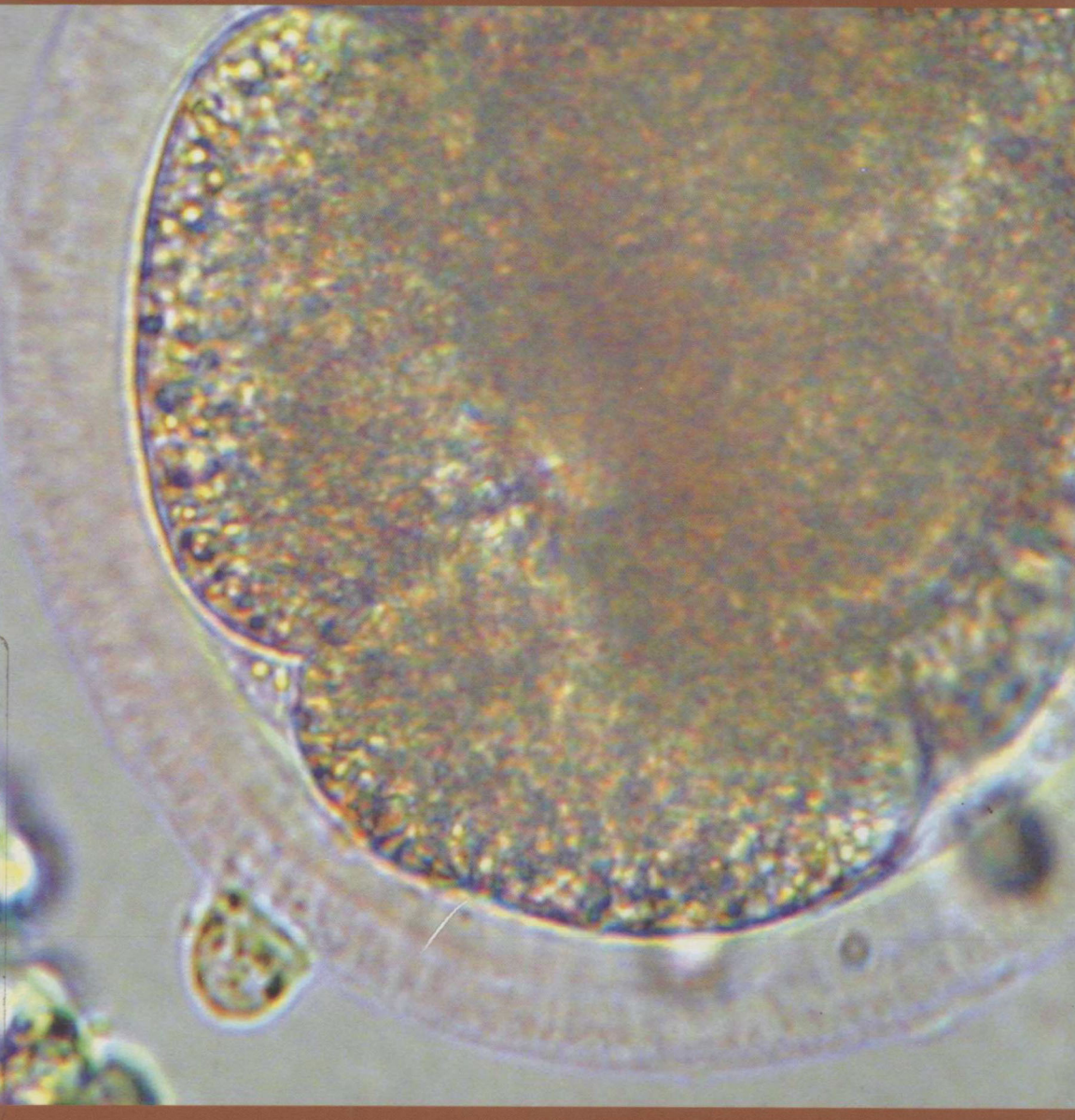
The Naked Clone

How Cloning Bans Threaten Our Personal Rights



John Charles Kunich

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This book is dedicated to the children of the world, present and future,
and to all of the people who love and believe in them.

