Human Dignity and Bioethics: Essays Commissioned by the President's Council on Bioethics

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Part 1: Dignity and Modern Science

Chapter 5: Human Dignity from a Neurophilosophical Perspective

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This essay on human dignity and bioethics will have six parts. In the first, I argue that dignity is an important concept whose meaning is inherently ambiguous and cannot be settled by appeals to religious authority, conceptual analysis, or philosophical argument; instead, the meaning of human dignity—and its specific consequences for today's biomedical controversies—must be worked out pragmatically, in a spirit of compromise. In the second part, I suggest that we can gain some clarity about human dignity by examining where morality comes from, and in particular the biological and social origins of human moral behavior. In the third part, I argue that moral progress is possible, but that misplaced moral certitude can do more harm to human dignity than good. In part four, I describe historical cases in which medical progress was impeded by moral and theological opposition, and I predict that those who today are morally opposed to embryonic stem cell research will fall silent once the clear medical benefits begin to emerge. Part five considers a deeper question concerning human dignity: whether modern biology has exposed human dignity itself as something that doesn't really exist. Part six addresses the related question of whether, in the light of modern neuroscience, holding people morally responsible makes any sense.

I. How Do We Figure Out What Adherence to the Idea of Human Dignity Requires of Us?

Consider a few obvious facts. First, “human dignity” is not a precise concept, in the way that “electron” or “hemoglobin” are precise. Nor is it merely conventional, in the way that “meter” or “gallon” are conventional. It is not a matter of etiquette, as thank-you notes are. It does not connote a matter of fact, as “the Earth revolves around the Sun” does. Regarding our fellow humans as worthy of dignity, and being considered worthy of dignified treatment ourselves, are important to us. But what that entails is not precisely defined. The idea varies—across cultures, within cultures, across history, and within a single person's lifetime. More exactly, it varies even among those persons of goodwill who are themselves exemplars of moral rectitude. For example, some of the morally wise consider contraception a moral abomination, while others view it as a moral obligation. Both may claim moral certitude; both claim religious blessing.[i]

In our recent history, some people viewed smallpox vaccination as morally heinous on the grounds that it usurped the power of God, while others considered it a moral duty to vaccinate all children against this disease. Some sacred books command us to kill anyone who is deemed a witch;[ii] other wise texts state that burning of heretics and blasphemers is morally indecent.[iii] In some cases, the very same sacred book is inconsistent on the question of the morality of slavery.[iv]

The variation in moral practice, which is often correlated with variation in religious preference, implies that we cannot settle what “human dignity” means by appealing to universally shared ideology.

Can philosophers deploy a tool known as “conceptual analysis” to reveal the requirements? No more than they can use conceptual analysis to discover whether fire is rapid oxidation or whether mortgage rates will rise next month. There is no final and indisputable source of truth about what “human dignity” entails, to which philosophers, even word-wise, reflective philosophers, have privileged access. There is no “essence” that is somehow fixed in some realm, if only we had access, or by deploying pure reason, if only we were smart enough.

What is conceptual analysis? If “conceptual analysis” merely taps into how the concept is currently used by ordinary people, then all the variation, ambiguity, vagueness, and open-endedness inherent in ordinary usage of “human dignity” is immediately laid bare. On this construal, conceptual analysis is essentially an anthropological enterprise. On the other hand, if conceptual analysis is deployed in hopes of dissipating all that ambiguity and vagueness and settling whether, for example, human dignity must be attributed to the fertilized egg, then the hopes are vain. There is no purely analytical technique that gets you from here to there. Some philosophers do covertly import into their “analysis” a favored moral conviction, but this over-reaches strictly analyzing the concept as it lives and breathes, and goes on to endorse a particular moral view. In which case, one might as well avoid the whole charade of conceptual analysis and just endorse the moral view forthrightly.

Is there any source of special knowledge to which philosophers uniquely can appeal? There is none. Plato famously believed that important concepts, complete with all their entailments, did exist in the realm of the intellect, later waggishly dubbed Plato's heaven. Alas, Plato's heaven is merely a fantasy, as Aristotle well knew. Concepts are part of living languages and are imbued with beliefs, associations, and analogies. They change over time, they sometimes vanish or come into existence; they are the categories brains use for making sense of the world. They are not fixed and frozen Platonic essences that are reachable via some semi-magical procedure such as Platonic intellection.

How then do we resolve moral disagreements about a certain practice? Can we embrace a principle of universal human dignity and still use contraception and support stem cell research? Like all social activities, resolution of these issues is a complex sociological dance. To a first approximation, it involves people of goodwill trying to come to a workable solution. That may sound mundane, but it embodies the wisdom of humans as diverse as Aristotle, John Locke, Benjamin Franklin, John Dewey, Nelson Mandela, and Confucius. It involves recognition that no single person, no single profession, no single religious sect, no single sacred text, can be counted on to deliver the correct answer to moral questions.

