Introduction: Experior

Humanity. What is that? What does it mean? It is, in a simple sense, a marker of species. But then, I have spent almost two decades thinking and writing about the history of the ways in which this species has defined itself, marked itself out as distinct or superior, drawn lines of exclusion at the expense of other animals and, often, other beings which sought to lay equal claim to the name 'human'.[1] In a more complex yet narrower sense, 'humanity' encompasses a set of practices comprising dynamically related clusters of experiences, emotions, sensations and thought, that *certain* humans have and do that define them, and only them, as such. Since the Enlightenment at least, 'humanity' has functioned as a synonym, more or less, of sympathy, compassion and pity and, much more recently, of empathy and altruism. It has marked a passional disposition of regard for others, whether human or other animal, with accompanying acts of succour for their suffering. It was definitive of that other Enlightenment master category, *civilization*. In this narrow sense it should be immediately clear that 'humanity' is political: its practice implies an embodied or an embrained quality limited to those who know (1) how to claim it; (2) how to dispense it; (3) how to discriminate among those deserving of it, or not; and (4) of its social value and function. This book, in its broadest terms, is about a breach in this compound knowledge, in the decades either side of 1900.

What I mean by this is that the meaning and experience of 'humanity', including its rhetorical construction, its emotional qualities and its associated activities, changed over time. At the moment of rupture, when

[1] Rob Boddice, 'The Moral Status of Animals and the Historical Human Cachet', *JAC: A Journal of Rhetoric, Culture and Politics*, 30:3–4 (2010); Rob Boddice, 'The End of Anthropocentrism', in *Anthropocentrism: Humans, Animals, Environments*, ed. Rob Boddice (Leiden: Brill, 2011); 'The Historical Animal Mind: "Sagacity" in Nineteenth-Century Britain', in *Experiencing Animals: Encounters between Animal and Human Minds*, ed. Robert W. Mitchell and Julie Smith (New York: Columbia University Press, 2012); 'Bestiality in a Time of Smallpox: Dr Jenner and the "Modern Chimera"', in *Exploring Animal Encounters: Philosophical, Cultural and Historical Perspectives*, ed. Dominik Ohrem and Matthew Calarco (London: Palgrave, 2018).

different versions of 'humanity' might be said to have been in competition, it seemed that civilization itself was at stake: on the one side, a prevailing understanding of humanity as Christian compassion; on the other side, an increasingly complex 'faith' in scientific knowledge and its production, coupled with the practices of that production. In fact, the book is only really concerned with this other side. Many before me have attempted to capture the history of the former. But the equation of scientific knowledge production to a practice of humanity is largely uncharted territory. As such, the book is a contribution to a growing body of work on the history of humanitarianism. What it shares with that body of work is a focus on the particular formation of an affective disposition and an accompanying set of practices, but it is at a stage of remove from the historiography's specific foci on nursing, explicitly humanitarian institutions such as the Red Cross and their protocols, philanthropy, war relief or abolition.[2] What is distinct about the humanitarianism in this case is that the cultivated feeling was experienced without having recourse to the *direct* experience of assisting or relieving other humans, and that there was a perceived need to justify and defend this kind of humanitarianism from its detractors who saw it precisely as the opposite of humane. Vivisection seems, on the face of it, to sit at odds with the rise of animal welfare as part of a narrative of humanitarian expansion in the nineteenth century, and accordingly the arguments of medical scientists and their allies with respect to the humanitarianism of experimentation have been essentially overlooked.[3]

[2] See Rebecca Gill, *Calculating Compassion: Humanity and Relief in War, Britain, 1870–1914* (Manchester: Manchester University Press, 2013); Karen Halttunen, 'Humanitarianism and the Pornography of Pain in Anglo-American Culture', *American Historical Review*, 100 (1995): 303–34; Thomas L. Haskell, 'Capitalism and the Origins of the Humanitarian Sensibility', parts I and II, *American Historical Review*, 90 (1985): 339–61, 547–66; John Hutchison, *Champions of Charity: War and the Rise of the Red Cross* (Boulder, CO: Westview Press, 1996); Dolores Martín Moruno, Brenda Lynn Edgar and Marie Leyder, 'Feminist Perspectives on the History of Humanitarian Relief (1870–1945)', *Medicine, Conflict and Survival*, 36 (2020): 2–18; Silvia Salvatici, *A History of Humanitarianism, 1755–1989: In the Name of Others* (Manchester: Manchester University Press, 2019); Bertrand Taithe, '"Cold Calculation in the Faces of Horrors?" Pity, Compassion and the Making of Humanitarian Protocols', in *Medicine, Emotion and Disease, 1700–1950*, ed. Fay Bound Alberti (Houdmills, UK: Palgrave, 2006), 79–99; Bertand Taithe and John Borton, 'History, Memory and "Lessons Learnt" from Humanitarian Practitioners', *European Review of History: Revue européenne d'histoire*, 23 (2016): 210–24.

