The Human Difference

Eric Cohen

In the contest for oddest pronouncement in a State of the Union address, high marks should go to President Bush's call last January for a national ban on "creating human-animal hybrids." Fortunately, the modern biotech laboratory does not yet resemble H.G. Wells's island of Dr. Moreau, that fictional place where an exiled scientist blends man and beast by vivisection. Not even our most skillful, least scrupulous genetic engineers can manufacture humanzees to provide spare parts or serve as semi-skilled labor. We are not yet so talented or so depraved.

Yet the President's call to action did not come out of nowhere. If it seemed strange, that is only because we live in genuinely strange times. In China and Britain, scientists are creating cloned man-animal embryos using rabbit eggs and human DNA. In the Caribbean island of St. Kitts, human neural stem cells are being inserted into monkey brains. At the Mayo Clinic in Minnesota, researchers have produced pigs with hybrid pig-human blood cells, demonstrating the possibility of genetic fusion between man and the lower animals.

So far, no one has produced a hybrid embryo using human sperm and animal eggs or animal sperm and human eggs. But this, too, is probably only a matter of time. Many of these man-animal experiments hold out the promise of useful results, like therapies for Parkinson's disease or the possibility of mass-producing designer stem cells. Some elicit a visceral negative reaction, a Levitical sense of a sacred boundary being violated. All of them should leave us wondering: just how interchangeable is man with the other animals? Could scientists one day recreate one of our extinct, not-quite human ancestors? Or produce creatures, as Wells imagined in 1896, that are "human in shape, and yet human beings with the strangest air about them of some familiar animal"?

Even the National Academy of Sciences (NAS) has been sufficiently concerned to distribute a set of guidelines regarding man-animal chimeras. It recommends that institutional review boards ask the following questions before approving experiments involving the insertion of human embryonic stem cells into non-human animals:

> Might the cell transfer result in the animal's acquiring characteristics that are valued as distinctly human? . . . If visible human-like characteristics might arise, have all those involved in these experiments, including animal-care staff, been informed and educated about this?

True, the most remarkable possibilities—the creation of monkeys with complex language, or men with working wings—are scientifically unlikely. But, the NAS seems to be saying, what about animals with human organs? Or man-animal hy-

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brids that develop for a few weeks or months in an animal uterus before spontaneously aborting? Better get the review boards ready just in case.

It is only fitting that modern biotechnology should be raising anew ancient questions about man's standing among the animals. The trouble is, however, that modern biology has also left us bewildered about how to think through such questions, precisely because it has left us bewildered about man himself. At the very moment when our technological cleverness is increasingly enabling us to blur the boundary between man and the other animals, we lack the clarity of the ancients about what sets man apart.

According to Aristotle, man is the only rational animal, the only being capable of choosing his own path or contemplating the cosmos in which he lives. According to the Hebrew Bible, man is the only being created "in the image of God"; capable of sin, aware of death, with longings for immortality, he is also ruler of the other animals. While the philosophy of Athens and the revelations of Jerusalem differ greatly on what elevates man, they agree that human beings are, or are meant to be, superior to everything else on earth.

Modern science, by contrast, is not so certain. Its radical ambivalence about man is traceable to the mixed marriage that gave it birth. First came Descartes, who treated the whole material world, including the human body, as a collection of aimless stuff to be mastered and manipulated by the human mind, which stands high above it all. Then came Darwin, who assimilated the whole of man, both mind and body, to the rest of biological life in a seamless continuum. Taken together, modern science treats man as both radically similar to *and* radically different from everything else in nature.

Thus, as theoreticians, modern biologists aim to convince us that man is just another animal; as practitioners, they conduct ruthless experiments on other animals for the sake of improving human life. Modern sociobiology declares human pride to be chauvinistic, yet modern biotechnology progresses only through such unapologetic human chauvinism. The scientist's pride in his biological discoveries is humbled only by his belief that pride and shame and everything else are just Darwinian survival mechanisms repackaged in human form.

