Erika Quinn and Holly Yanacek

Introduction: Feeling beyond the Human

A human becomes emotionally attached to a machine – this basic plot is found in a number of recent books, films, and television series about humanoid robots and digital assistants;¹ however, depictions of the emotional attachment of humans to machines are not new. In German literary history, one of the most well-known examples is E. T. A. Hoffmann's novella "Der Sandmann" ("The Sandman," 1816), in which the young student and Romantic poet Nathanael projects his desires for a woman partner onto the automaton Olimpia. Not long after Nathanael calls his human fiancée Clara a "lifeless, damned automaton"² for rejecting his gruesome poetry, Nathanael becomes more and more attracted to Olimpia, who, unlike Clara, appears to listen to him with interest and only sighs "Oh, oh!" in response.³ A critique of Nathanael's narcissistic projections and desire for a passive partner without her own thoughts or feelings is evident through Hoffmann's use of narrative irony, which also helps undermine the polarized early nineteenth-century gender roles in "The Sandman."

Olimpia is both an object of desire and danger for Nathanael, and the automaton changes human relationships in the town. When Olimpia is destroyed and Nathanael finally sees that she is a lifeless doll, the narrator notes that "madness seized him with its fiery claws and bored its way into his inner being, tearing his mind and thoughts apart."⁴ His attraction to Olimpia consumes him and negatively impacts his thoughts and emotions as well as his relationship with Clara. Nathanael's spectacular destruction typifies early Romantic emotional styles and gender roles. The masculine antihero needed a female muse (Clara) to reflect back his genius to him; her refusal to do so ultimately leads to his passionate self-destruction.

The narrator reveals that the story of this automaton deeply affects the people of the town and their relationships with their human partners, not just Nathanael:

¹ Examples include *Westworld* (1973; 2016–) and films such as *A.I. Artificial Intelligence* (2001), *Robot & Frank* (2012), *Her* (2013), and *Ex Machina* (2014). Another film, *Marjorie Prime* (2017) depicts a series of relationships between family members and the AIs programmed to stand in as their late loved ones.

² E. T. A. Hoffmann, "Der Sandmann," in *Werke*, vol. 2 (Frankfurt a. M.: Insel, 1967), 7–40, here 25. Translations by Holly Yanacek.

³ Hoffmann, "Der Sandmann," 31.

⁴ Hoffmann, "Der Sandmann," 36.

[. . .] [T]he story of the automaton had taken root deep in their souls, and indeed, a horrible distrust of human figures crept in. In order to be completely convinced that they were not in love with a wooden doll, a number of lovers wanted their beloved to sing and dance a little out of rhythm, to embroider, knit, play with their little dog, and so on, while being read to, but above all, to not merely listen, but also occasionally speak in such a way to demonstrate that their speech required actual thoughts and feelings.⁵

This passage suggests that imperfection (e.g., singing and dancing out of rhythm and being distracted) is desirable because imperfection, like having one's own thoughts and feelings, is authentically human. It also implies that a difference exists between real and simulated thoughts and emotions, something that is becoming more difficult to distinguish today with new artificial intelligence (AI) and emotion AI technologies like chatbots and virtual agents powered by conversational AI and natural language processing.

Non-human entities can affect communities by evoking not only fear and distrust, as seen in Hoffmann's tale, but also admiration and empathy. Franz Kafka's short story "In unserer Synagoge" (In our synagogue, 1922) presents such a dynamic. In the story, villagers encounter a mysterious animal that has been living in the synagogue for a long time. The narrator observes, "If only one could communicate with the animal, one could, of course, comfort it by telling it that the congregation in this mountain village of ours is becoming smaller every year."⁶ He longs to connect with the mysterious animal living in the synagogue and imagines that the animal's emotional life is similar enough to his own that it can be understood. The narrator asserts that, in fact, the animal is more troubled than troubling; indeed, "if it were not for the women, one would hardly be aware of the animal's existence."⁷ This puzzling story raises several questions about the emotions of non-human animals and humans' feelings about them. While humans may seek to understand and connect with animals, the animal's body itself is illegible. The narrator observes that the animal is the size of a marten, and it is thought to possess matted, bluish green fur, which could simply be the result of exposure to dust and mortar. The animal's body, and therefore its nature, remains inscrutable as it rarely shows itself, eludes categorization, and cannot speak. The pity and curiosity the animal evokes in the male narrator are belied by the other men's treatment of it. In the past, the men tried to drive the animal out as a nuisance, but because they don't come into physical proximity

5 Hoffmann, "Der Sandmann," 37.

6 Franz Kafka, "In unserer Synagoge . . .," in *Die Erzählungen und andere ausgewählte Prosa*, ed. Roger Hermes (Frankfurt a. M.: Fischer, 2010), 405–409, here 406. Translations by Erika Quinn.

7 Kafka, "In unserer Synagoge . . .," 406.

with it, they now, excepting the narrator, ignore it. The men exhibit emotional detachment or indifference to the animal, deeming it unthreatening. In this they adhere to normative gender roles as stoic protectors. They take no notice of the “pet” the animal has become.⁸ Animals can present a threat to humans, as the men in the synagogue first imagined. However, animals can also be alluring or attractive to humans for a variety of reasons. We may use them for our own instrumental desires; at first glance the animal in the synagogue is “frightening,”⁹ but the women in the story use their purported fear of the animal to garner the attention they crave (from men) while adhering to their town’s and religion’s emotional regimes around gender. They play the role of damsel in distress, using the animal as the threat, and engage (we assume) men’s sympathy and protective stances.

What of the animal itself? It remains a mystery, a screen onto which human longing and fear is projected. The forms those projections take carry the cultural understanding of gender with them. Like Nathanael’s relationship with the automaton Olympia in Hoffmann’s novella, the villagers’ interest in the animal reflects their own agendas, to provide safety or to attract attention.

This interdisciplinary volume examines depictions of affective relationships between humans and non-humans in German cultural history from the Enlightenment to the present. Historically, dominant understandings of emotion have tended to limit the faculty of emotions to human beings, though some accounts have allowed that non-human animals, especially certain mammals, may also experience some emotions. By investigating claims that suggest the emotionality of machines or AI technologies, our volume questions established assumptions regarding emotions, such as distinctions between emotional experience and expression or real and simulated emotion as raised in Hoffmann’s text. Yet rather than focusing on what or whether non-humans such as animals and robots feel, we ask what kind of emotional lives have been attributed to non-human animals and machines in German literary and cultural history and why? What do depictions of animals, robots, and machines in the modern era reveal about changing understandings of the human and the human/non-human boundary? Why are so many automata, robots, and virtual assistants, both real and imagined, gendered feminine? Which emotional functions have non-human animals and machines served in different historical periods? What are the implications of emotional attachments to and empathy for non-humans such as pets and humanlike social robots? Our volume seeks to use animals and machines as

8 Kafka, “In unserer Synagoge . . .,” 406.

9 Kafka, “In unserer Synagoge . . .,” 405.

heuristic lenses through which to investigate human emotions and more specifically, humans' affective relationships with non-human animals and machines. Following previous animal studies scholarship, we use the term "non-human animal" whenever possible in this volume.

In recent years, developments in robotics, fascination with machines, and the rapid growth of animal studies in the academy and beyond have given rise to questions about the nature of humanity. While older distinctions and definitions of what distinguishes humans from other organic animals, which rest on features such as tool use, use of language, and social structure, have been sidelined, questions persist about what, if anything, separates humans from other organic life forms. Neurologists' and psychologists' work on brain science also has deepened and complicated our understanding of brain functions, and studies of emotions, in particular, have been at the forefront of these scientific fields.

As cyberneticists currently work to create more and more sophisticated robots and AI algorithms, anthropologists, ethicists, and engineers ask questions about such developments and their potential hazards. Now that the old mind/body duality has been largely dismissed by brain scientists, the role of emotions in creating AI applications is all the more pressing. Thinking about human labor being replaced by robotic labor, and eventually, AI, has become a leading political and economic concern for some policy makers and corporate leaders. Creating AI forces programmers and engineers to investigate and confront the nature, function, operation, and expression of human emotions.

While anthropomorphism, the attribution of human characteristics, especially emotion, to non-human animals gained a bad reputation beginning in the Enlightenment era, the practice of imagining animal emotions, which emerged in the early nineteenth century, could well have served as a tool similar to empathy – one that aided in seeing animals as beings possessing minds, will, and pain. The development of biological and brain research has led to the growing recognition that humans are entangled with non-human animals. This has complicated the neat distinction of animal/human that has long reigned.

Scholarly interest in emotions can be traced back to the late nineteenth century with important developments in biology and the emergence of psychology as a field of study. Charles Darwin focused on one aspect of emotion – expression – in his pioneering study of the behavior of humans and non-human animals.¹⁰ Psychologist William James began to investigate the causes and function of

¹⁰ Charles Darwin, *The Expression of the Emotions in Man and Animals* (Oxford: Oxford UP, 2009).

emotion, asserting they arose from physiological processes; similar work was undertaken by Danish physician Carl Lange. German philosophers Friedrich Theodor Vischer, Robert Vischer, and Wilhelm Dilthey developed principles of aesthetic empathy or *Einfühlungsästhetik*. The historians of the Annales school in France, such as Lucien Febvre and Georges Lefebvre, as well as Norbert Elias in Germany, also contributed to emotion studies in the 1930s with their conceptions of *mentalités*, which included examination of the values and assumptions that shape emotional expression and norms.¹¹ Critiquing the methodology of the Annalistes, psychohistory as a field emerged in the late 1960s. Its best known proponent, Peter Gay, focused attention on the emotional-cultural context in which individuals operate.¹² The 1980s and 1990s saw a resurgence of scholarly interest in emotions, for instance in the work on the emotional economy of the family by historians David Sabean and Hans Medick, the coining of “emotionology” in the research of Peter Stearns and Carol Stearns, and the development of the idea of “emotives” by William Reddy.¹³ Groundbreaking research by Barbara Rosenwein on emotional communities, as well as theoretical interventions, individual case studies, and historical overviews have established the field of the “history of emotions.”¹⁴ Much of the historical work on emotions has been undertaken by specialists in medieval or early modern history, with the modern era, until recently at least, receiving relatively little attention.¹⁵ One important exception to this in the German-speaking world is the Max Planck Institute for Human Development Research Center for the History of Emotions in Berlin, where Director Ute Frevert and her researchers focus on the modern period in Europe, North America,

11 Lucien Febvre, “La sensibilité et l’histoire: Comment reconstituer la vie affective d’autrefois?,” *Annales d’histoire sociale*, 3 (Jan.–Jun. 1941): 5–20; Georges Lefebvre, *La Grande Peur de 1789* (Paris: Librairie Armand Colin, 1932); Norbert Elias, *Über den Prozess der Zivilisation* (Basel: Haus zum Falken, 1939).

