ONE

A Skeleton in the Closet and Fetuses in the Basement

AS I WALKED INTO THE BIOLOGY BUILDING on a glorious June day, the temperature in the basement was cool enough to cause a little shiver, and the piercing smell of formaldehyde in the storeroom gave the eerie impression of entering a morgue. One light bulb was burned out, yet in the gloom I could make out dozens of grimy jars of human fetuses packed three or four deep on industrial metal shelves. Judging by the dust, the collection had been untouched for decades. The formaldehyde had completely evaporated from some of the jars, leaving the contents to rot into sodden gray sludge. No one had taken much care with the collection even in its prime. Fetal specimens were casually stowed in mayonnaise jars and old-fashioned mason jars with glass lids and wire bails; just a few were in museum-quality exhibition vessels. An antique pill bottle with glass stopper held a tiny, one-inch fetus still enshrouded in its cloudlike chorionic membrane. One jar—inadequately sealed with masking tape—held a larger specimen that had turned an uncanny bright turquoise, discolored by the copper wire that held it against a glass plate. Another jar that had once contained eight pounds of Kraft fresh-chilled grapefruit sections now was packed with eight topsy-turvy fetuses in various states of deterioration. In total, I counted nearly one hundred fetuses in the jars.

It wasn't easy to look. I had the impulse to dash upstairs and forget I'd ever requested the visit. This was not the sanitized, schematic view of prenatal

development depicted in pregnancy books and Web sites. Nor was it a clean, brightly lit display of well-maintained specimens. It was dark, dirty, moldering. I tried to gather my wits. "You asked to come here," I scolded myself. "You are escorted by a professional scientist in a clean white coat. Don't be such a wimp!" So I drew a careful breath and looked more closely, tried to think of something to say, moved a few jars around. I wished I had brought gloves, although I knew that the impulse was motivated more by a fear of pollution than a fear of dirt. I had the urge to wash my hands. Even as I grew accustomed to the surroundings, the muscles behind my cheekbones remained taut.

The laboratory supervisor picked up one conspicuously large, heavy jar and moved it into the light. We marveled over a full-term, apparently stillborn fetus, with perfect little ears and curly red hair. In that one specimen was embodied the emotional impact of the collection. Each of these "specimens," I realized, had started its journey conceived and carried by some woman, some singular human being who had her own story to tell. Yet her identity was unknown and probably unknowable, and no effort had ever been made to credit her contribution to this scientific enterprise. There were no records that would connect the fetal specimens to the women who had carried them. I would never be able to ask a woman what had happened, or whether it bothered her that the remains of her pregnancy had ended up as an anonymous specimen relegated to the farthest corner of the biology basement storeroom. I felt a complicated sadness, not so much for the lives lost before they began (because I had no way of knowing whether those fetal deaths brought suffering or relief), but for the scientific practice that reduced so many women's reproductive experiences to a forgotten assemblage of zoological specimens pickled in formaldehyde. As an anthropologist, I felt this to be a strange custom indeed.

It had obviously happened a long time ago, but someone once had gathered those misbegotten embryos and fetuses and stored them on the shelves of a science department storeroom at Mount Holyoke College. There were other items on the shelves, including pickled snakes, fetal pigs, and various stuffed animals. Later I learned that most of the skeleton of a woman, minus a few bones, had been donated to the college in the early twentieth century and was still stored in a closet upstairs, along with miscellaneous collections of rocks, wax models of embryo brains, and antiquated instruments. Such is the detritus a college acquires over time. Of all these items, however, the fetal collection seemed the most strange. I knew that abnormal fetuses were practically a required fixture of medical schools. In *The Bell Jar,* Sylvia Plath described her tour of "some really interesting hospital sights," including "the

baby in the . . . bottle [that] had a large white head bent over a tiny curled-up body the size of a frog" (Plath 1971:51). I knew that anatomical museums sometimes displayed unusual pathological specimens—fetuses lacking brains and the skeletons of conjoined twins—but I could not imagine why dozens of apparently normal human fetuses were stored in formaldehyde at a venerable women's college in rural Massachusetts. There was no medical school nearby, and human embryology had not been taught at Mount Holyoke in decades. By what logic would anyone have amassed a collection of human embryos and fetuses, and why were they stored in a dark corner of the basement?

At a picnic that evening, a small crowd gathered as I explained what I had found. "Come here," people waved to their friends, "listen to this." After they had heard the details, they pelted me with questions I could not answer. "Where did they come from?" "Why were they there?" The picnickers—including those who had tracked the development of their own gestating fetuses in the pages of *What to Expect When You're Expecting,* and all of whom were perfectly accustomed to seeing fetuses on the covers of news magazines—thought the idea of a specimen collection downright bizarre. As the sun set beyond Groff Park, they spun lurid theories about what might account for the unusual collection. Someone wondered whether Mount Holyoke was once the site of a radical underground network of abortion providers, implying that only some criminal activity could explain the fetal cache, so amateurishly stored. This struck me as far-fetched, but it did make me wonder why, when confronted with the existence of fetal specimens, someone would leap to the conclusion that it must have something to do with abortion.

Eventually I learned that Mount Holyoke's collection was a small outpost of an important large-scale embryo collecting project based at Johns Hopkins during the first half of the twentieth century. The heyday of embryo collecting took place between 1913 and 1944, although the earliest efforts began around 1890 and the project lasted into the 1960s and beyond. During this time, anatomists interested in human embryology collected thousands of human embryos and fetuses as evidence for their scientific study of human origins and development. Results of that research formed the basis for much of what was known about human embryology in the late twentieth century. In contrast to the massive collecting initiative that took place in Baltimore, Mount Holyoke's specimens constituted a scientifically insignificant assortment of about three hundred specimens, used only for teaching. Without them, though, I would not have learned about the collecting effort that treated embryos and fetuses as objects of scientific inquiry and provided the empirical evidence for our embryo-centric worldview.

EMBRYO ORIGIN STORIES

Embryos are the central actors in the origin stories that many modern, educated people tell themselves—ourselves—about who we are and how we came to be. Some of our most heated debates hinge on the status of embryos, and we seem never to tire of the exchange because we constantly create new spaces to argue over the same issues: abortion, contraception, in-vitro fertilization, cloning, and stem cell research. People who disagree vehemently about these issues nevertheless manage to agree on one score: embryos are important biological organisms, the precursors to our natural selves, without which none of us would exist. Whether we believe that humans originated in the Garden of Eden or evolved from hominid ancestors, the embryo has come to represent the beginnings of each individual life (S. F. Gilbert 2006). Embryos have become the quintessential symbols of humanness, the minutest essence of our selves. Embryos represent our collective human past and the prospects for our future. Who would we be without them?

In the mid-twentieth century, anthropologists analyzed nonwestern origin stories to gain insights into deeply held worldviews. When the British-born anthropologist Ashley Montagu studied procreation beliefs among the aborigines of Central Australia in the 1930s, he realized that not all peoples consider what grows in a woman's womb to be a human embryo. He wrote that the aborigines could not be convinced that "a child born at a very premature stage" was an unformed human being. By their logic, what we would call a miscarried embryo was "nothing like a *Kuruna* [spirit] or a *ratappa* [newborn]; 'they are perfectly convinced that it is the young of some other animal, such as a kangaroo, which has by mistake got inside the woman'" (Montagu 1974:31). Anthropologist Jane Richardson Hanks reported a similar story from her fieldwork in Bang Chan, Thailand, in the 1960s. Women told her they had given birth to all kinds of nonhuman entities, including gold and jewels, monkeys and a fish's stomach, or a "Golden Child" spirit (Hanks 1963:34–35; see also L. M. Morgan 1989). Not schooled in an embryological view of human life, the women of Bang Chan evaluated on its own terms everything that came from their wombs. Like true empiricists, they reported what they saw, rather than what they expected to see. Turning these insights back on ourselves, we might ask how we came to see in tiny unformed embryos a reflection of our own origins?

Embryos as we know them today are a relatively recent invention. A hundred years ago, most Americans probably would not have been able to conjure up a mental image of a human embryo. When they thought at all about

the beginnings of life, they would have been likely to describe development as a mixture of spiritual, emotional, and biological processes. Many would have cited quickening, when a pregnant woman first felt fetal movements, as evidence that a soul had entered the child. Quickening usually occurs four to five months into a pregnancy, yet many people thought it was the first demonstrable sign that a new life was imminent. As Hopwood points out, even women who knew themselves to be pregnant "often did not interpret the contents of their wombs in embryological terms" (Hopwood 2000:39; see also Duden 1993). Nor did many of their doctors. Obstetricians were more likely to encourage pregnant women to think pleasant thoughts and avoid strenuous exercise than to offer them detailed descriptions of embryonic development. The earliest embryos were overlooked by pathologists, because they were literally too small to see. The embryo collectors were part of an immense social transformation that changed all that, turning embryos from entities that were socially and scientifically insignificant into tangible, material objects of enormous cultural importance.

By the year 2006, it was possible to make the following statement: "For most of recorded history, people have fundamentally disagreed about the moral status of the human embryo. In early times this was because people knew very little about what actually went on in the womb—and so had very little idea what an embryo was" (BBC 2006). This statement is remarkable in its confident assertion that the moral status of embryos will be resolved once the scientific facts are known. Morality, in other words, will be wholly consistent with and determined by the biological facts. According to this view, moral disagreements will vanish as technologies (such as microscopes and laparoscopes) allow us to view and to "know" embryos. This book takes up the question of how it became possible to believe that knowledge about "an embryo" would be so transcendent, that meanings would be encapsulated in embryo tissue. How did it become possible to believe that profound moral questions could be resolved by scientific description?

