 5 (1911): 117–28.
- Hui, Alexandra. *The Psychophysical Ear: Musical Experiments, Experimental Sounds, 1840-1910*. Cambridge, Mass.: The MIT Press, 2012.
- Index: Experimental Cylinders from the Berliner Phonogramm-Archiv (ca. 1907-1916)*, n.d. <https://soundandscience.de/text/index-experimental-cylinders-berliner-phonogramm-archiv-ca-1907-1916>. Sound and Science.
- Johnson, Harry Miles. "The Talking Dog." *Science* 35, no. 906 (May 10, 1912): 749–51.
- Jutzler-Kindermann, Henny. *Lola, or the Thought and Speech of Animals*. Translated by Agnes Blake. London: Methuen, 1923.
- . *Können Tiere denken? Ja. Ein Buch vom Verstand und Wesen der Tiere, die Antworten Lernten: Erfahrungen und Beobachtungen von 1890-1953*. Schopfheim: Eigenverlag H. Jutzler-Kindermann, 1954.
- Kafka, Franz. "15 (Elberfeld Fragment)." In *Nachgelassene Schriften und Fragmente*, I:225–28. Frankfurt am Main: S. Fischer, 1993.
- . "[A Young and Ambitious Student]." In *Investigations of a Dog and Other Creatures*, translated by Michael Hoffmann, 27–29. New York: New Directions, 2017.
- . *Sämtliche Erzählung*. Edited by Paul Raabe. Frankfurt am Main: Fischer Taschenbuch Verlag, 1970.
- Kelly, Alfred. *Descent of Darwin: The Popularization of Darwinism in Germany, 1860-1914*. New edition. Chapel Hill: University of North Carolina Press, 2009.
- King, Martina. "Sprachkrise: Fritz Mauthner." In *Handbuch Literatur und Philosophie*, 159–62. Stuttgart: Springer, 2012.
- Kittler, Friedrich A. *Gramophone, Film, Typewriter*. Translated by Geoffrey Winthrop-Young and Michael Wutz. Stanford: Stanford University Press, 1999.
- Koch, Lars-Christian. "Images of Sound: Erich M. von Hornbostel and the Berlin Phonogram Archive." In *The Cambridge History of World Music*, edited by Philip V. Bohlman, 475–97. Cambridge: Cambridge University Press, 2013.
- Kohls, N. and R. Benedikter. "The Origins of the Modern Concept of 'Neuroscience.'" In *Scientific and Philosophical Perspectives in Neuroethics*, edited by James J. Giordano and Bert Gordijn, 44–48. Cambridge: Cambridge University Press, 2010.
- Köhler, Wolfgang. *Intelligenzprüfungen an Menschenaffen*. Berlin: Julius Springer, 1921.
- Krall, Karl. *Denkende Tiere: Beiträge zur Tierseelenkunde auf Grund eigener Versuche*. Leipzig: F. Engelmann, 1912.
- . "'Denkübertragung zwischen Mensch und Tier: Versuchsanordnung mit Klingelfuß'schen Hochfrequenzpulsen zum evt. Nachweis einer Denk'Strahlung.'" In *Denkende Tiere: Denkübertragung zwischen Mensch und Tier: Vortrag gehalten auf dem*

- III. *Congrès International de Recherches Psychiques*. Stuttgart: Verlag der Gesellschaft für Tierpsychologie, 1927.
- Kull, Kalevi. "Jakob von Uexküll: An Introduction." *Semiotica* 134, no. 1 (n.d.): 1–59.
- Kursell, Julia. "Experimental Cylinders – Experiments in Music Psychology around 1900." *Journal of Sonic Studies* 13, no. 3 (January 19, 2017). <https://www.researchcatalogue.net/view/324247/324248>.
- . "Listening to More than Sounds: Carl Stumpf and the Experimental Recordings of the Berliner Phonogramm-Archiv." *Technology and Culture* 60, no. 2 (April 2019): S39–63.
- Latour, Bruno, and Steve Woolgar. *Laboratory Life: The Social Construction of Scientific Facts*. Princeton: Princeton University Press, 1986.
- Lebrun, David. *Proteus: A Nineteenth-Century Vision*. First Run Features, 2004.
- "Letzlingen/Theerhütte: Der Sprechende Hund von Theerhütte." *Volkstimme.de*, December 26, 2018.