As I am fond of telling my students, there is no Wise Guru sitting atop a mountain holding all moral truths in his pocket. How could there be? Such a guru would need to know about all social conditions and all possible scientific advancements. No human being falls into that privileged category. Nor is there a specific recipe for how people of goodwill work together to find a solution. But we do have history to learn from. In addition to examples of what to avoid, we do have examples where no bloody crusade was launched, no heretic burned, no infidel beheaded, no city sacked, and no idol smashed. Instead, fair-minded compromises were worked out. From these examples, we can hope to learn the morally decent ways of resolving disagreements about the uses of new medical technologies.

II. The Biological and Cultural Sources of Morality

We may be able to find common ground on the meaning and implications of human dignity by examining the origins of human moral behavior. Put simply, where does morality come from?

The answer has two parts. First, the evolution of the brain of social animals provides the neurobiological platform for social dispositions such as cooperation, reciprocity, group defense and prevention of disorder.[1] This is the neuro-genetic component. Second, conditions of life, accidents of history, and the capacity for cultural accretion stimulate the emergence of various superstructures on this biological platform. The first is biology, while the second is politics, in the broadest sense. Let me explain a bit further.

Humans are social animals, and as individuals our flourishing very much depends on the behavior of others in our group. Sociability confers a wide range of benefits on the individual. Living within a pack, a wolf can help hunt large animals such as deer and elk, rather than scrounge for mice. Benefits multiply: group defense against predators, shared resources for care of the young, warmth in the group huddle during winter storms, grooming to remove parasites from the hide, a division of labor whereby those who know where to find water or where the caribou cross the river can guide the rest of the pack. The life span of a loner chimpanzee is much shorter than that of his conspecifics who live in a troop.

The brains of social animals are wired to feel pleasure in the exercise of social dispositions such as grooming and cooperation, and to feel pain when shunned, scolded, or excluded. Neurochemicals such as vasopressin and oxytocin mediate pair-bonding, parent-offspring bonding, and probably also bonding to kith and kin. Other neurotransmitters, such as serotonin and dopamine, play a role in the astonishing complexity that is social life, as do hormones such as testosterone.[2]

Typically, young social mammals learn the prevailing practices and settle into a fairly stable pattern of social life. Humans, like other social animals, including chimpanzees, bonobos, baboons, monkeys, wolves, and ravens, have social instincts. These basic social instincts, enabled by the genes and tuned to local practices by the reward system, are the platform for cooperation and maintenance of the social order, and they provide the neurobiological foundation for ethics in its broader sense. More particularly, they provide the basis for love of mates and offspring, for the affection of kin, and for the default respect accorded to other group members. A plausible hypothesis is that the desire to extend to all humans the respect and dignity once more or less limited to small groups probably originates here.

In human society, the benefits of group membership are even more far-reaching and extensive than in baboons and chimpanzees, mainly because humans have a drive to share and accumulate knowledge. To a greater extent than other mammals, humans are consummate imitators.[3] The capacity to imitate a skill learned by an elder puts the young human at a singular advantage: he or she does not have to learn everything by trial and error. Jointly, the drive to learn by imitation and to upgrade that knowledge with new ideas is what yields the gradual accumulation of clever ways of doing things that can be passed on from one generation to the next. That is, it yields culture. A child can learn from the elders how to make fire and keep it going, how to prepare for winter, how to set a broken bone.

These benefits acknowledged, the costs of social life are mainly the costs associated with sharing resources, inhibiting the impulses to exploit the weakness of others, assisting in group defense, and maintaining the social order by, among other things, punishing those who violate group norms or threaten the group as a whole. Of course these may not be recognized as costs by the animal making its way in social life, but they are costs in the straightforward biological sense that risking loss of life and limb in defense of the group can get the animal injured or killed.

The greater reach of altruism in humans than in other primates has long been a puzzle, because the costs of helping strangers seem to outweigh the benefits to gene spread. A recent model by Samuel Bowles[4] suggests a solution: If our ancestral groups engaged in lethal intergroup competition, where the group successful in battle takes the resources of the vanquished, and if this was accompanied by practices of “reproductive leveling” such as monogamy and food sharing beyond the family, then genes disposing individuals to altruistic behavior would tend to spread through the population.

Social dispositions are only part of our motivational package, of course. Our brains are also wired to see to the welfare of ourselves and our offspring at the expense of those unrelated to us. If we are lucky, these impulses will not conflict with social impulses, but of course they often do. Even the rules of thumb conflict: charity begins at home; love your neighbor as yourself. Suppose one can enhance one's welfare at the expense of another? Depending on conditions, social and otherwise, this can lead to great complexity in behavior, including all the familiar ways of flouting the social norms: cheating, deceiving, hoarding, refusing to

reciprocate, etc. Historically, it has also led to branding some humans as "not fully human," and hence not deserving of dignity. Taking as slaves members of alien groups, where the slaves are considered "not of our kind," has had a long, if sorry, history, and if Bowles's theory is correct, in-group altruism and out-group aggression naturally co-occur. Because humans are very smart, these inclinations to violate social norms while seeming not to can be manifested in subtle as well as not so subtle ways. Hence we see complicated forms of deception, hypocrisy, extended forms of slavery, cabals, factions, power struggles masked as moral struggles, and all the other forms of human tragedy explored by Shakespeare. As with other social animals, humans augment the basic social dispositions with rewards for socially acceptable behavior and punishments for its opposite.

