Flesh and Blood: Organ Transplantation and Blood Transfusion in Twentieth-Century America

Susan E. Lederer

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For Emma, Eric, and Gregory,
my own flesh and blood
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Introduction

Organ transplantation is one of the most dramatic interventions in modern medicine. Since the 1950s, thousands of people have lived with “new” hearts, kidneys, lungs, corneas, and other organs and tissues transplanted into their bodies. But, even before the 1950s, American surgeons had attempted to treat catastrophic disease or injuries using tissues and organs retrieved from the bodies of other people and other species. Long before the success of kidney transplantation in the 1950s and heart transplantation in the 1960s, many Americans looked to the potential of these new surgeries to restore lost function and repair the ravages of illness and injury.

The contrast of surgical reality with the “surgical imaginary”—namely, the prospect of replacing old organs with new ones retrieved or purchased from another person—is a major focus of this book, which explores how the body and its parts—organs, tissues, cells, and fluids—possess not just medical and surgical significance, but complex political and cultural meanings as well. By focusing on the earlier “prehistory” of organ transplantation, as well as the successes of the 1950s and 1960s, Flesh and Blood: Organ Transplantation and Blood Transfusion in Twentieth-Century America argues that the so-called failures of organ transplantation have much to tell us about the ways in which Americans experienced the conceptual development of organ transplantation in twentieth-century America and the social and cultural implications of remaking American bodies through the harvest of other bodies—animal and human, living and dead.

The dramatic expansion of surgery in the late nineteenth century encouraged American surgeons to extend and explore the boundaries of the body, using a variety of new materials and new techniques. One of the most potent illustrations
of innovation in American surgery was the development of blood transfusion. First introduced in the seventeenth century and periodically revived over the next two centuries, blood transfusion became, in the hands of twentieth-century American surgeons, a life-extending therapeutic intervention useful in the treatment of a broad array of injuries and diseases. Although several historians have written about the checkered development of blood transfusion, they have focused, for the most part, on the various techniques and indications for the procedure, rather than on the cultural implications of the practice. In the early twentieth century, moving blood between bodies required much more than a willing surgeon, scalpel, and syringe; transfusion could only be effectively accomplished by physically uniting the exposed blood vessels of donors and recipients. The invasive intimacy of such transfusions made it difficult to ignore the social and material realities of the individual bodies and bloods involved.

Both the movement of blood between bodies and organ transplantation entail a supply problem. Then, as now, surgeons often encountered shortages of people willing and able to supply blood. Obtaining solid organs like ovaries, testes, skin, thyroid glands, bone, nerves, and other materials from human sources posed immediate challenges for surgeons during the first part of the twentieth century. In the face of these shortages, surgeons helped to broker financial arrangements between families and friends to acquire the tissues and blood for the necessary surgeries. Almost from the start, the commodification of the body, its fluids, and parts coexisted alongside a “gift exchange” in which no money changed hands. Although surgeons occasionally expressed concern about the “traffic in organs” and “blood money,” there was little or no public criticism about compensating individuals for their “parts and labor.” The status of blood and organs as commodities became increasingly contested in the second half of the twentieth century, and this sacralization of human flesh and blood is one focus of this book.

A second major focus of *Flesh and Blood* is how Americans responded to therapeutic interventions—blood transfusion and organ transplantation—that literally redrew the lines between self and nonself, between someone and a stranger, between spouses and family members, between the living and the dead, and between humans and animals. Most commentators who have studied the cultural status of organ transplantation have focused on resistance to organ donation. Some have drawn parallels between biologic resistance (an organism’s immune-mediated response to foreign tissue) and cultural resistance to organ donation. This idea has a becoming and attractive symmetry, but there is a danger that this attraction can obscure a more important truth: namely, the rapid embrace of organ transplantation by a large segment of the American public. Drawing on newspapers, magazines, legal cases, films, and the papers and correspondence of physicians and surgeons, *Flesh and Blood* challenges the assumptions, offered by bioethicists, anthropologists, and policy makers, that popular fears about organ transplantation necessarily reflect timeless human concerns and preoccupations with the body. It provides a compelling illustration of how notions about the body—intact, in parts, living, and dead—are shaped by the particular culture and society in which they are embedded and articulated. It also suggests the process whereby medical knowledge offered
new conceptions of individual bodies and their relationships to others through sharing the “gift of life” via donations of flesh and blood.