- "Lernen durch Einsicht," photograph, date unknown. Sammlung AWZ Würzburg.
- Lorenz, Konrad. "Beiträge zur Ethologie sozialer Corviden." *Journal Für Ornithologie* 79 (1931): 67–127.
- . "Beobachtungen an Dohlen." *Journal für Ornithologie* 75 (1927): 511–19.
- . *Er redete mit dem Vieh, den Vögeln und den Fischen*. Munich: dtv, 2018.
- . *So kam der Mensch auf den Hund: Hundesgeschichten*. Vienna: Borotha-Schoeler, 1950.
- . *Tiergeschichten: Er redete mit dem Vieh, den Vögeln und den Fischen*. Vienna: Borotha-Schoeler, 1949.
- Lucht, Marc, and Donna Yarri, eds. *Kafka's Creatures: Animals, Hybrids, and Other Fantastic Beings*. Lanham, MD: Lexington Books, 2010.
- Luckhurst, Roger. *The Invention of Telepathy, 1870-1901*. Oxford: Oxford University Press, 2002.
- Ludwig Koch on the Recording [of] a White-Rumped Shama in 1889*, n.d. The British Library. <https://www.bl.uk/collection-items/first-recording-of-a-bird-1889>.
- Maeterlinck, Maurice. *Das Leben der Bienen*. Translated by Friedrich von Oppeln-Bronikowski. Leipzig: Eugen Diederichs, 1901.
- . *Der Schatz der Armen*. Translated by Friedrich von Oppeln-Bronikowski. Leipzig: Eugen Diederichs, 1902.
- . "Die Pferde von Elberfeld: Ein Beitrag zur Tierpsychologie." *Die Neue Rundschau* 1 (1914): 782–820.
- . "The Elberfeld Horses." *Metropolitan Magazine*, June 1914.
- . *The Unknown Guest*. Translated by Alexander Teixeira de Mattos. London: Methuen, 1914.
- Mauthner, Fritz. "Aus dem Tagebuch des klugen Hans (Gedanken über den Ruhm)." *Berliner Tageblatt*, September 11, 1904, 463.
- . *Sprache und Psychologie*. Vol. 1. 3 vols. Beiträge zu einer Kritik der Sprache. Stuttgart: J. G. Cotta, 1901.
- Maxwell, Joesph. *Les phenomenes psychiques*. Paris: Félix Alcan, 1903.
- Moekel, Paula. *Erinnerungen und Briefe meines Hundes Rolf*. Stuttgart: Robert Lutz, 1920.
- . *Mein Hund Rolf: Ein rechnender und buchstabierender Airedale-Terrier*. Stuttgart: Robert Lutz, 1919.
- Müller, Max. "[Tiersprechschule ASRA]." *Tierärztliche Mitteilungen* 24 (1943): 71–2.

- Munz, Tania. *The Dancing Bees: Karl von Frisch and the Discovery of the Honeybee Language*. Chicago: University of Chicago Press, 2016.
- Naam, Fong. *The Nang Hong Suite: Siamese Funeral Music*, 1992.
- Naranch, Bradley, and Geoff Eley, eds. *German Colonialism in a Global Age*. Durham, NC: Duke University Press, 2014.
- Neumeyer, Harald. "Der 'Fall der Pferde von Elberfeld': Wilhelm von Osten, Karl Krall und Franz Kafka." In *Tier—Experiment—Literatur*, edited by Roland Borgards and Nicolas Pethes, 71–87. Würzburg: Königshausen & Neumann, 2013.
- Nyhart, Lynn K. *Biology Takes Form: Animal Morphology and the German Universities, 1800-1900*. Chicago, London: University of Chicago Press, 1995.
- Oppenheim, Janet. *The Other World: Spiritualism and Psychical Research in England, 1850-1914*. Cambridge: Cambridge University Press, 1985.
- Osty, Eugène. *Lucidité et intuition: étude expérimentale: Les sujets lucides sont comme des miroirs dans lesquels se reflète la pensée intuitive latent en chacun de nous*. Paris: Félix Alcan, 1913.
- Paulson, Steve. "The Women Who Revolutionized Primatology." *To the Best of Our Knowledge*, December 1, 2017. <https://www.ttbook.org/interview/women-who-revolutionized-primatology>.