Preface

Every human being has legal rights. These rights do not depend on whether a person came to be through in vitro fertilization, artificial insemination—or cloning.

Human cloning is inevitable, and the law must adjust. The title of this book, *The Naked Clone,* highlights how far off the mark the legal debate on cloning has been. The widespread public horror that has greeted the dawning of mammalian cloning is being translated into laws, and often outright bans, on the cloning of human beings, particularly reproductive cloning (cloning to produce children). Children will not be born at all because of these bans, and potential parents will be denied the children they could have had. The very processes that could have enabled these children to be born are criminalized and outlawed. The child of cloning—often inaccurately and callously called a "clone"—is therefore rendered naked and alone, in the legal sense. No laws shelter this child who will never be born. No laws cover this child with their protective shield and enable him or her to begin life. And the hopeful parents of this child are left similarly bereft.

The naked clone situation is happening right now. Within the United States, six states have enacted bans on human cloning in some form, and many more are considering it. The United States Congress has come close to enacting a permanent, sweeping ban on both reproductive cloning and therapeutic/research cloning, with the enthusiastic support and encouragement of President George W. Bush. Numerous other nations have already passed their own bans of various types, including the United Kingdom, Germany, Japan, Israel, Spain, Australia, Denmark, New Zealand,

and the Netherlands. And the United Nations has begun preparing an all-encompassing international agreement to halt reproductive cloning worldwide. Religious and political leaders on the global stage, from popes to presidents, have united to demand an end to the age of human cloning before it can even begin.

What has prodded the planet into this crisis mode? The momentous, earthshaking event that started it all was the birth of a sheep named Dolly in July 1996, the bleat heard 'round the world. This first reported successful cloning of a mammal from an adult cell shocked people all over the globe into a frenzy of political and legal action. But the facts and the science of cloning—its capabilities and limitations—swiftly were lost in the dust cloud stirred up by people rushing to do something, anything, to stop cloning before it reached humans. Science fiction and horror movies crowded out rational discourse, and vague notions of repugnance, or "the yuck factor," substituted for reasoned and balanced debate rooted in the rule of law and reality.

I wrote this book to change the direction of the legal debate on cloning, but not only because so many people have gotten their facts on cloning itself so wrong. Much more important are the multiple ways in which bans on cloning can endanger the core constitutional liberties of all Americans. Bans on reproductive cloning jeopardize the privacy and reproductive rights, including abortion, set forth in United States Supreme Court decisions from *Roe v. Wade* onward. Why? Because the *same* constitutional interests are at the heart of reproductive cloning and the rights to marry, have children, use contraceptives, choose whether to abort, and maintain a zone of personal privacy safe from unwarranted governmental intrusion. Some of these rights were first recognized and later sustained by bitterly divided Supreme Court panels with the narrowest of majorities. As the courts deal with challenges to statutes outlawing reproductive cloning, they will be confronted by extremely difficult and contentious issues equally applicable to these noncloning rights. If bans on cloning to produce children are upheld, this legal precedent could be the stepping stone to the next case, in which the target is no longer cloning but another fragile, intensely personal privacy interest.

The naked clone situation refers specifically and precisely to *reproductive cloning*. However, scientific/medical research into cloning for purposes apart from reproduction is also linked to other vital constitutional rights. Severe restrictions or outright bans on cloning research—"therapeutic cloning"—threaten much more than simply the right of a few scientists to conduct research on cloning and stem cells. The First Amendment to the United States Constitution is implicated by bans on cloning research. Such research may be worthy of First Amendment protection because it is the necessary and closely linked precursor to the expression of ideas; ideas must be created before they can be shared. Also, the research itself may be

a form of expression, or symbolic speech, in part making a statement that such research is vital and should be free from prior censorship by the government. If government can, with impunity, shut down scientific research *because it abhors the subject matter in question*—the content of the message expressed—this will imperil cherished expressive liberties that are quite remote from the cloning situation. Again, the act of banning an aspect of cloning, if upheld by the courts, might be the basis for far more widespread invasions of our First Amendment rights. The collateral legal damage from these bans could reach far beyond the narrow confines of cloning per se.