The point of much of cultural structure is to deter behavior that runs counter to the accepted practices. Stories about the glory of courage and the humiliation of cowardice instill the values of outgroup aggression and in-group defense; songs about kindness rewarded and sharing blessed, about truthfulness praised and deceit despised, solidify social values. Rituals involving praise for warriors and punishment for cheaters reinforce the cultural lines of demarcation. The local religion may depict both the basic social dispositions and their detailed local expression as gifts from spirits or gods and as deserving otherworldly goods after death. Sacrifices, of animals and humans, are often employed with the effect of dramatizing the power of the other-worldly source.

Once trained, the child has an automatic negative response to the very idea of stealing, as well as to cowardice. And history and anthropology both teach us that, with adolescence, a bloodlust for outgroup massacres often manifests itself.[5] The youth's desires change. He is apt to acquire narrow-minded convictions about what is right and what is wrong, about who is truly a group member, and who is not. The salient thing about this cultural activity is that a group's ethical standards may tend to be internalized as absolute; absolutely true, infallible, correct, applicable for all time under all conditions, and beyond explanation. Moral certitude is not inevitable, but it is common, more so in the young than in the broadly experienced, less so in certain kinds of temperaments (e.g., Aristotle, Gandhi, Lincoln, the Dalai Lama, Nelson Mandela) than in others.

To sum up: Both biology and "politics"—understood broadly to include cultural anthropology, sociology, and group psychology— help us to understand how and why moral standards of behavior developed among humans, as well as how and why we are tempted to violate those standards. The next question is whether, given such a realistic account of the origins and function of morality, it makes sense to speak of "moral progress," i.e., of one society being better than another at preserving "human dignity."

III. Can There Be Moral Progress?

Aristotle viewed moral understanding as a kind of skill—a skill in navigating the social world. He realized that, through one's experience of life, one could achieve an increasingly deep understanding of what is conducive to the flourishing of human societies and what undermines that flourishing. Skills may improve over time, but they may also degenerate, and that is true of social skills as well. It is, I think, fair to say that some moral progress has been achieved in some societies. For example, trial by one's peers, though an imperfect institution, is, all things considered, a more stable and efficacious system than trial by ordeal. The rule of monarchs by divine right has the defect that the monarch may have a diseased brain or a feeble brain; the education of females tends to reduce collective poverty; bribing government officials leads to a loss of faith in the system as a whole; and so on. Plainly, there are better and worse ways of organizing society.[6]

Not infrequently, it may be difficult to discern whether a proposed law will aid or impede human flourishing in the long run. As many moral thinkers, including Aristotle and John Dewey, have realized, sometimes the consequences are very hard to predict, and cautious legislation may be viewed as a kind of social experiment. For example, in the early part of the 19th century, many people predicted utter catastrophe if women were allowed to vote in elections to Federal and state office. Yet these predictions have turned out to be wholly false.

Prohibition of the sale and consumption of alcohol in the 1920s in the United States was acclaimed by temperance groups as a monumental moral achievement, but eventually it became evident that the legislation had addressed a bad problem and made it worse. This is probably also true of the current prohibition of other addictive drugs, such as marijuana, cocaine, and heroin.

As John Stuart Mill realized, legislating private morality (i.e., not what I do to others but what I do to myself) generally causes more trouble than it cures.[7] If you make my private life your business, the door is open to no end of busybody intrusion, no end of ugly harassment in the name of morality, and no end of enforcement costs. Moral certitude about the right way to lead one's private life tends, in the enthusiastic, to generate the impulse to force others to fall into line. Much moral courage and breadth of experience are needed to face the fact that such an impulse can lead to immense and unnecessary wretchedness.

Some well-intentioned advice, even from exemplary moral thinkers, can turn out to be poor advice. At one point, Jesus advised that we should live as the lilies in the field, without care for the long term. As historical research makes clear, he advised thus because he believed the end of the world was nigh. Since the world did not end, it was very bad advice indeed, and Sunday school teachers now hastily contrive an excuse for not taking it seriously. St. Paul also believed the end of the world was nigh and, in the midst of some rather moving ruminations about kindness, also rendered exceptionally poor advice, especially on the topic of sexuality. These lapses are not surprising.

Even thoughtful, experienced, balanced people may be ignorant of certain facts or may themselves be blinded by certain hopes and passions. Everyone sees the world from some perspective or other, influenced by one's own idiosyncratic experience, framed by one's own idiosyncratic brain, with its particular balance of emotions, fears, beliefs, and temperament. This means that we are all limited, in some respect or other. We do the best we can, but there is no guarantee that it is The Best Absolutely. To be sure, there are plenty of people who advertise their preeminent wisdom, including, sometimes, allegedly infallible guides to life. Self-styled wise men will always attract followers, since there are plenty of desperate people vulnerable to their promises.

To sum up: It does make sense to speak of moral progress; some societies are unquestionably better than others at treating people decently, i.e., with due respect to their dignity; and societies can learn from their mistakes and improve their performance in this regard. But it is an unfortunate fact that morally self-righteous attempts to improve human society—sometimes undertaken in the name of preserving human dignity—have sometimes led to the mistreatment of human beings and to much human suffering. Good intentions based on moral certitude are no guarantee that human beings will actually benefit.