[3] I have emphasized elsewhere the historiographical tendency to assume the historical position of antivivisectionists and the tendency to accept without criticism that animal-loving vivisectors, or experimenting humanitarians, must have had split personalities or, at best, conflicted emotions, Jekyll-and-Hyde-like. For discursion on this point, see Rob Boddice, *The Science of Sympathy: Morality, Evolution and Victorian Civilization* (Urbana: University of Illinois Press, 2016), 75–92, and the following for explicit

Hence this book's title, *Humane Professions*. It conjures with a variety of meanings that aim to capture, on the one hand, the rise of the professional and specialist medical scientist, whose métier was animal experimentation, and whose guiding principle was 'humanity', or the reduction of the aggregate of suffering in the world. On the other hand, it highlights the rhetorical rehearsal – the discursive *profession* – of scientific practices as humane and humanitarian, and connects these often defensive professions, in turn, to meaningful changes in the experience of doing science. For decades, beginning in the 1870s, there was significant emotion work on the part of medical researchers to internalize the practices of animal experimentation as practices of sympathy, to justify a certain affective coolness that was necessary for laboratory work and transform it into a humanitarian medical masculinity. This I have characterized as a kind of conscious callousness – William Osler famously put it under the head of *aequanimitas*, or imperturbability – that suspended immediate aesthetic responses to the sight of suffering and projected forwards to the far-reaching goods that such work seemed to promise.[4] This emotion work was, for many, essential to the formation of the scientific self: a way of justifying means by probable ends, and a way of translating horror into heart work. Routine practices of vivisection became both banal to the practitioner as well as being projected as medical expressions of a well-intentioned mercy.

The book is therefore a logical sequel to my 2016 book, *The Science of Sympathy*, which demonstrated a connection between new ideas of sympathy as 'social glue' that originated in Charles Darwin's (1809–82) *Descent of Man*, and scientific practices of this new sympathy in vivisection, vaccination and eugenics.[5] To the extent that *Science of Sympathy* discussed vivisection and physiology, there is some overlap here, especially in Chapter 1. But my focus in that book was principally on Britain and, concerning vivisection, was limited to the 1870s and 1880s. I use

examples: Patrizia Guarnieri, 'Mortitz Schiff (1823–96): Experimental Physiology and Noble Sentiment in Florence', in *Vivisection in Historical Perspective*, ed. Rupke, 106; Hilda Kean, '"The Smooth Cool Men of Science": The Feminist and Socialist Response to Vivisection', *History Workshop Journal*, 40 (1995): 19, 23; Stewart Richards, 'Drawing the Life-Blood of Physiology: Vivisection and the Physiologists' Dilemma, 1870–1900', *Annals of Science*, 43 (1996): 31, 47–80; Paul S. White, 'The Experimental Animal in Victorian Britain', in *Thinking with Animals: New Perspectives on Anthropomorphism*, ed. Lorraine Daston and Gregg Mitman (New York: Columbia University Press, 2005), 62, 74; Paul S. White, 'Sympathy under the Knife: Experimentation and Emotion in Late Victorian Medicine', in *Medicine, Emotion and Disease, 1700–1950*, ed. Fay Bound Alberti (Houndmills, UK: Palgrave, 2006); Paul S. White, 'Darwin Wept: Science and the Sentimental Subject', *Journal of Victorian Culture*, 16 (2011): 195–213.

[4] See Boddice, *Science of Sympathy*, *passim*. For Osler, see Chapter 2. For physiologists, see Chapters 3 and 4.

[5] Boddice, *Science of Sympathy*.

this as a starting point in *Humane Professions*, expanding the scope to include the period up until the First World War, and expanding the range to include Germany and the USA. It should perhaps be stated explicitly at the outset, therefore, that while the historiography concerning antivivisection has foregrounded questions of animal welfare, of the relative status of animals in relation to humans, and of the nature and politics of pain, here I allude to these things only tangentially, to the extent that they played a part in the defence of experimental medicine or the experience of experimental medicine, either as discourses or practices of humanity.

Conflagration

Scene: New York, 1911. Lower East Side tenement. Context: epidemic diseases, diphtheria, viral meningitis. Metaphor: fire.

As the flames of disease threatened to raze civilization, the fire-fighting doctors and the sick alike had only one hope: vivisection. Through the knowledge gained by it the conflagration could be doused. Through the medical advances it promised, those who had succumbed to illness were offered a life net. Antivivisectionist society women call out hypocritically from under bird-of-paradise bonnets for the 'life net' to be pulled away: a misplaced mercy for animals as practical mercilessness for humanity.

This striking image (Figure 0.1), which appeared in *Puck* magazine, a popular New York satirical weekly, captures what was at stake for medical science and society as a generation-long transnational controversy over vivisection reached its peak.[6] Its narrative, little studied compared with that of the history of antivivisection itself, was the product of a deliberate campaign, orchestrated from the heart of establishment medicine. The American Medical Association's (AMA's) Council for the Defense of Medical Research, formed in 1908, was to argue the case for animal experimentation in the court of public – not medical – opinion. The battlegrounds for medical research would be the pamphlet, the public lecture and the popular periodical press, especially targeted at women. In putting their plans into action, American society's leading medical scientists utilized the aggregate of more than three decades of experience, on two continents, to combat a determined opposition to the methods of medical research. This book is about that experience. At its core, it is about the strategies employed to try to cement an idea in the public consciousness: that the blood spilt in medical laboratories served a far-reaching human good.

[6] The image and its context are more fully discussed in Chapter 5.

Figure 0.1 'Vivisectional Research', *Puck*, 1911.

