Introduction

GIFTS, COMMODITIES, AND HUMAN TISSUES

Blood, Community, and September 11 Within hours of the terrorist attacks on the World Trade Center, the U.S. Department of Health and Human Services, the American Association of Blood Banks, and the American Red Cross issued calls for people to donate blood. Supplies were low throughout the state of New York. Four days before the attacks, state hospitals and health professionals had convened a meeting to discuss ways to improve the blood supply (Butler 2001). In the chaos following the attacks, health authorities could not estimate how many people were injured, or what quantities of transfusion blood they might need. Immediately thousands of people came forward to give blood. They waited in line for hours. The New York Blood Center, which supplies most of the city's hospitals, collected more than five thousand units of blood and fielded twelve thousand phone calls in the first twelve hours. In Washington, after the terrorist attack on the Pentagon, blood was collected at hospitals, makeshift centers, and a building next to the White House (Schmidt 2002). When the collection centers closed, many people queued through the night. At 6:30 the next morning there were already long lines outside blood banks (*Guardian*, 12 September 2001). Hospitals, already dealing with the wounded and dying, had difficulty finding enough trained staff to test donated blood, or storage capacity to accept the volume offered.

This overwhelming desire to give blood was not limited to the citizens of New York and Washington: all over the United States, similar scenes were played out. In the weeks following September 11, more than 475,000 units were collected for the victims, but only 258 units were used for them, and much of the blood had to be discarded (Schmidt 2002).

What was going on here? What can explain this response to a national disaster? Why did the citizens of the United States, after years of declining blood donation,[1] rush to give blood in the wake of the terrorist attack? To cast the question a little wider, what does it mean to give blood, and why does a national disaster elicit such a response? It is self-evident that for the people queuing, giving blood was a pragmatic means of helping those injured in the attack. They were acting on a model of the body, and of relationships between bodies, that we take for granted in the twenty-first century: one body can share its vitality with another through the redistribution of tissues, from donor to recipient, through biotechnical intervention. As the lucky ones, the healthy ones, they can give a portion of their blood, a self-renewing substance, to those who have lost blood in the violence of the attacks. A blood transfusion may mean the difference between living and dying. In this sense the donors give to victims a little of their health. In the face of a horrifying spectacle of death, the donors can give life.

It seems to us, however, that the desire to give blood in those disorienting days was driven by more than a wish to help the immediate victims of terrorism. The excessive nature of the donations—the queuing through the night, the reported reluctance to withdraw when no more storage space could be found, the continued high rates of donation after it was evident that there was far more blood available than could be used to treat the victims—this excess points to something more. It points, we argue, to the complex imbrication of giving blood with ideas and feelings about nation, citizenship and community, and the place of the body and its capacities within this constellation of concepts.

The technology of mass blood donation and transfusion has its origins in war and national defense. Blood banking methods were first developed in Barcelona during the Spanish Civil War,[2] and perfected in the United States, the United Kingdom, and Northern Africa dur-

ing the Second World War. Small blood collection networks were set up in London and other British cities in the early days of the war. Physicians in the United States collected civilian blood to send to Britain, and the Free French created a facility in Algeria to assist their forces fighting in southern France and Corsica. In each location the citizenry came forward in large numbers to give blood for the troops as a fundamental contribution to the war effort. As Starr (1998) describes it, blood was both strategic matériel in the Allied war effort, a resource, and a substance associated with the values of democracy and anti-fascism. Giving blood was a way for civilians to participate in the sacrifice made by soldiers at the front, to defend the integrity of the nation by giving part of their bodies. Starr, commenting on the Free French approach to blood collection, observes, "To them it represented a philosophy of medical care, embodying all that was both modern and humane, especially in contrast to the values of the fascist enemy. Blood donation was benevolent, voluntary and welcomed from all, French and Arab alike. Blood thus became more than a pharmaceutical; it symbolized a new social contract" (Starr 1998, 154).

Giving blood to the troops was a way to express solidarity and improve morale in the anxious conditions of world war. As Rabinow comments, the relationship between blood donation, distribution, and the war effort gave a particular cast to the systems of civilian blood banking set up after the war, particularly in the United Kingdom and France: "After the war, transfusion carried with it the mark of solidarity, of a voluntary and benevolent gesture, of a collective effort of the entire nation" (Rabinow 1999, 84).

Thus blood donation, even in the United States, where postwar blood banking and donation practices diverged markedly from the nationalized, welfarist models favored in the United Kingdom and France, is historically associated with the bonds and obligations of citizenship and the defense of the nation,[3] an idea which in turn emerges from nineteenth-century ideas equating blood with race and race with national citizenship (Foucault 1980). In a sense, the anxious queues outside blood facilities in New York in the days after the World Trade Center attacks were formed by the first volunteers in a new war effort by the United States, albeit a war profoundly different from the Second World War.[4] This was war not with the standing army of an-

other nation-state but with a globally organized, deterritorialized, and decentralized network of terrorist cells, who in attacking the World Trade Center and the Pentagon had managed to do what no national standing army had ever done—strike the mainland sovereign territory of the United States. The excessive desire to give blood was perhaps driven by a sense that the body politic was itself wounded in the attacks. Giving blood might help to heal the great visible trauma to lower Manhattan, the smoking ruins broadcast on national and international television for months hence.

The huge national mobilization of blood donors also suggests the continued currency of civic values often said to be in decline—values of altruism, citizenship, and identification with the fate of the nation over and above more segmented ethnic and religious identity. It suggests the continued currency of what Benedict Anderson famously called the imagined community of the nation-state, "Imagined because the members of even the smallest nation will never know most of their fellow members . . . yet in the minds of each lives the image of their communion. . . . it is imagined as community because, regardless of the actual inequality and exploitation that may prevail in each, the nation is always conceived as a deep, horizontal comradeship" (Anderson 1991, 6–7). For Anderson, citizens participate in fundamental acts of national imagined community when they read the national newspapers, and fight in national wars. Both acts involve citizens in a national narrative, and require them to imagine relations of solidarity with others in the space of the nation, others whom they will never meet. Blood donation too would appear to be an exemplary act of imagined community in Anderson's terms, a gift of health to an unknown other with whom one has nothing in common other than the shared space of the nation.

