Martin Reuss; Stephen H. Cutcliffe, eds. The Illusory Boundary: Environment and Technology in History.
The Illusory Boundary: Environment and Technology in History by Martin Reuss; Stephen H. Cutcliffe
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of Medical Progress. xviii + 377 pp., illus., bibl., index. Baltimore: Johns Hopkins University Press, 2011. $50 (cloth).

Hemophilia is one of several diseases characterized by deficiencies in factors in the blood plasma required for clotting. Even though fewer than twenty thousand of the 150 million males in the United States are affected, it is a well-known disease. This book focuses on the impact of developments in hemophilia treatment on the degree of normality of the lives of hemophiliacs.

The concept of hemophilia as a hemorrhaging disease was developed in the early nineteenth century, and knowledge of its hereditary basis was popularized by Queen Victoria's status as a carrier. Mendelian inheritance was later used to explain it as a sex-linked recessive genetic disorder limited to males.

In the 1890s the understanding of hemophilia was revolutionized by the discovery that blood clotting time was much greater for hemophiliacs. The ensuing decades saw many discoveries about the components and diseases of the blood, which produced new treatments, routine blood tests, and the specialty of hematology.

Clotting research led to the discovery that hemophilia was one of a number of clotting diseases, with others not being sex linked. After World War II the blood plasma rather than platelets was found to be responsible for blood clotting. Plasma fractionation separated the components of blood plasma and in 1957 produced a new classification system of clotting factors that differentiated hemophilia from other clotting disorders.

Blood transfusions became practical in the 1920s once blood types were understood and clotting of blood exposed to the air could be prevented. Their widespread use in World War II made them and blood banks a standard part of hospital medicine. However, it was not until the 1950s that transfusions of whole blood became central to the management of hemophilia. Transfusions made the lives of hemophiliacs more normal, but they required many donors for the very large quantities of blood needed. The hemophiliac community of patients and their families established local and national organizations to recruit voluntary donors and manage the blood supply.

In the 1960s plasma fractionation produced clotting factor concentrates, which enabled hemophiliacs to be transfused with small amounts of plasma factors rather than large quantities of whole blood. Patients could now transfuse themselves at home or other locations, making their lives much more normal. This also led in 1975 to federal funding for hemophilia treatment centers. Unfortunately, patients treated with concentrated clotting factors could develop hepatitis or antibodies that inhibited clotting.

Commercial firms that produced concentrated plasma clotting factors used blood from paid donors rather than volunteers, which greatly increased the risk of viral infections. This created a major tragedy for hemophiliacs with the rise of HIV in the early 1980s. The dilemma for the hemophiliac community in managing the blood supply during this period was that more careful screening of donors reduced the risk of infection but also decreased the quantity of blood available.

In the early 1980s, when HIV was still poorly understood, HIV infections became rampant among hemophiliacs, many of whom were children and adolescents. Nearly 60 percent of hemophiliacs contracted HIV, and among those with severe hemophilia the incidence was 90 percent. By 1994 more than 25 percent of all hemophiliacs had died of AIDS or related diseases. Many wives and children of hemophiliacs were also infected. By 1992 the blood supply was under control. In 1997 a class action lawsuit against the four firms that manufactured clotting concentrates gave $100,000 to each of about sixty-two hundred victims or surviving families. In 1998 Congress enacted a hemophilia relief law providing $100,000 per victim.

Stephen Pemberton believes that responsibility for the failure to reform the blood supply system in response to the HIV virus involved the "federal government, the blood industry, and even voluntary health organizations such as the National Hemophilia Foundation and the American Red Cross" (p. 238). The tragedy created conflicts within the hemophiliac community and led to new advocacy organizations.

The Bleeding Disease: Hemophilia and the Unintended Consequences of Medical Progress provides a thorough and detailed history of hemophilia, but the analysis is frequently disrupted by a plethora of uninformative biographical sketches. Another book, Susan Resnik's *Blood Saga: Hemophilia, AIDS, and the Survival of a Community* (California, 1999), provides some quantitative data and a different perspective. Neither book adequately describes the economic issues associated with hemophilia for the patients, their families, the health care system, and health insurance companies.

WILLIAM G. ROTHSTEIN

Martin Reuss; Stephen H. Cutcliffe (Editors). *The Illusory Boundary: Environment and Tech-*

nology in History. ix + 318 pp., illus., bibls., index. Charlottesville: University of Virginia Press, 2010. $29.50 (paper).