12 See his *Freud for Historians* (Oxford: Oxford UP, 1986), and *The Cultivation of Hatred: Vol. 3 of The Bourgeois Experience: Victoria to Freud* (New York: W. W. Norton, 1993).

13 David Sabean and Hans Medick, eds., *Interest and Emotions: Essays on the Study of Family and Kinship* (Cambridge: Cambridge UP, 1986); Peter N. Stearns and Carol Z. Stearns, “Emotionology: Clarifying the History of Emotions and Emotional Standards,” *American Historical Review* 90 (1985): 813–836; William Reddy, *The Navigation of Feeling: A Framework for the History of Emotions* (Cambridge: Cambridge UP, 2001).

14 Barbara Rosenwein, *Emotional Communities in the Early Middle Ages* (Ithaca, NY: Cornell UP, 2006).

15 A recent study does span the early modern and modern eras: Thomas J. Kehoe and Michael G. Pickering, eds., *Fear in the German-Speaking World, 1600–2000* (London: Bloomsbury Academic, 2020).

and South Asia. Inspired by their work, we hope to address the need for more scholarship on emotions in modern German cultural history in this volume.

The centrality of emotions to the human experience has recently been underlined in the sciences. Beginning around 2000 with fMRI and other brain imaging technology, cognitive psychology and neuroscience began “mapping” emotions onto the brain. Scientists Antonio Damasio and Lisa Feldman Barrett, and philosopher Martha Nussbaum, among others, demonstrated that thinking and feeling – cognition and emotion, rationality and hysteria – to sum up some of the binary pairs through which human experience has been understood in the past – are actually interconnected processes that cannot be disentangled from each other.¹⁶ It is now widely maintained that emotions play an important role in moral reasoning, decision making, and communication.¹⁷ Emotions scholars in the humanities have a varied response to the methodologies and findings of medical sciences. Indeed, cultural studies of emotions are adept at investigating this ongoing scientific curiosity with emotions as well as the public’s fascination with scientific findings. “Today’s experimental cognitive and neurosciences,” according to Ute Frevert, “lack depth by comparison” with the extensive and rich discussions in the humanities regarding cultural meanings of emotions in recent decades.¹⁸ Following Frevert, contributors to this volume observe that the range of emotions, their contexts and meanings is far greater than those investigated by psychology or neuroscience.

Explorations of emotions in literature, film, photography, painting, and other arts have been undertaken by scholars in recent decades, such that one can now speak of “emotion studies” as a field encompassing interdisciplinary critical cultural investigations of emotional phenomena in a cultural, material, and historical context. Emotion studies as such is a field also indebted to the decolonization of the academy beginning in the 1970s. With the establishment of women’s studies, Chicano studies, and Black studies, the single hegemonic viewpoint – coded rational while supported by privilege – began to gain additions and attract challenges. Women’s and ethnic studies scholars questioned how the key binary oppositions

16 Antonio Damasio, *The Strange Order of Things: Life, Feeling, and the Making of Cultures* (New York: Pantheon, 2018); Lisa Feldman Barrett, *How Emotions Are Made: The Secret Life of the Brain* (New York: Houghton Mifflin Harcourt, 2017); Martha Nussbaum, *Upheavals of Thought: The Intelligence of Emotions* (Cambridge: Cambridge UP, 2001).

17 On morality, see Rob Boddice, *The History of Emotions* (Manchester: Manchester UP, 2018), 192.

18 Ute Frevert, “Defining Emotions: Concepts and Debates over Three Centuries,” in *Emotional Lexicons: Continuity and Change in the Vocabulary of Feeling 1700–2000*, eds. Ute Frevert et al. (Oxford: Oxford UP, 2014), 1–31, here 2.

shaped sex, gender, and race rather than describing them, and the long-held view of human superiority and distinction from other animals also started to erode.¹⁹

Donna Haraway's pioneering "Cyborg Manifesto" (1985) exemplified some of these trends. As Haraway sought to de-center power for women and other marginalized groups, she asserted that the old ideal – of one pure, unitary self or entity – was no longer imaginable nor desirable. In fact, by the late twentieth century, she asserted, humans were all cyborgs – "creatures simultaneously animal and machine."²⁰ Humans' hybrid and indeterminate nature provided a possibility to take responsibility for the construction (and therefore, destruction) of boundaries – political, social, or otherwise. Nature and culture could be reworked for the sake of liberation.

Perhaps inspired by Haraway's call to embrace hybridity, scholars of emotion often seek to problematize the heuristic value of such dichotomies as individual/social, mind/body, and emotion/rationality. In challenging such binary models, these scholars point to the liminality of emotions and their "location . . . at the thresholds" that connect such dichotomies.²¹ This may include the binary most difficult for emotions scholars to take on: that is, the universalist, essentialist, transhistorical way of looking at emotions versus the social constructivist, culturally specific, historically grounded approach.²² Thinking about liminality makes the interrogation of the relationship between humans and machines or animals particularly fruitful as recent decades have seen more and more challenges to a central dichotomy, that of the human/non-human. Examining the influence that robots, machines, and animals exert on human emotions helps to highlight how historical actors defined humanity in light of its adaptability and vulnerability.

A direction indicated by Haraway's work, along with that of many others, is the embodiedness of being human. Bodies are the site of sensory experience as well as of emotional experience. The embodied nature of existence is also heavily gendered, which holds true for non-human animals as well. Emotions are at the center of the "worlded body."²³ Feminist scholar Sara Ahmed's work, often associated with affect theory, engages with the embodiment of affect and emotion. Her most recent projects explore the intersectionality of race and gender as they

19 Kari Weil, *Thinking Animals: Why Animal Studies Now?* (New York: Columbia UP, 2012), 23.

20 Donna J. Haraway, "A Cyborg Manifesto," in *Simians, Cyborgs, and Women: The Reinvention of Nature* (New York: Routledge, 1991), 149–182, here 149.

21 Benno Gammerl, "Emotional Styles – Concepts and Challenges," *Rethinking History* 15, no. 2 (June 2012): 161–175, here 162.

22 Jan Plamper, *The History of Emotions: An Introduction* (Oxford: Oxford UP, 2017), 74.

23 Boddice, *The History of Emotions*, 2.

play out in emotional experiences and bodily sensations.²⁴ While gender, then, is central to emotional experiences and expressions, it has received relatively little treatment in emotion studies.²⁵

Historically, and perhaps in more important ways in the bourgeois nineteenth century and the twentieth century, gender has been a key characteristic of humanness. For much of the period covered in this book, most specific emotions (fear, sadness, and hysteria, for example) and emotions generally were gendered feminine and believed to be unseemly, irrational, and embarrassingly exposing when expressed.²⁶ Emotions and rationality were thought to be polar opposites. As “rationality” had been used as a discourse of domination supported by property law, citizenship rights, and other structural means, so too had it been used as a benchmark of humanity, beginning with the Enlightenment.²⁷ The privileging of a linear, calculating thought process and the denigration of emotional expression coded women, people of color, and animals as Other. Ironically, this disavowal of emotions in elite males comes into direct conflict with the idea that the faculty of emotions defines all humans.

These binary models are also applied to non-human animals. Perhaps part of what makes the animal in the synagogue in Kafka’s story so inscrutable is its lack of gender. Gender is a vital component of empathy and connection across species; often, it is part of anthropomorphizing animals or machines. Judith Butler observes that fields of discourse and the power articulated through them “orchestrate[], delimit[], and sustain[] that which qualifies as ‘the human.’”²⁸ Abjected beings who are not properly gendered fall outside that qualification. A lot is at stake in gendering; the “human is . . . produced over and over against the inhuman; the construction of the human is a differential operation that produces the

²⁴ Sara Ahmed, *The Cultural Politics of Emotion* (New York: Routledge, 2004); Sara Ahmed, *Living a Feminist Life* (Durham, NC: Duke UP, 2017).

²⁵ Jan Plamper’s important study of the field, *The History of Emotions*, for example, lacks any index entries under “gender.” Another foundational book that does address gender and emotion in modern history is Ute Frevert’s *Emotions in History – Lost and Found* (2011), which features a chapter on “gendering emotions.”

²⁶ Karin Hausen, “Family and Role-Division: The Polarisation of Sexual Stereotypes in the Nineteenth Century – an Aspect of the Dissociation of Work and Family Life,” in *The German Family: Essays on the Social History of the Family in Nineteenth- and Twentieth-Century Germany*, eds. Richard J. Evans and W. R. Lee (London: Croom Helm, 1981), 51–83.

²⁷ Isabel V. Hull, *Sexuality, State, and Civil Society in Germany, 1700–1815* (Ithaca, NY: Cornell UP, 1997).