Numerous social theorists, particularly theorists of globalization, have argued that the kind of national imagined community posited by Anderson has fragmented irrevocably as the sovereign power of nation-states has been overtaken by deterritorialized social and political networks that characterize a globalized social order. As Urry (2000) articulates this shift, the new mobilities of people, capital, technologies, images, and ideas that characterize globalization have loosened the identification of citizens with the nation-state and diver-

sified the forms of belonging and obligation available to organize citizenship. He writes,

> Global networks and flows restructure social inequalities and transform many states into [mere] regulators of such flows. Corporations, brands, NGOs and multinational 'states' have emerged more powerful than nation-states. . . . Overall the hybrid character of many apparent societies in a post-colonial period results in a disjunctive, contested and inconsistent citizenship . . . There are many social organizations delivering different kinds of rights and duties to different kinds of citizens over very different geographical reaches. Citizenship is contested not just within a nation-state over the access of different social groups to rights such as personal property, a job or health care. There is a more fundamental contestation over what are the appropriate rights and duties of citizens living within, and moving around, the contemporary world; over what entities should provide citizenship, and over what entities should adjudicate between the different complexes of rights and duties over very different temporal and spatial scales. (Urry 2000, 163)

According to this kind of analysis, the sense of belonging within a nationally bounded imaginary community that Anderson attributes to the modern citizen has not been effaced, but only complicated and attenuated by other emerging forms of obligation and identification. The intense national identifications evident in the World Trade Center blood donations are not artifacts of a bygone era of the nation-state but coexist with these other kinds of identification in an uneasy tension, available for mobilization under particular circumstances. The specificity of the September 11 donations, the immediate responsiveness of the donors to the plight of *these* citizens and to new conditions of warfare, coupled with poor national rates of regular blood donation, is evidence of these kinds of tensions.[5] The blood supply itself has been subject to complex international pressures over the last twenty years, which have disturbed any simple equation between the borders of the nation-state and the origins of transfusion blood. This is particularly true of the blood supply in the United States, which depends upon a more decentralized and privatized system than exists in the United Kingdom and most West European countries. Moreover, as we shall examine in detail, the contamination of the blood supply with human

immunodeficiency virus (HIV) and hepatitis C virus (HCV) during the 1980s, due in part to the globalization of blood sources, has had a major impact on what blood means. The blood bank has been transformed from a source of communalized health to one of communalized risk, with parts of the population (sex workers, gay men, drug users) feared by other parts of the population as a source of contaminated blood (Waldby et al. 2004). Nevertheless, blood donation evidently retains powers of national mobilization and the power to express public health as a collective enterprise, shared among fellow citizens under particular circumstances.

Tissue Transfer and Social Order The World Trade Center attacks reminded many Americans that blood is a substance capable of being transferred between people, but in fact the disaster forced the mobilization of all sorts of body parts and biomedical technologies for their transfer and analysis. So for example, in the days following the attacks skin banks sent several square meters of allograft skin to New York City for burn victims. For many months afterward, volunteers and crisis workers searched the ruins for often tiny fragments of human remains, some identifiable remnant of the victims who were being mourned. Forensics experts used computers to analyze the fragments' DNA, sometimes even creating new software programs able to identify individuals on the basis of short single-nucleotide polymorphisms (SNPs).[6]

The medical response to the World Trade Center attacks, in other words, was closely linked to the affective significance of human tissues, their ability to represent complex ideas and feelings about human identity and community. The response also drew on extensive technical systems for the donation, circulation, analysis, and transplantation of human tissues available now, in the first years of the twenty-first century. While blood transfusion has been routinely practiced for one hundred years, other kinds of tissue transplantation are much more recent (we use "tissue" throughout this book in a generic sense, to include blood, organs, and any other kind of living matter taken from the body). Solid organ transplantation has been practiced since the late 1950s and commonplace since the late 1970s, as the refinement of tissue typing, surgical techniques, and immunological suppression

has allowed organ donors to be matched with compatible recipients (Fox and Swazey 1992). Skin, bone, heart valves, and corneas can now be banked and used in surgery (Hurley 1995). Reproductive tissue—sperm, ova, and embryos—can be donated and transplanted. Umbilical cord blood is increasingly harvested during birth procedures, stored, and used as an alternative to bone marrow in transplants. The recent development of techniques for propagating human stem cell lines derived from embryos means that embryonic tissues may become the source for a completely new range of transplantable tissues sometime in the future (Waldby 2002a). Many other kinds of tissues—cancerous material, surgical waste, saliva samples—are banked for medical research or commercial pharmaceutical production. Currently several countries, including Iceland, Singapore, Estonia, Sweden, the United Kingdom, and Canada, are setting up genetic databases that will contain DNA data about a substantial share of their populations (Kaye 2004a).

This proliferation of tissue fragments, and of medical and social technologies for their sourcing, storage, and distribution, has profound implications for health and embodiment, for civil identity and social order, and for delineating relations between the global and the local. Each new technology involves a reorganization of the boundaries and elements of the human body, the development of new kinds of "separable, exchangeable and reincorporable body parts" (Rabinow 1999, 95). What does it mean when the human body can be disaggregated into fragments that are derived from a particular person but are, strictly speaking, no longer constitutive of human identity (Rabinow 1999)? What is the legal status of such fragments? Are they a kind of property in the body? Does the person from whom they originate have defensible claims over them once they enter into social circulation? Are they experienced as fragments of the donor's self after donation, or as detachable objects (Waldby et al. 2004)? Do donors and recipients feel that some enduring relationship is created between them in the act of tissue transfer (Waldby 2002b)? How is the status of the individual (strictly speaking the in-*dividual*, he who cannot be subdivided) altered to accommodate these possibilities for fragmentation?

At the level of social relations, how might the exchange of such fragments between persons, their donation or sale, their receipt and

reincorporation, constitute relationships between them? The sharing of human tissues can be a powerful expression of communal solidarity and civil empathy, as we have already seen. However, the redistribution of human tissues can also produce injustice and exploitation, because one person makes a bodily sacrifice in favor of another's health and life. Often the transfer of tissues from one person to another follows the trajectories of power and wealth, as the poor sell their body parts to those with more wealth. The increased global mobility of people and money has seen the growth, alongside carefully regulated national systems for organ donation, of transnational black markets in human organs, sold by the urban and rural poor of the developing nations to aging, wealthy buyers in the industrialized world (Scheper-Hughes 2000). Thus the biotechnical capacity to transfer tissues immediately raises questions of just distribution. What social technologies and forms of governance are the most appropriate for this task? What complexities are introduced into all of these questions by the increasing globalization and liberalizing of the market in human tissue? Biotechnology and pharmaceutical companies are international brokers of many kinds of human tissue—stem cells, genetic material, blood products—and play an increasingly powerful role in shaping national health policy. How do these developments interact with older models of a national commitment to public health, and the free donation of tissues to fellow citizens?

The medical capacity to fragment the body and the techno-social systems that manage and distribute these fragments, in other words, raise fundamental issues about ontology, power, economy, and community, some of which we hope to address in this book. We propose to tackle these issues through a critical appraisal of the dichotomy that has organized bioethical and sociological evaluations of these issues for the last thirty years—the dichotomy of gift and commodity. Makers of health policy in the United Kingdom have favored, for the most part, a gift model for managing human tissues—that is, a model in which donation is voluntary, without financial compensation, and distribution is based on medical need rather than ability to pay. In the United States gift and commodity systems for some human tissues exist side by side—for example in reproductive material, which can be

both donated and sold—while others, for example whole organs, are circulated strictly as gifts.

