

BIOETHICS AND TRANSHUMANISM

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EXPERIMENTING WITH HUMANS AND ANIMALS: From Aristotle to CRISPR, second edition by Anita Guerrini. Baltimore, MD: Johns Hopkins University Press, 2022. viii + 208 pages. Paperback; \$28.95. ISBN: 9781421444055.

There has been a haunting thought ever since I began to use live mammals for my research in neurophysiology: “Will my descendants accuse me of cruelty towards animals as much as we do to the scientists under the Nazis?” A number of neurophysiologists have been threatened and attacked to stop their research, and, as a consequence, there are few neurophysiologists left using rhesus monkeys along the West coastline of the US and Canada. Research with rats is increasingly of concern to some, and mice might be the next subject of attention. Research staff and students, who are required to remain on budget with their projects, are put under increasing pressure and stress in order to take better care of their laboratory animals without receiving compensation or support. In the meantime, almost nobody seems to care to know how many animals were sacrificed to develop the celebrated COVID-19 vaccines. Are we, biomedical researchers, ever going to have a resolution to this ethical tension around us? Are we going to be viewed by future historians as the heroes of science—or as abusers of living creatures?

Anita Guerrini’s *Experimenting with Humans and Animals: From Aristotle to CRISPR* does not answer the question. As the author states in the beginning of her book, her objective is to tell the history of “trial and error, prejudice and leaps of faith, clashing egos and budget battles,” to help us evaluate “the value, and the values, of Western science,” and to “influence the future.” In other words, the purpose of the book is not to make ethical arguments or to appraise a certain aspect of historical development, such as the progress of ethical care for human and animal subjects. It is, rather, to reveal the reality that ethical views and sentiments have changed, collided, merged, and contradicted each other across time and political landscapes.

This text poses questions, implicitly and explicitly, to enable us to address some of the issues and challenges we are facing at present. A first question arises from the history of vivisection (chap. 1). Vivisection refers to experimenting with (mostly dissecting) live animals, and sometimes even humans. This appears for the first time in recorded history back in ancient Greece, meaning it was practiced for two millennia without

anesthesia, a discovery not made until the eighteenth century. More strikingly, vivisection was done as part of “edutainment” shows in ancient times. Criticism of the practice was not necessarily about the cruelty but rather about the usefulness of the knowledge obtained from dying or dead animals. The rights or well-being of animals were not much of an issue in the ancient age as human dominion was a firmly held belief. Such an ethical view continued to be dominant until early Modernity (seventeenth-century Europe) when human and animal bodies alike were viewed as machines, and animal experimentation began to be accepted as a cardinal method for biomedical sciences (chap. 2). At that time, ethical concerns on the use of animals did arise, but the concern lay rather in the human virtues of kindness and compassion rather than the rights of animals.

Eighteenth-century Europe slipped into a new stage of biomedical science after Queen Mary II of England died of smallpox, from which experimentation with humans becomes central (chap. 3). Inoculation, adopted from the Eastern world with initial suspicions, was slowly gaining credibility through parents who were unwilling to put their children at the risk of falling ill to smallpox. The validation of its effectiveness eventually came about upon testing with the socially marginalized, including prisoners, orphans, patients, and slaves. Yet criticisms around the “science” of inoculation were not made for using the marginalized as test subjects but rather for superseding God’s authority to cause one to be ill or healed. While an increasing number of animal experiments were conducted routinely, and mathematical descriptions of the body became of greater interest to scientists, the emerging utilitarian ethics began to awaken Europeans, especially the British, to the suffering of animals. While elevated sensitivity to animal suffering led to “antivivisection” movements in England, experimental medicine and physiology were established as scientific fields. During this period nation-states also began to be involved in science. This was also the time when anesthesia was discovered, and pain perception became an important topic in physiology. Eventually, common beliefs about racial or sexual differences in pain perception were also tested, by experimenting with women and black slaves.