Throughout the late nineteenth and early twentieth centuries, scientists argued over how to understand and explain human embryological development. Some, such as Louis Agassiz (1807–73), believed in recapitulation, the now largely discredited idea that embryos pass through the successive stages of "lower" animals as they develop. On the other side of this argument were an increasing number of scientists who favored material explanations of development. Embryo evidence was critical to this debate, and the importance of embryos was elevated by those who sought to create a holistic, biologically based appreciation of embryological development. Resolution of

the dispute would put embryology on a sound materialist footing, and would make religious and spiritual interpretations of human development seem outmoded, premodern, and nonsensical. The effort required empirical evidence, and thousands of nonhuman embryological specimens were gathered around the world. But human embryo specimens, especially those from the first few weeks of development, were in short supply. The embryo collectors dreamed about creating a storehouse of thousands of human embryo specimens, on an unprecedented and previously unimaginable scale. Most of them were bench scientists, though, who lacked access to the women whose bodies harbored the coveted specimens. They had to depend on the kindness of their clinical colleagues for access to specimens. Embryo collecting was born, then, as a collaborative effort between research scientists, clinicians, and pregnant (or formerly pregnant) women.

The embryo collectors spent a great deal of time, initially, teaching doctors how to look carefully through the clots of blood and tissue that passed from women's wombs. Whenever a uterus was scraped, removed through surgery, or examined at autopsy, surgeons and pathologists would look for the chorionic sac that might contain a coveted fresh embryo. Whenever a woman came to the clinic with vaginal bleeding, doctors were alert to the possible presence of a small embryo. Baltimore was full of recently arrived migrants at the turn of the twentieth century, and the women who produced embryos came from different backgrounds: Negro, European, American Indian, Protestant, Catholic, immigrant, native born, factory workers, domestic servants, farmers. But the embryologists were less interested in documenting the medical and sociodemographic diversity of the women than they were in producing a new class of embryo objects (see Landecker 2007:68). Because these embryo objects would be classified as a type, attributes of diversity were arguably less important than their collective identity as homogeneous "specimens." Candidates for the embryo collection were first screened into two fitness categories: those specimens judged "abnormal" or "pathological" were set aside, while those judged "normal" were sent along for further processing. They both marked and challenged "the boundaries of normal and abnormal, nature and culture, self and other" (Lock 2007:284). The putatively "normal" specimens entered the laboratory with their own unique characteristics. There were young specimens and old. Some were fresh, others were shriveled or tattered. After the embryos were processed—after being metaphorically stripped, numbered, and lined up in formation—they emerged with remarkably similar identities, each an adequate representative of relative uniformity, the generic human embryo. It took many embryos to produce the narrative

of singular embryological development. If the idea that all human embryos should be included under the same heading seems obvious, it is only because we live inside the embryological view of development.

Creating specimens required that the embryologists give special attention to their social context, but only at first. Each embryo entered the laboratory with medical histories and stories, of women's symptoms and menstrual histories, of how the embryo had "come away," even of the women's husbands and lovers (Medley 2002). Embryologists evaluated the women's histories for details that might help them assess a specimen's age, but once the age was determined, the specimen would be translated into a data point in the larger story of "ourselves unborn" (Corner 1944). Specimens were treated as anonymous things, without parents. If they were granted any genealogical ties, those ties were to the human species rather than to individual families. Specimens were stored carefully in glass jars, but without formal ceremony. The larger fetal specimens were sometimes stored together, en masse, in vats full of other specimens made anonymous. They were not personified, named, or clothed, and no memorial services commemorated their service to science. The processing of human fetal specimens was somewhat reminiscent of corporate meat packing, in which carcasses were lined up for treatment according to the exacting standards of industrial production. Producing uniform specimens was important, because it resulted in evidence that condensed and connected the history of the species with the history of individual bodies and selves. The embryologists crafted embryos that corresponded to their empirical, material view of embryological development, and in so doing they "displaced the source of . . . authority downward from the social toward the realm of the biotic" (Palmié 2007:213).

The social production of anonymity might have wrested embryos from the families that produced them, but it was also a crucial step in creating an embryological origin story and an entity called "embryo." As Donna Haraway might say, specimens were a pedagogy "for learning to see who exists in the world" (Haraway 1997:177). It would never have been possible to imagine embryos having "bodies," or functioning as potential or actual members of the human community or miniature versions of our grownup selves, were it not for those specimens. The embryo collectors provided models of the human embryonic form and the very concept of "development," conceived as a cumulative process of unfolding. Historian Nick Hopwood put it nicely when he argued that development should not be "taken for granted" as the subject that embryologists study. Instead, he argues, development should be regarded as an "effect" or "achievement" that the embryologists "labored to

produce" (2000:31, 76; see also Haraway 1997:182). By looking at this period of embryo genesis, we can see the social genesis of a supposedly natural form. Embryos and fetuses are thoroughly infused with culture, even (or especially) when tightly swaddled in the cloak of science.

It can take considerable effort to perceive the embryological view of life as one account among many, as *an* origin story rather than *the* origin story. Yet the embryological view shares several features with origin stories from other cultural contexts. All are patterned, predictable accounts of how "we" (the people) came to be. All origin stories get repeated frequently, to socialize children and reinforce a collective identity and history. The details of origin stories remain essentially the same no matter who tells it; the embryological origin story always begins with conception and ends with birth. The embryological view is told as one of the greatest, oldest human truths. Its legitimacy is enhanced by being linked with other powerful forms of knowledge in our society, especially science and religion.

NATURALIZING THE EMBRYO

By the late nineteenth century, the idea of embryological development becoming gaining ground, along with the Progressive Era social and scientific assumption that human culture is epistemologically rooted in nature. Increasingly, social significance was attributed to biological explanations. Like their peers, the embryologists were convinced that the key to understanding human origins would be found in embryological development. One by one, doctors gathered embryos and fetuses from miscarriages, abortions, and autopsies. They sent them along to embryologists, who preserved and sectioned the specimens, cutting them into thin slices to be mounted on glass slides. By projecting the slides they could draw pictures, create models, tell stories about the development of organ systems, publicize their results, recruit doctors to their cause, and gradually work to produce an "embryological view of life" (Hopwood 2000:32). Hopwood traces the first hints of the human embryological view to the late 1700s, when German anatomist and physician Samuel Thomas Soemmering made pictures of the sequence of human development (Hopwood 2000:33; Duden 1993:40–41). Yet Soemmering's ideas were slow to catch on. The modern embryological view of life did not take hold until nearly a hundred years later, Hopwood says, after Swiss-born German anatomist and embryologist Wilhelm His (1831–1904), working in Germany, began to promote the idea that human development could be understood as a sequence of demonstrable, predictable steps (Hopwood

2000:34). His began to standardize techniques for collecting and studying human embryos in 1878 (Hopwood 2000:37). He developed standardized developmental tables, called "normal plates," that allowed him to categorize embryos based on their size and morphological features (Hopwood 2005). These were instrumental in allowing embryological development to be envisioned as a sequential series of stages, usually depicted as ranging along a continuum from smallest to largest. The twenty-three developmental stages now known simply as the Carnegie stages summarize "major developmental events . . . correlated with embryonic length, approximate age, and stage" (O'Rahilly and Müller 1999). The Carnegie stages were a major achievement of the scientists who created the Carnegie Human Embryo Collection.

In 1887, one of His's students, a young American doctor named Franklin Paine Mall (1862–1917), brought His's methods for studying human embryology back to the United States. Inspired by what he had learned in Germany, Mall was determined to advance on what he saw as the largely uncharted frontier of human embryology. Operating slowly but steadily, with few resources, Mall began to collect a few precious embryo specimens and to educate doctors about the need to save embryos for scientific study. With support from His, Mall worked to establish methods for acquiring, cataloguing, and studying embryos and for disseminating the research results through scientific journals. His persistence paid off, and in time he became an embryo collector and producer par excellence. Mall was certainly not the only embryo collector, nor was he a superstar in the field of embryology. Nevertheless I will use him as a central figure in this book because of his dedication to collecting, and because his motivations and insights say a great deal about the logic and practice of collecting. By the time Mall died, he and his colleagues had cultivated an extensive and far-flung network of physicians committed to helping them gather embryos and fetal specimens from miscarriages, surgery, and autopsies. They established an embryo collecting tradition in the United States that lasted well into the 1960s. By the 1920s, gynecologists, obstetrical surgeons, pathologists, and family doctors had gotten into the habit of saving virtually all embryos and fetal remains that came into their possession. Embryo collecting became thoroughly normalized and unremarkable. During this time, many universities, hospitals, and even small undergraduate colleges would have acquired their own collections to use for reference, teaching, and research. The collection of embryos and fetal specimens became commonplace. Specimens were donated to the Mount Holyoke collection, for example, by the brother-in-law of a zoology professor, a physician who took them from the Pennsylvania hospital where he worked as chief

of staff. By 1944, nearly ten thousand human embryos and fetuses had been collected and catalogued by the embryological institute that Mall founded, the Baltimore-based Carnegie Institution of Washington Department of Embryology (CIWDE).

THE EMBRYOLOGICAL VIEW OF DEVELOPMENT

Gradually, the "new scientific objects" called human embryos made their way into popular culture, and embryo and fetal specimens were recruited to fulfill an ever-wider variety of social functions. As Hannah Landecker says in her history of tissue culture, "Scientific, literary, philosophical, and popular responses . . . are more than representations of this new object; they are specific responses to its material form" (2007:93). Embryos were taken up at various points as essential scientific work objects (Casper 1998:118), pawns in debates over the teaching of evolution (L. M. Morgan 2003), educational artifacts for museum display (C. Cole 1993), flashpoints in the conflict between science and religion (Grobstein 1990; George and Tollefsen 2008), and symbols of women's reproductive integrity, autonomy, and morality (Petchesky 1987). By the end of the twentieth century, embryos had escaped the jurisdictional confines of medicine entirely, and had found roles in entertainment, art, advertising, legislation, education, commerce, and of course as political propaganda. Old specimens from the early twentieth century have been reanimated and put to new uses. New digital technologies, for example, have allowed sectioned specimens to be scanned for the purpose of creating educational software to train future embryologists (O'Connor 2003; B. R. Smith 1999; Yamada et al. 2006).