- Petri, Olga, and Philip Howell. "From the Dawn Chorus to the Canary Choir: Notes on the Unnatural History of Birdsong." *HUMaNIMALIA* 11, no. 2 (Spring 2020): 163–92.
- Pfungst, Oskar. *Das Pferd des Herrn von Osten (Der kluge Hans): Ein Beitrag zur experimentellen Tier- und Menschen-Psychologie: Mit einer Einleitung von Prof. Dr. K. Stumpf sowie einer Abbildung und Fünfzehn Figuren*. Leipzig: J. A. Barth, 1907.
- . "Psychologie des Hundes." In *Bericht über den VII. Kongreß für experimentelle Psychologie in Marburg vom 20.-23. April 1921*, edited by Karl Bühler. Jena: Gustav Fischer, 1922.
- . "Über 'sprechende' Hunde (mit phonographischen Demonstrationen)." In *Bericht über den V. Kongreß für experimentelle Psychologie in Berlin vom 16. bis 20. April 1912*, edited by Prof. Dr. F. Schumann, 241–45. Leipzig: J. A. Barth, 1912.
- . *Vokalaufnahmen Dr. Pfungst*. Wax cylinder. Experimentalaufnahmen. Berlin, 1911. Ethnologisches Museum der Staatlichen Museen zu Berlin, Preußischer Kulturbesitz, Berliner Phonogramm-Archiv.
- Phillips, Denise. *Acolytes of Nature: Defining Natural Science in Germany, 1770-1850*. Chicago, London: University of Chicago Press, 2012.
- "[Photograph of 3 Tartar Musicians, Carl Stumpf, and Georg Schünemann]," 1915. HZK Bilddokument ID8249, Sammlungszugehörigkeit Lautarchiv, Inventar-Nr. Sign. Pn. 0113/5. Sound Archives of Humboldt-Universität in Berlin.
- Pollmann, Inga. *Cinematic Vitalism: Film Theory and the Question of Life*. Amsterdam: Amsterdam University Press, 2018.
- Pollock, Mary Sanders. *Storytelling Apes*. 1st edition. University Park, Pennsylvania: Penn State University Press, 2015.
- Pourciau, Sarah M. *The Writing of Spirit: Soul, System, and the Roots of Language Science*. New York: Fordham University Press, 2017.
- Puglionesi, Alicia. *Krall Krall*. Baltimore: Cars are Real, 2013.
- Pytlik, Priska. *Okkultismus und Moderne: Ein kulturhistorisches Phänomen und seine Bedeutung für die Literatur um 1900*. Paderborn: Ferdinand Schöningh, 2005.

- . *Spiritismus und ästhetische Moderne: Berlin und München um 1900: Dokumente und Kommentare*. Tübingen: A. Francke, 2006.
- Radick, Gregory. *The Simian Tongue: The Long Debate about Animal Language*. Illustrated edition. Chicago: University of Chicago Press, 2008.
- Reed, Edward S. *From Soul to Mind: The Emergence of Psychology, from Erasmus Darwin to William James*. New Haven: Yale University Press, 1998.
- Rehding, Alexander. “Wax Cylinder Revolutions.” *The Musical Quarterly* 88, no. 1 (Spring 2005): 123–60.
- Rheinberger, Hans-Jörg. *An Epistemology of the Concrete: Twentieth-Century Histories of Life*. Durham, NC: Duke University Press, 2010.
- Richards, Robert J. *The Romantic Conception of Life: Science and Philosophy in the Age of Goethe*. Chicago: The University of Chicago Press, 2004.
- Rickard, R. J. M. *Das rechnende Pferd von Elberfeld und andere Rätsel aus der Welt der Tiere*. Translated by Wulf Bergner. Frankfurt am Main: Ullstein Sachbuch, 1985.
- Riskin, Jessica. *The Restless Clock: A History of the Centuries-Long Argument over What Makes Living Things Tick*. Chicago, London: The University of Chicago Press, 2016.
- Rowdon, Maurice. *The Talking Dogs*. London: Macmillan, 1978.
- Rupnow, Dirk, Veronika Lipphardt, Jens Thiel, and Christina Wessely, eds. *Pseudowissenschaft: Konzeptionen von Nichtwissenschaftlichkeit in der Wissenschaftsgeschichte*. Suhrkamp Taschenbuch Wissenschaft. Frankfurt am Main: suhrkamp, 2008.