There is no comprehensive work on the defence of medical experimentation that examines the entrance, in a coordinated and transnational fashion, of the modern medical establishment into the political arena and into the court of public opinion for the sake of self-preservation.

https://doi.org/10.1017/9781108780087.001 Published online by Cambridge University Press

This is an astonishing lacuna in historical knowledge. Around the turn of the twentieth century, medical research was put on a propaganda footing, its power centralized in increasingly corporate non-governmental bodies. This is the essential dynamic that allows us to understand how medicine's experimental impetus survived largely unchecked, especially in the USA. The activism of this period set a standard for the way in which the world of medicine would talk to the lay public.

The story climaxes around the beginning of the First World War, but has its roots in the second scientific revolution, which was pregnant with possibilities for medical science, and in the processes of specialization. Physiology, toxicology, bacteriology, immunology and surgery went through great innovative changes, based on new experiments on animals, people and society.[7] The experimental impetus in medicine came from Germany and France. It gained traction in Britain around 1870 and soon afterwards in the USA. Throughout this period, beginning perhaps with François Magendie in France in the 1820s, medical experimentation was a challenge to morals, ethics and good taste.[8] We know remarkably little about how the medical response to such opposition was organized, implemented and networked across oceans and across countries. These are the formative moments in the development of modern medicine's public-relations machinery, which in turn reveal its political influence and social authority. The arguments of the medical establishment were complex, attuned to a particular understanding of experimental practice as an affective practice of humanity. Susan Lederer once wrote of American medical 'defenders of unrestricted animal experimentation' that they 'almost exclusively devoted their discussion to appeals to the clinical benefits accruing from vivisection'.[9] This is too narrow an interpretation. Medical scientists claimed an exclusive form of humanity in a carefully managed defensive strategy that was skilfully coordinated and built upon the lived experience of experimental beneficence.

Eminent individuals developed their defence of experimental medicine through a web of close-knit correspondence. Medical advances through vivisection, or the promise of such advances, had put the moral reputation of medicine itself in jeopardy. To combat accusations of cruelty and

[7] The classic reference is Geroge Weisz, *Divide and Conquer: A Comparative History of Medical Specialization* (Oxford: Oxford University Press, 2005).

[8] José Ramón Beromeu-Sánchez, 'Animal Experiments, Vital Forces and Courtrooms: Mateu Orfila, François Magendie and the Study of Poisons in Nineteenth-Century France', *Annals of Science*, 69 (2012): 1–26; Carin Berkowitz, 'Disputed Discovery: Vivisection and Experiment in the 19th Century', *Endeavour*, 30 (2006): 98–102.

[9] Susan Lederer, 'The Controversy over Animal Experimentation in America, 1880–1914', in *Vivisection in Historical Perspective*, ed. Nicolaas Rupke (London: Croom Helm, 1987), 241.

callousness, the medical profession set about publicly emphasizing its humanity. The modern medical scientist as far-sighted humanitarian was both a conscious construction of medical-establishment strategy and a deeply felt and daily practised dispositional attitude. With the formation of councils for the defence of medical research, the lines between propaganda and educational campaigns, between empty rhetoric and lived experience, were often blurred. Meanwhile, significant energy was applied to blocking the passage of laws that would regulate or limit the freedom of medical scientists to experiment as they saw fit.

In Britain, the USA and Germany, the medical profession did successfully control the public image of experimentation while simultaneously keeping legislation at arm's length. The book charts the specific ways in which this was carried out, homing in on the role of 'humanity' in successfully influencing both public policy and public opinion. It is much more difficult to assess the reception of this approach among the lay public, but there are key indicators of this at various points. Without getting ahead of the story too much in advance, it should suffice to say at this point that the particular construction and experience of humanity that medical scientists employed and advertised was often laced with a social, cultural and experiential authority that was further reinforced by allusion to exclusive expertise. Insofar as this is the story of the success of medical-scientific strategy in both politics and public life, it is also the story of the wielding of this authority: the cultural heft of a particular affect.

I approach this story in roughly chronological order, but shift focus to different national theatres throughout. We begin with the outbreak of controversy in England in the 1870s, before following that controversy first to Germany and then to the USA. We then return to England for the continuation of the account as it shifted ground at the beginning of the twentieth century, before resuming the story in America, where new strategies for defending medical experimentation emerged. Throughout, I attempt to keep the connections between the ideas and the personnel involved intact. While national conditions had a major bearing on the nature of the defence in each country, medical scientists and their allies represented, for all intents and purposes, a single community with a coherent moral economy.[10]

[10] Here I use the term 'moral economy' in the specific sense employed by Lorraine Daston, 'The Moral Economy of Science', *Osiris*, 2:10 (1995): 2–24: 'a web of affect-saturated values that stand and function in well-defined relationship to one another', deriving 'stability and integrity' from 'its ties to activities'. The moral economy combines *Denkkollektiv* and *Gefühlskollektiv*, which it expresses through social, bodily and professional practices (4–5). I have developed this approach empirically in *Science of Sympathy* and theoretically in *The History of Emotions* (Manchester: Manchester University Press, 2018), 190ff.

Magic

Medical-scientific research in the generation before the First World War modulated between the tropics of madness and magic, the monstrous and the heroic. Or at least, such was the range of its representation in public. For all their practical finesse, medical scientists grappled with the implications of both poles, and played a significant role in leading the public, and themselves, towards the magical and away from the mad.