One of the legislative options being pursued in the states and in the United States Senate is to enact an outright permanent ban on reproductive cloning while allowing therapeutic cloning to proceed with some restrictions. But this "split ban" generates a perverse incentive, indeed a duty, on the part of researchers: to destroy the nascent cloned human embryos created in the laboratory before they are ever implanted in a woman's womb, under the threat of severe criminal and civil penalties for violation. This "clone-and-kill" situation is without precedent in the United States. It is the first time the law has established an entire class of arguably human beings that American civilian citizens are under *a legal obligation to destroy.* When such a split ban is challenged, the courts will be forced to deal with a situation that many people would find abhorrent, and the precedent they set forth in the cloning cases may lead directly to the overturning of *Roe v. Wade* and other related cases. Could some of the proponents of the split bans be aware of this potential and knowingly advance their cloning legislation with the intention of using it as a type of Trojan Horse to reverse the abortion rights cases? It is a distinct possibility, made clear when one understands the sticky web of interconnected legal issues that binds cloning rights to abortion rights and other privacy interests.

This book, therefore, is about much more than cloning. It is a thorough examination of the immense, but hidden, *legal and constitutional* significance of the bans being considered and enacted state by state and at the federal level. It demonstrates how bans on cloning endanger some of our most personal constitutional rights, by confronting our courts with hard, complex choices involving a wildly unpopular cause. Judges, including justices of the Supreme Court, are not immune to the same misconceptions and fallacies that have spawned intense and overwhelming opposition to human cloning among the general populace. If, as the saying goes, hard cases make bad law, then bans on cloning could be the springboards for some very bad law indeed.

In chapter 1, I briefly summarize and clarify the basic history and scientific facts of cloning—what it is, what it is not, what it can and cannot do. This chapter also includes the main arguments against the cloning of humans. Next, in chapter 2, I discuss the anticloning laws within the United States. I begin with the laws now in place in states from California

to Rhode Island, followed by legislative initiatives along these lines in many more states. Chapter 2 also presents the federal approach to cloning thus far, including cloning bans passed by the House of Representatives in 2001 and 2003 and debated by the Senate to a standstill both times. In chapter 3, the various approaches to cloning legislation in other nations of the world are analyzed to provide an international context and to illustrate some options available to the United States in crafting its own cloning laws. Chapter 4 deals with the far-reaching First Amendment implications of bans on therapeutic cloning. This includes a basic introduction to the convoluted subject of First Amendment law, followed by an application of that jurisprudence to cloning research and the probable outcome in court when bans are challenged. In chapter 5, I discuss how bans on reproductive cloning threaten vital liberties from the right to marry and have children to the freedom to choose whether to have an abortion. The many links between cloning bans and an array of other privacy and personal autonomy interests will be made clear. Finally, in chapter 6, I describe the way ahead, a better alternative to the permanent, all-encompassing bans that have typified our legislative response to cloning thus far.

Cloning, on its own merits, could be a way for some people to have their own biologically related children where before that was impossible, just as in vitro fertilization has been for others. And research into cloning could lead to extremely important advancements in medicine and therapy for people with harmful genetic conditions, a variety of deadly diseases, and for those in desperate need of vital organ transplants. If these two points constituted the entirety of the significance of the cloning issue, they would be reason enough to rethink our instinctive impulse to ban that which we hate and fear. But this book is about the hidden legal meaning of human cloning, a meaning with momentous import far beyond that of cloning itself.

The Naked Clone is a window into a future whereby today's bans on cloning form the foundation for tomorrow's denial of many other fundamental constitutional rights. That future does not have to be. It is the purpose of this book to let us look into the future and change the path we are on, before tomorrow becomes today.

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Contents

CHAPTER 1

Cloning in Science and Science Fiction

"Whew! What they can't do these days!"