IV. Vaccines, Anesthesia, and Stem Cells

Now let us consider some of the burning issues of contemporary bioethics, and in particular the advent of new medical technologies that some observers believe pose a threat to human dignity.

What about stem cell research? More exactly, what about the research use of human embryos for therapeutic (not reproductive) purposes? Let us accept for this discussion the prevailing criterion that the embryos at issue have not yet advanced to the stage of cell differentiation (so there are no brain cells at all). Is a blastocyst (a ball of about 200 undifferentiated cells) something that commands the dignity, rights, and privileges accorded a full-term human infant? And what about assisted suicide for the terminally ill patient, suffering in agonizing pain, who pleads for it? If her religion allows it, but yours does not, why should yours prevail? On what basis can you assume that you know better? As I argued in Section I, attention and reflection to the everyday use of the concept “human dignity” cannot give us the answers. Life is harder than that.

What I can do is tell you how I am inclined to approach these questions, as I draw upon historical examples, and as I try to apply the ideas of diverse thinkers—e.g., Aristotle,

Confucius, Aquinas, Dewey, Mill, and the Dalai Lama. I shall avoid putting my eggs in one basket. I shall do the best I can, but I do not wish to claim it is Absolutely The Best, and I do not wish to claim special moral authority, though I do not think I should be taken less seriously than the Pope or Pat Robertson. I only wish to suggest that we reason together.

Past moral and theological opposition to novel medical technologies sheds some light on contemporary bioethical controversies. Smallpox is a highly contagious, painful and disfiguring viral disease. Mortality of those infected is about 20–40%. In the mid-18th century in Europe, on average one in thirteen children died of smallpox, and many more were left blind owing to corneal ulcerations. As early as 1000 BC, physicians in India used a form of inoculation to prevent the spread of infection. They rubbed the pus of an infected person into a small cut of a healthy person, who then contracted a mild form of smallpox and was immune thereafter. The Chinese variant was to powder a smallpox scab and inhale the powder into the nasal cavity. Eventually the British and Americans learned of the inoculation practices and began to try them, though some patients did still die in spite of inoculation, and some died as a result of the inoculation itself. Overall, however, it produced a transformative reduction in the rate of infection. In 1757 Jenner became famous for having safely vaccinated a boy with cowpox, after noticing that milkmaids were immune to smallpox. Cowpox vaccination produced very mild and local symptoms but provided immunity against smallpox.

Arch-conservative theologians and medical men, both Catholic and Protestant, bitterly opposed inoculation as well as vaccination with cowpox. The struggle went on for some thirty years.[8] The theological opposition turned on the conviction that smallpox is a judgment of God on the sins of the people, and that to avoid the disease was to risk further punishment. Inoculation was described as a tool of Satan that would distance man from God. For example, Rev. Edward Massey in England preached an impassioned sermon in 1772 entitled *The Dangerous and Sinful Practice of Inoculation.* Personal threats were leveled at medical practitioners, and primitive bombs were thrown into homes. Not all theologians were opposed, and some, especially among the Puritans, took an active role in promoting vaccination. One theologian, attempting to defend the science, argued that Job's boils were actually smallpox pustules caused by the devil. So, he concluded, if Job's agony was devilish in origin, then avoiding the agony is consistent with God's law.

By the middle of the 19th century, pro-vaccination forces had succeeded in getting large numbers of people vaccinated, and the number of deaths plummeted. The death rate of children in Europe due to smallpox fell from one in thirteen to one in sixteen hundred. In London, in 1890, only one person died of smallpox, while a hundred years earlier smallpox had taken thousands.

That vaccination against a horrible viral disease was once fought as a violation of God's law is rarely remembered today. That vaccination was opposed at all scarcely seems possible, and the opposition seems anything but moral. But the opposition was entirely real; it was also powerful, impassioned, widespread, and—but for the courage of a few—could have been successful. The opponents never did take the pulpit to admit they were wrong.

The opposition was defeated not by argument, but by the obvious benefits of vaccination. Quite simply, it became more and more difficult to convince people that the misery of smallpox was morally superior to the benefits of immunization. The bishops and priests and reverends who once thundered about the sin of inoculation drummed up other topics on which to thunder.

Incidentally, it may be worth noting that today, arch-conservative Christian groups, such as the Family Research Council, appear to continue this tradition of favoring misery and death over vaccination against a virus. They oppose routine vaccination of young girls against cervical cancer. The vaccination against human papilloma virus (HPV) is highly effective and can prevent some 10,000 new cases (and 3,500 hundred deaths) in the United States per year. Worldwide, 300,000 women die of cervical cancer each year. Cervical cancer is in fact the second leading cause of cancer deaths in women. “Abstinence is the best way to prevent HPV,” says Bridget Maher of the Family Research Council. “Giving the HPV vaccine to young women could be potentially harmful, because they may see it as a license to engage in