It can be difficult to recognize the cultural assumptions behind the embryological view of development. We like to tell ourselves that embryological facts represent *the* truth rather than *a* truth. Only since the 1980s have scholars started to question the cultural roots of our assumptions about embryos, how these are related to notions of reproduction, procreation, and how the latter are related to notions of kinship and relatedness. As Sarah Franklin points out, "The givenness of 'natural facts', and in particular the 'facts of life', has allowed them to operate as fixed, unquestionable anchors for much of the history of anthropology" (1997:2). Those days are behind us now, as anthropologists and historians dig deep into culture-bound assumptions about kinship, genetics, gender, race, and other supposedly stable biological categories (Delaney 1991; Franklin 1997, 2006; Ginsburg and Rapp 1995; Lindee, Goodman, and Heath 2003; Rapp 1995; Strathern 1992; Yanagisako

and Delaney 1995). The embryological view of development can be particularly hard to apprehend reflexively, because it tends to obscure the social aspects of reproduction at the same time that it *becomes the basis for their cultural production,* as Franklin so eloquently argues (1991:197). Much is lost when the complicated context of human reproduction is reduced, as it often is in the embryo- and feto-centric climate of the early twenty-first century, to a focus on the viability and sanctity of embryos and fetuses. "This double move, of displacing and replacing the social with the biological, . . . enables a woman's pregnancy, the work of nurturing a child, the meaning of motherhood, the social meaning of personhood (in terms of kinship, identity, naming, reciprocity, interdependence, etc.) all to be reduced to one dimension, which is that of biological life" (Franklin 1991:200). Because the embryological view of development is so taken –for granted in the contemporary world, it is worth spelling out some of its primary assumptions.

1. The embryological view of development holds that each human life begins—at least in organismic terms—at conception, passing progressively through embryological and fetal stages before being born. It holds that the embryo-fetus-baby pathway is the *only route* to becoming a full-fledged human being, and it encourages us to see in every embryo a tiny, telescoped image of our present selves. "The adult being that is now you or me is the same human being who, at an earlier stage of his or her life, was an adolescent, and before that a child, an infant, a fetus, and an embryo" (George and Gomez-Lobo 2005:201). This explanation carries of vestige of the old idea of preformationism, which held that the adult individual was bundled, fully formed but in miniature, inside the germ cells. It does not *necessarily* say when or how we should begin to value embryos (or fetuses, infants, children, adolescents, or any other life phase), just that their biological existence can be traced back to conception. All human beings begin as embryos, and all of us were fetuses at one time (although see Olson 1997).

2. All human pregnancies produce human embryos. According to the embryological view of development, a human pregnancy cannot produce an inanimate object or hybrid embryo of another species, no matter what Thai women or Australian aborigines say (although see Matthews and Wexler 2000:212–18). Cases in which a pregnancy does not produce a human embryo are considered very dire. Obstetricians watch out for a rare but sometimes deadly condition called gestational trophoblastic disease or molar pregnancy.[1] Meanwhile science fiction

writers and filmmakers have long exploited the dystopian possibilities of nonhuman pregnancy (think of Roman Polanski's 1968 horror film, *Rosemary's Baby*). The normal—and normative—course of events is for human pregnancies to produce human embryos.

3. Embryos are assumed to be amoral biological entities, defined and classified solely by their genetic and anatomical features. As one zoologist put it in 1912, "The fact is—and it is one which is not sufficiently recognized—that the formation of an individual from an embryo, the making of a man, is a biological problem fundamentally" (Leighton 1912:37). This kind of biological reductionism leads embryologists to grade and classify embryos according to the morphological features they possess. They do not attend to the spiritual, moral, or social circumstances that generate embryos; they do not differentiate between embryos conceived deliberately, for example, and those conceived inadvertently. The biology is all that matters.

4. Embryological knowledge is held to be true. The embryological worldview holds itself to be the one true story of how life begins, superior to all other explanations and inherently apolitical. Embryologists do not acknowledge their own role in producing embryos or embryo ideologies. They concentrate on their role in producing "knowledge" rather than "beliefs" or worldviews. This naturalized view of embryology was so widely adopted by the mid-twentieth century that most modern citizens called it "the facts of life." Even religiously motivated embryo advocates often cite scientific "facts" to justify their opposition to abortion and human cloning.

If it is hard for us to recognize the embryological view as a cultural rather than a natural artifact, it is no wonder. We are steeped in stories that promote the marvelous truth that is embryological development. One early example can be seen in a 1937, sixteen-minute film called *In the Beginning,* which was billed as "the story of the adventures of the mammalian egg."[2] What makes that film remarkable by today's standards is that it shows reproductive scientists at work operating on a pregnant rabbit, and it emphasizes the microscopic tools and technical work necessary to make reproduction visible to the human eye. By the time the award-winning *Nova* video *Life's Greatest Miracle* was released in 2001, scientists were no longer featured, and the stars of the show were the egg and the sperm that unite to form an embryo that grows into a fetus and then a baby. *Life's Greatest Miracle* is a sequel to the

1986 Emmy-award winning film *The Miracle of Life* (Stormer 1997), which became the most popular *Nova* video ever. Because it was designed to be educational, it was shown on the most public of all media—television (it is also easily accessible online). The story takes just under an hour to tell, and it unfolds chronologically—like most embryological origin stories. Gestation is presented as a unified whole. It would be unthinkable to focus just on implantation, for example, without also considering the sperm's imperiled journey or the amazing rapidity of fetal growth. Most of the film's imagery is set (presumably) inside the body, and explanations are couched in the authoritative language of biology. The script is sprinkled with witty anthropomorphisms about courtship, dating, and chaperones.

Even the most secular of these embryological origin stories are notable for their quasi-religious language and overreliance on the word "miraculous." In Haraway's terms, "A secular terrain has never been more explicitly sacred, embedded in the narratives of God's first Creation, which is repeated in miniature with each new life" (1997:178). The tale of embryological development is portrayed as a secular miracle. "Viewer discretion" is advised, but the program is carefully designed to be inoffensive. The story is fit for prime time; there are no depictions of sexual intercourse, no close-ups of childbirth, no mention of abortion. The star of the show is the plucky embryo-fetus on its arduous, wondrous journey from conception to birth. Viewers are told that human bodies are programmed to make babies. Because the story is told as an empirical account based in scientific rationality, it must begin with a biological event: fertilization. One can almost hear those immortal words from Genesis, "In the beginning, God created the heaven and the earth," as the omniscient narrator intones, "YOU looked like this," while onscreen viewers see a dramatically magnified image of a single cell against a blue background. Using the rationale that conception determines the genetic uniqueness of a new human bein1g, the embryological origin story uses conception as a defining moment. Conception, though, is only the beginning. The next few minutes of *Life's Greatest Miracle* skip from fertilization directly to alluring pictures of a well-developed fetus. The camera zooms in on the fetus's most humanlike features; its pristine unopened eyes, golden fingertips, perfect lips and toes. This quick reprise of the entire gestational period, right at the beginning of the film, reinforces the idea that conception leads directly to babies, and outlines the contours of what AmericanBaby.com (and scores of other web sites and popular sources) refer to as the "amazing journey from conception to birth."

Perceptions of fetuses can be tricky, as Ashley Montagu learned so long

ago in Australia. In *Life's Greatest Miracle,* pictures of fetuses are presented as straight-up biological facts. Feminist scholars have analyzed fetal photographs to show how such visual images shape our interpretations of human development.[3] They have noticed, for example, that the story of "life's greatest miracle" is more often illustrated with pictures of large (magnified) embryos and fetuses than with pictures of pregnant women. Such pictures encourage viewers to notice the continuity between tiny embryos and full-term newborns. Yet, curiously, the storytellers rarely say how the pictures were chosen or made. When a fetus appeared on the cover of *Newsweek* magazine in 2003, I tried—in vain—to learn who took it and how. Like the Wizard of Oz thundering, "Pay no attention to that man behind the curtain," editors and designers prefer to give the impression that the story they are telling—like the embryo itself—is a natural fact rather than a production assembled by a team of hardworking photographers, editors, producers, and technicians. *Life's Greatest Miracle* does not mention the scientists who devote their lives to producing embryos or the women whose lost pregnancies contribute to the advancement of embryological science. It ignores the social climate that accepted without question the embryologists' right to collect and section thousands of embryos. Rather than addressing disagreements about the beginnings of life, the *Nova* program, like most secular versions of the modern origin story, emphasizes that life begins during the journey from conception to birth.

The embryological view of development pretends to exist outside of time, yet it has changed a great deal over the past century. It became popular as Darwinian evolution was becoming popular, and during a time when the identification of microscopic pathogens made it possible to prevent and treat infectious diseases (including some of those that caused miscarriage). Energized by the triumphs of biomedical science, Americans were eager to understand the hidden interiors of the human body and to assist in the scientific effort to "make invisible life visible" (Stormer 1997:175). Even Horatio Robinson Storer (1830–1922), the Boston-based physician who led the 1860s movement to criminalize abortion in the United States, had not seen many early human embryos. When Storer argued that human life began prior to quickening, his evidence consisted, by his own admission, of "common sense, analogy, and all natural instinct" rather than empirical fact (1860:10). In the 1860s no scientists had yet observed human fertilization or anything close to it, and the systematic collection and study of early human embryos was still a quarter of a century off.

