GENETIC ENGINEERING AND THE SACRED

by Bernard E. Rollin

Abstract. Genetic engineering of life forms could well have a profound effect upon our sense of the sacred. Integrating the experience of the sacred as George Bataille does, we can characterize it as a phenomenological encounter with prelinguistic, noncategoreal experience. This view of the sacred is similar to Friedrich Nietzsche's Dionysian experience or Rudolf Otto's *mysterium tremendum* and diminishes one's sense of self. It seems similar to the eighteenth-century aesthetic categorization of "the sublime." Despite the dominant rational approach to religiosity in the United States, intimations of this experience persist in popular culture. What possible relationship does genetic engineering have to this allegedly inevitable and profound experience? If certain modifications of life occur, they are likely to create such an experience of the sacred in us. In principle, we can now resurrect the mammoth or even create beings designed to directly potentiate our experience of the numinous such as satyrs or centaurs. The creation of such beings could become an art form associated with awaking the sacred, in turn appropriated by religion, as art has always been. Such experimentation, though morally questionable, is probably inevitable.

Keywords: biotechnology; genetic engineering; *mysterium tremendum*; numinous; the sacred; the sublime.

Biologically based manipulation of nature—biotechnology—is almost certainly the most powerful technology ever devised by the human mind. Although in existence for not even three decades, it has clearly demonstrated unparalleled potential for altering life forms, extending life span, curing disease, duplicating life, and creating new and hitherto unimagined organisms. The exponential burgeoning of any technology, as computers

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have amply demonstrated, makes high-resolution predictions concerning the future of that technology futile, and only consequences painted in the broadest of brush strokes can be anticipated.

I supplied one such correct prognostication twenty years ago (Rollin 1986) when I made the point that any new and dramatic technology, particularly one as new and limitless as biotechnology, would create a vacuum in social ethics when people realized that they are unsure—and fearful—of the implications of that technology for how we live. If no one articulates the genuine issues occasioned by our newfound powers, the resulting ethical lacuna will be filled by bad ethics coming from groups representing vested interests, in what I call an ethics version of Gresham's Law in economics: bad ethics drives good ethics out of circulation (Rollin 1995), just as bad money drives good money out of circulation. Given the scientific community's steadfast refusal to engage in, let alone lead, pure ethical discussions of its results or its methodology (Rollin in press), that vacuum was inexorably filled in irresponsible ways concerning biotechnology by doomsayers and religious leaders mouthing bad ethics. For example, when the scientists who cloned Dolly the sheep failed to raise the genuine ethical concerns attendant upon cloning—for example, will cloning generate new sources of animal suffering? (Rollin 1997; 1999)—the vacuum was almost instantly filled by poor ethical reasoning, for example in the form of both religious leaders and fully 75 percent of the public affirming that cloning "violated God's will" (Rollin 1997).

Another plausible reflection on the sociocultural implications of biotechnology is that it will have a profound effect upon the form and nature of religious life in cultures developing such technology, in particular upon the pivotal religious concept of the sacred, which arguably stands as foundational to many if not all religions.

Technology has always affected religious expression. Be it the literal *deus ex machina* deployed in ancient Greek theater, the Urim and Thumim[1] by which Yahweh's will was made manifest to the ancient Hebrews, the arch and flying buttresses making possible the sublime medieval cathedrals, the stained-glass technology that lit those houses of faith, the dioramas presented in the Mormon Temple in Salt Lake City, the powerful organs deployed in churches, the advances in painting enforming the work of religious masters, the bizarre cargo cults engendered in the South Pacific by transport planes during World War II,[2] or today's audio-video-laser capabilities skillfully used in revival meetings, technology is instrumental in invoking in people a sense of the sacred.

But what precisely is the sacred? It is certainly not to be found in the starched, laundered, and pressed view of God widespread in America—the God who is something like the manager at Safeway, a benign Mr. Whipple watching that one does not squeeze the Charmin®. This is the God who,

I am assured by simpleton friends, is a fan of the Denver Broncos. Who is, as I actually have been told, in the infield with Christian softball players when they make a spectacular catch. Whose angels are the sort of benign vapid ciphers depicted in television's "Touched by an Angel." A God comfortable at Rotary clubs, church potluck suppers, and Harley Davidson toy runs for poor children at Christmastime. A regular-guy God who, in film, can be played by George Burns. Who wants masses sung in English, being a good American. Whose sacred places are clean, bright, and hidden in gated communities. A God totally shorn of one of the traditional aspects of divinity, *mysterium tremendum* (which I discuss shortly).