premarital sex," Maher claims.[9] The Christian Coalition of Florida also opposes routine vaccination, on much the same grounds: "We're concerned about the age of the kids and the message we're sending," said Bill Stephens, the coalition's executive director. Stephens said the coalition might be more apt to support the legislation if it included education about abstinence.[10] According to *Fortune* magazine, Dr. Hal Wallis, head of the Christian conservative group, Physicians Consortium, said, "If you don't want to suffer these diseases, you need to abstain, and when you find a partner, stick with that partner." The founder of the National Abstinence Clearinghouse also opposed the vaccine. This organization was formed "to promote the appreciation for and practice of sexual abstinence (purity) until marriage." Leslee Unruh, the organization's founder, was quoted as stating, "I personally object to vaccinating children against a disease that is 100 percent preventable with proper sexual behavior."[11] Phil Gingrey, a Republican representative from Georgia, has claimed, "States should require vaccinations for communicable diseases, like measles and the mumps. But you can't catch HPV if an infected schoolmate coughs on you or shares your juice box at lunch. Whether or not girls get vaccinated against HPV is a decision for parents and physicians, not state governments."[12] If the deeper motivation for opposition to the vaccine is that cervical cancer is a deserved result of failure to adhere to sexual abstinence outside of marriage, as AIDS has been claimed to be God's punishment for homosexual activity, one would have to question the morality of such a position. In any case, even if abstinence may be the surefire way to prevent sexually transmitted diseases, as a social policy it cannot be said to have had a successful history.

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The history of opposition to anesthesia as a method of relieving pain during surgery and childbirth is equally dismaying, and also surprising. What could be morally objectionable about relieving pain? Quite a lot, apparently. Arch-conservative theologians and physicians regarded pain as God's punishment for sin, as part of God's divine plan, as making the person closer to God as he begs for mercy. To interfere with that plan was to play into the hands of the devil. It was to usurp God's power and take it unto oneself or—as one might say now—to "play God."

Ether and chloroform, the best of the early anesthetics, were particularly potent and if used carefully, were also reasonably safe. William Morton, a dentist in Boston, demonstrated the use of ether at Massachusetts General Hospital in 1846, and chloroform was introduced by James Young Simpson in Scotland in 1847. In Scotland, Simpson's use of chloroform was widely denounced in the pulpit. One clergyman asserted that "chloroform is a decoy of Satan. It may appear to be a blessing, but it will harden society and rob God of the deep earnest cries for help." Use of anesthesia in childbirth, even in Caesarian sections, was strenuously opposed even by some who thought its use in amputation and tooth extraction was just barely acceptable. Their justification was that the procedure tried to circumvent God's curse upon Eve as she and Adam left the Garden of Eden: "I will greatly multiply your pain in childbearing. In pain shall ye bring forth children" (*Genesis* 3:16).

As with vaccination, the benefits were so profound and so immediately appreciated that religious opposition eventually fell silent. No one today would consider it a moral necessity to avoid anesthesia during a breach delivery. But the opposition in the 19th century was sincere, backed by Biblical text, devoutly embraced, and supported by unwavering moral certitude. Again, there is no evidence of clerics coming to the pulpit to announce a change of mind, the clear benefits notwithstanding. Rather, this embarrassing bit of theological history was left in the back of the closet.

There are plenty of other examples of religious condemnations of scientific technologies that have greatly benefited mankind, including contraceptive techniques, *in vitro* fertilization (which allegedly violates human dignity[13]), division (dissection) of the dead body (Boniface VIII in 1300[14]) and organ donation by living donors (Pope Pius XII, 1956), as well as religious blessings of such practices as female subjugation[v], slavery, forced conversions, and genital mutilation of females.

Part of the point of these historical interludes is that claims to know what God wants are no guarantee against moral failure. Humility, whatever one's religious inclinations or moral convictions, is surely appropriate. The main point, however, is that moral attitudes can change when the benefits of a technology are clear and demonstrable. As the benefits of a technology become plain, it becomes more and more difficult to convince large numbers of people that enduring the misery of disease is morally superior to enjoying the benefits of health. Ideology, however laced it may be with moral certainty, generally has a tendency to quietly fold its tents once the benefits of a technology are manifest and reasonable regulations have been worked out. Moral certitude itself can be a moral menace when it stymies the compromises and negotiations of fair-minded, sensible people.

If past experience is a guide, I predict that the opposition to stem cell research will likely weaken once the benefits of that research begin to emerge. Even now, parents whose infants have diabetes do not find it credible that a microscopic fertilized egg is a person. Someone who has macular degeneration and is blind at twenty or who is a quadriplegic at fifteen does not find it reasonable that a ball of undifferentiated cells—not a neuron in sight—is really his equal in rights and obligations. As I write this, new research is showing that when newly born retinal cells from mice pups are injected into the eyes of retina-damaged mice, they link up to existing retinal cells and restore a functional retina, providing the best evidence so far for cell replacement therapy in the central nervous system.[15] Once the therapeutic benefits become undeniable, the Biblical texts will be reinterpreted to show that God approves of scientific advances that ameliorate suffering, just as they were in the cases of anesthesia and vaccination. It will be seen as obvious that, just as a fertilized apple seed is not an apple tree and a fertilized chicken egg is not a chicken, so a fertilized egg is not a person. It will be acknowledged that just as fertilization is an important step in reproduction, so is the development of a nervous system. Neural development will turn out to be vastly more important in reaching agreement on when a person has come into being.[vi] Religious leaders who have supported well-regulated stem cell research will gather adherents. Common sense will prevail.