²⁸ Judith Butler, *Bodies that Matter: On the Discursive Limits of “Sex”* (New York: Routledge, 1993), 8.

more and the less ‘human,’ [and] the inhuman.”²⁹ While the attribution of gender may not make animals or machines human per se, it does give them the quality of relatability, and therefore opens the door to other emotions such as empathy and love.

As we think about general currents in the study of non-human emotions, we can detect two distinct periods: the first, focusing largely on individuals, in which scholars and scientists investigated inner forms and mechanisms and developed concepts and vocabulary. In the field of robotics, for example, the internal features of robots were the central concerns; however, this narrow focus on questions of robot consciousness, rights, and personhood overlooks areas of concern in Human-Robot Interaction, as Alexis Elder notes.³⁰ The second period, beginning roughly in the early 2000s, showed much more interest in the relationality of emotions, in particular, their co-constitutiveness, as discussed in Haraway’s *Companion Species Manifesto*.³¹ Indeed, the co-creation of emotions could cross the human/non-human divide as Haraway notes with dogs.³² This period also saw the development of academic fields in Human-Robot Interaction (HRI) and Canid-Human Relations.

This project is much more indebted to the second current of scholarship and seeks to extend interdisciplinary research in emotion studies by examining non-humans and the affective relationships between humans and non-humans in modern German cultural history. What constitutes emotion, or feeling, or affect, where it is to be found, and what it means has been explored in myriad ways throughout the history of Western modernity.³³ We are not, then, undertaking to answer questions about whether machines or non-human animals “actually” feel, nor will we seek to define emotions precisely. We understand that the capacity for emotions is hardwired into human (and many non-human) brains, while their expression, understanding, range, and meanings are socio-culturally shaped. “Feeling beyond the human,” this volume’s central concept, concerns humans’ feelings about entities outside their own lifeform. At the same time, emotions and how we attribute them to other beings compel humans to reassess the nature of the human.

²⁹ Butler, *Bodies that Matter*, 8.

³⁰ Alexis M. Elder, *Friendship, Robots, and Social Media: False Friends and Second Selves* (New York: Routledge, 2018), 75.

³¹ Donna Haraway, *The Companion Species Manifesto: Dogs, People, and Significant Otherness* (Chicago: Prickly Paradigm Press, 2003).

³² Haraway, *The Companion Species Manifesto*, 12.

³³ Frevert, “Defining Emotions,” 9–12.

Philosopher Martha Nussbaum, in her examination of political emotions, underlines the importance of conceptions of animals in defining humanness. Building on primatologist Frans de Waal's notion of "anthropodenial," she points out that humans have long viewed non-human animals as unwelcome reminders of human frailty and vulnerability. Humans have "disavowed their kinship" with other animals, who are seen as primitive or even atavistic.³⁴ On the other hand, robots or machines more generally have often been viewed as invulnerable, immortal beings onto whom humans can pin their hopes or fears. In times of rapid technological or social change, machines, robots, and AI have served as screens upon which to project anxieties. These relationships with the non-human are important expressions of humans' fears, longing, and self-conceptions. This is because the boundaries demarcating what is human and non-human are constantly in contention when regarding emotion. We suggest that such feelings indicate much about the human experience and can be instructive in formulating responses to difficult ethical issues; indeed, many of the essays in this volume put forward a possibility that intentional, mindful interactions with non-humans can enrich humans in developing a more inclusive ethics. Non-human animals and machines present experiential and imaginative possibilities.

This volume considers non-human animals, machines, and robots together in modern German cultural history. Thus, we aim to contribute to scholarship of the "non-human turn," which has emerged in the humanities and social sciences in academia over the past few decades. According to Richard Grusin, the non-human turn "is engaged in decentering the human in favor of a turn toward and concern for the nonhuman, understood variously in terms of animals, affectivity, bodies, organic and geophysical systems, materiality, or technologies."³⁵ One justification for this attention to the non-human is "that almost every problem of note that we face in the twenty-first century entails engagement with nonhumans – from climate change, drought, and famine; to biotechnology, intellectual property, and privacy; to genocide, terrorism, and war . . ."³⁶ While our volume participates in the non-human turn by decentering the human and considering animals, machines, and robots as worthy of study in their own right, our main intervention concerns filling a gap in emotion studies scholarship by exploring the emotional functions of non-humans and the affective relationships between humans and non-humans in modern German cultural history.

³⁴ Martha Nussbaum, *Political Emotions: Why Love Matters for Justice* (Cambridge, MA: Harvard UP, 2013), 139, 159.

³⁵ Richard Grusin, ed., *The Nonhuman Turn* (Minneapolis: U of Minnesota Press, 2015), vii.

³⁶ Grusin, ed., *The Nonhuman Turn*, vii.

Examining representations of non-human animals, robots, and machines together also provides insight into the changing understandings of what it means to be human through history and across cultures. In literature and culture, non-humans, especially robots but also non-human animals, are often stand-ins for oppressed groups (e.g., women, people of color, or religious minorities). In addition, human psychology tends to anthropomorphize non-humans, especially certain animals and machines. While an anthropocentric view would deny the existence of emotional experience in non-humans, an example of anthropomorphism would be to attribute the full range of human emotions to non-humans, including complex emotions like guilt, jealousy, shame, and others.

Comparing animals with robots and machines has proved to be a useful way to develop and question assumptions about the nature of being, consciousness, rationality, emotions, and sensations. Least examined are both non-human animals and machines in the context of an attribute that has for centuries been limited to the human – emotions. Sentient robots can be found in recent cultural productions, and social robots with “artificial empathy” – “the ability to sense human feelings and anticipate affective reactions”³⁷ – are being developed today. Still, humans have persisted in believing that emotion is what distinguishes us from robots and machines. Emotions were long considered the primary distinction between humans and non-human animals, especially before the publication of Charles Darwin’s *The Expression of the Emotions in Man and Animals* (1872), which asserted that humans and other animals “express the same state of mind by the same movements.”³⁸ For example, René Descartes famously viewed animals as “natural automata,” in other words, as complex machines without souls, experiences, or emotions.³⁹ This distinction has started to soften in recent decades with changes in ethology and brain science. *Animals, Machines, and AI* poses questions about the nature of the human through its investigation of emotions, non-humans, and relationships between humans, other animals, and machines. Why are accounts of animal or machine emotions so fascinating or threatening? How does the manifestation of animal or machine emotions unsettle our understandings of emotions, and thus humans? What are the stakes involved in projecting emotions onto animals or machines?

³⁷ Paul Dumouchel and Luisa Damiano, *Living with Robots*, trans. Malcolm DeBevoise (Cambridge, MA: Harvard UP, 2017), ix.

³⁸ Darwin, *The Expression of the Emotions in Man and Animals*, 348.

³⁹ Michael Tye, *Tense Bees and Shell-Shocked Crabs: Are Animals Conscious?* (Oxford: Oxford UP, 2017), 35.

Unlike humans and non-human animals, machines do not possess bodies; they are built physical structures, frames, or mainframes.⁴⁰ Machines are constructed by humans to serve human purposes, whether utilitarian, aesthetic, or otherwise. An artificial person (e.g., robot, android, cyborg, or automaton) can be understood as “a being who is partly or fully anthropomorphic, mechanical, or constructed from a variety of technological or natural materials and considered autonomous, animated, or capable of being animated.”⁴¹ The chapters in this volume focus most heavily on representations of humanlike machines such as automata and robots, but we acknowledge that non-humanlike machines and new technologies can also alter human affective states and we aim to address such cases.

A long-held distinction between animate subjects and inanimate objects has been based on the ability to feel, in both the sensory and emotional meanings. Scholars have started to reexamine traditional assumptions about machines as human-made objects, emotions, and agency. “Object-Oriented Ontology” tries to question these definitions of objects as inert. Machines (which are a kind of object) possess the capacity to “act” on people’s feelings, to alter human affective states. Objects can be understood as “actors that do not emote, that produce and transmit feeling [between human actors], but do not feel.”⁴²

Examining German language texts that feature machines can provide fruitful material to further explore non-humans’ affective power. Beginning in the early nineteenth century, German writers focused on the abilities of automata to evoke love and dread in their human companions. E. T. A. Hoffmann, along with Achim von Arnim and Jean Paul wrote stories that reflected fears about political and epistemological instability.⁴³ These early texts influenced later thinkers, with Hoffmann’s “The Sandman” (1816) especially notable for influencing explanations of the uncanny by psychiatrist Ernst Jentsch and psychoanalyst Sigmund Freud in the early twentieth century. Jentsch, who focused

⁴⁰ Stewart Hampshire, “Biology, Machines, and Humanity,” in *The Boundaries of Humanity: Humans, Animals, Machines*, eds. James J. Sheehan and Morton Sosna (Berkeley: UC Press, 1991), 253–258, here 253.

⁴¹ Despina Kakoudaki, *Anatomy of a Robot: Literature, Cinema, and the Cultural Work of Artificial People* (New Brunswick, NJ: Rutgers UP, 2014), 3.

⁴² Stephanie Downes, Sally Holloway, and Sarah Randles, “A Feeling for Things, Past and Present,” in *Feeling Things: Objects and Emotions through History*, eds. Stephanie Downes, Sally Holloway, and Sarah Randles (Oxford: Oxford UP, 2018), 8–26, here 8–11.