—Jiminy Cricket[1]

INTRODUCTION

As modern science rips gaping holes in the realm of the impossible, modern law struggles to keep pace. Particularly when revolutionary advancements in science demolish ancient notions of the proper ambit of human action, the legal system has been unprepared to meet the new challenges proactively. Instead of accommodating the new realities, there are powerful people—chiefly political and religious leaders—who have tried to bend the law into a reactive, even reactionary force in the path of full exploration of the inchoate terrain of the freshly possible.

Some of the fuel igniting the legal opposition to scientific forays into the frontiers of imagination is a strong primeval sense that people should not be allowed to "play God." This belief has been both explicitly and implicitly at the core of much of the resistance to genetic engineering of crop plants and domesticated animals.[2] Fundamentally, the idea is that our ability to perform certain tasks should not be coterminous with the legality of doing so, at least with regard to modifying living things. There is a belief, usually implicitly and often explicitly religious in origin, that places some life-related areas of medical and scientific endeavor in the category of taboo, top-sacred, forbidden mystical practices reserved exclusively unto deity.

There is a related concept as well. Reflecting the premise embodied and graphically portrayed in numerous popular horror and science-fiction

novels, motion pictures, and television programs, some people are afraid that human attempts to "play God"[3] or "fool Mother Nature" are fraught with overwhelming peril. The powerful message and visceral impact from these fantasies is clear: when we meddle in the secrets of life, we risk unleashing a Frankenstein's monster and visiting a horrific plague upon ourselves and our world.[4]

Legal and popular opposition to genetic engineering, formidable enough in its own right, has been dwarfed by the reaction to the prospect of cloning as applied to human beings. During the brief aftermath of the dawn of the cloning age, governments around the world have hastily acted to place severe restrictions, including outright bans, on the cloning of human beings and/or experimentation along such lines. The United States has been no exception. And the degree of unanimity in opposition to cloning has been astounding, often uniting liberal and conservative, pro-life and pro-choice, and secular and religious people of various persuasions.

Yet science continues to advance. In November 2001, scientists in Massachusetts announced that they had succeeded in creating the world's first cloned human embryos, albeit for only a few hours and only at the stage of four to six cells.[5] Although this privately funded research was not aimed at the actual birth of a cloned human baby, it set off anew a tidal wave of impassioned calls for a comprehensive permanent federal ban on the cloning of humans.[6] Within the next year there were claims, of varying degrees of credibility (none of which were independently corroborated), that a human baby had actually been born through the intervention of cloning. These widely publicized stories added incendiary fuel to the already raging outcry.[7] Passion has its place, but not to the exclusion of logic, reality, and the rule of law. That is why this book was written.

This book will trace the history of modern cloning and the various legal responses domestically and worldwide to recent scientific breakthroughs. It will then explore the constitutionality and the wisdom of the legal measures taken within the United States, particularly as anticloning legislation relates to other rights and liberties. Finally, there will be a proposal for a more appropriate, rational, and constitutionally sound course of action.

I must emphasize that this book is definitely *not* intended to be yet another public policy polemic devoted to supposed moral, ethical, and philosophical problems related to human cloning. There are plenty of books in that category, and I do not intend gratuitously to add one more book to the groaning library shelves straining under the collective weight of these volumes. If you are searching for an examination of cloning from the standpoint of ethics, religion, morality, philosophy, and/or public policy, without regard for the legal and constitutional issues, you would be better off looking elsewhere.[8] Moreover, in light of the quasi-official findings and recommendations of blue-ribbon panels such as the President's Council on Bioethics, that field has largely been mooted.

Rather, my goal in this book is to explore the *legal* issues implicated by the impulse to ban cloning. The constitutional collateral damage that could be caused by the more extreme bans is the primary concern of this book—that in the process of prohibiting human reproductive and/or therapeutic cloning, we may also inadvertently undermine our most personal constitutional rights. The law, especially constitutional law, is an aspect of the cloning controversy that has never been fully analyzed until now.