- Sachs-Hombach, Klaus. *Philosophische Psychologie im 19. Jahrhundert: Entstehung und Problemgeschichte*. Freiburg: Verlag K. Alber, 1993.
- Sanford, Edmund C. “Psychic Research in the Animal Field: Der Kluge Hans and the Elberfeld Horses.” *The American Journal of Psychology* 25, no. 1 (January 1914): 1–31.
- Saul, Nicholas, Thomas F. Glick, and Elinor Schaffer. “Darwin in German Literary Culture 1890-1914.” In *The Literary and Cultural Reception of Charles Darwin in Europe*, 3 & 4:46–77. London: Bloomsbury Academic, 2014.
- Sax, Boria. “Animal Psychology.” In *Animals in the Third Reich: Pets, Scapegoats, and the Holocaust*, 114–28. New York: Continuum Books, 2000.
- Scheitlin, Peter. *Versuch einer vollständigen Thierseelenkunde*. 2 vols. Stuttgart: J. G. Cotta, 1840.
- Scheitlin, Peter S.* In “Allgemeine deutsche Biographie, herausgegeben durch die historische Commission bei der Königl. Akademie der Wissenschaften,” 734–36. Leipzig: Duncker & Humblot, 1890.
- Scheller, Paul. *Der sprechende Hund und die Sprache der Tiere*. Leipzig: Richard Ehler, 1912.
- Schiffermüller, Isolde. “Elberfelder Protokolle: Franz Kafka und die klugen Pferde.” In “*Ein in der Phantasie durchgeführtes Experiment*”: *Literatur und Wissenschaft nach Neunzehnhundert*, edited by Raul Zalzone and Massimo Salgato, 77–90. Göttingen: V&R Press, 2010.
- Schmidgen, Henning. “Time and Noise: The Stable Surroundings of Reaction Experiments.” *Studies in History and Philosophy of Biological and Biomedical Sciences* 34 (2003): 237–75.
- Schmidt, Bastian. *Aus der Welt des Tieres: Ein Buch von der Seele des Anderen*. Berlin: Otto Salle, 1930.
- . *Das Seelenleben der Tiere*. Vienna: Rikola, 1926.
- . *Die Sprache und andere Ausdrucksformen der Tiere*. Munich: Rösl & Cie., 1923.

- . *Von den Aufgaben der Tierpsychologie*. Stuttgart: Gebrüder Borntraeger, 1921.
- Scholz, Juliane. “Duplicating Nature and Elements of Subjectivity in The Ethology of the Greylag Goose.” *Isis* 112, no. 2 (2021): 326–34.
- Stadler, Ulrich. “Kafkas Experimente.” In *“Es Ist Ein Laboratorium, Ein Laboratorium Für Worte”*: *Experiment und Literatur III, 1890-2010*, edited by Michael Bies and Michael Gamper, 139–61. Göttingen: Wallstein, 2011.
- Stumpf, Carl. “Das Berliner Phonogrammarchiv.” *Internationale Wochenschrift für Wissenschaft Kunst und Technik*, February 22, 1908, 225–46.
- . “Das Psychologische Institut.” In *Chronik der Königlichen Friedrich-Wilhelms-Universität zu Berlin für das Rechnungsjahr 1904*, 57–58. Halle: A.S. Waisenhauses, 1905.
- . “Der Rechenunterricht des Herrn v. Osten.” In *Das Pferd des Herrn von Osten: Der kluge Hans*, by Oskar Pfungst, 175–80. Leipzig: J. A. Barth, 1907.
- . “Die Anfänge der Musik.” *Internationale Wochenschrift für Wissenschaft, Kunst und Technik* 3, no. 51 (December 18, 1909): 1593–1616.
- . *Die Anfänge der Musik*. Leipzig: J. A. Barth, 1911.
- . *Die Sprachlaute: Experimentell-phonetische Untersuchungen*. Berlin: Julius Springer, 1926.
- . “Lieder der Bellakulla-Indianer.” *Vierteljahrsschrift für Musikwissenschaft* 2 (1886): 405–47.
- . “Musikpsychologie in England: Betrachtungen über Herleitung der Musik aus der Sprache und aus dem thierischen Entwicklungsprozeß, über Empirismus und Nativismus in der Musiktheorie.” *Vierteljahrsschrift Für Musikwissenschaft* 1 (1885): 261–349.
- . *Philosophische Reden und Vorträge*. Leipzig: J. A. Barth, 1910.