⁴³ Jean Paul Richter, *Jean Pauls Sämtliche Werke* XVI Bd. 2, “Einfältige aber gut gemeinte Biographie einer neuen angenehmen Frau von bloßen Holz, die ich längst erfunden und geheirathet” (Berlin: G. Reimer, 1826): 187–224; Achim von Arnim, *Novellen von Ludwig Achim von Arnim*, Bd. 1, “Isabella von Ägypten” (Berlin: Veit & Comp, 1839), 1–188.

on the automaton Olympia in Hoffmann's story, interpreted uncanniness as intellectual uncertainty about whether a figure is a human or an automaton. The figure of the uncanny automaton was so well known among educated Germans that by the 1930s, Walter Benjamin could use it as a figure representing "historical materialism" in his critique of Marxism, arguing that it, like the early-nineteenth century chess-playing automaton "The Turk," could "win" the game if it used the master – theology – hidden within it like the mechanism of the automaton. In this case, Benjamin's fears about the loss of agency in Marxism relied on a cultural reference from more than a century earlier.⁴⁴

Machines grew to occupy a central place in conceptions of German national identity in the nineteenth century. The German lands were the first states to implement public education, beginning with Prussia in 1806. Seeking to modernize their economy and society, states saw an opportunity in founding engineering schools. Technical schools started to emerge in Central Europe in disproportionately large numbers beginning in the 1840s.⁴⁵ While the state may have seen value in such education, *Bildungsbürger* and the intelligentsia did not. Playing into Enlightenment ideas about French and English superficiality, materialism, and empiricism, Romantic writers like Heinrich Heine saw those national traits as tied to machines and mechanistic thinking and behavior. After traveling to England, Heine wrote in "Ludwig Börne, A Memorial" (1840):

I shall never return to this despicable land, where machines behave like men and men like machines. The whirring and silence is [sic] so very annoying. When I was presented to the local governor and this thoroughly English Englishman stood motionless before me for several minutes without uttering a word, I inadvertently had the thought of looking at his back to determine whether one hadn't forgotten to wind up the machine.⁴⁶

Heine saw a mechanical mindlessness worthy of scorn.

Yet, as industrialization began to take off in the German lands in the 1860s and was bolstered by the creation of the Second Empire in 1871, by the end of the 1800s, "made in Germany" was a mark of excellence in engineering and design. Outstripping British coal and steel production, the German industrial economy was a behemoth. The German "cult of technicism" (*Technik*), that is, "emphasis on scientism, efficiency, and management" and the commitment to excellence in

⁴⁴ Walter Benjamin, "Theses on the Philosophy of History," in *Illuminations*, trans. Harry Zohn (New York: Harcourt Brace Jovanovich, Inc., 1968), 253.

⁴⁵ Modris Eksteins, *Rites of Spring: The Great War and the Birth of the Modern Age* (New York: Anchor Books, 1990), 71.

⁴⁶ Heinrich Heine, "Ludwig Börne: A Memorial," trans. Frederic Ewen and Robert C. Holub, in *The Romantic School and Other Essays*, eds. Jost Hermand and Robert C. Holub (New York: Continuum, 2002), 262.

building machines, had become a proud defining feature of German national identity, one that lasts into the twenty-first century.⁴⁷

In late nineteenth-century Germany, writer Ernst Kapp was just one of many to emphasize the admiration given to machines. This admiration was based on a new conception of machines' power and function. Prior to the 1780s automata received their inspiration and analogies from mechanical clockworks without relying on an energy supply for movement. The newest machines around 1800, such as the steam engine, were routinely conceived as resembling and expressive of a vital life force shared with human and non-human animals.⁴⁸ The shift from mechanistic to vitalistic views made machines and non-human animals seem more similar. Kapp observed of the new steam-powered machines: "It isn't only technical details that determine the strong admiration for steam engines; . . . it is also the fueling of the machine, the setting of combustibles into warmth and movement, in short the peculiar demonic appearance of independent achievement."⁴⁹ In the eyes of writers, philosophers, and scientists such as Otto Liebmann, Hermann von Helmholtz, or Ernst Kapp, machines, like humans and other animals, not only had similar mechanical working parts, but, more importantly, required "nourishment" that had to be burned to produce heat so as to convert it to strength to continue to "live," and if deprived of their energy source, would meet their "death."⁵⁰ For Kapp, machines served as vehicles through which humans became conscious of themselves and their own inner workings and vitality.

German Realist artist Adolph von Menzel's oil painting *Das Eisenwalzwerk* (*The Iron Rolling Mill*, 1875) presents an example of a similar late nineteenth-century attitude toward machines in visual culture. The glowing flames, massive machinery, and workers' lack of sturdy footwear represent dangerous working conditions in the factory. Steam and smoke accumulate near the ceiling and occupy the upper third of the painting. The interplay of light and shadow created through Menzel's use of the chiaroscuro technique heightens the dramatic quality of the factory scene; the beholder can almost feel the warmth of the fire, which illuminates the workers' faces, tools, and muscular arms. Expressions of exhaustion are evident on the faces of a few of the men. However, the visual language of the painting seems to communicate neither outrage at the working conditions nor sympathy for the workers. Instead, Menzel's painting depicts the

⁴⁷ Eksteins, *Rites of Spring*, 70, 72.

⁴⁸ Kakoudaki, *Anatomy of a Robot*, 27.

⁴⁹ Ernst Kapp, *Grundlinien einer Philosophie der Technik: Zur Entstehungsgeschichte der Cultur aus neuen Gesichtspunkten* (Braunschweig: Westermann, 1877), 137. Translation by Erika Quinn.

⁵⁰ Kapp, *Philosophie der Technik*, 128–129.

Figure 1: Adolph von Menzel, *Das Eisenwalzwerk* (1872–1875), oil on canvas, Nationalgalerie, Staatliche Museen zu Berlin.

close interaction between the workers and the machines in the factory, and the powerful machines and the strength of the workers together inspire awe in the beholder. Yet while machines and the people trained to operate them could inspire admiration, machines could also evoke fear. In Gerhart Hauptmann's Naturalist novella "Bahnwärter Thiel" ("Flagman Thiel," 1888), the technologies of the railroad and the telegraph pose a threat to human life and nature. Interestingly, while the railroad cuts through natural landscapes and is responsible for the death of wildlife and Thiel's son Tobias, different parts of the inanimate railroad system are associated with animate non-humans. The telegraph cords are "like the webs spun by a huge spider" and the tracks are like "a monstrous iron net" that begins to glow and resemble "fiery snakes," while the narrator calls the train itself a "puffing monster."⁵¹

The terrifying experience of the First World War called into question the nature and limits of the human, in particular regarding humanity's perceived sovereignty over the machines they created. When battles like the Somme and Verdun took hundreds of thousands of lives, military planners and leaders sought new ways to break such stalemates. In the United Kingdom, that meant an emphasis

⁵¹ Gerhart Hauptmann, "Bahnwärter Thiel," in *Erzählungen* (Gütersloh: C. Bertelsmann, 1957), 28–63, here 42–43. Translation by Holly Yanacek.

on and investment into technical knowledge, such as using better calculations to make artillery more precise and destructive. On the German side, however, that seems to have led to a blending of man and machine, not a distancing. Stormtroopers were equipped with flamethrowers, given much more autonomy to use them, and a cult of hardness and steel started to take shape, as soldiers and their commanders tried to contain the traumatic consequences and continue the war.⁵² Indeed, German military medical programs sought to blend disabled soldiers with machines so that they could still “be of service”; amputated limbs were fitted with pieces to connect to machinery so soldiers could continue to contribute to the war effort, and regain their sense of pride and masculinity.⁵³ After the war, a range of artistic and political voices – from Dadaists and Marxists to proto-fascists – all became enamored with automata, cyborgs, and machines.⁵⁴ The aesthetic movement that came to be known as *Neue Sachlichkeit* (New Objectivity) is most associated with this fascination. Machines were depicted in the graphic arts, in fiction, and in essays, most notably by conservative writer Ernst Jünger, who called on soldiers to become machines – to objectify their bodies so that they felt no pain.⁵⁵

Like the introduction of mechanized warfare had done early in the century, the use of robot technology in the workplace later in the twentieth century evoked disparate emotional responses. The 1970s in the German Democratic Republic (GDR) witnessed the growth of science fiction, due in part to Erich Hon-ecker’s proposed “socialist rationalization” of the economy, which aimed to increase production and efficiency through mechanization.⁵⁶ While the GDR only had 220 robots in 1980, the 1981–1985 Economic Plan called for the use of 40,000 to 45,000 industrial robots in the GDR by 1985.⁵⁷ However, uses of the word “robot” were misleading, as the term was applied to a range of different machines that fell short of the robotic standards in Western Europe, Japan, and

52 David Stevenson, *Cataclysm: The First World War as Political Tragedy* (New York: Basic Books, 2009), 156.

53 Heather R. Perry, *Recycling the Disabled: Army, Medicine, and Modernity in WWI Germany* (Manchester: Manchester UP, 2014).