Fast-forward to the 1920s, 1930s and 1940s and witness the high era of the doctor hero and of magical medicine.[11] In the preparation of this book, colleagues and peers frequently alerted me to this age of medical pre-eminence. The trope of the medical scientist hero in this period seems to be a matter of common knowledge. It is a matter of some wonder that, only a few years prior, so much seemed to be at stake, and a deep irony that the utilization of medical research in the twentieth century put such heroism in dubious ethical territory, justified more by nationalism and militarism than by humanity per se. But what had ushered in this apotheosis? Was it the First World War? Was it a particular scientific breakthrough that provided practical substantiation for biological magic? Perhaps both played a part, and I will spend some time working through the possibilities, but in general I take a more complex and *longue durée* approach.

The medical scientist as hero or magician had to be forged, which took time and fire. The process of fabrication is, of course, laden with double meaning. In this book I detail the ways in which scientists, through constant practice, constructed a new humanitarianism – a worldview that encompassed the elimination of suffering on a human scale – from the confines of the laboratory. The laboratory was a crucible of intellectual ideals, experimental means and emotional and moral ends. The results of this dynamic interaction were packaged and presented, in a circular fashion, as justification for the experimental method, and substantiation of a priori humanitarian claims. Experimental medicine – physiology, toxicology, bacteriology, immunology, neurology – aimed to salve and save, which in turn made the men who operationalized the experiments (their masculinity will be seen to be important) into saviours.

[11] For a general account, see D. Heyward Brock, 'The Doctor as Dramatic Hero', *Perspectives in Biology and Medicine*, 34 (1991): 279–95; Ross Mckibbin, 'Politics and the Medical Hero: A.J. Cronin's *The Citadel*', *English Historical Review*, 123 (2008): 651–78; Bert Hansen, 'Medical History for the Masses: How American Comic Books Celebrated Heroes of Medicine in the 1940s', *Bulleting of the History of Medicine*, 78 (2004): 148–91; Charles E. Rosenberg, 'Martin Arrowsmith: The Scientists as Hero', *American Quarterly*, 15 (1963): 447–58; Howard Gest, 'Dr. Martin Arrowsmith: Scientist and Medical Hero', *Perspectives in Biology and Medicine*, 35 (1991): 116–24.

It is important to state at the outset that medical scientists, by and large, internalized the humanitarian intent that their methods and materials signified, and believed themselves to be the saviours they claimed to be. A comparison of public statements with an abundance of private correspondence demonstrates a remarkable consistency. Antivivisectionists were denounced in private in less guarded fashion, perhaps, but the argument that antivivisectionists' humanity was false, while theirs was true, was retained. While this in itself is not a radical claim, it nonetheless needs to be stated explicitly because of the temptation to think of medical scientists as duplicitous, their humanitarianism a simple representational veneer that allowed them to experiment with impunity. I maintain that such duplicitousness, did it exist, would have resulted in catastrophe for medical science. Given the external pressure on experimental ethics and the scrutiny on the morals of experimenters themselves, anything but absolute conviction would surely have led to calamitous collapse. There were outliers: cases of ethical breaches and evidence of callousness, but their exceptionality was often employed to highlight the more general rule. It requires a complex analysis to reach an understanding of the making of and the feeling of humanitarianism in laboratory practice, or, put another way, of the lived experience of experimental sympathy and humanity.

Jutta Schickore affirms that 'Experimental reports are not a reliable source of information about what researchers really do in the laboratory', but helpfully the experimenters in this book left far more behind than their formal reports and publications about what they did in their respective laboratories.[12] They wrote, to each other, for popular publications and for speeches before lay audiences, about what they intended to do or had done, why they intended to do it or to have done it, how it would be or was in fact done, and what they felt about the whole thing. They rigorously scrutinized their own methods, as individuals and under institutional observation networks, and enquired into the methods of their peers, self-policing in private so that their public avowals of ethical high-mindedness would not merely ring true, but actually be true (at least as far as they were concerned). In this period, therefore, we probably know more about what researchers really did in the laboratory than at any period before this point. Moreover, we know how they felt about and how they wanted other people to feel about it. This dynamic, of the lived experience of the laboratory on the one hand, and of the expression of that experience, to different audiences, on the other, is critically

[12] Jutta Schickore, *About Method: Experimenters, Snake Venom, and the History of Writing Scientifically* (Chicago: University of Chicago Press, 2017), 5.

important. It provides for us the stakes of laboratory experience as well as an appreciation of the range of meanings and significance of the laboratory, as institutional medical science became more deeply entangled with public interest in experimental practice than perhaps it ever had been before.

The lived reality of experimental feelings notwithstanding, the other implication of forgery remains an important avenue of research. Much of this book concerns the conscious representation of medical science for a non-medical audience. This representation was, on both sides of the Atlantic, carefully controlled by medical scientists themselves and by close allies in the press and in high society. It was, in the face of stiff and often poisonous opposition, necessarily a highly selective and partial view of what experimental research looked and felt like. It dwelt almost entirely on medical success (to the point that experimental failure is subsumed under the narrative of a process that *always* ends well). I will argue that the aggregate of such material played an important role in feeding back on to medical scientists, lionizing them to themselves and bolstering convictions that were increasingly deeply felt. While medical scientists distinguished themselves by their access to specialist knowledge, specialist practices and a community of more or less like-minded experts, they presented themselves to the non-medical world of respected public opinion as pillars of progress, civilization and sensibility.