This "American God" view may be no more absurd than any other view of the Supreme Being, but it neglects an enormous part of what traditionally has been circumscribed by religion and what is thought of as sacred.

There is possibly no better ingression into thinking about the sacred than Georges Bataille's *Theory of Religion* (1989). To help us access this profound but difficult work, we can look back to a dualism inherent in pre-Socratic Pythagoreanism. In the *Metaphysics*, Aristotle tells us that the Pythagoreans postulated dualistic fundamental principles, of which the most basic were the limited and the unlimited, and "evil belongs to the unlimited, and good to the limited" (A5 985b23). From the limited and unlimited follow other dualistic pairs—male and female, light and dark, square and curved (*Nichomachean Ethics*, B5 1106b29).

There is no need to delve into Pythagoreanism here; I cite it only because it is a very early Western philosophical manifestation of what Bataille finds essential to religion. Influenced by Martin Heidegger, he points out that there are two aspects to the world. There is the primordial world that animals, according to him lacking language or categoreal apparatuses or self-awareness, experience. In his graphic image, animals are in the world as "water in water." He seems to mean that animals do not put their experiences in organizational boxes but rather simply are primordially *there*. There is no distinction between self and other, inner and outer experience, based on the old Cartesian idea that animals lack linguistic categories.[3] As linguistic and tool-making beings (language is a tool), we humans perceive and experience the world not as a unit but in discrete objects and events dictated by our "cookie cutters," or categories. (Even self and other and mind and body are ways of limiting what is primordial.) All of the history of civilization can be seen as acquiring more and more tools and concepts to tame and, in Pythagorean terms, *limit* the world. But our tool-making and concept-forming ability is always imperfect, so part of the world must remain untamed, as it were. It is this primordial world that religion addresses, specifically our experiential intimations of it.

Early humans were closer to the primordial, possessing far fewer tools and concepts. And in activities such as sacrifice, festivals, sexual frenzy and bacchanals, drunkenness, and orgiastic dance, we lose our carefully

wrought categories and come closer to the original continuum. (Bataille himself was fascinated by the degree to which extreme pain can create "ecstasy," literally, standing outside one's categoreal self.) This acknowledgment of the original world, uncharted and uncontrolled, is the purview of religion, and it is unsettling. The modes of experiencing the primordial are fear and terror, and ecstasy, compared to what we can categorize and control and understand.

As Friedrich Nietzsche pointed out in *The Birth of Tragedy* (1967), Greek religion plainly acknowledges these two faces of reality. The Apollonian, official, state religion lauded order and reason and was celebrated in ways that themselves emphasized order and reason: official dated festivals, holidays, organized activities. The other face included the Eleusinian mysteries and Dionysian, orgiastic festivals, where the mode was out-of-control chaos—musically, sexually, timelessly, mindlessly; dominated by satyrs, Pan, goat-men, centaurs combining men and animal and transcending moral and other rules. For Nietzsche, the melding of Apollonian and Dionysian in Greece was an endless source of creativity and energy.

The notion of the sacred as uncapturable in concepts, fearsome, inspiring terror, dread, and awe, and transcending rational categories is classically analyzed in Rudolf Otto's *Idea of the Holy* (1957), where, as in Bataille, the analysis is couched in experiential—that is, phenomenological—terms. Otto explicitly remarks that the nature of the sacred is such that it grips or stirs the human mind with this and that determinate, affective "state." He calls this state *mysterium tremendum*. Describing it, Otto affirms that "It may burst in sudden eruption up from the depths of the soul with spasms and convulsions, or lead to the strongest excitements, to intoxicated frenzy, to transport, and ecstasy. It has its will and demonic forms and can sink to an almost grisly horror and shuddering" (1957, 12–13).