54 Matthew Biro, *The Dada Cyborg: Visions of the New Human in Weimar Berlin* (Minneapolis: U of Minnesota Press, 2009).

55 Ernst Jünger, *On Pain* [*Über den Schmerz*, 1934], trans. David C. Durst (Candor, NY: Telos Press, 2008).

56 Sonja Fritzsche, *Science Fiction Literature in East Germany* (Oxford: Peter Lang, 2006), 163.

57 Arthur M. Hanhardt, Jr., “German Democratic Republic,” in *Communism in Eastern Europe*, ed. Teresa Rakowska-Harmstone (Bloomington: Indiana UP, 1984), 154.

the United States.⁵⁸ GDR works of the 1960s and 1970s such as Erich Schmitt's *Kollege Blech* (Colleague tin) comics (1965), Klaus Beuchler's "Silvanus contra Silvanus" (1969), and Karl-Heinz Tuschel's *Die Insel der Roboter* (Robot island, 1973) feature robot characters. Interestingly, the robot character in "Silvanus contra Silvanus" gets out of control because, as an emotionless machine, it does not understand what love is. Beuchler's story has been interpreted as a "very naïve plea not to forget love and romantic tradition in the face of technological progress and the striving for rationalization under socialism."⁵⁹

Robots and AI assistants are becoming increasingly visible in Germany today. In 2018 the Federal Government of Germany launched its Artificial Intelligence Strategy, which aims to achieve the following goals: "Increasing and consolidating Germany's future competitiveness by making Germany and Europe a leading center in AI; Guaranteeing a responsible development and deployment of AI which serves the good of society; Integrating AI in society in ethical, legal, cultural and institutional terms in the context of a broad societal dialogue and active political measures."⁶⁰ According to the German Federal Government's progress report published in 2019, Germany is currently ranked fifth in AI research publications (after China, the United States, Japan, and Great Britain) and is thus a player in the "Champions League" of AI.⁶¹ While industrial robots are more widely used, AI voice assistants are being developed and integrated, such as the robot SEMMI tested at the Deutsche Bahn Travel Center at the Berlin Central Train Station in 2019. In April 2021 Deutsche Bahn's website stated that this AI-based voice assistant, described as the "Siri for train travelers," is set to be available on the website, DB Navigator app, and as a digital avatar at selected train stations.⁶² Additionally, social robots are being designed with human needs for companionship in mind. Many social robots on the market respond to human facial expressions, tone of voice, and gaze. Unlike non-human animals, robots

⁵⁸ Hanhardt, "German Democratic Republic," 154.

⁵⁹ Karsten Greve, "Die Science-Fiction-Literatur der DDR," (PhD diss., Freie Universität Berlin, 2015), 137.

⁶⁰ European Commission-Knowledge for Policy, "Germany AI Strategy Report," accessed 25 May 2020, https://ec.europa.eu/knowledge4policy/ai-watch/germany-ai-strategy-report_en.

⁶¹ Die Bundesregierung, "Zwischenbericht: Ein Jahr KI-Strategie," *Nationale Strategie für Künstliche Intelligenz*, November 2019, <https://www.ki-strategie-deutschland.de/home.html>.

⁶² Deutsche Bahn, "Smart Services: The 'Siri for Train Travelers,'" accessed 1 April 2021, <https://www.deutschebahn.com/en/Digitalization/technology/innovations/Smart-services-the-Siri-for-train-travelers-4167438>.

that exist today are not sentient, yet humans still anthropomorphize robots and interact with them as if they have emotions.⁶³

Non-human animals are often associated with nature and the feminine, emotional, “natural” side of the binary – while animals themselves may not be gendered as individuals, they do serve as markers of Otherness, along with women, people of color, and other marginalized groups. They have bodies, which provide them with sensory information and experiences, and recent work has shown animals to construct complex social relationships which recognize individuals as such.⁶⁴ Although the capacity of non-human animals to think and have emotions remains contested in the sciences, today it is generally more acknowledged that at least certain mammals can feel in the sense of having emotions. The term *sentience* is commonly used in the field of animal studies to refer to this capacity to feel. Sentience can describe the ability to experience both pleasurable and aversive states, i.e., enjoyment and suffering, but scientific research concerning animal sentience tends to focus on animals’ experiences of feelings of physical pain.⁶⁵ Our purpose in this volume is not to determine what non-human animals actually feel, but rather to build on previous scholarship and show how the ways that humans imagine and relate emotionally to other species have changed over time.⁶⁶

Industrialization presented a significant shift in how humans related to non-human animals. It transformed humans’ relationship to the natural world, and by extension, to non-human animals. As mechanization slowly altered the countryside and people moved to cities, interactions with farm animals – animals and humans performing work together – became less and less a part of everyday life.⁶⁷ With their new urban lifestyle, city-dwellers often sought domestic animal companions, especially to help cultivate empathy in their middle-class children.⁶⁸ The increasing emotional bonds between people and their pets in the nineteenth century set the stage for animal advocacy.

While a nascent animal-welfare movement emerged decades later in the German lands than it did in Britain, by the last half of the century an anti-vivisection movement called for the humane treatment of animals, based on their

⁶³ Elder, *Friendship, Robots, and Social Media*, 77.

⁶⁴ Carl Safina, *Beyond Words: What Animals Think and Feel* (New York: Henry Holt, 2015).

⁶⁵ Gary Varner, “Sentience,” in *Critical Terms for Animal Studies*, ed. Lori Gruen (Chicago: U of Chicago Press, 2018), 360.

⁶⁶ Pascal Eitler, “Tierliebe und Menschenführung. Eine genealogische Perspektive auf das 19. und 20. Jahrhundert,” in *Tierstudien 3: Tierliebe*, eds. Jessica Ullrich and Friedrich Weltzien (Berlin: Neofelis Verlag, 2013), 40–48.

⁶⁷ Ulrich Raulff, *Farewell to the Horse: A Cultural History*, trans. Ruth Ahmedzai Kemp (New York: Liveright, 2018).

⁶⁸ Eitler, “Tierliebe und Menschenführung,” 41.

ability to feel pain and to suffer. Texts such as Anglo-German writer Elpis Melena's sentimental novel *Gemma; oder, Tugend und Laster* (*Gemma; or, Virtue and Vice*, 1877) and Ernst von Weber's pamphlet *Die Folterkammern der Wissenschaft* (*The Torture Chambers of Science*, 1879) spread anti-vivisectionist sentiment in Germany. A number of gender-coded binaries, including male rationality vs. female emotion and morality and male vivisectors vs. female activists are evident in discourses on animal rights and the anti-vivisection debate.⁶⁹ *Gemma*, for example, imagines the male vivisector as the personification of vice and the female activist as the embodiment of virtue, thus depicting animal activism and compassion for non-human animals as a gendered issue. In animal rights discourses, women were deemed responsible for the spread of animal advocacy and the moral education of future generations based on the view that women are supposedly distinguished by greater capacity to feel.⁷⁰ However, anti-vivisectionist arguments and publications were often dismissed as examples of "exaggerated sentimentalism" because of the centrality of feminine-coded compassion for animals.⁷¹ Some notable figures, including Richard Wagner, took the call for the humane treatment of animals a step further and embraced vegetarianism, an important component of some *Lebensreform* (life reform) cultures that lasted well into the twenty-first century. The relationship between the late nineteenth-century anti-vivisection movement and antisemitism is well-documented,⁷² and it is both ironic and appalling that the compassion that Richard Wagner and other anti-vivisectionists showed to animals was often denied to German Jews.

This notion of animal suffering was articulated in fiction as well as scientific texts that sought to cultivate empathy for animals. As a *Dinggedicht* (object poem), a poem that typically centers the non-human animal or object in an attempt to let it speak for itself, Rainer Maria Rilke's "Der Panther" ("The Panther," 1903)

69 Pascal Eitler, "Übertragungsgefahr: Zur Emotionalisierung und Verwissenschaftlichung des Mensch-Tier-Verhältnisses im deutschen Kaiserreich," in *Rationalisierungen des Gefühls: Zum Verhältnis von Wissenschaft und Emotionen 1880–1930*, eds. Uffa Jensen and Daniel Morat (Munich: Wilhelm Fink, 2008), 180.

70 Elpis Melena, *Gemma; oder, Tugend und Laster* (Munich: G. Franz'sche Verlagshandlung, 1877), 148. For more on *Gemma*, see Holly A. Yanacek, "Mobilising Disgust and Compassion: Elpis Melena's *Gemma; oder, Tugend und Laster* (1877) and the Anti-Vivisection Movement," *German Life and Letters* 73, no. 4 (October 2020): 564–580.

71 L. Goldstein, "Übersicht der neuern Verhandlungen über die Vivisektionsfrage. Nach den Arbeiten von v. Weber, Iatros, Hermann, Ludwig, Heidenhain, usw.," in *Schmidt's Jahrbücher der in- und ausländischen gesammten Medicin* 182.3 (1879): 281–285, here 282.

72 Arnold Arluke and Clinton R. Sanders, *Regarding Animals* (Philadelphia: Temple UP, 1996), 143.

invites readers to adopt the perspective of a caged panther. Rilke wrote this poem after visiting the Jardin des Plantes in Paris, and the first stanza, which attributes agency and motion to the bars of the cage rather than the living being therein, evokes empathy for the powerful yet numbed panther: “His gaze, from the passing of the bars, has become / so weary that it can focus on nothing more. / For him it’s as if there were a thousand bars / and behind those thousand bars no world.”⁷³ In *Umwelt und Innenwelt der Tiere* (*Environment and the Inner World of Animals*, 1909), Estonian-German biologist Jakob von Uexküll issued a call to abandon anthropocentrism and instead adopt the viewpoint of the animal,⁷⁴ an idea that resonates with what Rilke achieved with “The Panther” and his other object poems. Uexküll’s focus on the animal’s environment or surrounding world (*Umwelt*) gave special attention to so-called lower animals and “resulted in striking portraits of an ‘inner world’ imagined from a nonhuman perspective, expressed in a lucid, dramatic prose style accessible to nonspecialists.”⁷⁵

Despite the rapid rate of industrialization and the mechanized nature of twentieth-century warfare, non-human animals – horses and dogs in particular – played very important roles in both World Wars. Millions of horses were employed in the First World War. And although the Second World War saw the introduction of trucks and tanks to battlefields in significant numbers, horses were still widely used by the Wehrmacht on the Eastern Front – as many as 70,000 horses were deployed in Operation Barbarossa.⁷⁶ These animals served vital support roles. One officer remembered, “Thank God for our horses! At times they are the last and only thing we can rely on. Thanks to them we made it through the winter, even if they died in their thousands from exhaustion, lack of fodder and their tremendous exertions.”⁷⁷ In addition to animals’ roles in transportation and communication in the World Wars, some animals also served as mascots and companions, providing comfort and improving morale.⁷⁸

73 Rainer Maria Rilke, “Der Panther,” in *Werke in drei Bänden*, vol. 1, *Gedicht-Zyklen* (Frankfurt a. M.: Insel, 1966), 261. Translation by Holly Yanacek.