Why do I believe this is likely? Because when ideology conflicts with obvious benefits for human health and flourishing, common sense typically, if slowly, triumphs.

So, as a practical matter, I believe that mankind will by and large prove successful in meeting the challenges of modern biomedical technology, reaping its great fruits while pragmatically avoiding the threats it might pose to human dignity. But there remains, in the minds of some, a theoretical problem concerning human dignity and modern science: to the extent that evolutionary theory, neurobiology, and genetics can give an account of our moral behavior and how it arose, some are afraid that human dignity itself will be explained away. I turn to this question next.

V. If Ethics Is Rooted in Social Instincts Supplied by Our Genes, Doesn't That Mean Human Dignity Is Not Real?

Occasionally someone may suggest that, if our thoughts and ideas are merely the product of the brain and its activities, then they cannot be real—not genuinely real. Consequently, it will be concluded, neuroscientists must believe that human dignity is not something real. But this worry rests on a misunderstanding, the nature of which can be readily explained.

When we remember the mad scene in *King Lear,* when we shoot a basketball, run to catch the ferry, hum "Greensleeves," or recognize a flower as goldenrod, networks of neurons in the brain are responsible for the result. In no case is the achievement the result of a single neuron. In no case is the achievement owed to a nonphysical soul.[16]

Representations more generally—in perception, thought, emotion, motor planning—are distributed over many neurons, typically millions of neurons in the case of mammals. Even the rhythmic behavior of walking, chewing, breathing, and so forth, is not the product of a single "rhythmic generator," but is an emergent property that arises from the interactions of many neurons. By emergent property, I do not mean anything spooky or metaphysical. I merely mean

that the property is a function of both the intrinsic properties of neurons in the network and the dynamics of their interactions. I mean it is a network property.[17] The network provides the neural mechanism whereby the phenomenon is produced.

Discovering the mechanisms whereby networks yield their effects is horrendously complex. Nevertheless, neuroscience is beginning to piece together the story of how neurons collectively work together to represent colors, locations in space, decisions to move, odors, sounds, and temporal durations. Quite a lot is known about how populations of neurons represent in these ways, though much of the story is still ahead of us.

So the first point is simple: representations are network properties. The second point, to which I now turn, is that representations of the social world are also network properties, and they too are real and they too mediate behavior. Of course, if there is no social world for the animal (e.g., if it is completely isolated from others) then it will not have a social world to represent.

Chimpanzees have been shown to represent the goals of others; an individual chimpanzee can represent what another chimpanzee can and cannot see from its point of view.[18] Chimpanzees represent the niceties of social structure, and they know who is the offspring of whom. Young males can represent a weakness on the part of the alpha male and will orchestrate a challenge for dominance of the troop. With normal serotonin levels, participants in a donnybrook represent when it is prudent to back off the fight. These cognitive activities are the function of the orchestrated activity of neurons in neural networks. The representation of another animal's intention to ask for grooming is as real as the representation of a location of a food cache or the representation of movement. It as every bit as real as the activity of a single neuron; it just happens to be the activity of large numbers of neurons organized into a coherent network. Detailed understanding of exactly how all this works still eludes us, but every year brings new advances that make the problems more tractable.[19]

When social animals such as humans represent another as deserving dignified treatment, that cognitive/emotional state is achieved by networks of neurons. Representations of highly abstract ideas (e.g., infinity) and complex thoughts (e.g., mortgages) probably depend on the use of language, but linguistic representations nevertheless are still the business of neural networks. Social representations—of goals, intentions, sympathy, respect, fairness, kindness, exploitation, slavery—are as real as any other representation.

Notice, moreover, that many representations are not exact or precise, but typically have fuzzy boundaries. Depending on what is learned, in the myriad ways in which things can be learned, one's representation of the nature of the tides or of toilet training or of social justice may be modified—revised, augmented, deepened. A three-year-old's understanding of “fairness” is much less rich and elaborated than that of Abraham Lincoln.[20] In any event, it is simply a misunderstanding of neuroscience to conclude that, because there is a biological substratum underlying our representations of justice, morality, dignity and the like, those representations have no reality.

Even if it is accepted that such moral representations are real, some observers worry that the causal account of mental activity promised (and increasingly delivered) by neuroscience undermines our belief in free will and moral responsibility. But this too, I argue, is based on a misunderstanding.

VI. If My Decisions and Choices Are the Outcome of Brain Activity, and if the Brain Is a Causal Machine, Am I Responsible for Anything?