Pivotal to this experience is a sense of awfulness, of dread exceeding normal fear, "a terror fraught with an inward shuddering such as not even the most menacing and overpowering created thing can instill" (1957, 14). Such a state is mentioned in the Bible, as the Hebrew term *hareh*, and is described for example in Exodus 19 when a dark cloud descends at Sinai accompanied by thunder and lightning, and the sound of a trumpet, and the mountain quakes. According to Otto, "It is this feeling which, emerging in the mind of primeval man, forms the starting point for the entire religious development in history. 'Demons' and 'gods' alike spring from this root" (p. 16). "Creeping flesh," "skin crawling," and "blood running cold" are the closest phenomena to this usually experienced by civilized persons, or "[a sense of] personal nothingness and submergence before the awe-inspiring object directly experienced" (p. 17).

This terror, or feeling of being nothing in the face of what inspires it, is associated not with the rational category of having been created as an entity but rather with the *destruction* of the knowledge of self; it is, as Bataille

might say, "impotence and general nothingness as against overpowering might, dust and ashes as against 'majesty'" (1989, 21). This experience annihilates the sense or category of self.

The experience underlying religion is thus erosive of self or reason, according to both Bataille and Otto. This primordial experience tends to be played down and deemphasized by modern, liberal, ethics-based religion, but it lurks beneath that sanitized exterior in all major religions.

For Otto, the very fact of the experience provides an argument for the existence of its object—thus he thinks he is generating something of an ontological argument similar to Anselm's, wherein one goes from the concept of God to the existence of God. Here one goes from the experience of the numinous to the validation of what it signifies. Our discussion, however, is with phenomenology, not ontology—with a certain part of experience, not with the furniture of the universe.

Though the experience described here is generally considered religious, it shares many elements with a certain mode of aesthetic experience, discussion of which waned in the twentieth century. I am referring to what once was called sublimity, or the sublime. From the time that we are children, we realize that the usual categories of aesthetic experience built into ordinary language and discourse—"beautiful," "pretty," and similar notions—do not capture some of our most profound aesthetic experiences. Although a field of mountain wildflowers or a painting by Monet or Dufy may fairly be called pretty, or even beautiful, that is not the right word for certain paintings by El Greco, Goya, Van Gogh, or Di Chirico and certainly not for many of our most profound experiences of nature. Consider the William Wordsworth passage in *The Prelude* ([1850] 1995) where he is caught by a storm in a small boat, in the middle of a large lake, surrounded by crags. The profound sense of grandeur, of one's smallness or insignificance, of human weakness before nature, that Wordsworth captures so well, though manifestly aesthetic, is not an experience one would call pretty or beautiful. It is rather what those living in the eighteenth century called *sublime*, as best discussed, perhaps, by Kant in the *Critique of Judgment* (1987).

I have experienced sublimity many times in my life—when standing alone at night at the base of a great dam or beneath a massive bridge, or when camping at the base of a massive mountain range when a storm rolls in. Many people have similar experiences at Stonehenge, Easter Island, or the caves at Lascaux. Certain music can elicit a similar sensation, for example Carl Orff's *Carmina Burana*, as can certain artists, such as Francis Bacon or Bruce Nauman. The Nazis were particularly adept at producing the sense of the minuteness of the individual before the power of the state in architecture and at orchestrated festivals and rallies. Such experiences may be as close as most people get to the loss of self Bataille is talking about.

But still, the experiences described by Bataille and Otto are not at all uncommon in society. As a young man I would occasionally feel it in massive old Catholic cathedrals and at Latin masses. Pentecostal and other ecstatic forms of Protestantism seem to deliberately aim at creating such experiences. As a youth I was drawn to black churches and revival meetings, where the loss of self in music and rhythm was common and an energy close to sexual reigned. (Many of my peers, in fact, sought to take their dates to such events, as a modality for awakening latent sexual feeling.) Some persons have such feelings at bull fights (which I find loathsome); others at "holy roller" or charismatic prayer meetings, snake-handling events, Indian peyote ceremonies, Chasidic celebrations, raves and rock concerts and other musical gatherings, or while speaking in tongues. Mainstream churches eschew this experience, seeing ecstasy or lack of control as inimical to rational, morally didactic religion. The heady mixture of sexuality, music, loss of inhibition, fear, and adrenaline is too Dionysian for polite society's "*staats-religion*" (official religion).