74 Jakob von Uexküll, *Umwelt und Innenwelt der Tiere* (Berlin: Julius Springer, 1909), 6.

75 Mark M. Anderson, ed., “Jakob von Uexküll: From *The Environment and the Inner World of Animals*,” in Franz Kafka *The Metamorphosis*, ed. Mark M. Anderson (New York: W. W. Norton, 2016), 95.

76 Richard Overy, *Why the Allies Won* (New York: W. W. Norton, 1995), 215.

77 Hans Meier-Welcker, *Aufzeichnungen eines Generalstabsoffiziers 1939–1942* (Freiburg im Breisgau, 1982), 168, qtd in Richard J. Evans, *The Third Reich at War: 1939–1945* (London: Penguin, 2010), 200.

78 Elizabeth D. Schafer, “Animals, use of” in *The European Powers in the First World War, an Encyclopedia*, ed. Spencer C. Tucker (London: Routledge, 1999), 52. Nastasja Klothmann notes that during the World Wars humans’ emotional relationships with animals took on new

Non-human animals did not play solely benevolent roles in war; they could evoke feelings of dread and fear as well as comfort. Gerhard Richter's *Christa und Wolfi* (1964) captures this ambivalence toward animals. In the painting, Wolfi, a formidable German shepherd, sits on a chair in front of two women. Contemporaneous with the Auschwitz trials of the early 1960s, Richter had begun interrogating Germany's National Socialist past in conjunction with that of his own family. The painting, based on a family photo of his first wife's, places Wolfi as the center of the frame, and he is painted in a light metallic blue in contrast to the sepia tones of the rest of the work. It contrasts a simple family photo with a more painterly, formal work as it also contrasts a comforting domestic scene with the centrality of Wolfi's bright eyes and open mouth. In this image, one can detect a "resonance or trace of one of the brutal symbols of the SS and other Nazi perpetrators, that is, the German shepherd, or police dog."⁷⁹ While dogs employed at death camps appear in survivors' testimonies as terrifying figures of violence and brutality, many, if not most, of those dogs were also "friendly companion-dogs" to the families employed at the camps.⁸⁰

The ambivalent status of such dogs and their ability to evoke oppositional emotions echoed in the former East Germany as the Berlin Wall fell. An estimated 5,000 dogs had been used to patrol the border and were rescued by families after their jobs became obsolete. Caught up in political debate, people on one hand argued that the dogs were vicious killers that should all be euthanized, while others claimed the dogs were "eager for affection" as the "last victims of Stalinism."⁸¹

Fondness for and connection to non-human animals persisted through the twentieth century: a recent book claims that Cold War Berliners were "animal-obsessed" – bestowing honors, awards, and mourning flowers upon their favorite zoo animals as they would on human friends and companions.⁸² This kind of performative emotional demonstration highlights the relational and socio-cultural components of human emotions. Yoko Tawada's *Etüden im Schnee* (*Memoirs of a*

intensity and forms. *Gefühlswelten im Zoo: Eine Emotionsgeschichte 1900–1945* (Bielefeld: transcript, 2015), 29.

⁷⁹ Paul B. Jaskot, "Gerhard Richter and Adolf Eichmann," *Oxford Art Journal* 28, no. 3 (2005): 457–478, here 474.

⁸⁰ Robert Tindol, "The Best Friend of the Murderers: Guard Dogs and the Nazi Holocaust," in *Animals and War: Studies of Europe and North America*, ed. Ryan Hediger (Boston: Brill, 2013), 105–122, here 105.

⁸¹ Peter Schneider, *The German Comedy*, trans. Philip Boehm and Leigh Hafrey (New York: Farrar, Straus and Giroux, 1991), 210.

⁸² J. W. Mohnhaupt, *The Zookeepers' War: An Incredible True Story from the Cold War*, trans. Shelley Frisch (New York: Simon & Schuster, 2017), 5.

Polar Bear, 2014) explores anthropomorphism and human/non-human animal relationships through its narration of the lives of three generations of polar bears, from the division of postwar Germany into East and West to life in Berlin in the early twenty-first century. The novel invites readers to consider humans' entanglement with other species and the importance of decentering the human in approaches to solving contemporary issues such as climate change. *Memoirs of a Polar Bear* also exposes the possible dangers of becoming animal-obsessed, as we see in Knut's story in Part III. Based in part on the true story of Knut, a polar bear born in captivity in the Berlin Zoological Garden in 2006 and rejected by his mother, Tosca, at birth, Tawada's novel draws attention to the fine line between love for and exploitation of animals. For example, the novel comments on the "Knutmania" that swept the globe, as well as the polar bear's commercialization, death threats against him, and the use of his image to promote climate change action.⁸³

Formal recognition of animal sentience and laws against animal suffering still vary around the world today, even among German-speaking countries. Animal sentience is not specifically mentioned in the German Animal Protection Act, but the concept of animal suffering is included, and the protection of animals has been listed as a state goal since an amendment to Article 20a of the Basic Law of the Federal Republic of Germany 2002.⁸⁴ Both Austria and Switzerland are ranked one position higher than Germany on the World Animal Protection Index. The Austrian Animal Welfare Act 2004 recognizes the responsibility of humans towards other animals as "fellow creatures," thereby implicitly but not explicitly recognizing the concept of animal sentience.⁸⁵ Similarly, the Swiss Animal Welfare Act 2005 recognizes but does not explicitly refer to the concept of animal sentience.⁸⁶ Since formal recognition of animal sentience varies within Europe and around the world, it is perhaps not surprising that views of animal emotions may be controversial and vary across space and time. Yet different understandings of what animals actually feel have not prevented writers, artists, and humans in general from anthropomorphizing non-human animals, imagining their inner lives, or relating to them emotionally.

⁸³ Yoko Tawada, *Etüden im Schnee* (Tübingen: konkursbuch Verlag Claudia Gehrke, 2014), 261–267.

⁸⁴ World Animal Protection, "Animal Protection Index: Germany," accessed 1 June 2020, <https://api.worldanimalprotection.org/country/germany>.

⁸⁵ World Animal Protection, "Animal Protection Index: Austria," accessed 1 June 2020, <https://api.worldanimalprotection.org/country/austria>.

⁸⁶ World Animal Protection, "Animal Protection Index: Switzerland," accessed 1 June 2020, <https://api.worldanimalprotection.org/country/switzerland>.

The following essays illuminate different aspects of the affective relationships between humans and non-human animals or machines through analyses of significant texts and moments in modern German cultural history. They are organized in three parts based on common themes: Part I: Emotions and Human/Non-Human Boundaries; Part II: Emotional Functions of Non-Humans; and Part III: Empathic Understanding between Humans and Non-Humans. Within each part, the essays are presented in chronological order of the cultural periods and sources discussed.

Part I illuminates concerns about emotions and the human/non-human boundary in modern German cultural history. These three contributions attest to the important role that emotions played in scientific, philosophical, literary, and aesthetic discourses that attempted to reinforce distinctions or blur the boundaries between humans, non-human animals, and machines. Madalena Meirosu draws on affect theory to explore the interaction of the personal and the impersonal and the boundary between human and non-human in E. T. A. Hoffmann's story "Die Automate" ("The Automata," 1814). Her essay considers the implications of the emotional reactions of the human characters to the Turk, the central automaton in the story, and shows that their encounter with the Turk blurs the boundary between the human and non-human by giving rise to a personal affective response best described in impersonal and mechanical terms. Meirosu demonstrates that the Turk, the human characters, and other automata in the story are all connected through webs of affect that control bodies, feelings, actions, and sanity. Her essay shows the need to posit, both in literature and psychosis, an impersonal "influencing machine" that dominates the personal psyche and speaks to the emotional turmoil experienced by human beings in a post-industrialized age, as they struggle to adapt to an increasingly regulated, technologized, and threatening world, one where bodies and machines have lost their solid boundaries and have begun to fluidly dissolve into each other.

Derek Hillard examines discourses on emotion and the human/non-human boundary in his essay on animals, empathy, and aesthetics in Germany around 1900. Does a shared substratum of feeling enable humans to identify with non-human animals? For humanists since the early modern period, one of the characteristics that distinguishes humans from non-human animals is an aesthetic sense – the ability to experience beauty, sublimity, ugliness, or feel disgust – in general, to appreciate aesthetic differences. Hillard's essay provides insight into different positions of German philosophers and zoologists, such as Adolf Göller, Johannes Volkelt, Karl Möbius, and Theodor Lipps. He shows that many of these thinkers contested the existence of an animal aesthetic, while others posited an unproblematic human identification with animals. Still other thinkers,

Hillard argues, imagined that animals have an aesthetic and even made feelings seem less human because they were infused with something animalistic, thereby granting animals a new kind of autonomy.

Jared Poley probes the interrelated history of biology and emotion studies. He argues that studies of the biological parameters of emotional experience provided a foundation upon which larger claims about the difference and sameness of the animal, the human, and the artificial were built. This chapter allows us to examine, through the history of science, how emotion was conceived as being an essential quality of being human, just as it was also found in other forms of life – both biological and artificial. By conceptualizing emotion in material ways, scientists before 1960 broadened the category in ways that allowed the inclusion of the non-human and the artificial as beings capable of experiencing emotion.