Advocates for the greater commodification of therapeutic tissues generally base their arguments on the efficacy of the market as a way to increase the number of organ or blood donors through financial reward. Their arguments are pragmatic and utilitarian, advocating payment for kidneys, for example, as a way to increase supply.[7] Advocates of gift systems, however, claim a much wider ambit of social benefits. As Rabinow (1999) reports, French bioethical deliberations and legal constraints prohibit the selling of human tissues, on the grounds that the commercialization of tissues is incompatible with human dignity, a bioethical position shared by institutions in the United Kingdom and those of many other countries to a greater or lesser extent. As we have already seen, the gift of blood is historically associated with the constitution of a community-minded citizenry and a resilient nation, a claim examined in detail below and throughout the book. Correlatively, the advocates of gift systems associate the selling of human tissues with exploitation and dehumanization, the reduction of human status to the status of a thing (Andrews and Nelkin 2001; Scheper-Hughes 2000; Kimbrell 1993). Scheper-Hughes, for example, likens the commodification of organs to "a new form of late modern cannibalism": "Commercialized transplant medicine has allowed global society to be divided into two decidedly unequal populations—organ givers and organ receivers. The former are an invisible and discredited collection of anonymous suppliers of spare parts; the latter are cherished patients, treated as moral subjects and suffering individuals. Their names and their biographies and medical histories are known, and their proprietary rights over the bodies and body parts of the poor, living and dead, are virtually unquestioned" (Scheper-Hughes 2002a, 4).

Gift systems and commodity systems for managing human tissues are often cast in this way, as mutually exclusive and morally incompatible social forms. In this book we hope to complicate and disorganize the gift-commodity dichotomy, because we consider it an inadequate way to conceptualize the political economy of tissues in the modern world of globalized biotechnology. To do this we will first consider the

most eloquent theorization of the relationships between gift and commodity systems of tissue exchange and their implications for citizenship, identity, community, the body, and the body politic: Richard Titmuss's celebrated study *The Gift Relationship: From Human Blood to Social Policy*, first published in 1970. Titmuss, a great scholar and defender of the postwar welfare state, sets out a compelling set of arguments for retaining a gift model for blood donation and transfusion. We will first consider his arguments in some detail. We will then consider the impact of subsequent developments in biotechnology, commerce, globalization, and social theory on the specific content of his arguments.

Titmuss: The Political Economy of Tissues Titmuss's work is inescapable because he recognized that the material forms of tissue circulation have complex implications for the form of the polity. *The Gift Relationship*, written in the late 1960s, is a primarily comparative study of the systems of blood donation and distribution that grew up after the Second World War in the United Kingdom and the United States. These two systems served Titmuss as exemplars of the virtues of the gift over the commodity form, and of public over market models of service provision. At the time when Titmuss was writing, the British blood system retained much of the character of the wartime service. As part of the postwar creation of a comprehensive National Health Service (NHS), a National Blood Service (NBS) was set up under the jurisdiction of the Ministry of Health. Blood was treated along the lines of the nationalized health system and the postwar welfare state reforms, as a public resource to be distributed according to social principles of capacity to give and medical need. Donors gave without remuneration, as they had during the war, and a system of regional transfusion centers ensured that each hospital in a region was supplied according to need. Patients did not pay for blood received, nor were they obliged to give blood in return. The system was entirely voluntary (Starr 1998). Despite the rapid increase in demand for blood attendant on new forms of surgery, this voluntary system provided an adequate supply of blood during the years leading up to Titmuss's study. Between 1951 and 1965 almost every regional center increased the size of its donor pool (Titmuss 1997).

In the United States, in the absence of any national policy on blood management, a much more complex and internally conflicted set of arrangements grew up to supply hospitals with blood. During the war the Red Cross had been the primary coordinator of the blood mobilization effort, though small local and community blood banks had also opened to meet the demand. After the war these two forms of organization continued to coexist, despite attempts by the Red Cross to establish itself as the sole national blood supplier. The Red Cross managed a system that more closely resembled the British one, with predominantly free voluntary donation and transfusion, while the community blood banks often used a credit system according to which recipients of transfusion owed the bank a donation, from either themselves or a friend or relative. Both systems would on occasion use paid donors to supplement voluntary ones. They did so reluctantly, on the grounds that people who sold blood were more likely than voluntary donors to present a risk of hepatitis or syphilis. Unable to cooperate, the two systems divided the United States into an erratic patchwork of territories, and patients might find themselves in either a voluntary or a credit system according to where they fell ill. Excesses and deficiencies in regional blood supply could not be remedied, because neither service would share information with the other, leading to much wastage (Starr 1998).

In addition to this confusion, a parallel system of for-profit blood banks grew up alongside the voluntary sector during the 1950s, exploiting the gaps and problems in supply and demand arising from regional and organizational conflicts. In the absence of a licensing system, nonmedical entrepreneurs could set up a bank with a minimal degree of medical supervision, buy blood (often from the poor and derelict), and sell it to hospitals. During the early 1960s the worst implications of this unregulated market for blood played out in a spectacular legal battle in the Federal Trade Commission (FTC), a legal battle that strongly influenced Titmuss's thinking about the pivotal status of blood in forming social relations. In an action initiated by the for-profit blood banks in Kansas City, the FTC investigated the charge that the city's community blood banks were engaged in an illegal trade boycott of the commercial sector by refusing to purchase blood from it. At the heart of the case was this question: Was blood a commodity,

or did it have some other kind of status? At its initial hearing the FTC accepted the argument that because citrate anticoagulant was added to blood to increase its shelf life, blood was not simply a living human substance but a commodity, "something that could be bought, sold and processed like any other drug. As such it would fall subject to the normal trade laws, forbidding economic boycotts and restraint of trade" (Starr 1998, 228). The implications of this for the community suppliers were both that they would be obliged to purchase blood that they considered a public health risk and that any recipient of tainted blood (still a very real possibility under the strictest testing and hygiene regimes available at the time) could sue the suppliers for violating implied warranty. The community sector appealed, and in 1969 the FTC decided that the case, since it involved nonprofit groups, did not come under its jurisdiction. The potential to treat blood as a commodity was not restricted by the ruling, and in the late 1960s another form of for-profit blood business developed. Pharmaceutical companies set up plasma collection businesses using a technique called plasmapheresis, which enabled the collection of large amounts of plasma from paid donors, to be used in the production of blood products. Again the donor populations were predominantly the indigent and homeless, and the pooling of the collected plasma in large vats presented a serious risk of contamination.