- . “Singen und Sprechen.” *Beiträge zur Akustik und Musikwissenschaft* 9 (1924): 38–74.
- . *Tonpsychologie*. 2 vols. Leipzig: Hirzel, 1883.
- . “Tonsystem und Musik der Siamesen.” *Beiträge zur Akustik und Musikwissenschaft* 3 (1901): 69–138.
- Stumpf, Carl, and Erich von Hornbostel. “Über die Bedeutung ethnologischer Untersuchungen für die Psychologie und Ästhetik der Tonkunst.” In *Bericht über den IV. Kongress der Deutschen Gesellschaft für Psychologie in Innsbruck vom 19. bis 22. April 1910*, 256–69. Leipzig: J. A. Barth, 1911.
- . “Über die Bedeutung ethnologischer Untersuchungen für die Psychologie und Ästhetik der Tonkunst.” *Beiträge zur Akustik und Musikwissenschaft* 6 (1911): 102–15.
- Susfeld, Irving S., ed. “Alexander Graham Bell’s Early Life.” In *American Annals of the Deaf: Organ of the Convention of American Instructors of the Deaf*, 185–87. 67, 1922.
- Swisher, Charles N. “Charles Darwin on the Origins of Behavior.” *Bulletin of the History of Medicine* 41, no. 1 (February 1967): 24–43.
- Traisnel, Antoine. “Fabulous Taxonomy (Hawthorne).” In *Capture: American Pursuits and the Making of a New Animal Condition*, 123–52. Minneapolis: University of Minnesota Press, 2019.
- Treitel, Corinna. *A Science for the Soul: Occultism and the Genesis of the German Modern*. Baltimore, MD: Johns Hopkins University Press, 2004.
- Uexküll, Jakob von. *Niegeschauter Welten: Die Umwelten meiner Freunde: Ein Erinnerungsbuch*. Berlin: Fischer, 1936.

- . *Streifzüge durch die Welten von Tieren und Menschen: Ein Bilderbuch unsichtbarer Welten*. Hamburg: Rowolt, 1934.
- . *Umwelt und Innenwelt der Tiere*. Berlin: Springer, 1909.
- Ulrici, Hermann. “Der sogenannte Spiritismus: Eine wissenschaftliche Frage (Mit Beziehung auf die Schriften von 1) Fr. Zöllner: Wissenschaftliche Abhandlung, Theil I. u. II. Leipzig, Staackmann, 1878. 2) J. H. v. Fichte: Der neuere Spiritualismus, sein Werth und seine Täuschungen. Leipzig, Brockhaus, 1878.)” *Zeitschrift für Philosophie und philosophische Kritik* 74 (1879): 239–71.
- . *Über den Spiritismus als wissenschaftliche Frage: Antwortschreiben auf den offenen Brief des Herrn Professor Dr. W. Wundt*. Halle: C. E. M. Pfeffer, 1879.
- Vidal, Fernando. *The Sciences of the Soul: The Early Modern Origins of Psychology*. Translated by Saskia Brown. Illustrated edition. Chicago; London: University of Chicago Press, 2011.
- Virtual Laboratory: Max Planck Institute for the History of Science. “Objects,” n.d. <https://vlp.mpiwg-berlin.mpg.de/objects>.
- Vogt, Carl. “Beiträge zur Neurologie der Reptilien,” *Neue Denkschriften der Allgemeinen Schweizerischen Gesellschaft für die Gesammten Naturwissenschaften* 4 (1840): 10-59.
- Voigt, Alwin. *Exkursionsbuch zum Studium der Vogelstimmen*. Dresden: Hans Schultze, 1906.
- Vosseler, Prof. Dr. J. ‘Don’ der Sprechende Hund. Hamburg: Fremdenblatt-Druckerei, 1911.
- Wassmann, Erich. “Vulgäre oder wissenschaftliche Thierpsychologie?” In *Instinct und Intelligenz im Thierreich: Ein kritischer Beitrag zur modernen Thierpsychologie*, 1–8. Freiburg im Breisgau: Herder, 1897.
- Weinland, David Friedrich. “A Method of Comparative Animal Psychology.” In *Proceedings of the American Association for the Advancement of Science (12th Meeting, Held at Baltimore, Maryland, May 1858)*, 256–66. Cambridge: Joseph Lovering, 1859.