Part II explores different emotional functions of representations of non-human animals and machines in modern German cultural history. Taken together, these three chapters suggest that some possible emotional functions of non-human animals and machines include shaping what was considered human, signaling humans' capacity for sentiment and emotional attachment, establishing group identity and solidarity, critiquing Enlightenment discourses of rationality, and evoking unfamiliar dimensions of feeling. In doing so, non-human animals and machines gained gendered attributes and functions, particularly in regard to signaling humans' emotional capacities and establishing group identity and solidarity. Sarah L. Leonard examines the emotional functions that non-human animals served in early photography in the German States. Building upon John Berger's argument in his influential essay "Why Look at Animals?" (1980), Leonard points out that animals increasingly served emotional roles, as pets that encouraged particular kinds of affective learning and responses and as animals in the zoo that prompted carefully controlled fear and fascination. As the only animal to make regular appearances alongside their human counterparts in daguerreotype portraits from 1840–1860, dogs served important functions in the photographic studio and helped shape what was considered "human." Leonard argues that in the artificial spaces of the photographic studios, dogs, who helped relax the faces and the bodies of human sitters, and therefore, achieve an ideal expression in terms of emotional tone and gender performance, signaled the distinction between the animal and the human and suggested that the humans in the portrait were capable of sentiment and attachment.

Brett Martz focuses on how Robert Musil depicts human characters relating their dispositions to the inner lives of animals in order to explore the limits and alternatives to emotions structured by quotidian existence. His reading of Musil's

short text “Kann ein Pferd lachen?” (“Can a Horse Laugh?” 1936) suggests that the application of anthropocentric concepts onto the behavior and inner life of a horse reveals not the shortcomings of the animal, but rather the arbitrary constraints of human frameworks. Musil’s novella “Die Portugiesin” (“The Lady from Portugal,” 1923) offers a potentially more optimistic assessment of human emotions and their relationship to vulnerability and structures of power. Focusing on an ailing cat, the novella suggests that ineffable emotions may not only deepen connections between humans and non-humans, but may also provide an alternative to gendered discourses and structures of oppression. Martz suggests that the protagonist Herr von Ketten is able to glimpse ways of relating outside of his own masculine acculturation through his confrontation with the Other, embodied not only by the Lady from Portugal, but also the cat.

Erika Quinn shows how Thea von Harbou’s *Metropolis* (1925) uses machines and robots – human-made tools that lack emotions – to interrogate what it means to be authentically human in a modern world. While *Metropolis* has been analyzed through the lenses of Marxist theory and literary criticism, this highly melodramatic text has not yet been addressed in emotions scholarship. Quinn argues that Harbou’s novel not only points out the dangers of machines replacing human labor, but through its interrogation of authenticity, also emphasizes human affective positions of aversion and attraction in regard to the Other as exhibited by various men’s reactions to the robot Maria. By referencing contemporary thought about group dynamics and emotions, Quinn explores the realms of emotional styles and their function in creating group identity and solidarity, particularly by drawing contrasts with the ultimate Others, machines and robots.

Part III considers the capacity of humans to empathize with non-humans and vice versa as suggested in examples of literature, art, photography, and children’s fiction in modern German cultural history. These three chapters analyze different kinds of affective understanding and influence between humans and non-human animals and machines, ranging from automata that can read human thoughts and feelings, to humans who empathize with caged animals, to children who nurture affective bonds of friendship with social robots. Claudia Mueller-Greene examines how E. T. A. Hoffmann’s “Die Automate” (“The Automata,” 1814) represents and reflects human-machine interactions, with a particular focus on emotion and the role of music. Her essay shows how Hoffmann’s multi-layered text repeatedly undermines the human protagonists’ low opinions of machines. Mueller-Greene argues that “The Automata” proves to be uncannily prescient by conjuring up technologies capable of reading human minds and feelings, predicting future developments, simulating human voices, and evoking strong emotional responses. Mueller-Greene ponders a number of questions

that arise from Hoffmann's Romantic tale and brings concepts of other thinkers from the nineteenth century to the present into a diachronic and interdisciplinary dialogue on emotion, music, and machines.

Andrea Meyertholen interrogates the human/non-human divide by studying early twentieth-century artistic, literary, and photographic representations of animals displayed in cages in order to explore the limits of human empathy with and sympathy for them. She points out that the cage, a structure literally and figuratively framing our experience, creates meaning depending on standpoint (inside/outside), inhabitant (human/animal), and cultural connotation (prison/zoo). Meyertholen's literary and visual analyses reveal that the presence of bars affects how emotional depth is ascribed or denied to caged inhabitants, causing us to "humanize" animals in such a way that we believe to experience emotions in and with them. Meyertholen explores not only where we draw the line between animal and human, but where we are willing to draw it and why.

Holly Yanacek examines the depiction of social robots and child-robot friendship in recent German children's literature, including in the books *Schlupp vom grünen Stern* (Schlupp from the green star, 1974), *Orbis Abenteuer* (Orbi's adventures, 2011), *Roboter Sam* (Robot Sam, 2017), and *Roki: Mein Freund mit Herz und Schraube* (Roki: my friend with heart and bolt, 2018). Her essay focuses on the feelings of emotional attachment that the child protagonists develop for their robot friends and considers the extent to which these social robots serve as positive identification figures for child readers. Although the robots depicted in these books are non-threatening, toylike machines that bear little resemblance to the human characters, these stories blur the boundary between humans and machines by attributing emotions or a "soul" to the robot characters. Taken together, these books imagine a world in which humans and robots can peacefully coexist and even form meaningful friendships that do not threaten human relationships. Yanacek's analysis demonstrates that the greatest aim of these children's books is to teach respect and compassion for all life forms, both human and nonhuman, organic and artificial.

Animals, Machines, and AI ultimately sheds light on the centrality of non-human animals and machines within the context of the human emotional world. Much of this volume was written during the COVID-19 pandemic, which made us editors more keenly aware of the importance of non-human animals, machines, and technology in our daily emotional lives. Changing relationships between humans and non-human animals appear to be what "created" COVID-19. We can likely expect more such viruses in the future as a result of how we humans have altered our environment, specifically our relationship to non-human animal life. On a more personal note, those of us who live with domestic animal companions have turned to them even more than usual for comfort, affection, and distraction.

So, too, have our companion animals come to depend on us even more than before since they became accustomed to our continued presence at home during the months we spent working remotely. While quarantined in our homes, many of us became dependent on digital technology in much more significant ways. These digital technologies, which now play a central role in mediating human relationships, can provoke frustration, loneliness, or fatigue. Yet they can also facilitate human communication, emotional connection, and care when in-person contact is restricted or not available, for example, for remote learning, virtual dating, telemedicine, and online therapy and counseling.

Bibliography

- Ahmed, Sara. *The Cultural Politics of Emotion* (New York: Routledge, 2004).
- Ahmed, Sara. *Living a Feminist Life* (Durham, NC: Duke UP, 2017).
- Anderson, Mark M., ed. "Jakob von Uexküll: From *The Environment and the Inner World of Animals*," in Franz Kafka *The Metamorphosis*. Ed. Mark M. Anderson (New York: W. W. Norton, 2016), 95–99.
- Arluke, Arnold, and Clinton R. Sanders. *Regarding Animals* (Philadelphia: Temple UP, 1996).
- Barrett, Lisa Feldman. *How Emotions Are Made: The Secret Life of the Brain* (New York: Houghton Mifflin Harcourt, 2017).
- Benjamin, Walter. "Theses on the Philosophy of History," in *Illuminations*. Trans. Harry Zohn (New York: Harcourt Brace Jovanovich, Inc., 1968).
- Biro, Matthew. *The Dada Cyborg: Visions of the New Human in Weimar Berlin* (Minneapolis: U of Minnesota Press, 2009).
- Boddice, Rob. *The History of Emotions* (Manchester: Manchester UP, 2018).
- Die Bundesregierung. "Zwischenbericht: Ein Jahr KI-Strategie." *Nationale Strategie für Künstliche Intelligenz*, November 2019. Accessed 28 May 2020. <https://www.ki-strategie-deutschland.de/home.html>.
- Butler, Judith. *Bodies that Matter: On the Discursive Limits of "Sex"* (New York: Routledge, 1993).
- Damasio, Antonio. *The Strange Order of Things: Life, Feeling, and the Making of Cultures* (New York: Pantheon, 2018).
- Darwin, Charles. *The Expression of the Emotions in Man and Animals* (Oxford: Oxford UP, 2009).
- Deutsche Bahn. "Smart Services: The 'Siri for Train Travelers.'" Accessed 1 April 2021. <https://www.deutschebahn.com/en/Digitalization/technology/innovations/Smart-services-the-Siri-for-train-travelers-4167438>.
- Downes, Stephanie, Sally Holloway, and Sarah Randles. "A Feeling for Things, Past and Present," in *Feeling Things: Objects and Emotions through History*. Eds. Stephanie Downes, Sally Holloway, and Sarah Randles (Oxford: Oxford UP, 2018), 8–26.
- Dumouchel, Paul, and Luisa Damiano. *Living with Robots*. Trans. Malcolm DeBevoise (Cambridge, MA: Harvard UP, 2017).