Let me begin by simplifying. The fundamental point about holding an individual responsible ultimately rests on the need for safety of individuals in the group. We understand reasonably well the conditions permitting social traits to spread through a population, and they include the capacity to detect and remember who are the socially dangerous individuals and the willingness to punish them—as well as to punish those who will not share the burden of exacting punishment.[21]

Darwin had the basic story right when he remarked in *The Descent of Man,* "A tribe including many members who, from possessing in high degree the spirit of patriotism, obedience, courage and sympathy, were always ready to aid one another and to sacrifice themselves for the common good would be victorious over most other tribes; and this would be natural selection."[22]

Monogamous pair bonding is typical in certain species, such as marmosets, Canada geese and prairie voles. The behavior exists not because Divine Law or Pure Reason decrees its universal propriety, but owing to the utility of monogamy for their way of making a living. The species have evolved so that most individuals have high concentrations of receptors for the peptides oxytocin and vasopressin in limbic structures of the brain.[23] The limbic pathways connect to the dopamine-mediated reward system (mainly the ventral tegmental area and the nucleus accumbens). Thus, when a pair of voles copulates each comes to associate great pleasure with that particular mate. In social animals (including human beings), bonding with kith and kin probably involves these same biochemical pathways.

Fundamentally, punishment of cheaters (in the broadest sense) is justified because social traits such as cooperation and sharing cannot spread through a population unless cheaters are punished. Dispositions to punish are likely also to be regulated by neural modulators such as dopamine in the reward system, serotonin in frontal structures, and oxytocin in limbic structures. The precise nature of the punishment—shunning, beating, biting or whatever—may, in some species such as humans, be a matter for negotiation and cultural standards.

In varying degrees, human groups also recognize that under special circumstances the form of punishment calls for a closer look. Special circumstances may include being involuntarily intoxicated, being very young, sleep-walking, having an epileptic seizure, or being severely brain damaged. Insanity has always been a complicated issue for judicial systems, and it remains so now, though agreement on the necessity for public safety is pretty much universal.[24]

There are many forms of mental abnormality, some that render the individual merely eccentric, others that distort the representation of reality to such a degree that custodial care is essential. There are no easy answers regarding how to diagnose those forms of insanity, or exactly when responsibility is diminished. Nor is it at all obvious, in many cases, what justice requires. In his book *The Ethical Brain,* Michael Gazzaniga has suggested that issues involving insanity and criminal justice will not be made easier even when we can identify differences in the brains of those who are classified as insane and those who are not.[25] I suspect he is right, mainly because asylums for the criminally insane will have to be as secure as regular prisons, and because many people believe that—insanity notwithstanding—the possibility of punishment acts as a strong deterrent.

In any event, far from being undermined by neuroscience's insights into human behavior and its causes, moral responsibility is actually put on a firmer and more realistic basis, the more we understand about the neurological substratum of our moral life.

Conclusion

Treating all members of our species with dignity is, certainly, a worthy aim. What must remain sobering to all thoughtful people, however, is that—as a matter of historical fact—those who espoused such a principle have often been willing to take coercive action, sometimes brutally coercive, to achieve their version of human dignity. Such coercion may be exercised even in matters of private morality, where the welfare of others is entirely irrelevant. In the name of religion, so-called heretics have been burned, blasphemers hunted down, private lives invaded and made miserable, cities sacked, and the peace overturned. For your own good, and in the name of your own dignity, it may be argued, you must suffer terrible pain and submit to smallpox or Parkinson's disease or spinal paralysis.

We have much more to fear from the moral dogmatist who brandishes his unshakable certainty

about what God supposedly wants and intends concerning human dignity than from the calmly tolerant person who will listen to others, and who will work toward a peaceful compromise that is conducive to human flourishing. If someone professes certainty regarding a fact, we can always test his claim against the evidence. By contrast, if someone expresses certitude regarding what God intends, it is much harder to test his claim. In any case, it would be inconsistent with human decency to assume that feeling certain is itself conclusive evidence of possessing the truth.

FootNOTES

i. See Adam Schulman's introductory essay in this volume.

ii. The Old Testament—see *Exodus* 22:18: "Thou shalt not suffer a witch to live."

iii.Among the earliest, Friedrich von Spee's work of 1631, *Cautio Criminalis, or a Book on Witch Trial,* trans. Marcus Hellyer (Charlottesville, Virginia: University of Virginia Press, 2003).

iv. See, for example, *Exodus* 21:2-6: "If thou buy a Hebrew servant…." and *Exodus* 22:2-3: "If a thief…have nothing, then he shall be sold for his theft." On the other hand, see also *Exodus* 21:16, where "stealing a man" is grounds for execution, and *Deuteronomy* 23:15-16, where it is forbidden to hand over an escaped slave to his master. As Bernard Shaw wryly noted, no one believes the Bible means what it says; everyone believes it means what *he* says.

v. According to 1 *Timothy* 2:8-11, women are required to learn in silence and to submit to men in silence.

vi. As Robert Pasnau observes, Aquinas believed that God would not put "the rational soul" into a body that was not prepared, and the body of the developing human fetus was not prepared for the rational soul until about three months of gestation. He selected that date because by then the fetus begins to move. See Robert Pasnau, *Thomas Aquinas on Human Nature: A Philosophical Study of* Summa theologiae *1a 75-89* (Cambridge: Cambridge University Press, 2002).

EndNOTES

1. See Edward O. Wilson, *On Human Nature* (Cambridge, Massachusetts: Harvard University Press, 1988); Matt Ridley, *The Origins of Virtue: Human Instincts and the Evolution of Cooperation* (New York: Viking, 1996); Frans de Waal, *Good Natured: The Origin of Right and Wrong in Humans and Other Animals* (Cambridge, Massachusetts: Harvard University Press, 1996).