Storer's argument was uncannily similar to one made today by advocates

of mandatory ultrasound screening for pregnant women seeking abortion: if women understood the nature of embryological development, they would be horrified by the prospect of abortion. The argument rests on the assumption that embryological evidence is both more real and more compelling than other considerations. Storer's idea of common sense, however, overlooked the point that knowing the "facts" of embryological development does not tell us what to make of the biological evidence. When we look at a bit of human tissue, how do we know what it means? "Biological science provides not only a set of facts about conception," as Franklin writes, "but also a key source of symbolic material through which these various beliefs are given cultural meaning" (1991:197). Contrary to Storer's assertion, embryos do not carry their meanings intact.

EMBRYO GENESIS

Embryology is one of the origin stories that modern, cosmopolitan peoples (not limited by nationality or language) like to tell themselves. Embryos, in turn, are the social and scientific artifacts that sit at the center of contemporary biological origin stories. They are you, me, and us; each of us is "everyembryo" and "everyembryo" is each of us. This book takes up the question of how embryos—as ideas, images, symbols, and tiny bits of human tissue—are generated, circulated, and enlivened by social and political discourse. I draw attention to the historical and social processes that produced them and attached certain symbolic meanings (but not others) to these small but culturally significant bits of flesh.

How do human embryos come to stand alone and apart from the events that create them? Embryologists ponder a version of this question when they talk about epigenesis. The word *epigenesis* has a very specific meaning in the history of biology, emerging in the nineteenth century as a theory to explain how individual organisms are formed and to address the question of whether an individual's form is predetermined. Do we exist prior to being formed? Developmental biologist Scott Gilbert defines epigenesis as "an embryological concept that celebrates interaction, change, emergence, and the reciprocal relationship between the whole and its component parts. Epigenesis states that the identity of any particular cell is not preordained, but that this particular fate arises through the interactions between the cell and its neighbors" (S. F. Gilbert 2004:xi). When embryologists refer to epigenesis, they are referring to the growth and differentiation of a material embryo. But the theory of epigenesis also addresses questions that have occupied

natural philosophers and scientists for millennia (Pinto-Correia 1997; Van Speybroeck, De Waele, and Van de Vijver 2002).

The theory of epigenesis encapsulates questions that have occupied natural philosophers and scientists for millennia, namely, is the form of an organism predetermined or contained within, or does it unfold and emerge over time (Maienschein, Glitz, and Allen 2005; Pinto-Correia 1997; Van Speybroech, De Waele, and Van de Vijver 2002)? I would pose a similar question, not about the embryonic organism itself, but about our ideas about it. How did embryos come to be assembled and represented as the central figure in our cultural origin stories? Gilbert's definition of epigenesis helps me, as an anthropologist, to reflect on where our ideas about embryos come from and how we decide what embryos mean. Do we regard embryos as predetermined wholes that exist prior to our interpretations of them? Or do we consider embryos as the consequence and result of those very interpretations? The contemporary significance of human embryos can be better understood, I argue, by looking at the occult history of embryo collecting, because it was in the process of collecting that embryos came to be regarded as precious, autonomous objects. As Gilbert's definition of epigenesis demonstrates, it is important to put embryos into a context that includes their "reciprocal relationships." This requires that we consider embryos, not on their own merits, but as part of a constellation that includes those who brought them into social being. Embryos cannot be separated from the women who experienced pregnancy loss; or from the anatomists who bottled the tissue; or from the scientists who argued about evolution and racial differentiation; or even from the late nineteenth-century fin de siécle rise of urbanization, industrialization, immigration, and social upheaval in Baltimore. The place of embryos in our origin stories is not preordained or fixed or timeless; it arises and changes through interactions between embryos and the social contexts in which they are produced (S. F. Gilbert 2004:xi).

There is a reciprocal relationship between embryos as socially constituted entities and the societies that produce them that affects and changes both sides. An essay by the French sociologist of science Bruno Latour, entitled, "The historicity of things: Where were microbes before Pasteur?" dovetails nicely with Gilbert's depiction of epigenesis (Latour 1999:145–73). Latour argues that entities such as microbes (or embryos) cannot exist before the components (he calls them "associations") that bring them into social awareness. If we apply this insight to embryos, we would say that embryos were immaterial, both literally and figuratively, before the embryologists conjured them into existence. Bringing them into social existence was not a one-way

street, though. Societies, too, Latour argues, are changed by the entities that they constitute. This reciprocal relationship persists through time. Embryos and societies constitute one another; just as embryos act to compel social action, so do societies act to reshape and reconstitute embryos. We can see this in the way we are willing to organize our lives, politics, and social relationships around them. We imbue them with the power to effect social action. This relationship can include many animate and inanimate actors: artists, scientists, specimens, activists, patients, ultrasound machines, litigants, legislation, and politicians. Latour demonstrates an important point: the embryos that surround us today are decidedly not the same as those the embryologists collected and materialized. Embryos have much greater ontological and political power today because we are constituted by them as much as they are constituted by us. To appreciate why this matters, this book takes us back to a time when people were beginning to understand embryos as asocial biological entities, and when embryos were moving from the embryologists' laboratories into social awareness. It looks at the reciprocal interactions that allowed embryos, scientists, and a host of other embryo-fascinated subjects to co-construct one another.

CONTRADICTIONS ABOUND

When I found the fetal specimens in the basement at Mount Holyoke, I was initially confused about how to react. Were these dead babies or biological specimens? Was I supposed to feel respectful or aloof? Unemotional or disturbed? Although I was confused, I couldn't imagine why. I had been thinking about the relationship between abortion rights and fetal personhood for a number of years already. I had recently spent eight months doing anthropological fieldwork in highland Ecuador, asking women about the status of the unborn and the criteria for ascribing personhood. I was well versed in and had even *written* some of the burgeoning literature on fetal subjects and fetal politics. I was familiar with the cross-cultural research on abortion, fetal subjectivity, and the category of the person, and I knew that my country had an unnatural obsession with fetuses. But none of that helped me in the moment. For ten years I walked into that building every week, yet I had never expected to find eighty-seven jars of fetal specimens in the basement. Then, to confront the smelly, dead, decaying materiality of those specimens . . . well, made me feel confused.

The confusion resulted, I suspect, from trying to fit the specimens into the uniquely American debate over abortion. Where did they fit? What

did they mean? Looking at them in jars on the shelves, I became subject to a jumble of competing, contradictory interpretations filling my head. This confusion, though, was one of the first clues for me that embryos and fetuses symbolize many different things. Any attempt to fix a single set of meanings to them seems either impossible or arbitrary. How, then, can there be any ontological stability or moral consistency with respect to embryos or fetuses? After an hour-long conversation about the many ways that fetuses are interpreted in nonwestern cultures, a bioethicist once asked me in frustration, "But what *is* the fetus?" It does seem frustrating that embryos and fetuses are so epistemologically slippery that they seem to resist the considerable effort that goes into defining and circumscribing them. The Catholic Church has a reputation for opposing abortion, for example, yet an influential pro-life group is called Catholics for a Free Choice. Feminists generally support abortion rights, yet a powerful anti-choice organization is called Feminists for Life. Abortion is discussed as both sin and salvation. The death of an embryo can be portrayed as a moral infraction *and* as evolution's ingenious solution to chromosomal abnormalities. Fetal tissue might be ritually mourned *and* coveted as valuable research material. Conflicting emotions can coexist in the same individual, who might cherish one pregnancy and regret another. Fetal surgeons may work feverishly to repair a neural tube defect in a fetus that could still legally be aborted, as sociologist Monica J. Casper points out in her prize-winning study of fetal surgery. "Contradictions abound," she says (Casper 1998:14–15).

The contradictions result from trying to fix a set of meanings to a process—the beginnings of life and personhood—that is inherently ambiguous and open to social negotiation. Anthropologist Katherine Verdery makes a similar point about the meanings associated with corpses in her book *The Political Lives of Dead Bodies:*

> Because they have a single name and a single body, they present the illusion of having *only one* significance. Fortifying that illusion is their materiality, which implies their having a single meaning that is solidly "grounded," even though in fact they have no such single meaning. Different people can invoke corpses as symbols, thinking those corpses mean the same thing to all present, whereas in fact they may mean different things to each. All that is shared is everyone's *recognition* of this dead person as somehow important. In other words, what gives a dead body symbolic effectiveness in politics is precisely its ambiguity, its capacity to evoke a variety of understandings. (Verdery 1999:29)

Verdery's insight shows the error I made in trying to have the specimens in the basement correspond to any of the static, unified images I carried in my head. This expectation, though, was based on the assumption that there is such a thing as "the" embryo or "the" fetus. As Franklin and Roberts note in their study of preimplantation genetic diagnosis, "it does not really make sense to speak of *the* embryo as a singular entity." Of the twenty or so embryos that might be used in a given cycle of IVF treatment, they explain, "some will be used for treatment, some may be discarded as pathological or morbid, some may be stored for future treatment, some may be donated to other couples, and some may be donated for research purposes" (Franklin and Roberts 2001:4; emphasis in original). That we can think of "the" embryo at all is one of the legacies left by the early embryologists, who helped to naturalize embryos. To be fair, the embryologists produced several kinds of embryos, too: some they sectioned, some they modeled, some they discarded, some they stored for dissection by the medical students, some they donated to other embryologists. Some they designated "abnormal." But their embryos were confined to a narrower range of meanings than today's embryos. Today, embryos may be invoked in debates over the availability of emergency contraception, but in the early twentieth century the embryologists did not link their work (or their work objects) to Margaret Sanger's (1879–1966) ongoing campaign to disseminate contraceptives. Their embryos were biological entities first and foremost, discursively separated from women's stories and cultural politics. Standing in the basement of the biology building, I was in the same boat as scientists, ethicists, and judges who have trouble determining "*the* status of *the* fetus"—there are so many embryos, so many fetuses, and so many ways to feel about them.