It is the Darwinian side of science that most worries those who think about man's standing in the universe. The theory of evolution is less a single theory than a maze of agreements and disagreements, but most Darwinians make three claims about the mechanisms of man's descent. First, man and the other animals share a primitive, common ancestry. Second, man came into being through a process of genetic mutation and natural selection, with new biological powers emerging inexplicably, persisting genealogically, and accumulating sufficiently to form a new species. Finally, coming into being as he did through the chance unfolding of matter's aimless history, man might never have existed at all. It is therefore quite possible that the universe could have persisted without containing any such rational being, or without becoming truly conscious of itself.

On the evidence provided by nature, Darwin's claim of common descent seems undeniably compelling; man's emergence via genetic mutation and natural selection seems likely; and the possibility of man's never emerging seems all too possible. Yet for all its insights into the development of complex life, the theory of evolution ends before the most interesting questions begin. Where did matter come from in the first place, and with it the latent possibility of man? What is the source of nature's fixed laws, by which the chance process of evolution plays itself out? Why do animals seek to survive and reproduce at all, hungering for life even with its manifold sufferings?

To these questions, modern Darwinian theory has no compelling answer, and its methods are poorly equipped even to initiate the right sort of inquiry. Evolution may explain the mechanisms of man's *descent*, but not the mystery of his *ascent*, including the wonder he exhibits about the origins and destiny of the cosmos—a wonder that serves no useful animal function. A theory of man's origins is not yet a theory of man, let alone a theory about why there is something rather than nothing.

What is especially striking is the zeal with which contemporary scientists defend the theory of evolution against its skeptics and detractors even as they often fail to acknowledge or understand its limitations. They see polls showing that a high percentage of Americans disbelieve in evolution, and they cringe, feeling, in the words of the Nobel laureate Harold Varmus, "under siege." By contrast, in the conversion of each new child in Pennsylvania or Kansas to a belief in evolution, they see an intellectual and moral victory. For radical neo-Darwinians like Daniel Dennett and Richard Dawkins, evolution is indeed a kind of liberation: proof that God is dead, proof that we are free to make our own gods, proof that we can impose our own moral order on a world governed only by amoral chance. With this absolute license comes, in the scientists' perception,

an absolute and exclusive responsibility to ameliorate the physical misery of humankind, heeding the cry of the sick that falls on heaven's deaf ears.

That is where the practical side of science comes in, with its debt not only to Descartes but to Francis Bacon (1561-1626), the English philosopher and defender of the scientific revolution. For what science says about human origins has become the ground for claiming an uninhibited scientific freedom, aimed at correcting the broken life that nature so callously gives us. The Darwinian metaphysic—man as the product of blind chance—becomes a basis for Baconian science—man as the redeemer of blind nature.

This is why stem-cell research is, along with evolution, the other great scientific issue of the age, where godlike responsibility for human suffering supposedly justifies the godlike destruction of nascent human life (and where scientists regularly complain of being "under siege"). For many scientists, this is also the ground for conducting man-animal experiments with virtually no moral limits: because such research will help the sick, and because there is nothing all that special about man in the first place. As the NAS report asserts, "There is general agreement in the scientific community that [species] boundaries are to some extent arbitrary." Mouse, monkey, man—at least under the microscope, it is all a blur.

Given the often sterile, shrunken, and confused image of man put forward by the neo-Darwinists, it is hard not to have a great deal of sympathy for the movement known as intelligent design (ID). Against a view of nature as aimless matter in motion, proponents of ID seek to restore a guiding purpose to the universe. Against the belief that human freedom is simply an unintended by-product of blind evolution, they aim to defend human freedom as the Creator's gift.

Describing what motivates him, William Dembski, perhaps the most prominent ID theorist, once declared:

> I think God's glory is being robbed by these naturalistic approaches to biological evolution, creation, the origin of the world, the origin of biological complexity and diversity. When you are attributing the wonders of nature to these mindless material mechanisms, God's glory is getting robbed.