- Eitler, Pascal. "Tierliebe und Menschenführung. Eine genealogische Perspektive auf das 19. und 20. Jahrhundert," in *Tierstudien 3: Tierliebe*. Eds. Jessica Ullrich and Friedrich Weltzien (Berlin: Neofelis Verlag, 2013), 40–48.
- Eitler, Pascal. "Übertragungsgefahr: Zur Emotionalisierung und Verwissenschaftlichung des Mensch-Tier-Verhältnisses im deutschen Kaiserreich," in *Rationalisierungen des Gefühls: Zum Verhältnis von Wissenschaft und Emotionen 1880–1930*. Eds. Uffa Jensen and Daniel Morat (Munich: Wilhelm Fink, 2008), 171–187.
- Eksteins, Modris. *Rites of Spring: The Great War and the Birth of the Modern Age* (New York: Anchor Books, 1990).
- Elder, Alexis M. *Friendship, Robots, and Social Media: False Friends and Second Selves* (New York: Routledge, 2018).
- Elias, Norbert. *Über den Prozess der Zivilisation* (Basel: Haus zum Falken, 1939).
- European Union. "Germany AI Strategy Report." *European Commission – Knowledge for Policy*. Accessed 25 May 2020. https://ec.europa.eu/knowledge4policy/ai-watch/germany-ai-strategy-report_en.
- Evans, Richard J. *The Third Reich at War: 1939–1945* (London: Penguin, 2010).
- Febvre, Lucien. "La sensibilité et l'histoire: Comment reconstituer la vie affective d'autrefois?" *Annales d'histoire sociale* 3 (Jan.–Jun. 1941): 5–20.
- Frevert, Ute. "Defining Emotions: Concepts and Debates over Three Centuries," in *Emotional Lexicons: Continuity and Change in the Vocabulary of Feeling 1700–2000*. Eds. Ute Frevert et al. (Oxford: Oxford UP, 2014), 1–31.
- Frevert, Ute. *Emotions in History – Lost and Found* (Budapest: Central European UP, 2011).
- Fritzsche, Sonja. *Science Fiction Literature in East Germany* (Oxford: Peter Lang, 2006).
- Gammerl, Benno. "Emotional Styles – Concepts and Challenges," *Rethinking History* 15, no. 2 (June 2012): 161–175.
- Gay, Peter. *The Cultivation of Hatred: Vol. 3 of The Bourgeois Experience: Victoria to Freud* (New York: W. W. Norton, 1993).
- Gay, Peter. *Freud for Historians* (Oxford: Oxford UP, 1986).
- Goldstein, L. "Übersicht der neuern Verhandlungen über die Vivisektionsfrage. Nach den Arbeiten von v. Weber, Iatros, Hermann, Ludwig, Heidenhain, usw.," in *Schmidt's Jahrbücher der in- und ausländischen gesammten Medicin* 182, no. 3 (1879): 281–285.
- Greve, Karsten. "Die Science-Fiction-Literatur der DDR." (PhD diss., Freie Universität Berlin, 2015).
- Grusin, Richard, ed. *The Nonhuman Turn* (Minneapolis: U of Minnesota Press, 2015).
- Hampshire, Stewart. "Biology, Machines, and Humanity," in *The Boundaries of Humanity: Humans, Animals, Machines*. Eds. James J. Sheehan and Morton Sosna (Berkeley: UC Press, 1991), 253–258.
- Hanhardt, Arthur M, Jr. "German Democratic Republic," in *Communism in Eastern Europe*. Ed. Teresa Rakowska-Harmstone (Bloomington: Indiana UP, 1984), 137–161.
- Haraway, Donna. *The Companion Species Manifesto: Dogs, People, and Significant Otherness* (Chicago: Prickly Paradigm Press, 2003).
- Haraway, Donna J. "A Cyborg Manifesto," in *Simians, Cyborgs, and Women: The Reinvention of Nature* (New York: Routledge, 1991), 149–181.
- Hauptmann, Gerhart. "Bahnwärter Thiel," in *Erzählungen* (Gütersloh: C. Bertelsmann, 1957), 28–63.
- Hausen, Karin. "Family and Role-Division: The Polarisation of Sexual Stereotypes in the Nineteenth Century – an Aspect of the Dissociation of Work and Family Life," in *The*

- German Family: Essays on the Social History of the Family in Nineteenth- and Twentieth-Century Germany*. Eds. Richard J. Evans and W. R. Lee (London: Croom Helm, 1981), 51–83.
- Heine, Heinrich. “Ludwig Börne: A Memorial,” trans. Frederic Ewen and Robert C. Holub, in *The Romantic School and Other Essays*. Eds. Jost Hermand and Robert C. Holub (New York: Continuum, 2002), 261–284.
- Hoffmann, E. T. A. “Der Sandmann,” in *Werke*, vol. 2 (Frankfurt a. M.: Insel, 1967), 7–40.
- Hull, Isabel V. *Sexuality, State, and Civil Society in Germany, 1700–1815* (Ithaca, NY: Cornell UP, 1997).
- James, William. *The Principles of Psychology*, vol. 2 (London: Macmillan, 1890).
- Jaskot, Paul B. “Gerhard Richter and Adolf Eichmann,” *Oxford Art Journal* 28, no. 3 (2005): 457–478.
- Jünger, Ernst. *On Pain*. Trans. David C. Durst (Candor, NY: Telos Press, 2008).
- Kafka, Franz. “In unserer Synagoge . . .” in *Die Erzählungen und andere ausgewählte Prosa*. Ed. Roger Hermes (Frankfurt a. M.: Fischer, 2010), 405–409.
- Kakoudaki, Despina. *Anatomy of a Robot: Literature, Cinema, and the Cultural Work of Artificial People* (New Brunswick, NJ: Rutgers UP, 2014).
- Kapp, Ernst. *Grundlinien einer Philosophie der Technik. Zur Entstehungsgeschichte der Cultur aus neuen Gesichtspunkten* (Braunschweig: Westermann, 1877).
- Klothmann, Nastasja. *Gefühlswelten im Zoo: Eine Emotionsgeschichte 1900–1945* (Bielefeld: transcript, 2015).
- Lange, C. G. *Ueber Gemüthsbewegungen. Eine Psycho-Physiologische Studie* (Leipzig: Theodor Thomas, 1887).
- Lefebvre, Georges. *La Grande Peur de 1789* (Paris: Librairie Armand Colin, 1932).
- Meier-Welcker, Hans. *Aufzeichnungen eines Generalstabsoffiziers 1939–1942* (Freiburg im Breisgau: Rombach, 1982).
- Melena, Elpis. *Gemma; oder, Tugend und Laster* (Munich: G. Franz’sche Verlagshandlung, 1877).
- Mohnhaupt, J. W. *The Zookeepers’ War: An Incredible True Story from the Cold War*. Trans. Shelley Frisch (New York: Simon & Schuster, 2017).
- Nussbaum, Martha. *Political Emotions: Why Love Matters for Justice* (Cambridge, MA: Harvard UP, 2013).
- Nussbaum, Martha. *Upheavals of Thought: The Intelligence of Emotions* (Cambridge: Cambridge UP, 2001).
- Overy, Richard. *Why the Allies Won* (New York: W. W. Norton, 1995).
- Perry, Heather R. *Recycling the Disabled: Army, Medicine, and Modernity in WWI Germany* (Manchester: Manchester UP, 2014).
- Plamper, Jan. *The History of Emotions: An Introduction* (Oxford: Oxford UP, 2017).
- Raulff, Ulrich. *Farewell to the Horse: A Cultural History*. Trans. Ruth Ahmedzai Kemp (New York: Liveright, 2018).
- Reddy, William. *The Navigation of Feeling: A Framework for the History of Emotions* (Cambridge: Cambridge UP, 2001).
- Rilke, Rainer Maria. “Der Panther,” in *Werke in drei Bänden*, vol. 1, *Gedicht-Zyklen* (Frankfurt a. M.: Insel, 1966), 261.
- Rosenwein, Barbara. *Emotional Communities in the Early Middle Ages* (Ithaca, NY: Cornell UP, 2006).

- Sabean, David, and Hans Medick, eds. *Interest and Emotions: Essays on the Study of Family and Kinship* (Cambridge: Cambridge UP, 1986).
- Safina, Carl. *Beyond Words: What Animals Think and Feel* (New York: Henry Holt, 2015).
- Schafer, Elizabeth D. "Animals, use of," in *The European Powers in the First World War, an Encyclopedia*. Ed. Spencer C. Tucker (London: Routledge, 1999), 52–54.
- Schneider, Peter. *The German Comedy*. Trans. Philip Boehm and Leigh Hafrey (New York: Farrar, Straus and Giroux, 1991).
- Stearns, Peter N., and Carol Z. Stearns. "Emotionology: Clarifying the History of Emotions and Emotional Standards," *American Historical Review* 90 (1985): 813–836.
- Stevenson, David. *Cataclysm: The First World War as Political Tragedy* (New York: Basic Books, 2009).
- Tawada, Yoko. *Etüden im Schnee* (Tübingen: konkursbuch Verlag Claudia Gehrke, 2014).
- Tindol, Robert. "The Best Friend of the Murderers: Guard Dogs and the Nazi Holocaust," in *Animals and War: Studies of Europe and North America*. Ed. Ryan Hediger (Boston: Brill, 2013), 105–122.
- Tye, Michael. *Tense Bees and Shell-Shocked Crabs: Are Animals Conscious?* (Oxford: Oxford UP, 2017).
- Uexküll, Jakob von. *Umwelt und Innenwelt der Tiere* (Berlin: Julius Springer, 1909).
- Varner, Gary. "Sentience," in *Critical Terms for Animal Studies*. Ed. Lori Gruen (Chicago: U of Chicago Press, 2018), 356–369.
- Weil, Kari. *Thinking Animals: Why Animal Studies Now?* (New York: Columbia UP, 2012).
- World Animal Protection. "Animal Protection Index: Austria." Accessed 1 June 2020. <https://api.worldanimalprotection.org/country/austria>.
- World Animal Protection. "Animal Protection Index: Germany." Accessed 1 June 2020. <https://api.worldanimalprotection.org/country/germany>.
- World Animal Protection. "Animal Protection Index: Switzerland." Accessed 1 June 2020. <https://api.worldanimalprotection.org/country/switzerland>.
- Yanacek, Holly A. "Mobilising Disgust and Compassion: Elpis Melena's *Gemma; oder, Tugend und Laster* (1877) and the Anti-Vivisection Movement." *German Life and Letters* 73, no. 4 (October 2020): 564–580.