There can be no doubt that the embryological view of development has paved the way for significant scientific and medical advances in the past century. Without it there would be no pregnancy test, no birth control pill, no prenatal screening for birth defects, no assisted reproductive technologies, no test tube babies, and no effective treatments for infertility. Yet the embryological view of development has also fostered the creation of an embryo- and feto-centric political climate, which in turn has hampered scientific progress. Federal funding has been unavailable for most kinds of embryo and fetal tissue research since the 1970s, partly as a result of intense lobbying by abortion opponents (see Rini 1988). This move has effectively blocked federal funding for medical research that has the potential to save lives—including, paradoxically, the lives of those yet to be born (Coutts 1993).

One case in point is embryonic stem cell research. In 1998, scientists at

the University of Wisconsin figured out how to isolate and grow pluripotent human embryonic stem cells using the inner masses of surplus embryos left over from in-vitro procedures. Pluripotent stem cells are capable of differentiating into any of the body's organs and tissues, and are of interest for their potential in developing new ways to treat diseases such as Parkinson's and Alzheimer's. Because embryonic stem cell research requires the destruction of embryos, however, it is controversial. In 2001, President George W. Bush prohibited the expenditure of federal funds on anything other than a small number of already existing embryonic stem cell lines. Some researchers moved their research outside the United States, while others tried to devise cumbersome alternatives. Some have tried, for example, to coax somatic stem cells (which are not derived from embryos) to function like embryonic stem cells. Stem cell scientists are forced to use more complex methods than they would otherwise, to navigate around the political obstacles. The embryological view of development, in short, made possible the politics that drives the science, and the science that drives the politics.

Embryo-centric attitudes on the part of lawmakers and ethicists have impeded other kinds of research as well. Religious ethicist Ronald M. Green, who served on the National Institute of Health's Human Embryo Research Panel in 1994, cites the prevention of birth defects as one casualty of the federal ban on embryo research. If the ban had not been in effect, he argues, scientists would have realized much sooner that folic acid supplementation can prevent neural tube defects including the incomplete closure of the spine known as *spina bifida* (2001:x). Few over-the-counter or prescription medications are tested on pregnant women or fetuses before they are approved. As a result, pregnant women who become ill—even with a simple headache or hay fever—are forced to choose between suffering without medication and risking harm to the fetus they are carrying. This situation is particularly dire for women with chronic or life-threatening conditions who must choose between cancer treatment, say, or controlling their seizure disorders, and the health of their fetuses. Likewise there has been relatively little scientific research on the causes of miscarriage, stillbirth, and infertility. On the other hand, the embryological view of development has resulted in increased surveillance of pregnant women's behaviors such as smoking and the consumption of drugs and alcohol (Hartouni 1997; Oaks 2001; Roth 2003), and an increase of interventions such as fetal surgery that elevate the risk to a healthy woman's life (Casper 1998). A less skewed, less embryo-centric view would consider pregnancy and women's health more broadly, under the assumption that fetuses will do better under social poli-

cies that look out for the health of women, mothers, men, children, families, and communities.

From the 1980s forward, ideological controversies about the beginnings of life came to center increasingly on the physical "stuff," the corporeal substance, of embryos and fetuses. The feminist political theorist Rosalind Petchesky made this point in the 1980s, writing about the history of abortion politics: "Increasingly, in response to accusations of religious bias and violations of church-state separation, the evidence marshaled by antiabortionists to affirm the personhood of the fetus is not its alleged possession of a soul but its possession of a human body and genotype" (1984:334). Petchesky's insight was important because she identified a shift in moral and political discourse that meant that the embryological view of development was destined to become *more* politicized in the years ahead. It was a prescient observation. No longer do opponents argue abstractly about morality; no longer is the debate framed as a battle between scientific knowledge and religious doctrine. Rather, the focus has shifted to science, putting pressure on how scientific evidence is interpreted and deployed. People on all sides now look inside the "bodies" (or tissue, or cell masses) of embryos and fetuses for answers to metaphysical, moral, legal, and ethical questions. Pro-life priests and Catholic in-vitro fertilization specialists cite embryological evidence to support their views (see DeMarco 2000; Roberts 2007). Meanwhile, some scientists seek to distance themselves from the moral or philosophical interpretations of their work, while staying faithful to the tenets of embryology. As cultural studies critic Nathan Stormer says, "Pro-choice and pro-life advocates . . . stand on the same biological ground" (1997:173). Once a relatively uncomplicated scientific proposition, the microscopic body has come to dominate reproductive politics.

As the embryological view of development rose to prominence, it was easy to overlook the fact that even scientists were not all of one mind as to when life begins. There is a great deal of disagreement among embryologists about the so-called facts and significance of fertilization and other biological markers. Developmental biologist Scott Gilbert and anthropologist Rebecca Howes-Mischel cite four different schools of thought among biologists on the question of when life begins: "(1) fertilization—the acquisition of a novel genome (2) gastrulation—the acquisition of an individual identity, (3) EEG activation—the acquisition of the human-specific electroencephalogram, and (4) the period of or surrounding birth" (2004:381). Back in the 1960s, Carnegie embryologist Bent Boving insisted that the egg and sperm are also alive and that there is nothing special (biologically speaking) about a fertil-

ized ovum. Of course embryologists would not need to be so precise were it not for the fact that embryos are so heavily politicized. The moral significance of biological markers is raised only in relation to humans; it does not come up when discussing the embryological development of sheep, pigs, or cattle (Gilbert and Howes-Mischel 2004:378). There is no consensus among scientists; there are no apolitical embryos.

AN ANTHROPOLOGIST APPROACHES EMBRYO COLLECTING

I was initially interested in embryo politics when I was a medical anthropologist researching procreation beliefs, trying to understand how people negotiate the status of new and incipient persons at life's earliest margins. Although I took a cross-cultural approach to examining how people welcome the youngest members of their communities, I was always motivated by a desire to understand what was happening in the United States, where I grew up. *Roe v. Wade,* the Supreme Court decision legalizing abortion, was handed down in 1973, when I was sixteen years old, and I grew up surrounded by an increasingly uncivil, vituperative, and deadly debate over abortion, women's right to choose, and the status of fetuses. Anthropology provided an ideal set of tools for investigating the passions incited by this issue and the cultural meanings of the bio-logical.

Anthropologists have long inquired about the procreation beliefs of non-western cultures. How do people produce understandings of the beginnings of life? How do people come to define bodies as persons, and under what circumstances are they accepted (or not) into social worlds? What kind of entities are embryos thought to be, and what kind of cultural work do they perform? Anthropologists emphasize that personhood is based not in biology, but in the social significance granted to biological phenomena and the meanings attributed to bodies, relationships, and potentialities. Scientific knowledge will never answer the question of when life begins, therefore, because people are made by people. All peoples must decide how, when, and under what circumstances to value (or not) its youngest members. And in every culture, there are bound to be disagreements as people continually renegotiate who will be admitted to personhood and under what circumstances.

The comparative, cross-cultural perspective that anthropologists use gives ample evidence that not all cultures attach the same kinds of meaning to embryos and fetuses. In 1988 and again in 1992, I conducted ethnographic fieldwork in the wind-swept Ecuadorian Andes. There, on the steep moun-

tainsides near the Colombia border, women patiently explained to me that the spirits of dead, unbaptized fetuses and newborns could become *aucas,* unhappy spirits who would wail and haunt the earth because they are distressed at not being allowed into heaven. Interpreted in the context of U.S. abortion debates, the concept of *auca* seemed to be a placeholder for a quasi person, an almost or not-yet person, or a person interrupted in the process of becoming (L. M. Morgan 1998). It seemed like a solution to the perplexingly definitive questions that tried to pin down the status of "the" fetus as either a full person or nothing at all. Unlike my compatriots, these Ecuadorians seemed to allow the possibility that fetuses could exist as liminal beings, their status unfixed unless and until they could achieve full Christian personhood through baptism (see Squier 2004).

In these days of assisted reproductive technologies, there are many ways to manipulate the developmental process through genetic screening and embryo selection. Once a baby's genetic makeup is determined, though, we intervene little on the development of the bones and skeleton. This is not the case in the highlands of Ecuador, where a woman once showed me how to massage a newborn infant firmly to make its body grow straight (*recto*). She showed me how to pull gently but insistently on the bowed little legs that still collapsed so easily into the fetal position. She showed me how to pinch its flattened nose and smooth the top of its lumpy head. She stressed the importance of swaddling the baby tightly, like a mummy, before putting it to sleep. She treated her newborn very much like a clump of clay, molding and shaping its body before it hardened. Her maneuvers reminded me of how differently children's bodies are disciplined now than when I was a child. I grew up reading stories about the Choctaw, Native Americans who used to artificially flatten their babies' heads. Several children in my elementary school wore special braces and shoes to correct their bowlegs and pigeon-toes. Today's parents are more often assured that bowlegs and lumpy heads are normal and will correct themselves. Babies' bodies don't need to be molded, we tell ourselves; their bodies will assume their own genetically determined dimensions. That the Ecuadorian women deliberately stretched and kneaded their babies' limbs seemed to me a clue to an important cultural difference: they consider babies' bodies to be eminently malleable, formed not just "naturally" but by human intention. To what extent do we "form" (as well as "reform") children, I wondered, and by what means?