Mindful of these developments, Titmuss set out to defend the British voluntary system of blood donation against the dangers that he saw in the quasi-commercial system of the United States. Titmuss believed that the greatest threat to the gift system was not the pragmatic example of the blood system in the United States per se but the early stirrings of neoliberal market rationalism, articulated by economists like Friedrich von Hayek and Milton Friedman. His particular target was the policies favored by the influential Institute of Economic Affairs (IEA), a neoconservative think tank,[8] which advocated introducing market forces and analysis into British health care (Fontaine 2002). Titmuss regarded its arguments as a serious challenge to the National Health Service and its philosophy of national community and distributive justice. More broadly, he saw market rationalism as imperiling the whole ethos of welfare and public provision which characterized postwar Britain and which he considered essential to social cohesion. As

Philippe Fontaine comments in his detailed analysis of the historical context of Titmuss's work, "Encouraged by Labour's return to power in 1964 . . . [Titmuss] reconsidered the orientation of social policy in connection with externalities—that is, benefits and costs that are external to the market and for which people neither pay nor are compensated. In Titmuss's view, 'socialist' social policies stimulated ethical behavior, which generates positive externalities and averts negative externalities, whereas 'private' social policies, as envisaged by the IEA, favored commercialism, which neglects positive externalities and underestimates negative externalities. . . . Titmuss could sense that economic considerations were gaining ground in official Labour circles, a trend that would lead to gradual departures from the principle of free social services in the second half of the 1960s" (Fontaine 2002, 403).

Titmuss's intention in writing *The Gift Relationship* was to demonstrate how the problems evident in the American system typified the danger of exposing essential human services like blood donation to market forces (Oakley and Ashton 1997). The book contains a thorough investigation of the size and composition of donor pools, contamination risks, and blood wastage in each system. It found that the voluntary, national system in the United Kingdom provided a donor pool drawn from all social classes, better security against infectious contamination, and little wastage of blood supplies. The system in the United States, on the other hand, drew a high proportion of its ever-dwindling donor pool from ill and indigent donors, and the fragmentation of the system produced high degrees of waste and expense. More importantly for us, Titmuss used these findings to formulate a complex and rigorous argument about the values of the social as opposed to the economic sphere of life, and the moral and civil effects of gift systems of tissue circulation, which he opposed to commodity systems. In doing so he set out a framework for thinking about tissue donation and banking that is still highly influential in bioethical and health policy arenas throughout the world.

Titmuss locates the donation and distribution of blood within a broader set of questions regarding the nature of the social contract and the power of the welfare state to produce egalitarian and communitarian relations between citizens. At the start of *The Gift Relationship*, he notes:

> [This] study originates . . . from a series of value questions formulated within the context of attempts to distinguish the "social" from the "economic" in public policies and in those institutions and services with declared welfare goals. Could, however, such distinctions be drawn and the territory of social policy at least broadly defined without raising issues about the morality of society and of man's regard or disregard for the needs of others? Why should men not contract out of the social and act to their own immediate advantage? Why give to strangers?—a question that provokes an even more fundamental moral issue: who is my stranger in the relatively affluent, acquisitive and divisive societies of the twentieth century? What are the connections then, if obligations are extended, between the reciprocals of giving and receiving and modern welfare systems? (Titmuss 1997, 57–58)

For Titmuss the management of blood is a critical nodal point in the network of civil obligations created by a democratic welfare state. If blood, as an intimate part of the embodied self, is not sequestered from market forces, then all kinds of social services—education, social security, child foster care, social work—would also inevitably be laid open to the market, because the sharing rather than selling of blood represents *the* fundamental assertion of collective values. "To give or not to give, to lend, repay or even buy and sell blood leads us . . . into the fundamentals of social and economic life" (Titmuss 1997, 124). Blood must be given and not sold, Titmuss writes, because the circulation of gifts is crucial to forming collective social relations and mutuality among citizens. He develops this argument by drawing on Marcel Mauss's celebrated anthropological study of gift relations in Melanesian, Polynesian, and Canadian Indian societies, *The Gift: The Form and Reason for Exchange in Archaic Societies*. Mauss identified the giving and receiving of gifts as the primary basis for social solidarity in these societies. Gifts are important, Mauss argues, because they create relations of indebtedness and obligation between parties. Gifts are not so much things as relationships between persons. A gift exercises a certain hold over its recipient, insofar as the recipient is bound to the giver by the obligation to reciprocate. In this sense the gift is not a simple transfer of ownership from one party to another, but instead invokes the person of the giver, even after it has been given. Mauss

writes, "What imposes obligation in the [gift] received and exchanged, is the fact that the thing received is not inactive. Even when it has been abandoned by the giver, it still possesses something of him. Through it the giver has a hold over the beneficiary . . . to make a gift of something to someone is to make a present of some part of oneself . . . [and] to accept something from someone is to accept some part of his spiritual essence, his soul" (Mauss 1990, 11–12).

Frow (1997), in his careful reading of Mauss, notes that in this traditional system of obligatory giving, receiving, and reciprocation, gifts act more like loans. They both create and mediate relationships between persons, and continue to refer to their original owner, irrespective of circulation. They create above all a demand and obligation for reciprocation, and so the circulation of gifts creates a web of indebtedness and exerts a continued pressure for reciprocity. "The gift continues to form a part of the giver even when alienated to another . . . this link is a kind of property right which persists as an obligation to return the gift, even when the gift passes through a number of hands. We are concerned here with a transaction that perhaps bears rather more resemblance to a loan than to an absolute gift or the alienation of a property right" (Frow 1997, 110).

It is this power of gifts to constitute positive social relations that Titmuss draws upon to argue for the necessity of voluntary and gratuitous blood donation. Titmuss notes that in traditional societies, strict forms of obligation and compulsion characterize gift relations. As displays of wealth, they are crucial for creating chiefly hierarchies and personal power. Gift giving in this context is not disinterested and altruistic, but rather caught up in a system of calculation and strategy. Titmuss argues, however, that the gift of blood in the modern welfare state is a different category of practice. It is free of power relationships because it is impersonal, transmitted from one stranger to another, and so lacks the element of personal aggrandizement and indebtedness. It is voluntary, not compulsory, and the recipient is under no personal pressure to reciprocate. It is given not because the giver expects a return, but as an act of voluntary altruism and social duty. Blood is both an intimate part of a person and a circulable substance that can be given to another under conditions of mutual anonymity. Hence giving and receiving blood create the conditions for imagined

community (Anderson 1991) among fellow citizens, a sense of impersonal mutuality and inclusion, in place of the personal relations of power and indebtedness described by Mauss. Rather than constitute complex forms of social hierarchy, the gift of blood, according to Titmuss's model, helps to constitute a sense of social responsibility and trust among strangers, and gratitude not toward particular persons but to the social body as a whole. As social policy, free blood donation forms an integrative system, in which "[p]rocesses, transactions and institutions . . . promote an individual's sense of identity, participation and community and allow him more freedom of choice for the expression of altruism and . . . discourage a sense of individual alienation" (Titmuss 1997, 20). Furthermore, this system promotes good public health. In a nonremunerative system, donors have no profit incentive to lie about their health. They are much more likely than paid donors, for example, to truthfully answer questions about past episodes of hepatitis or syphilis. A gift system also promotes equitable redistribution, transferring precious biological matériel from the healthy to the ill, the strong to the weak, along the same lines of economy as those associated with the welfare state. In this way the blood bank becomes a site for constituting both collective health and the best values of citizenship, where the bodies of citizens are materially indebted to each other and to the redistributive state.