The first two chapters of the book explore the early development of the surgical transfer of skin, bone, nerves, organs, and blood between bodies. Not least among the challenges facing surgeons performing skin grafting was locating suitable sources for tissue. Living human donors presented a number of difficulties; the pain associated with the procedure of shaving off pieces of skin to be donated to another person troubled donors, as did the psychological dimension of being “flayed alive.” In light of these problems, surgeons looked to alternative sources. Surgeons harvested skin from pigeons, dogs, cats, chickens, rabbits, and frogs for application to their patients. Doctors also retrieved human skin from the bodies of the dead, amputated limbs, and stillborn infants. Chapter 1 considers what it meant for physicians and patients in the first part of the twentieth century to administer and receive physically intimate materials from others—animal and human. It explores the role of the news media in shaping expectations about the procedure and its results, and in influencing ideas about altruism, self-sacrifice, and heroism involving the donation of one’s skin or other body part. Drawing on early twentieth-century letters from individuals seeking transplantation for themselves or for a family member, the chapter contends that, just as such basic human instincts as hunger and appetite are influenced by social and cultural factors, so too conceptions of the intact and dismembered human body—dead and alive—are transformed in particular cultural settings.

The second chapter examines the reintroduction of blood transfusion during the early twentieth century. Performed only sporadically in the nineteenth century, the transfusion of blood became a significant surgical intervention in the first part of the twentieth century. In the era before blood could be safely stored, surgical transfusion offered a dramatic, technically demanding method to treat hemorrhages and other blood conditions. Surgical practices, as historian Christopher Lawrence has argued, “are never mere empirical procedures. Even the most simple of them employ a theory of the body, either explicit or implicit.” Direct transfusion, as surgically achieved blood transfusion became known, was neither a simple procedure nor a merely empirical one. Instead, the physically intimate contact between the veins of two different individuals entailed a radical reconceptualization of the body, its fluids, and its parts.

Focusing on Crile’s clinical tests of surgical transfusion involving 55 patients, Chapter 2 examines the American development of direct transfusion as a means to restore life to the nearly dead. Essential to the success of the procedure was the availability of suitable donors willing and able to endure the physical and psychological rigors of donation, including the incision made on the arm or leg to expose a blood vessel and the surgical union with a dying recipient. Part of the compensation for this participation was the lionization of donors in the popular press. Almost from its introduction in 1906, blood transfusions engaged newspaper reporters attracted by the drama and mystery of these miracles of resurrection. Chapter 2 explores the medical and cultural implications of moving blood between bodies, from Crile’s pioneering efforts to the advent of blood banking in the 1930s.

The third chapter, Banking on the Body, considers the contested commodification of the human body, its fluids, and parts. Almost from the inception of surgical
transfusion, a market for human blood developed in the United States. By the 1930s, when the American Federation of Labor recognized a “blood seller’s union,” obstetricians were turning to such professionals to serve as “ghost fathers” for artificial insemination. The rigors of early blood transfusion made financial incentives necessary to obtain sufficient donors in time of need. Doctors and surgeons often brokered the transactions between blood suppliers and the patient’s friends or family members to ensure that blood would be available. This chapter considers how the buying and selling of blood influenced the American experience of transfusion from the earliest payments to blood suppliers, through the development of networks of professional blood sellers, to the large-scale reliance on blood from prison inmates and the residents of Skid Row. The chapter explores how money shaped interactions between donors, recipients, and surgeons, and how systems for paying blood suppliers coexisted, at times uneasily, with a new “philanthropy of the body” and its fluids.