Here we encounter medical science as genre. Given this high public interest, much of the writing for a lay audience discussed in this book is not scientific writing per se, but writing about science, with the complicity and support of scientists, constructed often by lay writers for lay readers. It is not scientific reporting but scientific *reportage*, heavily editorialized, carefully packaged. This kind of medical writing about experiment is a kind of banal magical realism. What happened as a result of laboratory research, according to the standard plot devices of this literature, was nothing short of *miraculous*, yet miracles of this type could be thoroughly described and explained, if one only looked into the details (although the details were not typically supplied). The reader, therefore, was presented with a stimulus to awe, but commanded to ground it in reason, and to take such reason on trust. The humanitarian marvels of modern medicine were indeed the most modern of 'wonders': secular, worldly, technical, professional, procedural and empirical. To a large extent, they were also hidden from view, not necessarily because there was 'something to hide', but because of a lack of faith that the intelligent public was intelligent or experienced enough. When defending themselves before legislators, this defence was often offered.

Madness

Importantly, this genre, in its infancy, had to compete with its polar opposite, and was much less assured of the victory that would follow in the post-war years. I have previously written about the emergence of a popular discourse of scientific madness and excess that played on the heavy emphasis, coming from within science itself, on experiment in the mode of an unbounded curiosity.[13] The sequestered scientist, unchecked by social mores and lost to religion, was not likely to let 'I dare not' wait upon 'I would'. Poor cats. A host of other animals, including other humans, were the further literary victims of these men without feeling, these men of pure intellect and hardened hearts. From the early exemplar of Mary Shelley's *Frankenstein* through to the accounts of *Dr Jekyll and Mr Hyde*, *The Island of Doctor Moreau*, and the unfeeling scientist in *The Picture of Dorian Gray*, callousness and cruelty had become popular leitmotivs in literary representations of science by the beginning of the twentieth century.[14] The scientist monster in literature was drawn from anecdotal evidence in the real world of science, but also fed back into the real-world denunciation of scientists by their opponents, suggestive of a portent of moral and civilizational doom in their hands. Yet for all of these direct allusions to mad doctors and evil scientists, it was in another of H. G. Wells' novels that we encounter, by a sense of remove, what many believed to be at stake if the scientific vision be allowed to guide humanity.

The War of the Worlds was first published serially in *Pearson's Magazine* in 1897, being republished as a novel the following year. It was framed by the value of science and introduced in terms that would make sense to the popular scientific imagination. The Martians, with their superior intelligence, watched humanity with their own scientific gaze: 'as men busied themselves about their various concerns they were scrutinised and studied, perhaps as narrowly as a man with a microscope might scrutinise the transient creatures that swarm and multiply in a drop of water'. If men had an 'empire over matter', their complacency would be shattered by a species that claimed empire over them. Wells asked his readers, implicitly, to reflect on what they did, for 'across the gulf of space, minds that are to our minds as ours are to those of the beasts that perish, intellects vast and cool and unsympathetic, regarded this earth with envious eyes, and slowly and surely

[13] Boddice, *Science of Sympathy*, 58–62. See also Anne Stiles, *Popular Fiction and Brain Science in the Late Nineteenth Century* (Cambridge: Cambridge University Press, 2012).

[14] Mary Shelley, *Frankenstein; or, the Modern Prometheus* (London: Lackington, Hughes, Harding, Mavor, & Jones, 1818); Robert Louis Stevenson, *The Strange Case of Dr Jekyll and Mr Hyde* (London: Longmans, Green, 1886); H. G. Wells, *The Island of Doctor Moreau* (1896; London: Heinemann, 1921); Oscar Wilde, *The Picture of Dorian Gray* (1891; New York: Mondial, 2015).

drew their plans against us'.[15] This description, of the vast intellect housed in a merciless, unfeeling body, was a description commonly used against experimental scientists by their opponents. They sought, so it was claimed, a dominion over nature that went beyond God's will, usurping God, in fact, and claiming the earth for themselves against the better nature of compassionate, God-fearing people, who properly understood the duty of mercy and the quality of conscience. Wells captured a popular fear that experiment might extend to everyone; that rapacious curiosity would know no limits. This trope of a genius couched in madness was the cultural fabric into which antivivisectionist arguments were woven. To defend experimental medicine was to diminish these fears and emphasize, on the one hand, the miraculous ends of scientific work, and on the other, the greater good for which this work was done.

The Greatest Happiness for the Greatest Number?