So for Titmuss, organizing blood along the lines of a gift system was a way to engender socially constructive and redistributive embodied relations between citizens. A gift economy for blood, he believed, would promote the optimum form of circulation to maintain the body politic of the welfare state, by creating a particular kind of civil intercorporeality, one in which the explicit relations of indebtedness between bodies would provoke a continued round of donation, a continuing replenishment of both the population's vitality and its generosity. Titmuss explicitly contrasts this communitarian economy with the social fragmentation that he believed was produced by the marketization of blood, its exposure to pricing mechanisms. Markets, he claimed, organize oppositional relationships between buyers and sellers, and resolve this opposition through the striking of price and the completion of a transaction. Selling blood creates instrumental, nonbinding commodity relations between producers and consumers,

whose relationship is strictly temporary, lasting as long as the transaction. If blood is subject to market relations then the identity between the person and his or her blood is severed, so that it circulates as a commodity and is incorporated as an object of possession and consumption, without the creation of any tie between vendor and purchaser. On the contrary, any relationship can be readily disentangled, as the blood itself is decontextualized from its point of production. As Frow puts it, "a market system . . . puts in place some very specific negative freedoms: freedom from obligation to or for unnamed strangers, and freedom from a sense of inclusion in the social" (Frow 1997, 105). It allows individuals to contract out of the social, to act in purely instrumental ways that further their own self-interest, including the selling of their blood to the highest bidder. The commodification of such an intimate part of the person was for Titmuss a synecdoche for the reduction of all forms of relationship to the contractual mechanisms of capitalism, and the destruction of any domain of social life outside of market relations. It is, he implies, on a continuum with slavery, the commodification not of the body as a whole but of body parts: "Short of examining . . . the institution of slavery—of men and women as market commodities—blood as a living tissue may now constitute in Western societies one of the ultimate tests of where the 'social' begins and the 'economic' ends. If blood is considered . . . as a trading commodity, then ultimately human hearts, kidneys, eyes and other organs of the body may also come to be treated as commodities to be bought and sold in the marketplace" (Titmuss 1997, 219).

The commodification of blood is also detrimental to public and individual health and to the proper delivery of health services. Drawing on the Kansas City case described above, Titmuss argues that establishing a market in blood would bring all blood-related medicine under the purview of commercial law: "A private market in blood . . . or other sectors of medical care will, in the end, require to be supported and controlled by the same laws of restraint and warranty as those that obtain in the buying and selling of consumption goods" (Titmuss 1997, 230). The blood sector would become the domain of civil litigation and adversarial relations between doctors and patients. Marketizing blood also distributes blood from the poor, who need to sell their blood, to the rich, who can afford to pay for it. It draws on a

necessarily less healthy population, and if blood has a price, this gives the donor an incentive to lie about his or her health. Hence Titmuss regards paid donors as presenting a greater risk of introducing infection, particularly serum hepatitis, into the blood supply: "The paid seller of blood is confronted . . . with a personal conflict of interests. To tell the truth about himself, his way of life and his relationships may limit his freedom to sell his blood in the market. Because he desires money and is not seeking in this particular act to affirm a sense of belonging, he thinks primarily of his own freedom; he separates his freedom from other people's freedoms" (Titmuss 1997, 308). Titmuss concludes his study with a round condemnation of blood markets:

> From our study of the private market in blood in the United States, we have concluded that the commercialization of blood and donor relationships represses the expression of altruism, erodes the sense of community, lowers scientific standards, limits both personal and professional freedoms, sanctions the making of profits in clinics and laboratories, legalizes hostility between doctor and patient, subjects critical areas of medicine to the laws of the marketplace, places immense social costs on those least able to bear them—the poor, the sick and the inept—increases the dangers of unethical behavior in various sectors of medical science and practice, and results in situations in which proportionally more and more blood is supplied by the poor, the unskilled and the unemployed, Negroes and other low income groups and categories of exploited populations of high blood yielders. Redistribution of blood and blood products from the poor to the rich appears to be one of the dominant effects of the American blood-banking systems. (Titmuss 1997, 314)

The Social, the Economic, and the Body Titmuss's study conceptualizes tissue distribution systems as specific political economies with intrinsic forms of value, exchange, and circulation, and the power to constitute sociality. It retains the fundamental insight of Marx's work on capital and the commodity form: that gifts and commodities "are not objects at all, but transactions and social relations. . . . As an order of social relations the gift economy [and the commodity economy are] bound up with the forms of the person as they are diversely con-

stituted and as it constitutes them" (Frow 1997, 124). Titmuss's primary concern is to formulate social policies that protect a putative realm of social values and "social man" against the predations of the market and "economic man." His passionate defense of the gift of blood is an attempt to insert the human body as a wedge between encroaching marketization and a domain of nonmarket sociality, where, he believes, social relations can be purely qualitative and free of calculation. In arguing that blood must be anonymously given and accepted, not bought and sold, Titmuss attempts to consolidate the principle that the human body, and the forms of sociality built upon its capacities, exist beyond relations of commerce, and that the value of the body is intrinsic and unquantifiable. Only an unqualified and unquantified civil generosity, the direct sharing of bodily substance, would adequately maintain the material relations of the welfare state and guard against the dehumanizing, fragmenting action of corporeal markets.

Here Titmuss draws on a discourse regarding the dignity of the human body that developed in an international context after the disclosure of the atrocities committed during the Second World War. A number of documents related to the establishment of international human rights legislation, including the Universal Declaration of Human Rights (1948) and the International Covenant on Civil and Political Rights (1966), employ the term "dignity" as defining the status of humans (Schachter 1983). As Rabinow (1999) notes, this contemporary understanding of dignity draws heavily on the Kantian opposition between dignity and price, or absolute and relative value: "In the kingdom of ends everything has either a price or a dignity. Whatever has a price can be replaced by something else as its equivalent; on the other hand, whatever is above all price, and therefore admits of no equivalent, has a dignity" (Kant 1981, 40). Working from this opposition between price and dignity, many twentieth-century politicians and bioethicists argued that the human body itself is the locus of absolute dignity, and that dignity involves the preservation and protection of integrity. Dignity is destroyed if any part of the body is assigned a market value and rendered alienable.