Fascination with the dark side of religious experience is manifest in popular culture. An underground culture of sexual vampirism has emerged in large cities, with adherents even having dental surgery to create fangs, and the correlative blood-consuming erotic activity inducing ecstasy and loss of consciousness. The widespread use of drugs speaks for itself and is omnipresent in all societies and in many religions. According to some, chemical intoxication also pervades the animal kingdom (Siegel 1989).

A recent book by a psychologist on exorcism (Cuneo 2001) documents in great detail the spectacular rise in exorcisms in Catholicism and fundamentalist Protestantism. Despite our living in the age of mapping the human genome and space travel (or perhaps because of living in such an age), many of us find the presence of demons clearly operative in the world undeniable. A surprising number of psychologists attribute aberrant human behavior to demons. Exorcisms were performed by Pope John Paul II; others have been televised. "Demonic possession" is actually listed as a disease in the *Diagnostic and Statistical Manual* defining mental illness.

A remarkable series of films starring Christopher Walken, beginning with *The Prophecy*, demonstrates the power of the Bataille/Otto view of religion over the social imagination. In these films, the focus is on angels, the emissaries of God who do God's work. As against the popular puerile image of angels as aerodynamically unsound porky babies, or cloyingly lovable women comfortably ensconced in lapel pins, these films present a far more biblically accurate view of angels as God's gunslingers, awesome in demeanor and action. (Recall that angels are dispatched to destroy Sodom and perform similar awe-inspiring tasks.) As such, the angels are portrayed as beyond good and evil as we conceive it and as inspiring fear and awe in humans. They remind us that being "touched by an angel" is almost certainly not a pleasant church-supper sort of experience.

Otto demonstrates in his book the degree to which the dark and awesome experience of the sacred we have been discussing pervades the major religions. It can be found in Christian mysticism, in Kabalistic writings in Judaism, in Hinduism, in rituals of Shiva the Destroyer and Kali, and in Tantric Buddhism. Historically and epistemologically fascinating, such an exposition is beyond the scope of our discussion here. We have said enough to justify the centrality of the dark concept of the sacred to the experiential dimension of religion, even today. The next question is whether such an experience is good or bad, deleterious or salubrious to human life.

In my reading of Bataille's theory, such experience is above all else essential and inevitable to human life, because human life is at root the taming of the primordial by linguistic categorization and other tools. We will never fully capture the world in and by our concepts and tools, because such a task is a moving target and always leaves a residue, presumably as a result of what Arthur Danto has aptly called the "space between language and the world" (1968, passim). Primordial reality will always elude us, leaving a remainder that is present as the experience of the sacred. However we refine our concepts, there is always an ineffable leftover that is there to haunt and taunt.

If that is the case, the experience of the sacred can be seen as a consolation, an affirmation of the fact that, while we can engage forever in Apollonian striving, we can retreat to the Dionysian in a self-abnegating way that has its own rewards (ecstasy being nothing to sneer at). It further reminds us that the purely intellectual is not the be-all and end-all of apprehending reality, that there is a largely experiential inexplicable alternative that thrills while it chills and delights without insights. Loss of self, ecstasy, fear, and finitude can be fun! Even more dramatically, as Bataille's lifelong obsession with ecstasy achieved through pain reveals, there may indeed be redemption through suffering.

We now approach the hard part. If we assume that the experience of the sacred is desirable for adding balance to life, or at least inevitable, what relation does this have to genetic engineering, the branch of biotechnology we shall take as representative? Will it augment, diminish, or be irrelevant to the experience of the sacred?

On one level, it appears that it could undercut our experience of the sacred. If animals are indeed primordially other in not being capturable by our concepts, themselves lacking concepts, is not genetic engineering likely to diminish this mystery, for they are now made by us? To be sure, we have always made animals as tools. Domestication and selective breeding of cattle, sheep, dogs, and horses are surely human tool-making triumphs. The dog is a clichéd example. William Blake can sing of tigers burning bright, but surely not of Chihuahuas!