Chapter 3 also probes the power and significance of the “banking” metaphor for both blood transfusion and organ transplantation. In the 1930s, physicians in Spain and Russia developed systems for preserving and storing blood in a central facility, but it was the American physician Bernard Fantus who coined the word “blood bank” when he opened the first such facility at Chicago’s Cook County Hospital in 1937. In an era notable for bank failure and economic collapse, American surgeons became blood “bankers,” who discussed loans, deposits, and balance sheets. Physicians borrowed this usage in developing storage facilities for other body fluids (sperm) and tissues (bone banks, eye banks). This chapter considers alternative concepts of blood and tissue storage and the implications of selecting a financial institution as the model for the storage and distribution of blood and other tissues.

During the first half of the twentieth century, occasional reports surfaced about the selling of solid tissue—skin, ears, and especially male generative glands. This prompted, in the 1920s, the first expressions of concern about “traffic in organs.” Long before the late 1960s, when the scarcity of donor organs for heart transplantation fostered speculation about a black market in hearts, authors and film makers incorporated the sale of body parts into fiction and film. In 1984, the United States Congress passed the National Organ Transplantation Act, which outlawed the buying and selling of human organs. Organ sales remain illegal in 2007, but despite critics of international organ selling by historian David J. Rothman and anthropologist Nancy Scheper-Hughes, among others, proposals for the legalization of organ selling have increased in light of the intensifying shortage of donor organs. Chapter 3 examines the social and cultural implications of the incomplete and contested transformation of body parts into marketable goods and services.

The fourth chapter, Lost Boundaries, focuses on some of the dynamics of “blood mixing” in the twentieth century. Recent works by historians Keith Wailoo and Spencie Love have documented how, in 1941, the American National Red Cross assumed supervision of a massive blood-collection effort for American military personnel. Amid concerns that blood donation would be adversely affected by rumors of racially mixed blood, officials of the Red Cross announced that blood from African American donors would not be accepted for collection. In the face of protests by organizations such as the National Medical Association, the American
Medical Association, and the American Public Health Association, and the personal intervention of First Lady Eleanor Roosevelt, the Red Cross reversed its policy; “Negro blood” would be accepted. However, this blood would be collected and labeled separately from that of white donors. This chapter emphasizes how experience with “transfusion accidents” involving donors infected with syphilis shaped popular and professional fears about “Negro blood,” fears that had been largely absent through several previous decades of blood transfusion.

Chapter 4 extends into the postwar decades the history of moving blood between people of different races. Since the early twentieth century, the popular association of blood with an individual’s ethnic, racial, religious, and even political identity made transfusion between dissimilar donors noteworthy. Newspapers reported, for example, that seven Republican legislators in Utah donated blood to their lone Democratic colleague (he died), how six white college students in Georgia donated blood to save the life of “a Negro servant” (he lived), and how an Orthodox Jewish woman refused any blood from gentile donors. By the 1940s, however, as the changing technology of transfusion cloaked the identity of donors, fears about the safety and purity of the nation’s blood prompted segregation of the blood supply and the stigmatization of African American donors. Although the Red Cross and the American armed forces desegregated the blood supply on the eve of the Korean War, the racially charged politics of the 1950s and 1960s prompted legislators in southern states to enact laws for racial labels on blood and required notification when patients received racially dissimilar blood. This legislation represented only a minor skirmish in the larger battles over civil rights, but illustrates the enormously powerful symbolic role of blood in American culture and politics.

Chapter 5 examines how biomedical science differentiated blood not on racial grounds but on the knowledge of immunologic specificity. In the early twentieth century, Austrian pathologist Karl Landsteiner observed what he later labeled “the unexpected existence of clearly demonstrable differences between the bloods within one animal species.” In 1900, he discovered that human blood could be differentiated into three distinct groups; his colleagues, repeating the work, added a fourth group in 1901. At first, these groupings represented more of an immunologic curiosity than a finding with clinical significance. Although Reuben Ottenberg introduced cross-matching for blood transfusion in 1912, routine pretransfusion blood typing did not take place in the United States until after World War I. In the 1920s, as more physicians practiced blood transfusion, efforts to educate Americans about blood groups introduced confusion about “blood relationships” in families. Why a father or mother would not be a suitable candidate for a blood transfusion to a child, for example, violated longstanding conceptions of “familial closeness” and relationships. Ideas about immunologically unsuitable blood, sometimes labeled “bad blood,” resonated with older ideas about blood purity and pollution and were intensified during an era of acute anxiety about syphilis.