What is the place of utilitarianism in this story? Much has been made, and rightly, of the greatest happiness for the greatest number argument within medical and scientific ethics. The utilitarian maxim drills down to the moral justification for experimentation, especially when experimentation seems to increase suffering in the moment. Experimenters forecasting a great benefit to humanity in the long run are not by any means limited to this period, nor did they invent it. But something is distinctly different about the ways in which medical science specialized and proliferated from the 1870s. The utilitarian maxim was, on occasion, doled out word for word. It was more or less always implicit. But most of the people who figure in this book did not self-identify as utilitarians *first*, and if we ignore what they said and thought about themselves in order to reduce them to a simple utilitarianism calculus then we shall miss the point and misrepresent what was at stake for them. Most, especially in the earlier period, rooted their ideas much more squarely in Darwinism (as it was, if this even needs to be said, not as it would become), and Darwin's contribution in *The Descent of Man* was a biocultural antidote to utilitarianism's cold calculations.[16] It implicated the human, at the level of feeling, of experience, as an emblem, as an exemplar and as a practitioner of evolved civilization. The moral calculus of experimental medicine was *lived*. As such, the claim that medical research and experimentation would have beneficent results in the long run was proffered as an article of individual

[15] H. G. Wells, *The War of the Worlds* (London: Heinemann, 1898), 1–2.
[16] Charles Darwin, *The Descent of Man and Selection in Relation to Sex* (London: John Murray, 1871).

and collective *faith*. It was a claim that ran to the heart of who medical scientists believed themselves to be, insofar as what they *did* was conflated with who they *were*. We could call this scientism and it would not be inaccurate. But the protagonists in this story would not (or not all) have seen it that way. Science was necessarily formational, through its practices, of a worldview. For all that their avowed objectivity has been demonstrated to have been an affect, this affect was nonetheless invisible to those who practised it.[17] The attachment of the medical scientists documented here to narratives of utility and to the rhetoric of compassion was no empty ruse. They genuinely believed, and their belief was built upon empirical grounds. It was a belief that could theoretically be proven by and through the laboratory. It was a belief that compassion inhered in medical research. Medical researchers were the vanguard of evolutionary development themselves, as representatives of humanity's most progressive state. Their influence, along Darwinian lines, would encompass the rest of (less-evolved) society such that society would enjoy the protection borne of the vision of those more advanced than the majority. It was the perfect entanglement of biological adaptation (in this case, mental evolution) and the power of cultural influence. Society was not in a state of nature, in Darwinian terms, but in a state of domestication, a 'garden' in T. H. Huxley's (1825–95) terms.[18] It was therefore subject to artificial selection, manipulation, an imposed set of constraints on future development. Medical researchers represented a major group of 'gardeners', doing what was best for society by virtue of their own evolved state, while limiting the forces of evolution for everyone else. The story of experiment in these years is the story of a lived experience and practice of bioculture. The blueprint was Darwin's *Descent*, as interpreted by an army of followers.

Importantly, then, this is not a story of civilization as defined by an ideology or a philosophy, but of a practice believed to have emerged directly from biology, into a cultural context that could subsequently be formed in its image. In her extensive intellectual history of utilitarianism Cathy Gere demonstrates that for this philosophy's protagonists, from Hobbes to Bentham, what lay at its core was an idea about human nature.[19] Government along utilitarian lines was about guiding and limiting that nature, to make the best of humans' desire for pleasure over and against their capacities to inflict pain in pursuit of it. But this view of human nature never had firm biological roots, however much the idea

[17] Lorraine Daston and Peter Galison, *Objectivity* (New York: Zone Books, 2007).
[18] T. H. Huxley, 'Evolution and Ethics: Prolegomena' (1894), in *Collected Essays* (London: Macmillan, 1895), IX, 1–45.
[19] Cathy Gere, *Pain, Pleasure, and the Greater Good: From the Panopticon to the Skinner Box and Beyond* (Chicago: University of Chicago Press, 2017).

depended on a biological foundation. Rather, biology was inferred from social and political behaviour, to which utilitarian ideas were a response. If there was a biological vision, it was of human nature in its most brutal form – rapacious, selfish, indulgent, *animal*. Darwinism reversed this. While Darwin undeniably tried to make biology cohere with social observation – it was made to *justify* the Victorian worldview – it nevertheless reached this point through natural history, seeing society as a product of evolution. And insofar as Darwin connected humans with animals in a chain of being, he nonetheless put certain humans (the most civilized of the bunch, like himself) in such a state of exception that the animal connection was distant.[20] If utilitarianism saw humans at their worst and tried to coerce them, Darwinism saw humans at their best and tried to let the best flourish for the sake of the rest. Gere ultimately underplays this. She notes, in passing, that Herbert Spencer ultimately came to reject utilitarianism's moral calculus, on the basis that outcome prediction was just too fraught in a complex society. One had, in the end, to rely on the cognitive and emotional *motivation* of individual actors – the best representatives of nature – whose evolutionary prowess would better ensure a good outcome than any kind of statistical or demographic forecast. Darwinism, which Gere largely overlooks, had, in the end, a biological explanation, and this explanation was at hand. Insofar as experimental medicine cohered around a moral economy based in turn on a scientific understanding of humanity, this understanding of humanity was expressed as a *natural* outcome of human evolution, limited to those men whose own intellectual adaptations had put them at the vanguard of civilizational change. Expressed this way, the rhetorical argument of the greatest happiness for the greatest number had even more power. For, it was not dismissible as mere rhetoric. It was embodied in these men who pursued it through their research. The condition of compassion, sympathy or humanity was the guarantor of a good outcome, even where in any specific case a good outcome could not be precisely forecast. This permitted the ambiguity or open-endedness of research, or of research for its own sake. Research, then, was not a utilitarian *argument*, but a mode of human being. As such, its practitioners embraced it as an undeniable force. It gave the strategic defence of medical experimentation a conviction beyond any paper philosophy. In fact, it gave it a conviction to match that of their opponents, whose compassion and moral conscience came from God. Here, then, is the most important dynamic of this story: two versions of

[20] Such humans represented an evolutionary saltation. See Boddice, *Science of Sympathy*, 163n14.

humanity, one naturally selected and enshrined in biological evolution, the other divinely designed and embodied, utterly undeniable to those who believed in it. In between them lay society, an amorphous and shifting thing, with its sympathies on both sides. It was here that the battle would be fought. It is almost a cliché to talk of warring for hearts and minds. In this case, both sides thought this was literally the case.