To put it another way, one might argue that animals created by humans, being tools, products of human conceptual deployment, are inimical to the otherness required for the sense of the sacred. This certainly is conceptually plausible, but it is empirically wrong. First, the experience of the sacred is an experience and is verified phenomenologically. So whatever actually provides us with the experience in question is a legitimate source of sacred experience, be it a drug or something artifactual. LSD is a humanly synthesized drug, yet it can lead to profound experiences of the sacred. Second, works of art, architecture, and literature that create in us a sense of the sublime or the numinous also are artifacts, or tools, created by humans. If they can effect in us an experience of the sacred, why not animals we have engineered? Third, rituals, dances, and festivals such as the Eleusinian mysteries that create in us the experience of the sacred are human creations and tools—artifacts, products of human creativity—but that does not stop them from being the basis of experiencing the sacred.

Finally, the Chihuahua is a loaded example, being essentially ludicrous. Other specially bred animals could well provide us with ingression into religious experiences of the sort we are discussing; one may imagine the sort of experience Otto or Bataille discusses arising, for example, out of orgiastic activity culminating in a wild night ride on a magnificent thoroughbred horse. In other words, we must be careful not to commit a version of the genetic fallacy. Just because something is created by human categoreally based contrivance, and thus is an example of humans circumscribing the world by thought and language, does not mean that the entity in question cannot create in us the experience of sacredness. If the sacred itself were required to be acategoreal, the above claim would be true. But it is an experience we are talking about, so the source of the experience can be based in linguistic or categoreal thought. Indeed, it is not hard to imagine a great deal of human tool-making contrivance—be it drug invention, painting, music or dance composition, literature, or brain manipulation—being deliberately directed at creating the awe, fear, ecstasy, and separateness essential to the numinous experience. Genetic engineering is a new and natural vehicle for artists. The art school at the University of Amsterdam has a unit devoted to genetic engineering.

In the 1950s I talked to a Roman Catholic priest at length about his claim that if humans could create and manipulate life, nature would be desacralized, and religion would be routed. For many years, I took this as a truism. In the early 1970s I read another article by a Catholic priest who was commenting on the claim that the '60s counterculture was dealing a death blow to religion with its rampant sexuality, atheism, contempt for organized religion, flirtations with Eastern thought, fascination with drugs, and so on. Nonsense! he declared; all of those vectors bespoke an element of spiritual need leading to exploration. In the end, he argued, all of these explorations would lead back to organized religion, for only organized re-

ligion, particularly Catholicism, had the institutionalized vehicles for dealing with such spiritual need and thousands of years of practice. The church needed only to modernize some of its superstructure; its infrastructure was solid.

Indeed, he was right. To meet the needs of that generation, the church modernized its music with rock masses and created retreats calculated to provide religious experiences by use of food and sleep deprivation to cater to those wanting "spiritual sustenance." "Jewish renewal" has done the same thing. In fact, I would argue that in Vatican II the church did far more harm to itself by deemphasizing Latin and Protestantizing its ritual than the 1960s did. Old Catholicism (as in the demand for exorcism) was more suited to meet the '60s' need for "spirituality" and sacred experience, which continues today, than the antiseptic modernity of today's masses is. The underground demand for exorcism supports this claim.

The effect of genetic engineering on the core religious experience of the sacred will therefore depend in part on the sort of genetic engineering to be done in society, in part on how society evolves, and in part on how religious institutions manage this change. Genetic engineering may erode belief based on what Bonhoeffer called the God of the gaps—that is, religion serving to fill in gaps in our knowledge—but it is much more likely that it will be deployed to enliven our sense of the sacred.

For the remainder of this discussion, I assume that the human attraction for the numinous and sacred will remain a ubiquitous part of the human psyche for the foreseeable future. As Otto points out, virtually all cultures revel in ghost stories and in tales that thrill and frighten by involving the sacred.

One possible scenario is to imagine that all genetic engineering in animals will be so prosaic as to be perceived simply as extending our tools over nature with no element of the sacred involved. This might occur if we genetically engineered only such things as vegetables, to increase their shelf life; plants, to resist insect infestation (for example, by BT genes[4]); and animals, to use feed more efficiently or produce more milk or resist disease that once would have decimated them. All such prosaic innovations would probably do little if anything to increase the social sense of the sacred and might well diminish it by showing yet another set of examples of human mastery over wild nature before which humans were historically impotent.