Chapter 5 examines the cultural history of the blood groups in twentieth-century America, especially Landsteiner’s ABO system and his subsequent discovery with Alexander Weiner of the Rh blood factor. (In present-day Japan, many people believe that blood type determine an individual character; media profiles of Japanese
politicans, for example, often disclose the individual’s blood type.) Blood groups offered one avenue for a biomedical transformation of cultural knowledge of the self and self-identity over the course of the twentieth century. In the 1960s, the advent of tissue typing based on human leukocyte antigens offered another way to understand the extent to which humans were both different from and similar to one another. One of the major problems in organ and tissue transplantation continues to be biologic rejection of foreign tissue. In the 1960s, the discovery of tissue groups promised to resolve this longstanding issue of incompatible donors and recipients, and to inaugurate a new era in transplantation. However, the nonrandom distribution of these tissue types—the fact that whites and African Americans had different antigen profiles—raised new questions about fairness and equity in the allocation of scarce cadaveric kidneys and other organs. More than that, the tissue types represented another means to understand differences and similarities among human beings and their families.

Some of these factors are considered in Chapter 6, Medicalizing Miscegenation, which focuses on the ways in which assumptions about race and value influenced the transfer of solid body parts. When South African surgeon Christiaan Barnard transplanted the heart of a “Cape coloured man” into the body of a white, Jewish, retired dentist in 1968, African American magazines such as *Ebony* noted the irony that the “colored man’s heart” could now enter literally hundreds of places restricted to whites only. In the United States, African Americans expressed concern that white doctors—already feared for using black patients as experimental subjects—would hasten the deaths of black patients so that their bodies could be harvested for organs intended for white recipients. This chapter analyzes the role of race in the growth and diffusion of organ transplantation since the 1960s, and the efforts of African American transplant surgeons to raise the level of organ donation in the African American community, where donor rates remain low.6

“Blood is the life” reads the passage from the Biblical book Leviticus. The Judeo-Christian tradition brims with blood. In the eucharistic doctrine of the Catholic Church, bread and wine become transubstantiated into the body and blood of Jesus Christ. The complex cultural and spiritual associations of blood as a vital fluid, a source of life-sustaining, mystical power and essence, retained their potency in the twentieth century. New scientific findings about blood and its components did not strip blood of these mystical and spiritual meanings. Chapter 7 considers the controversial stance of the Jehovah’s Witnesses about the acceptability of blood transfusion. Grounded in verses from Genesis, Leviticus, and the New Testament book of Acts, the sect ruled in 1945 that transfusion violated God’s law and that Jehovah’s Witnesses could not accept blood transfusion even if death was the alternative. The prohibition on blood transfusion troubled physicians and surgeons. In the 1950s, the Jehovah’s Witnesses problem sparked renewed attention to medical ethics; in the 1960s, the issue moved into state and federal courts as hospitals pursued court orders to permit transfusions against the explicit wishes of patients and in spite of their firmly held religious beliefs.

Transplantation, even more than the transfusion of blood, raised fundamental religious questions about bodily integrity and identity. The potential violations of
long-sacred boundaries between bodies and souls troubled many of the major religious groups in the twentieth century. Catholic theologians, already animated by the moral dimensions of birth control, abortion, and eugenic sterilization, helped to structure public discourse about the morality of “organic transplantation” long before transplantation achieved its first significant successes in the 1950s. Chapter 7 revives the religious dimensions of public response to transplanting body parts taken from human and animal donors, both living and dead, and argues that religion played a crucial role in the reception of medical advances in twentieth-century America.

The last chapter, Organ Recital, examines the cultural and social implications of transplantation and transfusion and how it established a trajectory for thinking about the developments of the 1950s, when a new generation of surgeons, building on extensive experience with animal models and galvanized by discoveries in immunology, prepared to reanimate transplantation. In 1954, surgeons at Harvard Medical School and the Peter Bent Brigham Hospital in Boston performed the first “successful” human organ transplant when they took one kidney from a healthy man and placed it into the body of his sick twin brother. The success of this surgery, and efforts to resolve the ongoing problems of immune response to foreign tissue, sparked intense activity on the part of surgeons, who quickly moved from kidneys, to lungs, to what Life magazine dubbed “the ultimate operation,” the transplantation of the human heart. This chapter explores the changing fortunes of transplantation from the 1950s through the 1980s.