Using this international moral conceptualization, Titmuss could position the absolute value of the body and its products as the most

effective and worthy bulwark against the incipient commercial forces that he felt threatened the postwar welfare state. As we have seen, Titmuss wrote *The Gift Relationship* as a direct rejoinder to the early articulations of neoliberal economics, and published it just at the point when the postwar social consensus in favor of a Keynesian, welfarist nation-state, understood as a protection against both communism and the economic instability of the Great Depression, began to fracture. A few years after the publication in 1970 of *The Gift Relationship*, the international economic order began to shift irrevocably, a shift highlighted by the oil crisis, the end of the Bretton Woods agreement and the gold standard, and the decline of industrial production in favor of "informational" and service production as the economic base for the advanced industrial economies. The postwar welfare state was gradually undermined in ways that Titmuss had partially foreseen. By the early 1980s neoliberal administrations in the United States and Britain were actively devolving state provision of pensions and health services to the private sector, privatizing previously "essential" public infrastructure like telecommunications and energy, shrinking the tax base and shifting the economic base from nationally organized industry to transnational finance capital.

At the same time, blood plasma processing became an international business operated by increasingly powerful pharmaceutical multinationals. These companies used paid donors, often the poor in underdeveloped countries, to meet the blood requirements of the industrialized nations. We investigate this development at length in chapter 1. Here we can see the beginnings of the biocommercial activity that was to become such an important part of international commerce in the 1980s and 1990s, one of the primary drivers of the new knowledge economies. Titmuss's text linked these two phenomena, the commodification of human tissues and the neoliberalization of economies. In his argument, the commodification of human tissues leads irrevocably to the decline of the welfare state. Enshrining the noncommodifiable status of the body was, he thought, the best hedge against such a decline.

Yet even as the postwar welfare state was showing signs of collapse, *The Gift Relationship* proved to be a very influential book. It prompted the Nixon administration to begin reforms of the blood donation sys-

tem and to decrease, although not eliminate, paid donors for whole blood. Margaret Thatcher's failure to marketize the blood donation system in Britain has been linked to the success and popularity of the book's arguments among doctors and health administrators (Oakley and Ashton 1997). Titmuss's ideas inform present policies in the United Kingdom regarding other kinds of human tissue. As in western Europe and the industrialized Commonwealth countries (Canada, Australia, New Zealand), donors may not sell their tissues:[9] generally speaking, human tissues must be given (Medical Research Council 2001; Council of Europe 1997). In the United States in the mid-1980s, Titmuss's book was cited approvingly in congressional hearings that eventually resulted in the prohibition of whole organ sales.

Tissue Economies in the Information Age Titmuss's study of blood donation provides us with a dynamic, open-ended set of concepts about the social constitution of tissue economies, one that can be productively linked to contemporary theoretical and political concerns. It speaks very directly to the social, philosophical, and feminist literatures on embodiment, for it understands tissue donation as a way to constitute relationships between embodied citizens, to develop public trust and social equity through systems for the exchange of bodily substance. Tissue donation also expresses the way the populace is related to the nation-state: people donate because they identify themselves as included in the common fate of the nation. Titmuss's study also provides ways to analyze relationships between different systems for sourcing, distributing, and incorporating human tissues and to understand the consequences of each for public and individual health, social justice, and subjectivity. In positing and elaborating these relationships, Titmuss's work is invaluable for any attempt to understand what is at stake in contemporary tissue economies.

However, we would argue that Titmuss's study also has some significant limitations and blind spots, particularly evident when his argument is applied to more recent developments in tissue exchange. In particular, his reliance on what he considered the inherent moral and distributive qualities of gift systems as a solution to all potential problems is no longer an adequate response. Recent biotechnical, economic, and critical developments render the specific content of

Titmuss's approach problematic in several ways. First, Titmuss represented the gift of blood as a relatively simple *transfer* of a stable substance—*whole* blood—from one person to another, a representation that enhanced his model of anonymous generosity and exchange between equal strangers. However, very soon after the publication of *The Gift Relationship*, the technologies of blood transfusion changed. Since the mid-1970s a donated unit has generally been fractioned into a number of components—plasma, red cells, white cells, and platelets—and rarely transfused as whole blood. Hence one donor's blood may go to several recipients in some form, and a single recipient may receive blood products from more than one donor. This form of circulation somewhat complicates Titmuss's emphasis on blood as a one-to-one transaction between subjects, and indicates a disjuncture between the technical systems for the circulation of blood and the social economies of citizenship. Many contemporary tissue economies are still more complex and fractured than those of blood donation, further emphasizing this disjuncture. The engineering of tissues after donation means that any donated tissue may be put to multiple uses and adopt multiple trajectories (Waldby 2002a). With the exception of some organs, donated tissues are not simply transferred intact from one person to another, but rather diverted through laboratory processes where they may be fractionated, cloned, immortalized, and multiplied in various ways. Tissue sourced from one person may be distributed in altered forms along complex pathways to multiple recipients at different times and at different locations throughout the world. So, for example, a single donated embryo may form the starting point for several immortalized cell lines that can be copied, divided, sent to laboratories and clinics around the world, and eventually used to treat an open-ended number of patients. Tissue donation is thus transformed from an act of direct civic responsibility between fellow citizens into a complex network of donor-recipient relations heavily mediated by biotechnical processes and an institutional complex of tissue banks, pharmaceutical and research companies, and clinics. The implications of these networks for the social relations of tissue exchange will form one of the overarching themes of this book.

Second, the increasingly global nature of tissue exchanges renders problematic any attempts to isolate national medical systems from

international systems of exchange. While Titmuss's study was primarily concerned with whole blood, a substance whose relatively short shelf life means that it tends to be collected and distributed within national boundaries, blood products like plasma and Factor VIII, a treatment for hemophilia, are sourced globally and processed and sold by transnational pharmaceutical companies. Sperm banks like the Scandinavian Cryobank set up international branches to market "Nordic" semen to women in the United States and elsewhere.[10] The embryonic stem cell lines described above are another instance of tissue fragments that circulate across borders and between laboratories, tissue banks, and bodies in complex systems that exceed the regulations of any nation-state, and can rapidly disseminate both vital life-giving matter and contamination risks throughout the world. Hence the movement of tissues from one body to another is likely to take place beyond the relationships characterized by national citizenship and the body of law and governance that regulates national space. The difficulties of regulating transnational tissue exchange are manifested most urgently in the growth of global black markets for kidneys or corneas from live donors, who sell their body's long-term capacities for cash (Scheper-Hughes 2002a). How can we characterize the diversity of transnational interactions created by this proliferation and complication of global tissue economies?