That such mundane use of genetic engineering would provide the exclusive domain for such technology is inconceivable to me. Indeed, we already went beyond this when the "geep" was produced by fusing embryos of a goat and a sheep. (This technically is not genetic engineering, but is close enough.) More dramatic has been the incorporation of the insect firefly gene (luciferase) for luminosity into tobacco plants making them glow phenotypically and the incorporation of the gene for green fluorescent protein into a rabbit by a French artist working with a biologist

yielding a rabbit that glowed in the dark. Similarly, fish that glow in an ornamental fashion have been produced and sold commercially. Expecting biotechnologists to restrict themselves to the mundane is like expecting a person with a new Harley Davidson to observe the speed limit or a child with a BB gun to shoot only at targets. Creating rabbits that glow in the dark approaches the terrain of the sacred in the sense we have been discussing.

My colleague George Seidel has for many years raised the possibility of resurrecting the mammoth by biotechnological means. Mammoth DNA is preserved in Siberian permafrost, and, given the funds, Seidel believes it would be relatively simple to recreate a mammoth birthed by an elephant. Recreating an animal that has been extinct for 10,000 years, particularly an animal of great size, is certainly a way of creating in those who see it a sense of great mystery and numinousness, something we already may experience in the presence of tigers, giant blue whales, sea crocodiles, and other animals of great size and otherness. (My own earliest memory of sublimity was, as a child, seeing the breathtaking blue whale, preserved by taxidermy and hanging in the New York Museum of Natural History.)

Why stop there? People are talking about recreating the extinct dodo, and we could create a literal zoo of extinct animals of which we have remnants of DNA. What could create a greater sense of awe and the sacred than coming face to face with animals that walked the earth 10,000 years ago, or more, previously vanished and now contained in a vivarium designed to create a sense of *mysterium tremendum*? I visited the Monterey aquarium recently and saw an exhibit of deep-sea luminous jellyfish in an artificially lit room, and it gave me something close to a numinous experience.

Indeed, why stop there? I can see genetic engineering emerging as an art form, with artists manipulating genomes, in the manner of the luminous rabbit, that would be calculated to inspire experiences of sublimity—mammals engineered to live underwater; giant insects; animals with enormously enhanced intelligence; dogs who communicate using bee-dance language. The shaping of life itself could well become an aesthetic pursuit, while collection of such life could become a cultural norm.

Indeed, why stop there in our extrapolation from current culture? Entertainment is a huge industry, and new technologies are quickly deployed on behalf of entertainment—new roller coasters, video games, ever more convenient musical recordings, holograms, virtual reality. There already are religion-based theme parks. Why not genetic engineering? Jurassic Park is not that farfetched if the technology continues to accelerate exponentially. Legal constraints? The industry would simply go offshore or buy its own island somewhere where we can resurrect dinosaurs, hunt saber-tooth tigers, and ride pterodactyls.

The bulk of videos and DVDs sold are pornography, or, more kindly, erotica, catering to all manner of predilection. With genetic engineering, we could in principle have genuine satyrs and centaurs cavorting and indulging us in orgiastic abandonment greatly surpassing even ancient erotic rituals. Those able to afford such recreation could have sex with mermaids and centaurs under conditions that replicate ancient myths that already evoke the sacred as stories, let alone as life experiences. Why not build a maze inhabited by a Minotaur? And why stop there? We could shape humans into demonic forms. We could craft them to live underwater. We could build them according to specifications. We could clone historical figures such as Abraham Lincoln, samples of whose DNA we have in our possession, or iconic figures like Mother Teresa. Public opinion would certainly draw the line at altering or cloning humans for whimsical reasons, but no amount or law or ethics will stop the wealthy from so indulging themselves, nor will it halt such experimentation. We are not talking about billion-dollar investments here. The presence of an illegal industry trafficking in altered humans is surely one of the most numinous of possibilities. Even if such activity is so well concealed as to be merely rumored, that in itself would create an inexhaustible source of *mysterium tremendum*, the whispers fanning the flames of imagination.