As it had in an earlier era, the large-scale advent of transplantation renewed old problems of how to locate suitable sources of tissue and raised new issues of morality and medical ethics. The introduction of heart transplantation prompted intense debate about the traditional conceptions of life and death and the need for a new, legal definition of brain death. Concerns about organ transplantation and fears that doctors would allow some patients to die in order to enhance the lives of others played a significant role in the development of a new public discourse about medical morality—bioethics.

Since the 1980s, American investment in organ transplantation has grown dramatically. Although the supply of organs available for transplantation has remained roughly the same, the medical indications for transplant have expanded. In 2007, more than 97,000 people in the United States are currently listed as waiting for one or more donor organs, but only 20,000 or so are expected to become available. The disparity between supply and demand has fostered intense interest in increasing the supply of organs, through xenotransplantation, through such political solutions such as laws for “presumed” consent to donate organs, and through economic plans of private insurers and state laws to pay organ suppliers or their families for tissue. The final chapter of Flesh and Blood explores how the problems of allocation and scarcity have influenced public responses to organ transplantation and donation by placing the issue in the context of larger societal concerns about the integrity of the body.

In the 1980s and 1990s, one profound challenge to bodily integrity was the advent of a new blood-borne and sexually transmitted agent, the human immunodeficiency virus (HIV). The outbreak of the acquired immune deficiency syndrome (AIDS)
pandemic and the profound compromise of the American blood supply stirred new concerns about the violation of natural boundaries and the issue of self-protection. These boundary transgressions have intensified following publicity surrounding such emerging diseases as Ebola and “mad cow disease” (bovine spongiform encephalopathy), and the fears about crossing the species barrier in transplantation.

The issue of bodily integrity, as *Flesh and Blood* argues, is neither simple nor straightforward. Instead, the meanings of self, identity, and integrity reflect particular historical situations and contingencies. Throughout the twentieth century, the technologies of transfusion and transplantation offered new opportunities and novel interfaces for probing the limits of biomedical innovation, reconsidering the nature of heroism and altruism, reconceptualizing human individuality and community, and for understanding the nature of what it means to be flesh and blood.

Notes


Flesh and Blood
Living on the Island of Dr. Moreau

Grafting Tissues in the Early Twentieth Century

In his 1896 novel, *The Island of Doctor Moreau*, English novelist H. G. Wells created a memorable and influential portrait of a surgeon, forced to leave London after the press reported the escape of dogs mutilated in his experiments. Far away in the South Seas, Doctor Moreau performs surgery in what the island inhabitants call the “House of Pain.” These surgeries produce “humanized animals”—wolf-hyena-man, ox-hog-man, and puma-woman—which Moreau regards as “triumphs of vivisection.” The surgical manipulation of the flesh and blood, as he informs a hapless, shipwrecked visitor to the island where he conducts his dark science, could accomplish many things:

> You have heard, perhaps, of a common surgical operation resorted to in cases where the nose has been destroyed: a flap of skin is cut from the forehead, turned down on the nose, and heals in the new position. This is a kind of grafting in a new position of a part of an animal upon itself.

Moreau explains that tissue could also be transferred from one animal to another: “Grafting of freshly obtained material from another animal is also possible—the case of teeth, for example. The grafting of skin and bone is done to facilitate healing: the surgeon places in the middle of the wound pieces of skin snipped from another animal, or fragments of bone from a victim freshly killed.”

Wells knew that such surgical techniques were no scientific romance. Moreau’s reference to teeth invoked the classic experiments in transplantation undertaken by surgeon John Hunter. In his 1771 *Treatise on the Natural History of Human Teeth*, Hunter had described how he successfully implanted a human tooth in a rooster’s comb, and transferred the spur from a young cock onto a hen, and the spur of a hen