Third, Titmuss's work, like most subsequent bioethical work, enshrines the principle that the human body exists beyond relations of commerce, and that its value is intrinsic and unquantifiable. In this it reflects both the Kantian discourse of dignity, discussed above, and the English common-law principle that persons do not have a property right in their bodies, and hence cannot sell themselves or purchase another. Since the publication of Titmuss's study, this laudable principle has become vexed in the area of tissue donation by the rapidly increasing commercial value of the tissue fragment *after it has been donated*. While donors are largely excluded in U.S. and British law from selling their tissues (with the exception of reproductive tissues and plasma in the United States), their donated tissue may be either sold by the receiving party (hospitals routinely sell tissues to pharmaceutical or cosmetics companies, for example) or transformed into cell lines or gene sequences and patented. The extension of intellec-

tual property rights to living entities has had a decisive effect on the biopolitics of human tissues. In the case of *Diamond v. Chakrabarty* (1980), discussed in chapter 3, the U.S. Supreme Court allowed the granting of a patent for a genetically engineered bacterium, on the grounds that the critical distinction in intellectual property rights was not between living and nonliving entities but between natural and fabricated entities. Since then intellectual property rights have been established in multicellular entities like knockout mice, in immortalized cell lines based on adult human tissue, in embryonic stem cell lines, and in genetic sequences. This constitution of biological entities as the repositories of intellectual property has transformed biomedical research into a lucrative area of investment for the increasingly mobile forms of finance and venture capital that have dominated the global economy since the 1970s (Arrighi 1994). These novel forms of living matter thus become the material base for highly inventive kinds of biocommerce, and companies like Geron, Advanced Cell Technologies, PPL Therapeutics, and many others use their patent licensing rights to attract venture capital. At the same time, as we explore in detail in chapters 2 and 3, donors themselves are legally excluded from any stake in this profitability. This legal distribution of property rights raises serious questions of social equity unforeseen by Titmuss's endorsement of gratuitous donation as intrinsically ethical. Effectively his strategy to make the human body a bulwark against the commodification of social life, a strategy now institutionalized in bioethical procedure, has simply rendered the body an open source of free biological material for commercial use.

Fourth, recent anthropological, sociological, and legal work on structures of exchange has begun a major reevaluation of the seemingly mutually exclusive relationship between gifts and commodities assumed by Titmuss. Frow (1997), in his extended essay on gift and commodity forms, undertakes a thorough critique of the Marxist analysis, assumed by Titmuss, that the commodity form and the functions of the market have an a priori atomizing effect on human relations, while gift systems are inherently more ethical. After reviewing anthropological studies of both traditional and contemporary gift economies, and noting the extent to which gifts work to constitute power relations and to further various strategies of prestige and domination, he ar-

gues, "There is no single form of 'the gift,' and no pure type of either the gift economy or the commodity economy. . . . on the one hand gift and commodity economies are always intertwined in various hybrid configurations and present a range of alternative possibilities for the use of objects; on the other, gift and commodity are not mutually exclusive modes of transaction, since they tend to have in common certain forms of calculation, strategy, and motivation. The gift therefore cannot and should not be conceived as an ethical category: it embodies no general principle of creativity, of generosity, of gratuitous reciprocality, or of sacrifice or loss" (Frow 1997, 124).

Callon (1998) extends some of these points when he argues that in a complex contemporary economy, gift and commodity systems interpenetrate each other in increasingly complex ways, and cannot maintain mutually exclusive forms of social space or spheres of relationship. Markets do not form discrete spaces contained by the power of nonmarket regulatory institutions and social life, nor can gift relationships function free of market calculation or considerations of exchange value. As we shall see, this interpenetration of public and commercial agencies characterizes contemporary tissue economies and their products. Correlatively, the distinction made by Titmuss regarding the natures of "economic man" and "social man" is unsustainable, because it assumes "the existence of individual agents with perfectly stabilized competencies . . . endowed with a set of fixed interests and stable preferences" (Callon 1998, 8). Such fixed ontologies could not be maintained under the conditions of uncertainty, fluctuation, and demand for strategic calculation that characterize the social networks of modernity.

Moreover, according to work by Appadurai (1986) on the social life of things, an alleged discreteness between gift and commodity forms cannot secure discrete spheres of social and economic life, because the same object may change status from gift to commodity and back again, according to the network of relationships in which it circulates at any given time: "The commodity is not one kind of thing rather than another, but one phase in the life of some things" (Appadurai 1986, 17). Appadurai notes that societies place limitations and termination points on the commodification of certain sacred objects (relics, ritual items, etc.). A variety of human tissues falls into this category. Many

people in the industrial democracies believe that embryos have a privileged relationship to the origins of human life, the opposite pole to the commodity (Kopytoff 1986; Waldby and Squier 2003). Other tissues—hair, urine, or saliva—have been historically treated as "abjects" that may be readily commodified precisely because they are waste, and do not signify the donor. As we shall see in chapter 2, the status of embryos is bitterly contested in many nations with active stem cell research programs, and embryos and the cell lines derived from them move in complex ways through gift and commodity regimes. Waste tissues have also changed status in dramatic ways under the aegis of genetic biotechnology, which can transform even the most modest biological material into both a marker for the self and a potentially lucrative source of genetic material or biological chemicals. We will examine some contestations and reversals of waste status in part II. Such rapid transformations of status, in and out of waste, gift, and commodity forms, typify the forms of circulating value assumed by human tissues today.

Finally, we point to the increasing importance of "information" as a mediating term between individuals and tissues used for research and therapies. The transformation of the economic foundation of the United States and most western European countries from industrial to informational has encouraged the extension of intellectual property categories (copyrights, patents, trademarks, and publicity rights) to an ever-increasing number of objects, and human tissues (and information about human tissues) are no exception. As a consequence, national courts and legislatures have become increasingly interested in understanding, and controlling, how informational flows—especially those between universities and corporations—operate in these countries. Models of public and national health still rely on the notion of individual donations of tissues, but these gifts are understood as components of vast informational systems that connect the public and corporate spheres both nationally and globally.

In what follows, we will examine some of the consequences of these transformations both in the socio-technical organization of tissue economies and in analytic frameworks for their understanding. It would be impossible today to account for all kinds of tissue economy

in one book, so we have elected to explore case studies, described below, as indications of some broader trends.