THE HISTORY AND FACTS OF CLONING

Popular misconceptions abound concerning cloning.[9] Among the most common fallacious notions are that cloning produces exact copies of an original organism; children of cloning are in some sense less genuine or less worthy than their parents; and cloning is capable of mass-producing legions of superpowered transgenics or superevil menaces, such as an army of Hitlers. Let us dispatch these fallacies as swiftly and painlessly as possible, with the aid of a brief historical and scientific overview.

We need a working definition of cloning for purposes of this book, preferably one that will not cause our eyes to glaze over. Any simple definition is vulnerable to charges of oversimplification and incompleteness, but if it aids our understanding, it is at least a good place to begin. Here is one that with a solid scientific pedigree that will work for us:

> Reproductive cloning is defined as the deliberate production of genetically identical individuals. Each newly produced individual is a clone of the original. Monozygotic (identical) twins are natural clones. Clones contain identical sets of genetic material in the nucleus—the compartment that contains the chromosomes—of every cell in their bodies. Thus, cells from two clones [of the same individual] have the same DNA and the same genes in their nuclei.[10]

The term *cloning* itself was once reserved for horticultural practices involving plants, not animals, in which a group of plants are grown from an original plant but do not come from "true seed." Plants can be reproduced asexually through cuttings, for example. Today, there are several modern forms of cloning that usually consist of direct manipulation of genetic material in a process called somatic cell nuclear transfer (SCNT),[11] or dividing an embryonic cell (embryo splitting), although there are other methods of cloning as well.[12]

Hans Spemann, a German embryologist, laid the foundation for all subsequent experiments into animal cloning as part of his work on whether each differentiated cell retains in some sense the full complement of genetic information present initially in the zygote. During the late 1920s, he took a salamander embryo at the sixteen-cell stage and tied off part of a cell with its nucleus; he was able to get the single cell to divide, showing that the nucleus of that early embryo could essentially begin its processes

again. He subsequently speculated as to whether more completely differentiated cells had the same capacity; he theorized about the possibility of transferring the nucleus from a differentiated cell, taken from either a later-stage embryo or an adult organism, into an enucleated egg.[13] Spemann wrote: "Decisive information about this question may perhaps be afforded by an experiment which appears, at first sight, to be somewhat fantastical. This experiment might possibly show that even nuclei of differentiated cells can initiate normal development in the egg protoplasms."[14]

In 1952, American embryologists Robert Briggs and Thomas King made significant strides toward actually conducting the "fantastical experiment" Spemann had envisioned when they became the first researchers successfully to transfer nuclei from early embryonic cells of leopard frogs to enucleated leopard frog eggs. The resulting "activated eggs" began to divide and develop, became embryos, and then developed into tadpoles. Other researchers were able to replicate the Briggs and King experiments on different species of frogs, but this work showed that the older and more differentiated a DNA donor cell becomes, the less likely it is that its nucleus will be able to be returned to its early full potential. Notably, during the 1960s and 1970s, the British developmental biologist John Gurdon reportedly produced adult cloned frogs by transferring nuclei both from intestinal cells of tadpoles and adult frog skin cells into enucleated frog eggs.[15]

Cloning research then gradually shifted to the possibility of cloning mammals from adult cells. The major challenge was how to reset the genetic functioning of differentiated, somatic cells, after some early successes in transferring DNA from embryonic nuclei of mice during the 1980s.[16] Famously, this culminated in the work of Dr. Ian Wilmut and his colleagues at the Roslin Institute in Scotland, in which the nuclei of adult mammary cells were used to clone the sheep named Dolly in 1996.[17] During the post-Dolly cloning explosion, scientists have successfully cloned several additional species of mammals, including cattle, goats, pigs, mice, cats, and rabbits.[18]