Experience, Experiment, Expertise

Humane Professions is about the strategy and tactics developed for an internationally networked defence of experimental medicine. In some respects, it is about the formation of a public-relations strategy by the medical establishment, but the analysis goes beyond the political and rhetorical to the experiential. Indeed, at the core of this book is the claim that the nature of the defence, as it evolved over forty years, was rooted in an entanglement of emotional, sensory, intellectual and practical involvement in the justifications for and methods of animal experimentation by individual members of the medical community. The defence was orchestrated to defend a meaningful way of life conceived on two different levels: the way of life of an increasingly professionalized body of medical-scientific researchers; and the way of life of a civilization that, in the view of the aforementioned professional body, was predicated on its activities. Humanity itself was perceived to be at stake in the defence of experimental medicine, and this meant that lived conceptual understandings of suffering, progress and humanitarian action were in play in rhetorical and political justifications for the continuation and development of this kind of research.

It is not a straightforward matter to say, in a pithy way, what the history of experience amounts to, but I offer this book as an exemplification of it. It draws upon the history of emotions and the history of the senses, but it goes beyond them, connecting them to the realm of ideas and reason, to practice (professional and bodily), perception, narrative and representation, to build an account of *meaningful purpose* and *meaningful behaviour*. Vivisection, to vivisectors, was practised in a meaningful way, with a positive moral valuation that aggregated the sensory, the emotional and the intellectual and, at the same time, amounted to more than this aggregation. The humanity that vivisectors professed, the encapsulation of their professional lives in narrations and representations designed for political and public ears, formed the primary justification and the organizing principle for the defence of those professions. It was a belief system, woven through a whole tapestry of subjectivity and collectivity that encompassed notions of moral fibre and character; professional conduct,

status, theories and methods and the associated technical apparatus of those professions; class and gender chauvinism; work ethic; the veneration of an intellectual genealogy and a concept of eminence; a situated and specialized understanding of pain and suffering; an elevated estimation of the progress of civilization and scientists' place in it, leading it; and a dismissal of the beliefs of others (with a corresponding evaluation of the moral defects of such beliefs) where they failed to take into account the core principles of the production of knowledge, the necessary methods of this production, the clear humanitarian benefits of the application of such knowledge, and the incompatibility of such knowledge production with *sentimentality*.

There are probably many more things to add to this list of ingredients, but in enumerating even this much one sees the futility of reducing this account to a history of emotions or a history of senses, considered narrowly. The defence of experimental medicine was a way of formulating the experience of experimental medicine. It was a kind of incantation that drew from past experiences in the laboratory in order to represent its larger, humanitarian purpose. In turn, this fed back into the meaningfulness of continuing to design and perform experiments in the laboratory, where those representations were *lived* and re-lived. One might think of it as a compound of practice and preaching, of practical belief, of experiment experienced as humanity. The medical establishment talked so often, and over such a long period, about being humane because this state of being, in the terms in which they constructed and conceived it, prompted and animated their actions. Key to understanding the argument of this book is the interpretation of constructions of humanity not as mere representations, or rhetorical justifications, of vivisection, but as causes of vivisection and as experiences of vivisection. The medical scientists who appear in these pages experimented on animals not just in the name of humanity, and not simply to enact humanity, but as embodiments of humanity, experienced as a totality of emotional, sensory, intellectual, philosophical, professional and distinctly human meaningfulness. If we see the defence as less than this – if we see it as largely serving professional interests that covered over callousness, cruelty, monstrousness – then we misunderstand the level of conviction that experimenters brought with them to their work.

Humane Professions, therefore, goes beyond the creation of professional institutions of self-defence and beyond the history of networked collective action, to a situated history of the experience of being a medical scientist in this period. It takes medical scientists at their word, through a process of putting their words in context so that the meaning – their own perception of their own lived reality and its importance at a human level – becomes clear.

In unfolding the great lengths they went to in protecting their professional activities from outside interference, both legislative and cultural, we can see beyond a story of their professional self-interest to a story of professional subjectivity itself, and to the connection of professional subjects in a network of shared value and shared experience.

It perhaps requires me to say at this point that it is not for the historian to gainsay lived experience. When these men claimed to be practising humanitarians, it is not my place to say that they were otherwise, but it is my place to try to understand and demonstrate what it was they meant by 'humanitarian' in the context in which they employed the concept. I want to re-build this humanity from the inside, to see it from their point of view, and to see against what they were pitting it, and with what stakes. At root, *Humane Professions* is about the perception of an historical state of civilization, how to safeguard it and how to advance it. There was no consensus on such matters, but the medical establishment on two continents *knew* that the defence of experimental medicine was a key plank in safeguarding the future (just as their opponents *knew* the opposite).