This is a comparative study in two senses. First, we develop some general ideas about the concept of tissue economies, and the organization and transformations of tissue value, by comparing the social trajectories of different tissue types and their transformations over time. Second, like Titmuss we focus our study primarily on cases drawn from the United Kingdom and the United States. While we touch upon other national situations as we go, the regulatory complexities and national traditions in tissue management vary so much in their detail that it was imperative to settle on specific social locations. Titmuss began with the understanding that the United Kingdom and the United States had distinctly different approaches to valuating and managing human tissues, the first committed to gift economies and national health as a common public good, the second accommodating a mixed economy in which gifts and commodities, private and public health services, mingled and collided. We have retained his focus here, not because this distinction holds up in any clear way in practice, but because specific tissue economies in each location must navigate their way through these differing traditions and different cultural weightings placed on the gift and commodity forms. Because we investigate several tissue types, and because we are interested in the ways that ideas and practices of value mutate across different social and technical landscapes, our study is not rigorously and exhaustively comparative in an empirical sense. Instead we have taken particular case studies as exemplary of these broader themes.

In part I, "Tissue Banks: Managing the Tissue Economy," we focus on the place of tissue banks in developing and circulating tissue economies, particularly how they must now adjudicate between the ontological and communal values associated with gratuitous donation, and the market values introduced by the growing role of biocommercial enterprise in developing tissue-based therapies. In chapter 1 we examine the fate of blood economies since Titmuss's analysis, focusing particularly on the HIV and hepatitis C contamination scandals of the 1980s, and we discuss the decisive role played by blood banks and their understandings of the gift-commodity relation in these scandals. This history is by now well documented (Starr 1998; Rabinow 1999;

Bayer 1999), and we draw on this material as a necessary introduction to the contemporary political economy of human tissues. However, we also use this history to illustrate the inauguration of a new kind of tissue economy, the autologous economy. Here the donors use the regenerative powers of their own bodies for themselves rather than for others, and use the tissue bank not as a point of redistribution but as a place to set up private tissue accounts to save their tissues for the future. This emergence of the autologous tissue economy is taken up again in chapter 4 in relation to umbilical cord blood and regenerative medicine.

In chapter 2 we examine the creation of a new kind of tissue bank, the UK Stem Cell Bank, which has an explicit remit to facilitate the donation of embryos by demonstrating good governance of the human stem cell economy. Embryos are particularly problematic forms of human tissue, because they are heavily charged with local, ontological significance yet form the starting point for complex, global flows through for-profit biotechnology circuits, with highly uncertain therapeutic outcomes and destinations. We argue that the UK Stem Cell Bank is a highly strategic initiative, set up to manage at least some strands of these global flows in accordance with ideas of both national and public good, and to mange potential conflicts of interest between donors, commercial actors, and (eventual) recipients.

Part II, "Waste and Tissue Economies," moves from the highly ontologized tissues described in part I to an examination of waste tissues in the organization of tissue economies. Waste, as a source of latent value, is essential to all forms of economy. While much of the force of Titmuss's account depended upon his demonstration that the market system of blood collection in the United States wasted far more blood than the British gift system, he understood "waste" as an entirely negative category, simply a loss of value. Waste as a source of positive value is a possibility unexamined by Titmuss, and one absent from his theory of tissue economies. We investigate the ways that designating some tissues as "hospital waste" severs them from the identity of their (often-unwitting) donors and frees them up for innovative and profitable forms of circulation and transformation. In chapter 3 we revisit a legal case with a now extensive commentary literature, *Moore v. Regents of the University of California*, in which a U.S.

citizen, John Moore, tries and fails to establish property rights in a patented cell line established without his consent from his spleen tissues. Our task in revisiting this case is to elucidate the central role that designations of waste played in the ruling, and play more generally in the circulation of human tissues through for-profit laboratories. Moore's case makes plain that the designation of some tissues as waste, as valueless or dangerous before their entry point into the revivifying space of biocommerce, is a crucial move in securing the intellectual property rights and profit margins of the biotechnology industry.

In chapter 4 we examine another transformation of waste into positive value, that of umbilical cord blood. In the late 1980s cord blood was dramatically revalued, from (useful) detritus to precious therapeutic substance, a treatment for life-threatening blood disorders in children. At this point it became a part of two distinct systems of value: a redistributive gift economy, in which public cord-blood banks accept allogenic donations and store cord blood to be matched with a needy recipient in the future; and a private, autologous cord-blood system, in which parents open a personal cord-blood account for their child, for future use. This second system of value gives eloquent expression, we suggest, to both the neoliberal appeal of investing a part of the body in the future and the increasingly important regenerative models of tissue economy, in which each person relies not on the surpluses generated by another body but on the regenerative possibilities of his or her own body.

Part III, "Biogifts of Capital," examines situations where the social virtues historically associated with gift economies are claimed by advocates of various kinds of tissue markets. Chapter 5 examines several cases in which commodified tissues have functioned as the basis for kinds of civil belonging and public circulation. It looks in particular at the paradoxical status of biotechnology patents. One the one hand, these can be configured as a form of exclusive property right, enclosing what might otherwise be public domain knowledge or low-cost biomaterials within the high walls of maximum license fees and stringent boundary policing. On the other, legal devices like the General Public License and public good considerations in the pricing of license fees allow many patent holders to favor some form of biomedical "com-

mons," where knowledge, tissues, and techniques can circulate under conditions of common access and contribution. At the same time, some patient groups have entered into exclusive patent-based relationships with medical researchers, co-managing access to the knowledge and profits generated from research on their tissue fragments. As medical charities and patient advocacy groups become powerful players in funding and directing for-profit therapeutic research, these kinds of arrangements seem set to become more common.

Chapter 6 examines the practices and arguments around organ markets. National gift economies in cadaveric organs have proved unable to meet the demand for transplants, and waiting lists for organs grow ever longer in industrialized nations. We discuss the relationship between these waiting lists and the growth of a global black market in "spare" kidneys, sold by the poor in the South to organ brokers who arrange their transport to wealthy transplant patients. Health economists and some bioethicists regard this black market as the result of the intrinsic inefficiency of gift systems, and advocate the creation of regulated organ markets to undercut the exploitative nature of black markets. We consider the systematic blindness in these arguments to the insatiable nature of demand for transplant organs, driven by the elaboration in both transplant medicine and regenerative medicine of an idea of a regenerative body, whose every loss can be repaired.

This book is ultimately about how the human body's productivity is sutured into social systems of productivity, community, and politics, the various proposals for altering the present arrangements, and the kinds of cultural significance that these proposals carry. In this sense the book is profoundly concerned with the contemporary power relations of life and the life sciences, the sphere of biopolitics (Foucault 1980), and the ways that these power relations frame the domain of bioethics and public policy. The capacity of commercial biotechnology to generate novel capacities and forms of profit from in vitro human tissues has dramatically transformed these power relations and now, it seems to us, a great deal is at stake in different proposals for the best way to organize tissue economies. We hope that this book contributes significantly to the debate.