After finding the fetal specimens in the basement, I used anthropological questions to study the history of embryo collecting. Typically, an anthropologist would collect data through interviews and participant observation,

but most of the original embryo collectors had long since died. I adapted my methodology accordingly, borrowing from the historian's toolkit. "When a subject is given its history," says historian Rickie Solinger, "it becomes unsettlingly impossible to think about the subject in a fixed, static way or to claim universalized, decontextualized meanings for [it]" (Solinger, ed., 1998:1–2). I visited archives in Baltimore, Washington, D.C., Philadelphia, Princeton, Boston, Ann Arbor, Woods Hole, rural western Virginia, and South Hadley, Massachusetts. I pored over the embryologists' often handwritten correspondence, struggling to decipher Mall's execrable handwriting and hiring a translator to read letters written in old German. I examined institutional reports and records, read scientific publications, and donned white cotton gloves to handle yellowing photographs in an effort to piece together the social lives of the specimens.

Anthropology, like history, is about context, and the historian's methods suited my goal. Yet the questions I asked in the archives were more anthropological than strictly historical. In this book I draw from the work of historians who have analyzed the intellectual, institutional, material, and social environments in which the embryologists worked, but my questions have to do with how specimens are produced, how specimens figure in the embryological view of development, and how that story came to underwrite the story we tell ourselves about "ourselves unborn." At every step, I aim to show that the biological entity we call "embryo," as well as the embryo collecting project, stand *inside* of culture (Good 1994:66). Only by understanding the cultural dimensions is it possible to question the assumption, commonly made, that disagreements about the moral status of embryos are rooted in ignorance of the biological "facts." According to this logic, if we only knew "what actually went on in the womb," then it would be "natural to think of the embryo as a being that was able to do things" (BBC 2006). But the so-called facts are only as convincing as the cultural consensus that surrounds them, and only by adding culture to the equation can we appreciate why some highly educated individuals would devote their lives to collecting and studying minuscule bits of human flesh (or, for that matter, to writing books about them). Only in a specific cultural context could human embryos be transformed into such potent symbols and instigators.

RECOGNIZING FETAL SUBJECTS

Luckily for me, a cohort of feminist scholars began to write about "fetal subjects" in the 1980s (Morgan and Michaels 1999). There were plenty of

reasons for them to be concerned. There was a backlash against women during the Reagan era in the 1980s, brought on in part by the rise of the New Right and its intense opposition to the *Roe v. Wade* decision legalizing abortion. The hostility took various forms. Access to reproductive health services was challenged by legal restrictions such as parental notification laws, abortion clinics were firebombed, and abortion providers feared for their lives. In this context, the rapid proliferation of fetal imagery in popular culture carried a dangerous political undercurrent (Faludi 1991; C. Mason 2002; Stabile 1999). One infamous example was the 1984 anti-abortion propaganda film *The Silent Scream,* which purported to show what was happening to the fetus during an abortion. Rosalind Petchesky wrote a now-classic critique of the film and in the process showed the importance of visual culture to anti-abortion politics (Petchesky 1987).[4] These authors were picking up on a disturbing confluence of events that seemed poised to elevate the status of fetuses, to the detriment and exclusion of women.

Around the same time, sociologist Barbara Katz Rothman published a small but influential book called *The Tentative Pregnancy* (1986). In it, she showed that the new technology of amniocentesis was changing the way women related to their pregnancies. Women who planned to undergo amniocentesis, either because of their age or their family history, were waiting to become emotionally attached to their pregnancies until they learned the results of the test. Rothman showed that they were reluctant to become attached, knowing that they might opt to terminate even a wanted pregnancy if the test showed a serious problem. Without a doubt, the emerging fetal subjects were affecting attitudes toward pregnant women and abortion. Petchesky reminded readers that to focus on fetuses was to divert attention from other important moral questions, such as whether women should be forced to bear children they did not want (Petchesky 1984:327). Janet Gallagher asked—in a theme that would be reiterated many times in subsequent decades—how government could best protect and provide for poor women and families rather than fetuses (Gallagher 1987). Feminists who wrote about fetuses risked compounding the problem of feto-centrism by drawing attention to it. In countering this trend, anthropologist Faye Ginsburg interviewed activists on both sides of the debate about building an abortion clinic in Fargo, North Dakota. Her results showed that attitudes toward abortion were determined, not by anything to do with fetuses per se, but by differing approaches to women's shared commitments to motherhood and nurturing (Ginsburg 1989).

Throughout the 1990s, feminist social scientists covered an ever-wider range of social phenomena that fit under the heading of fetal politics. In her

award-winning book on fetal surgery and the construction of fetal patients, Monica Casper explained how fetal politics was expanding in late twentieth-century America:[5] "Fetal politics [include] the crafting of a new science called fetology, controversies over fetal tissue research, the emergence of fetal rights in law and ethics, debates about and proscriptions on pregnant women's behavior, a cultural obsession with fetal images, and the relentless pursuit of new reproductive technologies. Many of these practices themselves are sites at which fetal personhood and maternal identity are constructed and contested" (Casper 1998:4).

The feminist position was consistent: the personhood of pregnant women needs to be paramount, because "fetuses are part of their mothers' bodies" (Rothman 1989:59). They argued for looking at how and why fetal personhood has been asserted and practiced, rather than trying to convince others on moral matters. Lynn Paltrow, a respected reproductive rights attorney, takes a pragmatic approach. She argues that abortion and fetal personhood are ideological devices that divert us from recognizing and opposing policies that jeopardize the health and well-being of women, fetuses, and families. At the same time that President George W. Bush was signing the Unborn Victims of Violence Act into law, his administration was deregulating coal-burning power plants, thus releasing harmful mercury into the environment and creating a direct threat to fetal and child health (Paltrow 2006). It is an important point, especially in an era when governments increasingly treat fetuses as though they were independent entities. For example, the U.S. government awarded health insurance coverage to fetuses, while denying it to the pregnant women who carry them. It also required that ethical review boards consider fetuses as "human subjects" in federally funded research projects (Casper and Morgan 2004).

Despite Paltrow's admonitions, the popularity of embryos and fetuses continued to grow throughout the 1990s. Anthropologist Janelle Taylor drew attention to the rise of the public fetus in her analysis of the contradictory cultural politics of a fetal image that appeared in a magazine ad for Volvo. A full-page ultrasound image of a fetus was poised over the caption, "Is something inside telling you to buy a Volvo?" Other advertisements followed, portraying fetuses in ways that both drew upon and distorted anti-abortion messages and imagery (Taylor 1992:67). This trend continues. A recent example came across my desk from Pampers.com. Five postcard-sized cards showed big close-ups of the now-familiar fetus, one of which seems to be sucking its thumb. Rather than addressing the reader, the cards addressed the fetus directly: "You're not even born yet and you're already discovering your world."

They invited "Mom" (not Dad?) to register on the Web site ("enter membership code 'Rattle'") to gain access to a pregnancy calendar timed to provide information (including "weekly sonograms") for "Mom" to experience "the world from [her] baby's point of view." It was impossible not to see behind this campaign the manufacturer's desperate wish to figure out how to put fetuses in diapers.

Fetuses sell. Taylor captured the marketing power of fetuses by beginning her article with these words: "Not long ago, a fetus tried to sell me a car—or should I say, a car tried to sell me a fetus?" (1992:67). Fetuses were used to sell a range of products in the 1990s: long-distance telephone service, cars, books, music, and of course baby products. By the beginning of the new century, advertisers had taken the consumers' fetal fascination to a whole new level. In their latest guise, fetuses would represent our collective desire for a cleaner planet. Who could object? Ford Motor Company's "green" advertising campaign used computer-generated images and silicon models of fetal dolphins, elephants, and polar bears to sell flexifuel vehicles, "for the next generation." The irony was too much for some critics, who charged that the Ford Motor Company was at the same time suing to stop California from reducing gas emissions and had reneged on its promise to increase fuel efficiency on its gas-guzzling SUVs (Robison and Viscusi 2006). These inconvenient truths, however, could not undermine the appeal of a cute, animated polar bear fetus. It was a short step from the sublime to the ridiculous, and fetal kitsch can now be found all over the Internet. During the second Iraq war, the MissPoppy.com Web site sold an "Unborn Baby [Christmas] Ornament, US Troop Model." A three-inch-long gun-toting plastic fetal replica, carrying a military rucksack, was encased in a clear plastic bubble topped by a yellow ribbon. The page read, "Protect our troops—from the womb to the war. What if the fetus you were going to abort would grow up to be a soldier bringing democracy to a godless dictatorship?" The designers felt obliged to include a "NOTE TO THE CONFUSED: This is a real product, from a real site. The product is a satire, but it is also a real product—FOR SALE."[6] It is one thing to analyze how embryos are constituted, but these examples serve to show how we are likewise constituted by our understandings of them.