And if God's glory is robbed, man's glory is diminished. The elevation of man that once came from being created "in God's image" is replaced by the will of the robbers, who believe that man is a beast answerable to no god, and hence a god who can remake human life as he sees fit.

In essence, ID theory is a modern restatement of the ancient belief that the visible order of the cosmos is evidence of God's handiwork. Just as the watch is proof of a watchmaker, the existence of man is proof of a divine engineer who imagined the human whole before breathing life into the parts. Modern ID theorists—like Dembski, Michael Behe, and Stephen Meyer—reformulate the watchmaker metaphor in mathematical and biochemical terms, focusing primarily on the inadequacy of Darwinism as an explanation for the emergence of complex life. Organisms, they say, possess an "irreducible complexity" (the phrase is Behe's), for which the design of the whole necessarily precedes the arrangement of the parts. Even the hidden functions of the body—the parts of the parts, like the molecular mechanism for blood-clotting—make sense only as functional wholes with subordinate parts of their own. Only if every species type came into existence by design, not piecemeal via nature's purposeless mutations, could the organism precede and give direction to the organs, the organs to the cells, the cells to the proteins.

Yet whatever the merits (and limits) of ID as an explanation of human origins, it too offers little as a theory of man's being. Saying that humans are designed says nothing about what they are designed for, or how they are different from the other animals that are also, presumably, products of design. Conversely, to celebrate the orderliness of nature as a reason to believe in divine creation ignores the gross disorderliness of nature that relentlessly afflicts us. Inexplicable natural misery is what often awakens a longing for the divine in the first place, or a desire for perfect justice that will transcend the crookedness of nature with its mad epidemics and childhood cancers. Without a theory of man's fall—an inescapably religious idea—the theory of design seems like a half-truth, if not an absurdity.

The irony is that by focusing relentlessly on man's origin, not man's being, ID theorists ultimately make the same error as orthodox Darwinians. In an age when biotechnology may soon allow us to redraw the biological boundaries between man and the other animals, what we need to understand is not the human beginning but the human difference. Who we *are*, not where we came from, is the question that matters most. For this, we need to look beyond the chimera laboratory, beyond neo-Darwinism, and beyond the theory of intelligent design.

FORTUNATELY, there are other sources of human self-understanding. In modern times, perhaps the deepest thinker about man's place in nature was Hans Jonas (1903-1993), a philosopher of biology and a founder of modern bioethics before that field took a drastic turn for the worse. In a remarkable essay, "Tool, Image, and Grave: On What is Beyond the Animal in Man" (1985), Jonas reminds us that our commonality with the animals is hardly news to anyone who has read the ancients. But, he adds, "recognizing these similarities . . . has never been an obstacle to distinguishing" man from beast.

Jonas does not dismiss Darwin's discovery. He even welcomes it as a corrective to Cartesian extremism, or the misguided belief that everything in nature except the human mind is formless stuff, to be manipulated by us without restraint. While raising difficult questions about man's stature, Darwin also elevated the rest of nature: the mouse was no longer just a biological model for dissection but an animal precursor of the dissector himself.

And yet, Jonas insists, Darwin's focus on natural selection only takes us so far. Survival value alone "fails to explain the enormous surplus of those characteristics that have emerged in man beyond what is needed for purposes of survival." In this connection, Jonas explores three artifacts—the tool, the image, and the grave—that together reveal the ascending heights of man's difference.

In tools, humans meet their animal necessities with distinctly human intelligence and will. They build hammers and screwdrivers in order to build scaffolding and cranes in order to build bridges and skyscrapers. While other animals sometimes use what they find in nature to achieve some instinctual purpose—Jonas gives the example of sticks and stones used as "momentary aid[s]"—man alone deliberates about his inventions, learns by trial and error, perfects past designs with the latest materials, and treats nature as a raw material. As our tools become more sophisticated, so do our needs and desires, pointing beyond the utilitarian to the aesthetic. The tools man makes often serve no function except his own love of beauty, and especially his human pride in the aesthetically pleasing artifacts of his imagination.