There is another aspect to this focus on experience, which makes it a particularly germane approach in this case. For experimental scientists, 'experience' had become a central pillar in their capacity to know. Crucially, a lack of experience was equated not just with a lack of knowledge, but with an inability to know. Experimental research had made the biological sciences entirely *practical*. It was, so they claimed, only possible to judge the moral value of the knowledge produced from within the experience of producing it practically. One could not simply read about it.

This emphasis on practical knowledge, on experience as a means to knowing, was itself something of an ongoing revolution in the period here under study. If we examine, for example, T. H. Huxley's enormously successful text book for 'teachers and learners in boys' and girls' schools', the *Lessons in Elementary Physiology*, we can mark the changes, which are both epistemological and political. In the first edition, published in 1866, prior to the wave of antivivisectionist agitation that would arise in the 1870s, Huxley wrote in the preface that his 'object in writing ... had been to set down, in plain and concise language, that which any person who desires to become acquainted with the principles of Human Physiology may learn, with a fair prospect of having but little to unlearn as our knowledge widens'.[21] Reading, in 1866, offered a good chance of acquiring knowledge.

[21] T. H. Huxley, *Lessons in Elementary Physiology* (London: Macmillan, 1866), v.

By the time of the second edition, only two years later, Huxley felt compelled to add a new preface, containing the following qualifications:

> It will be well for those who attempt to study Elementary Physiology, to bear in mind the important truth that the knowledge of science which is attainable by mere reading, though infinitely better than ignorance, is knowledge of a very different kind from that which arises from direct contact with fact; and that the worth of the pursuit of science as an intellectual discipline is almost lost by those who seek it only in books.

Of course, this meant urging those with a will to know into a practical course. Huxley's next paragraph would get him into serious trouble later, when the antivivisectionists would level the charge of the corruption of youth:

> As the majority of the readers of these Lessons will assuredly have no opportunity of studying anatomy or physiology upon the human subject, these remarks may seem discouraging. But they are not so in reality. For the purpose of acquiring a practical, though elementary, acquaintance with physiological anatomy and histology, the organs and tissues of the commonest domestic animals afford ample materials.... Under these circumstances there really is no reason why the teaching of elementary physiology should not be made perfectly sound and thorough.[22]

By the sixth edition, in 1872, still prior to the outbreak of controversy, Huxley added another new preface, alerting readers to the addition of new images 'to aid those, who, in accordance with the recommendation contained in the Preface to the Second Edition, attempt to make their knowledge real, by acquiring some practical acquaintance with the facts of Anatomy and Physiology'.[23] In each edition, the previous preface was also retained, making it rather straightforward to mark the changes. Huxley would have to walk much of this back in a highly public manner, when accused of suggesting that the youth of the country should engage in vivisection, but the principle here espoused, that scientific knowledge was attainable only through practical experience, was retained and reinforced by the growing ranks of professional physiologists, toxicologists, bacteriologists and immunologists.[24]

This would become a double-edged sword in the defence of experimental medicine. One motive was to open the doors, to shine a light on experimental practices and allow the lay public to scrutinize what went on in the laboratories. The problem was that the aesthetics of the laboratory

[22] T. H. Huxley, *Lessons in Elementary Physiology*, 6th edn (London: Macmillan, 1872), vii–viii.
[23] Huxley, *Lessons*, 6th edn, v.
[24] For the controversy, and for Huxley's own problems with squaring the rational justification of vivisection with its direct experience, see Boddice, *Science of Sympathy*, 94–9.

worked overwhelmingly against the scientists. To allow the public to *see* did not allow them to *know*, but only to equate blood and cries with pain and pain with cruelty. One could hardly claim that experience was the only way to know and hope to demonstrate to those without experience that scientific practices were humane. This led to the opposite motive, to bar the doors and to tell the public and the politicians to mind their own business. If experience was the only means of acquiring knowledge, then on what basis could science defend itself to a public that claimed the right to hold science accountable for its practical ethics and for the moral qualities of its practitioners? Here, the scientists would revert to trust.

Trust us, they begged, for you, the public, know we are intelligent men, and our intelligence is being put to humanitarian ends. Some of those ends were repeatedly appealed to: the effect of animal experimentation on diphtheria, meningitis and other diseases; its positive effects on surgical techniques and on the elimination of post-surgical infection. The ends are good, they argued, so please trust that the means are good, and that the operators act with good intentions. Where understanding was impossible to share, trust in the humane professions of the men who did understand was, they argued, the only option.

This account necessarily conflates three closely related words and concepts: experience, expertise and experiment. To gain expertise one had to gain experience and experience, in this context, meant experimentation. It was a closed loop of knowledge production and practical activity. All three words share a linguistic root in the Latin: *ex-* (out of); *periri* (to go through). I introduce this book with the title 'experior' because it would have been a fitting slogan for the scientists here under study. Its five meanings capture the rationale of experimental medicine, its moral justification, its practical spirit, its intellectual exclusivity, and the principle of its defence: I test, or put to the test; I try, attempt or prove; I find out; I experience; I *do*.[25]

[25] 'Experior', https://en.wiktionary.org/wiki/experior, accessed 27 March 2020.