It has always been easier for anthropologists to recognize when people in nonindustrialized societies project their social assumptions and prejudices onto their interpretations of embryos and fetuses; it is not so easy to recognize the culture-bound features of the anthropologist's own reproductive origin stories. This began to change in the 1980s, when Emily Martin showed that medical textbooks often utilize metaphors of assembly lines and other

features of industrial capitalism when they discuss the biological "facts" of reproduction (Martin 1987). Biological reductionism is another feature of modern industrialized societies that permits an obsessive focus on embryos and fetuses. Petchesky showed biological reductionism to be the product of Darwinian thinking, eugenics, and scientific rationalism that accompanied the rise of modernity (Petchesky 1984:334). Yet even many feminist writers tended to accept uncritically the view that embryos and fetuses are naturally developing creatures, the biological consequence of sexual intercourse and nature's way of perpetuating the species. Petchesky herself asked what an "accurate representation of a real fetus" would be, seeming to assume that the fetus was—underneath the political distortions—a natural object (Petchesky 1987:268). She cited biological reductionism as responsible for claims of fetal personhood that "showed photographs of fetuses at different stages of development, revealing recognizable physiological features" (Petchesky 1984:334). By framing her discussion as a critique of fetal personhood, Petchesky laid the groundwork for social scientists and philosophers to criticize the attribution of personhood to fetuses and to see it as a historical and political process, but she overlooked the extent to which the idea of fetal autonomy was constructed by the embryo collectors. Only after they collected and described "the" embryo, determined its stages, identified its features, and convinced the lay public to set aside alternative explanations of prenatal development did it become possible to personify embryos and fetuses. None of Petchesky's "different stages of development" or "recognizable physiological features," in other words, would have been recognizable before the embryologists did their work, because the Carnegie embryologists produced the very embryos that they purported to discover.[7]

There were two contradictory trends occurring simultaneously roughout the late twentieth century. On one hand, the proliferation of fetal imagery made it much easier to see and appreciate human embryos and fetuses. On the other hand, it became much harder to accept embryos, fetuses, and other biological "facts" as given, because new work in the social studies of science challenged many supposedly stable biological "facts." Stories about sexual reproduction, hormones, kinship, stem cells, and primates were all shown to be shaped by unexamined social assumptions, economic arrangements, and power relations.[8] Embryos and fetuses were already heavily laden with cultural assumptions by the time they emerged into public discourse in the mid- to late twentieth century. "A theory about human development is never culturally neutral" (Gilbert and Howes-Mischel 2004:377), and indeed American embryologists put considerable effort into shaping and molding the features that

many of us have come to accept as "natural." When the embryologists isolated specimens from women's bodies and brought them into their laboratories, they created embryos that would correspond to their anatomical concerns and preoccupations. Today, nonscientists do the same thing when they create representations of embryos that will conform to their specific agendas (emotional, political, and social). Obstetrical ultrasound and prenatal testing, for example, have much in common with earlier embryo-production technologies, in that each "the [embryo or] fetus emerges as the product of expert intervention" (Mitchell 2001:121).

THE SILENCING OF FETAL DEATH

While feminist social scientists identified the practices that produced fetal persons (Hartouni 1999), most of them were concerned with active, living fetal subjects. Yet we must also direct our attention to dead embryos and fetuses—research and anatomical specimens—which were produced within specific social contexts (Clarke 1987, 2004; Sappol 2002). Let us pause for a moment to consider just how many dead embryos and fetuses are produced each year in the United States, in addition to the approximately four million registered births that occur annually. In contrast to births, the deaths of embryos and fetuses are almost invisible, in social terms, and any numbers are at best estimates. Dead embryos and fetuses are counted under the headings of miscarriage (also called "spontaneous abortion"), induced abortion, and stillbirth. Miscarriage rates are notoriously difficult to ascertain because many miscarriages occur before women realize they are pregnant. Researchers estimate are that between 15 and 50 percent of fertilized ova die or abort spontaneously. Among known pregnancies, an average of one in ten women will miscarry (MedlinePlus 2006). There were 1.29 million induced abortions in the United States in 2002. That year, 24 percent of pregnancies (not including miscarriages) ended in abortion. At those rates, one-third of American women would have an induced abortion by the time she was forty-five years of age (Guttmacher Institute 2006). In 2001, twenty-six thousand stillbirths, defined as the death in pregnancy of a fetus of more than twenty weeks' gestation, were reported in the United States (Stillbirth Collaborative Research Network 2004). It seems surprising, given the large number of pregnancy losses and terminations, that we do not talk about them publicly and that few social rituals acknowledge fetal death or tell us how to handle the remains.

The silence surrounding embryo and fetal deaths sends the message that

these deaths do not count. Anthropologist Nancy Scheper-Hughes's ethnographic study of infant death in the northeast of Brazil showed that much can be learned by looking at who counts and who gets counted (1992). She found that many babies' deaths in Brazil were not recorded in vital statistics registries. The question of who counts was brought home to me when I asked my aunt, from the Mexican side of my family, to list her children in birth order. She listed Valerina, Ronald, Patricia, Roger, Rick. Then she paused, "Do I include the boy who died at seven months, before he was born?" My brother, standing behind her where she couldn't see him, was vehemently shaking his head. "No," he was trying to tell me, "don't write that down." Should this child, dead before it was born, be included among her children in the permanent family genealogy? Of course the fact that she was telling me about it fifty years later proved that the loss was significant to her, but my brother obviously thought it inappropriate to list never-born children in the family history. Who counts?

The same point was made by one of my students on a genealogy assignment. She had asked her Mexican grandmother for background about the family, and dutifully recorded as "deceased" the two miscarriages that the grandmother included among her offspring. Never before had one of my students included a never-born "person" in a genealogical diagram. Not even a pro-life student. The exceptions prove the rule; we do not count babies that die before they are born. A poignant story appeared in *The New Yorker* magazine in 2006. I had to read the title twice before I could make sense of it: "Irene Raeburn: Born December 28, 2004, Died December 24, 2004." When Raeburn and his wife went to a support group meeting for parents of stillborn infants, Raeburn asked the others, "What do you say when people ask you if you have kids? If I say yes, they're going to ask about them. If I say no, I'm lying." No one, he said ruefully, knew how to answer his question (Raeburn 2006:52). We live in a society that celebrates and places great importance on childbirth and on the biological essence of humanity. We ascribe great social significance to biological initiations, such as genomic maps, fertilization, ultrasound pictures of unborn babies, and birthdays. But death at the beginning of life weighs heavily, as if ignoring it could make it disappear.

The experience of pregnancy loss is silenced in the United States, as anthropologist Linda Layne clearly shows in *Motherhood Lost: A Feminist Account of Pregnancy Loss in America* (2003), and the disposition of embryo and fetal remains is hidden from public view. A great deal of embryonic and fetal tissue is incinerated by hospitals and clinics under the heading of "medical waste."

For stillborn fetuses greater than twenty weeks' gestation, parents are given the option of burying or cremating the remains. Yet we hear little about the disposition of fetal tissue in the media, even as prime-time television shows like *CSI* zoom in on cadavers and morgues. The disappearance of fetal remains and fetal collections is correlated with the broader disappearance of dead fetuses from American society, which Layne would argue is a purposeful act of erasure. A wall of invisibility, silence, and taboo has been systematically built around the experience of pregnancy loss and the disposal of embryonic and fetal remains (Layne 2003:68–74). This silence is damaging to women who experience miscarriage and stillbirth, Layne argues, when society denies the emotional pain and legitimacy of their losses. This silence also cedes territory to anti-abortion activists, when the only images of fetal remains to appear in public are intentionally horrifying, bloodied, and dismembered (Davis 2003; Stabile 1999). It can be difficult, in this context, to remember that not all dead embryos and fetuses are the product of abortion, and that abortion should not be reduced to dead embryos and fetuses. Yet as long as fetal remains appear only to symbolize abortion, this link will remain unchallenged. This is a vicious cycle: the less that fetal remains are visible in public, and the more limited the contexts in which they appear, the more shocking and sordid their appearance comes to seem.

For the past forty years collections of embryo and fetal specimens have been gradually disappearing from museums, universities, and hospitals. This is lamentable because the display of old embryo collections can be an important way to break the symbolic association that makes "dead fetus" symbolize "abortion." There are other reasons why it makes sense to display and discuss these old collections. The collections make it obvious that there are many reasons for pregnancy loss and termination, including, for example, infectious disease, environmental contamination, occupational injury, the stigma of pregnancy out –of wedlock, and lack of access to contraception. Putting old collections on display would provide an opportunity to discuss the many uses to which embryo specimens have been put since the early twentieth century, including educational displays, descriptive scientific research, and development of vaccines and other therapies. A variety of specimen preparations could be displayed, including those that are embalmed, cleared, sectioned, plastinated, and/or dye-injected (see Schultz 1924). Alongside the specimens, an exhibit could show how they have been used in artistic, photographic, and propagandistic renderings (Worden 2002; Purcell and Gould 1986). The display of old collections would be a rare opportunity to see embryos in their unmediated state, thus providing a counterweight to

the sanitized, beautified, digitized, colorized, magnified, lifelike images that currently dominate the visual imagery associated with embryos and fetuses (Duden 1993; L. M. Morgan 2006a). And finally, of course, a display could put the embryo-collecting endeavor into its historical context, showing what it meant to anatomists, embryologists, and clinical doctors and illustrating how it shaped the embryological view of development.

The embryological view of development is by now deeply entrenched. It is fundamental to the stories that many educated, modern citizens—despite vastly different religions, politics, and cultural beliefs—tell themselves and each other about how we came to be. The embryological view is indispensable to scientists who use embryos for therapeutic and research purposes. It is also increasingly central to the production of emergent life forms, forms of population surveillance and control, and to the politics of life itself (N. Rose 2007). The result of this proliferation of meanings attached to embryos is both contradictory and confusing, but it also explains why embryos have become such potent symbols. On the one hand, we trust developmental biologists to provide factual scientific information that will prevent unwanted pregnancy, treat infertility, and identify genetic anomalies. On the other hand, embryos have escaped from the confines of science and the ability of scientists to control what they mean. Competing constituencies claim the right to define what embryos and fetuses are, what they should mean, and what should be done with them. These claims will be familiar to readers who follow the polarized politics of the abortion debate: should embryo research be permitted if it destroys embryos? If it saves lives? Paradoxically, it is the embryological view of development that keeps even those fetuses that have already been designated by their parents-to-be as "persons" locked into their status as "fetuses," because the embryological view of development determines the operative "rules of recognition by which societies selectively allocate their members to specific subject positions" (Palmié 2007:210). The contestation is met with attempts to legislate solutions, as seen in the recent U.S. Supreme Court decision upholding the ban on so-called partial-birth abortion, but legislative efforts end up fanning the flames of controversy. The embryological view of development renders it impossible to conceive that not all embryo-fetal trajectories are the same. They are classic boundary crossers—the dead unborn.