Indeed, it is in the realm of the image, Jonas's second instance, that man "displays a total, rather than a gradual, divergence" from the other animals. Even the simplest picture creates a new layer of being, entirely separate and separable from the merely material. The decorated cave or painted canvas becomes a reminder of the glorious hunt, a portrait of the Christian savior, a two-dimensional diagram of the three-dimensional brain.

This physical image always begins in the imagination, where man alone can remake past events or bring to life future possibilities. In the imagination, we humans liberate ourselves from the constraints of time and place. No longer enslaved by the iron law of necessity, we assert a novel freedom by remaking the world in our mind's eye—including, most profoundly, the freedom to imagine what lies beyond death.

This brings Jonas to his third artifact. An image can be partially explained by the useful functions it sometimes serves, but "that the grave is an exclusively human phenomenon is empirically demonstrated to us by the fact that no animal buries or gives further consideration to its dead." In the grave, humans confront their self-conscious mortality with rituals of remembrance; they think beyond the lifeless body to the possibility of immortality; and they reach beyond nature in search of an answer to nature's limits. "Metaphysics," says Jonas, "arises from graves." For in knowing that he must die, man is forced to reflect on who he is.

JUDGED BY the standards of modern science, Jonas's speculative reflections on man's nature "prove" nothing. Yet by taking seriously these everyday objects and deeds, by looking with self-awareness at the visible evidence of man's ways, he invites us to see what the human animal truly is. Following his example, we might explore still other dimensions of man's difference—keeping in mind all the while that although this difference sometimes elevates him far above the beasts, sometimes it degrades him far below them.

One of those dimensions, and one that man conspicuously shares with the other animals, is sex. Here Darwin himself—the historical Darwin, not the philosophical one—offers an instructive case. Soon after returning to England from his great voyage on HMS *Beagle* in 1836, Darwin tried to decide whether to marry. He prepared two columns of opposing notes, "marry" versus "not marry," each beginning with his thoughts on the meaning of children. Children were a "second life," he observed, but also a threat to his "freedom to go where he liked." Children would be companions and caregivers in old age; but they would also mean the "loss of time—cannot read in the evenings" and "less money for books etc.—if many children, forced to gain one's bread."

In the end, even with all the losses carefully cal-

culated—"I never should know French—or see the Continent—or go to America, or go up in a Balloon, or take solitary trip in Wales"—Darwin married and became the father of ten. "Never mind my boy—Cheer up—One cannot live this solitary life, with groggy old age, friendless and cold and childless, staring one in one's face, already beginning to wrinkle. Never mind, trust to chance."

When it comes to sex, men and women are animals indeed. He and she desire sexual coupling, usually with a member of the opposite sex; and he and she reproduce sexually, the union of bodies permitting the union of egg and sperm, giving life to a new person connected to father and mother genetically but also a wholly unique member of the species. But as one moves beyond this birds-and-bees aspect of things, the sexual behavior of human beings diverges dramatically from that of their animal cousins. Darwin's life, perhaps even more than his theory, points us toward the truth of human sexuality.

For the very fact that Darwin had to decide—that he could deliberately choose *against* children—shows how different he was from the other animals he studied. Only humans bring sex under the kingship of reason, and only humans, seduced by the pleasures of childless freedom, or depressed by the miseries of an inhuman world, or devoted to a calling like the priesthood, can choose against self-perpetuation. Just as humans alone can choose suicide, humans alone can choose sterility; to humans alone would it ever occur to sever the pleasures of sex from its reproductive consequences and parental obligations.

The sexual difference between man and the other animals obviously does not end there. Both prostitution (the selling of the body, as a thing) and marriage (the giving of the body, in fidelity) are uniquely human possibilities. Moreover, only man can remedy the body's infertility through technological intervention and is capable, potentially, of replacing sexual reproduction with asexual reproduction via cloning.