- Wenzel, Gottfried Immanuel. *Neue auf Vernunft und Erfahrung gegründete Entdeckungen über die Sprache der Tiere*. Vienna: Anton Doll, 1800.
- West, Meredith J., and Andrew P. King. “Mozart’s Starling.” *American Scientist*, April 1990.
- Wilson, Leigh. ““But the Facts of Life Persist”: Magic, Experiment, and the Problem of Representing the World Otherwise.” In *Modernism and Magic: Experiments with Spiritualism, Theosophy and the Occult*, 22–43. Edinburgh: Edinburgh University Press, 2013.
- Wilson, T. *Prehistoric Art: Smithsonian Institution Annual Report 1896*. Washington: Govt. Print. Off., 1898.
- Wolffram, Heather. “In the Laboratory of the Geisterbaron: Experimental Parapsychology in Germany.” In *The Stepchildren of Science: Psychical Research and Parapsychology in Germany, c. 1870-1939*, 131–90. New York: Rodopi, 2009.
- Wolfgang G. Bringmann and Gustav A. Ungerer. “The Foundation of the Institute for Experimental Psychology at Leipzig University.” *Psychological Research* 42 (1980): 5–18.
- Woodward, William R. “Wundt’s Program for the New Psychology: Vicissitudes of Experiment, Theory, and System.” In *The Problematic Science: Psychology in Nineteenth-Century Thought*. New York: Praeger, 1982.
- Wundt, Wilhelm. *Der Spiritismus: Eine sogenannte wissenschaftliche Frage: Offener Brief an Herrn Prof. Dr. Hermann Ulrici in Halle*. Leipzig: Wilhelm Engelmann, 1879.
- . *Essays*. Leipzig: W. Engelmann, 1885.

- . *System der Philosophie*. 4th ed. Vol. 1. Leipzig: Engelmann, 1919.
- . *Völkerpsychologie: Eine Untersuchung der Entwicklungsgesetze von Sprache, Mythos und Sitte*. 10 eds. Leipzig: Engelmann, 1900-20.
- . *Vorlesungen über die Menschen- und Thierseele*. 1st ed. Leipzig: L. Voss, 1863.
- . *Vorlesungen über die Menschen- und Thierseele*. 2nd ed. Leipzig: L. Voss, 1892.
- Young, Robert M. “The Role of Psychology in the Nineteenth-Century Evolutionary Debate.” In *Historical Conceptions of Psychology*, edited by Mary Henle, 180–204. New York: Springer, 1973.
- Zeitschrift Für Tierpsychologie* 1, no. 1 (January 1937).
- Ziegler, Heinrich Ernst. *Der Begriff des Instinktes einst und jetzt: Eine Studie über die Geschichte und die Grundlagen der Tierpsychologie*. 2nd ed. Jena: Gustav Fischer, 1910.
- . *Die Seele des Tieres: Berichte über die neuen Beobachtungen an Pferden und Hunden*. 2nd ed. Berlin: W. Junk, 1915.
- . *Mitteilungen der Gesellschaft für Tierpsychologie*. 1. Walblingen: Gustav Stürner, 1920.
- Ziegler, Susanne. *Die Wachsylinder des Berliner Phonogramm-Archivs*. Berlin: Ethnologisches Museum Berlin, 2006.
- Zimmer, Carl. “Editor’s Introduction.” In *The Descent of Man: The Concise Edition*, 1–19. New York: PLUME, 2007.
- Zimmermann, E. “Apparate zu experimental-psychologischen Untersuchungen nach Angaben des Herrn Prof. Dr. Sommer,” 1904.
- Zobel, E. “Das lesende und rechnende Pferd.” *Der Weltspiegel: Illustrierte Halbwochen-Chronik des Berliner Tageblatts* 54. July 7, 1904.
- Zöllner, Friedrich. *Die transcendente Physik und die sogenannte Philosophie: Eine deutsche Antwort auf eine “sogenannte Wissenschaftliche Frage.”* Leipzig: Commissionsverlag von L. Staackmann, 1879.
- . *Transcendental Physics: An Account of Experimental Investigations from the Scientific Treatises*. Translated by Charles Carleton Massey. Boston: Colby & Rich, 1881.
- Zoological Society of London (ZSL). “Portrait of Jenny.” Accessed December 31, 2020. <https://www.zsl.org/blogs/artefact-of-the-month/portrait-of-jenny>.