Biotech, envirotech, bionics, and soft-tech. The various fusions between the natural and the artificial have been a topic of intense historical and philosophical debate, of which this fine anthology is the latest outcome. Here both historians of the environment and historians of technology question the traditional demarcation between the natural and the technological realms, arguing that there is only an "illusory boundary" between them.

Construing a sharp dichotomy between the environment and technology is not only "misleading" but also conceptually "false," editors Martin Reuss and Stephen H. Cutcliffe argue (p. 1). As an alternative, they suggest the word "envirotech" to describe landscapes as well as organisms construed by human interventions. The contributors to the volume follow up in their analyses by reading both environments and human bodies as archives of historical interactions between nature and technology.

The volume as a whole picks up themes and discussions harking back to *Uncommon Ground: Toward Reinventing Nature*, edited by William Cronon (Norton, 1995), and also to *The Social Construction of Technological Systems*, edited by Wiebe E. Bijker, Thomas P. Hughes, and Trevor Pinch (MIT, 1987). Whether *The Illusory Boundary* will have a similar impact remains to be seen. There are few, if any, references reflecting the body of literature that draws on Donna Haraway's work on the nature/technology conundrum, from "A Cyborg Manifesto" (*Socialist Review*, 1985) to *Modest_WitnessSecond_Millennium.FemaleMan©Meets_OncoMouse*™ (Routledge, 1997) to *Crystals, Fabrics, and Fields* (with Scott Gilbert; North Atlantic Books, 2004). From a very different angle, literature by scholars working within the field of ecological design and restoration, such as Eric Higgs's *Nature by Design* (MIT, 2003), is hardly to be found here. These omissions are understandable given the vast and growing field of nature/technology studies.

The format of the contributions is that of overview and reflections on the current "envirotech" debate, which looks back to the Society for the History of Technology conference held in Munich in 2000. The key participants would meet again for a workshop at the University of Maryland in 2006, which resulted in the present volume. As a whole, the anthology gives the reader a firm grasp on the current state of historical research on envirotechnical systems. I found "The Nature of Industrialization," by Sara B. Pritchard and Thomas Zeller, and "Understanding the Place of Humans in Nature," by James C. Williams, particularly helpful.

Other contributions worth mentioning include "Our Bodies and Our Histories of Technology and the Environment," by Joy Parr; "Waste and Pollution: Changing Views and Environmental Consequences," by Craig E. Colten; "Can Organisms Be Technology?" by Edmund Russell; and "Are Tomatoes Natural?" by Ann Vileisis. Though a bit too short and fragmented, Peter Coates's "Can Nature Improve Technology?" stands out as the volume's most interesting piece. Here Coates argues that, in addition to investigating how technologies have shaped our environments, one should also investigate how the natural realm has shaped human artifacts, as in the history of bionics and biomimetics.

The anthology is meant, in the words of the editors, for "a broad audience, including historians, geographers, engineers, and earth scientists" (p. 6). To reach this audience, the authors have written in an inclusive and informative style, generally at the expense of originality, philosophical precision, and historical depth. Most of the essays show a lack of extensive archival work. And historians of science may wonder why they have not been participating in the "envirotech" debate.

The volume will serve students and scholars in need of an overview well. Hugh S. Gorman and Betsy Mendelsohn's concluding essay, "Where Does Nature End and Culture Begin? Converging Themes in the History of Technology and Environmental History," is a good beginning. I hope that *The Illusory Boundary* will find its way into university and college libraries as the standard "envirotech" reference. It is a first-rate intervention in the ongoing attempt to identify the natural and the artificial.

PEDER ANKER

Elizabeth Stephens. *Anatomy as Spectacle: Public Exhibitions of the Body from 1700 to the Present.* (Representations: Health, Disability, Culture, and Society.) viii + 166 pp., illus., bibl., index. Liverpool: Liverpool University Press, 2011. $90 (cloth).

Elizabeth Stephens's latest book examines displays of the human body from the anatomical Venuses of the eighteenth century, through popular anatomical museums and the "spermatorrhoea epidemic," to Victorian freak shows, and, finally, to Gunther von Hagens's *Body Worlds*. She argues that these types of exhibitions pro-