In this most animal realm, humans reveal how high above the other animals they stand and how far below them they often fall; they reveal their unique dignity, and their unique capacity for self-degradation. Interestingly, what is most elevated in human sexuality mirrors the behavior of some animals, who in their own instinctual way give themselves to one another and take responsibility for their own offspring. What is most dehumanizing in human sexuality is distinctly human, disconnected entirely from any animal precursor.

The passion of sex is often described as a kind of fire—sometimes extinguished in a night, sometimes suffocated by marriage, sometimes transformed by hearth and home. But fire, unlike sex, is a natural phenomenon that burns to no end, leaving behind ashes rather than offspring. Unlike man *or* animals, fire has no aim, no desire, no inner life. It is a power that appears without warning, a relentless agent of destruction.

Unless, that is, it is tamed by men. For animals, fire is neither servant nor symbol. For man, it is both, even while it remains a potential destroyer—a servant of good and evil, a symbol of terror as well as hope. In Aeschylus' famous tale of Prometheus, fire is the source of man's ascent out of "wretchedness," stolen from the god Zeus who sought to keep it for himself. Without the art of fire, a distinctly human life, with cooked food and heated homes, is unimaginable. Yet the many meanings of fire point beyond the utilitarian—from the fires of hell to the Olympic torch to the fireside chat. Armed with fire, humans have committed the most evil acts, systematically burning their fellow humans in ovens as if to demonstrate man's capacity to be more beastly than the beasts. With fire, the same burned bodies are lovingly mourned in candles of remembrance, tiny flickers that connect the living and the dead with the possibility of the eternal.

Perhaps like nothing else in nature, fire has become the mark of man's difference—the emblem of our creativity (Lincoln's "fire of invention"), our depravity (the fires of the Holocaust), and the mystery of our being (the Bible's burning bush). It seems only fitting that Moses encounters God shrouded in fire, even as the fire of divine liberation is made vividly present in the journey out of Egypt. Our longings are answered, but the ultimate source of our being is left shrouded in mystery.

What best defines the modern spirit, however, may not be the burning bush but the flaming rocket. Recast as conqueror of the heavens, man alone uses fire to venture up into space; and up there, in the vast unknown, he simultaneously displays his greatness and discovers his smallness. "Rocket science" is a metaphor for distinctly human genius, a standard for belittling, or bringing down to earth, the mundane tasks of our animal life. But as Hannah Arendt observed in a 1963 essay, "The Conquest of Space and the Stature of Man," our venture into space also demotes us. "The astronaut," she wrote, "shot into outer space and imprisoned in his instrument-ridden capsule," assimilates himself into the cosmos that he once stood above. To

be on a space walk is to confront, in one perilous moment of self-recognition, both man's power and his vulnerability. It is to witness firsthand our creative ascent—into the void.

Of course, sex and fire—or tool, image, and grave—are not the only phenomena of life that invite reflection on the human difference. Eating, like sex, is a phenomenon that we share with the other animals, but only man incorporates food into an elevated way of life. Water, like fire, is a blind phenomenon of nature that serves man as both servant and symbol, and sometimes as destroyer.

In all of these—sex and fire, eating and water, tools, images, and graves—we have a portrait of man far richer than that proffered by "natural selection" or "irreducible complexity," interesting and important as those ideas are. Modern science is itself one of the great exemplars of the human difference, the mark of our creativity and, often, our compassion for those afflicted by the natural miseries that science aims to diagnose and ameliorate.

But, as we have seen, our science was also born of two radicalisms—the Darwinian reduction of man to the beasts and the Cartesian elevation of man into a god—that occasionally unite to threaten our human dignity. Standing before a new age of man-animal mixing in the laboratory, we need to be mindful of the human animal who is at stake in our experiments: the only rational, moral, God-seeking being. This same being, it behooves us to remember, also stands to be judged for the use he makes of his great powers. For it is not just the callous destruction of near-human life that should concern us in an age of hybrids and chimeras. It is also the self-degradation of man, who would lie down with the beasts in his quest to remake nature like a god.