In the late nineteenth century, animal experimentation made a strong comeback as the germ theory of disease was solidly validated by scientists such as Pasteur, Koch, and Ehrlich (chap. 5). As scientists began to conquer many diseases such as anthrax, rabies, syphilis, and tuberculosis, the victory of science quenched the antivivisectionist movement. A number of animals, including rabbits, guinea pigs, dogs, and monkeys, were used to test theories, vaccines, and drugs during

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this period. At the same time, human experimentation begins to be regulated by states, but the regulation was so elementary that practices were allowed that would not be tolerated in our time. Concerns with animal experimentation reemerged in the twentieth century when polio research, strongly advocated by Franklin Roosevelt, a victim of polio himself, claimed a striking number of rhesus monkey lives (chap. 6). As an example, in the 1950s, the United States imported from India 200,000 rhesus monkeys per year for polio research. Despite the polio vaccine's success, primate research appalled the public, especially when behavioral research on primates revealed the emotional depth and social intelligence of these animals. Animals came to be seen no longer just as machines, but as our cousins who, like us, have consciousness.

The last chapter begins by depicting the Nuremberg War Crimes Tribunal of 1946, which led to the first written set of guidelines for human experimentation. Up until this time, there had been little consensus or regulation in using humans for experiments, let alone with the requirement that they must be mentally competent, uncoerced, and fully aware of possible consequences. It is hence not surprising that scientists under the Nazis defended themselves against charges of abuse and euthanasia of human subjects by paralleling their conduct with the practices of contemporary American scientists. American practice was exemplified by the Tuskegee Study of Untreated Syphilis in the Negro Male, conducted from the 1930s to the 1970s, in which the United States Public Health Service left four hundred black syphilis-infected males untreated, without telling them that their treatment had been stopped, in order to study the natural development of untreated syphilis. More than one hundred died as a result. Inconsistency in research ethics can also be found in the case of Japanese scientists, who, in contrast to Germans, were pardoned for their research conduct during World War II in return for providing information to the United States. Nonetheless, through the twentieth century until today, the level of public awareness and national regulations on the use of animal and human subjects has been progressively elevated. Yet, accelerated advances in research technology, including the latest breakthrough of gene editing, and expansion of research fields, continue to add complexity to ethical discourses.

I was impressed by Guerrini's vast knowledge of the historical development of biomedical science, including the events that matter to ethical issues around use of animal and human subjects in research. At the same time, she manages to make the book concise. While the book concerns the ethics of animal and human experimentation, it is certainly not an ethics or philosophy book but rather a story book. That is, while the book raises

ethical questions in an unbiased manner, the chronological organization of this story does not conveniently lend itself to efforts to systematically examine or establish ethical principles on these matters. Nonetheless, a deeper understanding of the historical background to the different perspectives encountered in these stories enables one to make more-informed assessments of present-day perspectives. The book can be particularly helpful for those who do not have a biomedical background but wish to engage in contemporary ethical discourses, as well as for those who have rarely thought about the issues at all, often under the assumption that science has justly treated human or animal subjects. Finally, reading these accounts from ancient to contemporary times will certainly help one realize that what is the norm today was not necessarily the norm in the past, nor will it be in the future. Therefore, scientists like me need to humbly accept that we will someday be judged; I believe this knowledge will help us use our best conscience in the present.

Reviewed by Kuwook Cha, Postdoctoral researcher in Physiology, McGill University, Montreal, QC H3A 0G4.

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HUMAN TECHNOLOGICAL ENHANCEMENT AND THEOLOGICAL ANTHROPOLOGY by Victoria Lorrimar. Cambridge, UK: Cambridge University Press, 2022. 300 pages, bibliography, index. Hardcover; \$120.00. ISBN: 9781316515020.

In her introduction, Victoria Lorrimar states that

The goal of this book is to deepen our understanding of human creativity from a theological perspective, and to resource Christian theology (and more broadly the church) for reflecting on the possibilities for enhancing human capabilities through (plausible or far-fetched) technologies. (p. 8)

Given the contemporary relevance of this topic, and that she writes "within an (assumed) understanding of salvation as effected by God and not by us" (p. 6), her work will be of special interest to a number of readers of this journal.

Lorrimar addresses the movement known as transhumanism and major themes associated with it: radical life extension, hedonic recalibration (replacement of pain and suffering by an abundance of "good" feelings), moral enhancement by technological or pharmacological means, and mind uploading. She notes that there is considerable diversity of aims within the transhumanist movement, and that not all those that endorse some of these enhancements would identify as transhumanists.

So how should Christian theology respond to technological enhancement of human beings? Lorrimar argues