Embryo splitting, or blastomere separation, has not received as much media (or legislative) attention as SCNT, but it is important to note its existence because it implicates some, but by no means all, of the same issues. Simply put, the process entails the manipulation of a very recently fertilized ovum, the union of egg and sperm. Within about 1.5 days after fertilization, the fertilized ovum begins to divide, forming a blastomere as cell division produces two, four, eight, and then sixteen cells, becoming a blastocyst by about the four-day point.[19] Each of these very early embryonic cells is totipotent, that is, capable of developing into an entire adult organism if separated from the other cells. To clone via embryo splitting, the blastomere is fragmented (into two, four, eight, or sixteen identical

cells), and each cell is then cultured to grow into a very small multicell embryo, which must then be implanted into an adult female of the same species.[20] Each embryo is implanted into a separate adult female for gestation. Each surrogate mother then carries one of these embryos to term in the usual manner, and each resultant individual would be genetically identical to the others produced from the same split blastomere.[21] That is, they would be genetically identical to the others split from the same early-stage embryo but *not* identical to any existing postbirth individual.

The process of SCNT generally involves isolating deoxyribonucleic acid (DNA)[22] from the nucleus of a somatic (body) cell (i.e., a differentiated, nongamete cell, not an ovum or spermatozoa) of a donor to be cloned. These somatic cells may first be deprived of nutrients for a period sufficient to halt further cellular development and bring them back to a totipotent state in which they are capable of developing into any type of cell. Then the nucleus is extracted from the donor cell and transplanted into an oocyte (egg cell) that has had its nucleus and chromosomes removed (enucleated). The resulting renucleated cell is then treated (often with a minuscule electrical pulse) in an attempt to fuse the nucleus with the remainder of the cell and activate it. If activation is successful, the cell will begin to divide, essentially in the same manner as with an ovum fertilized by a sperm cell.[23] If the cell develops to the blastocyst (live preimplantation embryo) stage, it is transferred to and implanted in the uterus of a living female (a surrogate mother/gestational mother) of the same species as the donor and recipient cells, with the goal of enabling the female to carry the embryo and eventual fetus until birth, similar to the methods widely used for in vitro fertilization.[24] The resulting individual would be a clone of the DNA donor and would "inherit" its nuclear DNA from only that one genetic parent.[25]

In current practice, this SCNT is not performed only once but many times over, in an effort to overcome low success rates at the stages of blastocyst development, implantation in the female's uterus, and progress to birth. For example, in the famous case of the cloned sheep named Dolly, 277 enucleated eggs were obtained and received nuclei from adult mammary gland cells,[26] and 29 of these cells made it to the blastocyst stage (an 11 percent success rate); of those 29 blastocysts that were then transferred to the uterus of 13 female sheep (ewes), only 1 cloned sheep was eventually born.[27] This reflected a 3 percent success rate among the blastocysts, and a 0.36 rate overall from start to finish.[28] However, another legitimate way of interpreting the same results is that 1 out of 13 ewes that received implanted cloned blastocysts eventually gave birth, a 7.7 percent success rate that compares favorably with those achieved using in vitro fertilization during the first several years of its history.[29]

An individual born through SCNT intervention is not, strictly speaking, genetically identical to the donor of the DNA. Although the nucleic DNA

is the same as in the donor, the DNA in the mitochondria (the organelles within each cell that produce energy for cellular functions), or m-DNA, is the same as the m-DNA of the recipient enucleated ovum.[30] Thus, in SCNT, the new individual is *not* an exact copy, even genetically, of either the donor or the recipient; his or her nuclear DNA comes from the DNA donor, while the m-DNA comes from the egg donor. The only ways in which SCNT can yield an individual with *both* nuclear DNA and m-DNA identical to that of the donor is by using the egg donor's own somatic cell DNA to clone herself, or where the egg comes from the nucleus donor's biological mother (because mitochondria are inherited maternally).[31] In contrast, embryo splitting does produce an exact genotypic duplicate—both nuclear and m-DNA—of the original fertilized ovum (the good old-fashioned union of egg and sperm), but *not* a duplicate of any preexisting individual.