If the scenario we have described plays out, it is easy to imagine organized religion (or new religions) quickly appropriating such technology in the service of orchestrating close encounters of the sacred kind, even as religion has always appropriated art, music, ritual, and architecture for creating such experiences. I can imagine organized religions rising up to quell and condemn that use of biology as art and demanding that creation be restricted to God. I can see a variety of other advocates joining forces with churches to put a stop to such activities—animal-rights and -welfare advocates who worry about the treatment of artificial life; environmentalists who worry about the effect of such manipulation of life on ecology and the environment; public-health advocates who fear the emergence and dissemination of new diseases; humanists who see such manipulation as riding roughshod over human nature; bluenoses who deplore the sexual aspects; Kantians and innumerable other advocates who see the entire enterprise as demonic. Such opposition would itself evoke a sense of awe, fear, and *mysterium tremendum* in persons who oppose such activity without their experiencing anything but hints of what is happening.

Those of us growing up after World War II and living under a historically unprecedented Sword of Damocles—nuclear weaponry—were strongly affected by that state of affairs. Prior to that period, the only power comparable to the atomic bomb was in nature: tornadoes, floods, hurricanes, avalanches. Surely the constant sense that the annihilation of humanity sits in the hands of humans would have a major psychological

effect. Perhaps the 1960s' pacifism, drug culture, loosening of sexual mores, and experimentation with alternative religions were responses to such power concentrated in human hands. Certainly the '60s moved more people away from mindless white-bread religion to greater "spirituality," alternative searches for comfort and meaning. Clearly drugs, meditation, music, the teachings of Don Juan, and sexual experimentation were approaches to the sacred in Bataille's sense—ecstasy, loss of individuality, dissolution of hard-edged conventionally assumed reality.

We can expect the same from biotechnology. The idea that humans are shaping life is worrisome and assurance of bureaucratic control over the process even more worrisome. Biotechnology will change the world far more than nuclear power would. At worst, nuclear weaponry could obliterate, but it was unlikely short of that to change our reality. Biotechnology will constantly mutate that reality and could indeed establish Heraclitean flux as the fundamental mode of reality. Distinctions long assumed, for example the divide between nature and convention, nature and culture, animal and human, even living and dead, cannot stand in the face of a technology capable of changing life. Inexorable evolution, like God out of our control, is no longer a given. Evolution is in our hands, the hands of scientists and bureaucrats, who are actually less reassuring than the Divine Watchmaker[5] or the Blind Watchmaker (Dawkins 1987). That in itself can lead us to greater escapism, which in turn can accelerate movement toward the sacred and the numinous.

Many of us have some notion of animals as standing across a vast cognitive chasm from us—that animals think and feel, but not like we do. Pets provide us with an illusion of mentational proximity and cousinhood, but even a brief encounter with wild animals shatters that. Perhaps that is why we anthropomorphize wild animals into laughable or cuddly cartoons or stuffed toy bears. If animals are made by us, as we see fit, will they be less separated from us than they are now, or more separated? I would argue the latter, because every piece of genetic engineering is a throw of the dice, a spin of the wheel. We modify a gene for immunity, and leglessness results. We cannot predict the effects of our manipulations. So chaos is built into genetic engineering. Can that chaos not serve to increase our distance from these animals? How do I know that engineering a dog to resist a given disease will not unleash primordial ferocity? Given this uncertainty of results compared to traditional breeding, given the ecological anarchy that could result, could not the proliferation of genetic engineering lead us away from a sense of order and control to an inherent sense of randomness tied to the possibility of infinite manipulation by humans? Could not increased control without increased predictability make us more responsive to the sacred, to the otherworldly, to the fearsome? We probably trust people less than we trust nature or God.

Ethical theorist and rationalist though I am, there is something pervasively appealing about a man-created nature. It diminishes our obsequious fawning and beseeching of the gods. If we are playing God, They is Us, to misquote the cartoon character Pogo. And with rationalism, scientism, and their technological products spinning us out of control, we can perhaps intuit a new mode for humanity, an increased surrender to the chaotic, which, in the end, may make for a renewed experience of the sacred.

NOTE

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1. Jeweled breastplate worn by the high priests of ancient Israel serving as an oracular medium by which Yahweh expressed his will.
2. Indigenous people in the South Pacific began to create models of cargo planes and worship them after the crews gave them supplies.
3. As I have written elsewhere (Rollin 1993), I do not believe that animals lack concepts, but that is irrelevant to our discussion here.
4. BT = Bacillus Thuringiensis, an insect-killing bacterium.
5. Divine Watchmaker is the term of English theologian William Paley (1743–1805).

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