Today's lively fetal subjects are historical and cultural achievements, built atop the remains of thousands of dead embryos, fetuses, and infants. Without these specimens, embryologists would not have been able to construct the empirical foundation for describing embryological anatomy and physiology,

which in turn provided the "recognizable physiological features" so familiar to us today. Specimens provided the data with which to write atlases and textbooks of embryological development to instruct students of medicine and developmental biology. Specimens were behind the ubiquitous online pregnancy calendars that describe the week-by-week development (with pictures, videos, and lots of advertising) of "your baby." Because specimens were separated from pregnant women, it became possible to imagine that fetuses had "their own" interests, which led to the idea that fetuses could be "in conflict" with their mothers. Specimens provided the information people use when they glorify and enshrine the sanctity of microscopic embryos. Specimens were the "fetal subjects" of embryology long before parents named their unborn children and incorporated them into their social worlds (Rothman 1986).

OUTLINE OF THIS BOOK

The ten thousand specimens that make up the Carnegie Human Embryo Collection are still in existence, housed at the Human Developmental Anatomy Center in the Museum of Health and Medicine, in Washington, D.C. (Noe 2004). It can be strange, from today's vantage point, to imagine that anyone would ever have wanted to collect thousands of human embryo and fetal remains. It is stranger still to realize that those forgotten specimens provided the foundation for so many competing interpretations of what embryos and fetuses are and what they mean. This book peels back those layers of strangeness to expose the cultural logic and social practices that made embryo collecting seem both normal and reasonable. Embryo collecting helped to underwrite a scientific narrative of progress, but the exalted status of the embryo in contemporary society cannot be reduced to scientific advances. The special status accorded to embryos reveals less about what embryos are than it does about our cultural willingness to give ontological priority to anatomical evidence. Embryos mean only as much as the faith that is placed on embryological evidence.

In giving attention to the cultural history of embryo collecting and the social lives of specimens, this book gives short shrift to other frameworks used to analyze embryo controversies, including the ethical, political, institutional, scientific, and intellectual histories of embryology told elsewhere.[9] Likewise I skip over the headlines concerning stem cell research, abortion, and the fate of surplus embryos, except insofar as they related to embryo specimen collecting. The collection was an important step in turning embryos

from worthless scraps of tissue into material entities that would eventually become highly visible and contentious symbols of life, and embryo specimens continue to act as protagonists in a powerful modern origin story.

The next chapter is an introduction to the world of Franklin Mall, the anatomist and avid human embryo collector without whom the embryo collection might not have existed. Mall's career spanned a transitional period in the history of anatomy, from an old style concerned with descriptive morphology to a new style focused on experimentation and heredity, and Mall was both a traditionalist and an innovator. He used the old comparative and descriptive methods to study a new, relatively uncharted object: the human embryo. He considered human embryology the last uncharted frontier of human gross anatomy, and in 1913 he convinced the Carnegie Institution of Washington to set up a department of embryology. As its first director, he created a far-flung culture of embryo collecting, cultivating a network of doctors who eagerly saved specimens for science.

The embryologists regarded embryos in biological terms and urged others to do the same. Although they looked in and at embryos for clues about human origins, much of their daily collecting work was by necessity social. Chapter 3 describes how they built the professional relationships that gave them exclusive access to the precious specimens located within women's bodily realms, and how they devised mechanisms for acquiring, exchanging, labeling, and handling specimens. The embryologists worked hard to convince women that doctor-experts held the most accurate knowledge about pregnancy, and that "superstitions" about fetal development had no place in a modern woman's thoughts. During the mid-twentieth century, the exchange of embryo specimens was widespread among health professionals who solidified their social networks through the exchange of embryo specimens, as was evident in the hundreds of specimens donated by alumnae and friends of Mount Holyoke College from 1917 through the 1950s.

Chapter 4 moves inside the embryological laboratories. It traces the stories of two embryo specimens produced there: the first was a model of a so-called "embryo" brain (although it was probably that of a fetus or infant) made by Gertrude Stein in 1901 when she was a young medical student at Johns Hopkins. The second specimen was a young human embryo, collected in 1914, that later became famous (or as famous as an embryo specimen can be) as Carnegie no. 836.

Chapter 5 looks at the social and medical circumstances that generated a reliable supply of embryo specimens. It considers the health and welfare

of pregnant women in early twentieth-century Baltimore, and the circumstances that caused pregnancy loss. The availability of specimens was contingent on myriad factors that made women susceptible to pregnancy, pregnancy loss, and obstetrical surgery, including a moralistic social context that stigmatized out-of-wedlock birth and led to the deaths of one-third of illegitimate infants. In Boston in the 1930s, an obstetrical surgeon teamed up with an embryological pathologist to ferret out the very earliest human embryos, which still remained to be found even after two decades of searching. The charismatic duo known as the "the Ham and the Egg" found what they were looking for by examining the wombs of 210 women subjected to hysterectomy. Such specimens, when they were later featured in embryological textbooks and museum exhibits, were described as "naturally occurring."

All embryos are produced within a social framework, even when the dominant origin story directs people's attention to the riveting drama of the sperm penetrating the ovum. With the expansion of the embryological view of development, a de facto consensus emerged: biological scientists would be the legitimate anatomical and embryological experts, collecting specimens and producing knowledge inside the laboratory, while others would avert their collective gaze. Our story straddles both sides of this divide, entering into the hallowed halls of the embryological laboratory in 1914 to watch while scientists painstakingly work to produce a single, exemplary, quarter-inch embryo specimen. On the other side of the divide, we accompany a writer who stood before the closed doors of an anatomical collection with a question on her lips. Poised to knock, she turned away because she felt ashamed that her curiosity was "morbid."

What do embryos tell us? While feminist scholars traced the emergence of the public fetus to ultrasound and other imaging technologies, chapter 6 examines how embryos were recruited much earlier to "speak" about the social issues of the day. When the Scopes trial was underway in 1925, embryologists weighed in on the side of Darwinian evolution by invoking the human embryonic tail to argue that humans were descended from monkeys. Embryologists trained at Johns Hopkins University went to China in the second decade of the twentieth century, where they collected Chinese embryos and fetuses to study what they called "racial embryology." Throughout the latter twentieth century, embryo specimens were recruited to "speak" about a changing and ever-expanding array of social issues, from birth defects to women's rights to the spiciness of jalapeño hamburgers to global warming. When embryos "speak," of course, their utterances reflect the concerns of the grownups who

put words in their mouths. But there is a reciprocal effect as well, when the emergence and increasing volubility of embryos fuels debate and sparks social anxiety.

Chapters 7 and 8 examine what happened to embryo specimens after the end of the collecting project. In the 1960s, embryo and fetal imagery moved outside the laboratory into popular magazines, prenatal guidebooks, and photographs. Specimens were pivotal in this transformation. People started to spruce them up and feature them in feel-good stories about the wonders of life and our common humanity. In the process, embryos were granted ever more authority and social agency. They began to assert their influence in law, medicine, politics, and the identities people were willing to ascribe to their children-to-be. Just as we (in our varied identities and guises) created embryos (in their varied identities and guises), so embryos created us. Embryo specimens from the Carnegie collection continue to surface in popular culture, in creative and sometimes surprising ways. But attention to the ubiquity of these fetal icons masks the fact that specimen collections were quickly disappearing. Embryo collecting fell out of fashion in the 1960s, and collections began to be de-accessioned, destroyed, and erased from public consciousness. The Carnegie collecting project has been largely forgotten or obscured, although some of the specimens are very much alive—including a single, exemplary Carnegie specimen produced in 1914 (and mentioned earlier), which was recently reanimated as a digitized, beautified icon of life.

At the end of the book we return to Mount Holyoke to learn the fate of the specimens I found in the basement. The news media increasingly represent fetuses as of two types: "good" fetuses are associated with life, innocence, and our collective humanity; "bad" fetuses are represented as dead, polluting signs of our collective depravity. The Carnegie embryo collecting project once provided dead embryos and fetuses with scientific legitimacy and a place on the shelf. Now, the collection, along with memories about its origins, has been largely dismantled. One unfortunate consequence of these vanishing acts is that the disappearance of specimens reflects and reinforces the political agenda known as the "culture of life," in which dead embryos come to stand for abortion. Although some of the embryologists' collecting practices would be prohibited by today's standards, the embryologists were reasonable, dedicated scientists with noble intentions. They could not have taken today's approach to embryo subjects, because there were no such subjects before they did their work. To resuscitate memories of the collection, as I do in this book, is to show that social contexts produce multiple interpretations of embryos and fetuses.

The embryo collectors helped to produce a modernist interpretation of embryos that would be consistent with their view of the factors relevant to development. As the designated scientific experts in growth and development from conception through birth, their primary goal was to document what they understood to be a biological process. For at least the first half of the twentieth century, they valued embryos as scientific specimens. They did not regard embryos as incipient persons; nor could they have imagined the political role that embryos would come to play. Looking back on the embryologists' legacy today, the paradox becomes clear. Their view of embryos as autonomous, free-floating, biological specimens justified their efforts to collect and section ten thousand embryos for the greater good of science. On the other hand, they created the corpus of scientific data that allowed nonscientists to imagine embryos as natural, asocial creatures, and to appropriate that ideology (and the corresponding embryo imagery) in support of a variety of competing causes. We still draw on culturally authorized scientific data, but we use it underwrite contradictory claims. In a society that prizes scientific knowledge and that ascribes social significance to biological material, we are trapped in a view of embryos that is at once scientific (because science is the source of authoritative knowledge about bodies) and symbolic (because fetal imagery has broken free of the laboratory). Both the view of embryos as the product of scientific knowledge and the view that "embryos-are-us" leave out the social contexts in which pregnancy is conceived. In dealing with embryos and fetuses in their capacity *as anatomical specimens,* this book steps outside the familiar, conventional embryological narratives to show how scientists produced embryos and wrote women out of the picture, and how embryos shape who we are.