This is an important point, and it is worthwhile to emphasize certain key differences between the two major methods of cloning. Embryo splitting is technologically much easier, at present, because there is no need to perform delicate microscopic surgery on a cell or to "reset" a fully differentiated somatic cell and render it totipotent so that it can develop into an entire organism. Also, as mentioned, because embryo splitting begins with a fertilized egg, it clones a new combination of DNA from a male and a female, not any preexisting individual. In no respect does embryo splitting genetically replicate any one already-born individual, any more than does the natural process of fertilization that unites DNA from mother and father to form an offspring. Embryo splitting is essentially a process of artificially twinning (and beyond) an early stage embryo. In contrast, SCNT does transfer the nuclear DNA from a somatic cell of a single post-birth individual, even an adult, and with the exception of differences in mitochondrial DNA, reproduces the nuclear DNA of that one individual precisely.

There is nothing in either the SCNT process or embryo splitting that lends itself to mass production of clones. The renucleated eggs must each be introduced into the uterus of a living female of the same species (e.g., a female sheep in Dolly's case), one by one, each adult female receiving one renucleated egg. Although the blastomere separation (in embryo splitting) and extraction of nucleic DNA from donor somatic cells and the enucleation of recipient eggs (in SCNT) are done in the laboratory, any resulting embryos must be carried to term by live females, one at a time. The horror-story image of hordes of Hitlers being churned out, factory style, is utterly without basis in scientific fact.

There are, however, some noteworthy questions regarding the risks of human cloning—questions that remain without completely satisfactory answers chiefly because of our limited experience with cloning. For instance, early experiments in cloning frogs sometimes produced badly

deformed clones.[32] Subsequent attempts to clone cows resulted in some abnormally large calves, as much as double the usual birth weight, and some cloned calves were born with diseases and deformed hearts; 18 to 20 percent of these died soon after birth.[33] However, more recent experiments involving cloned cows have resulted in "vigorous, healthy, and normal" individuals, as healthy as conventional cows, with a pregnancy survival rate akin to those achieved by conventional livestock breeders.[34] But post-Dolly efforts to create cloned, transgenic sheep met with a very low success rate, and among the few lambs that survived to live outside their surrogate mothers, some weighed almost twice the normal amount.[35] Such phenomena have obvious, very serious implications for the health and well-being of the mother as well as the offspring born through the SCNT cloning process.

The reasons underlying these mixed results remain unclear. One hypothesis is that the process of reactivating the donor DNA in the SCNT process sometimes damages it, possibly by activating normally dormant genes that harbor deleterious mutations or undesirable phenotypic potential, or by failing properly to reactivate all necessary genes or to erase previous patterns of gene activity in the enucleated egg.[36]

There are other questions awaiting answers that only time will deliver. One intriguing issue is whether a cloned organism somehow "inherits" the age of its DNA donor.[37] Was Dolly, in effect, born fully grown, with a remaining life expectancy (derived from the adult mammary gland cell that contributed her DNA) far less than that of an ordinary newborn lamb? Or does the act of rendering the donor cells totipotent restore them to the effective age of any gamete, with a full lifespan in store for any eventual cloned individual? Further research, and time, is necessary to resolve such questions. But these important inquiries may be cut short by legal intervention.

Dolly the sheep was born on July 5, 1996, having been produced by a research team headed by Scottish embryologist Ian Wilmut at the Roslin Institute in Edinburgh.[38] Dolly was front-page news because this was the first time fully differentiated adult somatic cells had been used successfully to clone a mammal—although previously mammals had been cloned using early embryonic cells—thereby proving that cellular differentiation can be reversed.[39] Obviously, a key feature was the freedom from reliance on very early, undifferentiated embryonic cells—any normal somatic cells from a fully grown adult were now potentially the source of a clone. In the aftermath of the February 23, 1997, announcement[40] of this stunning advancement, there came much controversy. Popes and presidents, politicians and philosophers, pundits and people on the street all felt compelled to speak out on the latest, greatest issue of the modern age. Most famously, physicist Richard Seed declared his intention on December 5, 1997, to commence the cloning of human beings;[41] others followed suit.[42] At that