2. For a comprehensive review, see Thomas R. Insel and Russell D. Fernald, "How the brain processes social information: Searching for the social brain," *Annual Review of Neuroscience* 27 (2004): 697-722. See also Frances P. Champagne and James P. Curley, "How social experiences influence the brain," *Current Opinion in Neurobiology* 15 (2005): 704-709.

3. Michael Tomasello, Malinda Carpenter, Josep Call, Tanya Behne, and Henrike Moll, "Understanding and sharing intentions: The origins of cultural cognition," in *Behavioral and Brain Sciences* 28 (2005): 675-691; Michael Tomasello, *The Cultural Origins of Human Cognition* (Cambridge, Massachusetts: Harvard University Press, 1999).

4. Samuel Bowles, "Group Competition, Reproductive Leveling and the Evolution of Human Altruism," *Science* 314 (2006): 1569-1572.

5. Richard W. Wrangham and Dale Peterson, *Demonic Males: Apes and the Origin of Human Violence* (New York: Mariner Books, 1996); Patricia S. Churchland, "Of gangs and genocide: Chimp behavior provides clues to the neural basis for aggression in humans," *Science and Theology News* , August 11, 2006.

6. See William D. Casebeer, *Natural Ethical Facts: Evolution, Connectionism, and Moral Cognition* (Cambridge, Massachusetts: MIT Press, 2001).

7. John Stuart Mill, *On Liberty* , ed. Gertrude Himmelfarb (London: Penguin, 1974 [1859]).

8. Andrew Dickson White, *A History of the Warfare of Science with Theology in Christendom* (Gloucester, Massachusetts: Peter Smith, 1978 [1896]), chapter XIII, section 5.

9. Deborah MacKenzie, "Will Cancer Vaccine Get to All Women?," *The New Scientist* , April 18, 2005.

10. Shannon Colavecchio-van Sickler, "Vaccine bill finds tough opposition," *St. Petersburg Times* , February 26, 2007.

11. Janet Guyon, "The Coming Storm Over a Cancer Vaccine," *Fortune* , October 31, 2005, p. 123.

12. Fran Eaton, "HPV Vaccine Effort Encounters Strong Opposition," *Health Care News* , June 1, 2007, available online at www.heartland.org/Article. cfm?artId=21151.

13. In 1968, Pope Paul VI issued the encyclical *Humanae vitae* (i.e., "Of human life"), all contraceptive devices, including condoms, intrauterine devices, the pill and patches, as well as sterilization techniques (vasectomy and tubal ligation), forbidding because of the "the inseparable connection, established by God, which man on his own initiative may not break, between the unitive significance and the procreative significance which are both inherent to the marriage act" (*Humanae vitae* II.12). He used the same argument in forbidding *in vitro* fertilization. (The official English translation of *Humanae vitae*

, quoted here, may be found online at www.vatican.va/holy_father/paul_vi/encyclicals/documents/hf_p-vi_enc_25071968_humanae-vitae_en.html.)

Catholic Insight explains that IVF is "in opposition to the dignity of procreation and the conjugal union." See John B. Shea, MD, "What the Church teaches about human reproduction," *Catholic Insight* , September, 2006, available online at www.catholicinsight.com/online/church/humanae/article_684.shtml. According to Australian physician John Billings, "this moral attitude [separation of sex and possible procreation] has produced in our own time an anti-child society." See John Billings, MD, *Gift of Life and Love* (Apostolate of Catholic Truth, Sixth Printing, 1997), quoted in Fr. Joseph Hattie, "The prophecies of Paul VI," *Catholic Insight* , July/August 2003, available online at www.catholicinsight.com/online/church/humanae/article_131.shtml).

In the 1968 encyclical, Paul VI goes on to say: "Consequently, unless we are willing that the responsibility of procreating life should be left to the arbitrary decision of men, we must accept that there are certain limits, beyond which it is wrong to go, to the power of man over his own body and its natural functions—limits, let it be said, which no one, whether as a private individual or as a public authority, can lawfully exceed" (*Humanae vitae* , II.17). Having witnessed for myself, as a child growing up in rural Canada, the unspeakable misery caused in many families by inability to control family size, I cannot but find these claims morally dubious. Common sense generally prevails here too, as many educated Catholics ignore the injunction against contraception.

14. Boniface's bull, *Detestande feritatis* (i.e., "Of Abhorred Wounds") of 1300, forbade the division of the body, and did so in the strongest terms, with excommunication and denial of an ecclesiastical burial as automatic penalties for violation. Some historians have argued that Boniface's intent was only to prohibit the friends of dead crusaders from extracting the bones, boiling them, and returning them home for burial. See, for example, Daniel Boorstin, *The Discoverers* (New York: Random House, 1983). More recent and thorough historical analysis reveals a much more complicated story that has little to do with the crusaders and was intended to apply quite broadly.

Among other things, the evidence suggests that Boniface, a sickly man, had a strong concern with his own body and a deep personal abhorrence of the fairly common practice of bodily division before burial, perhaps fearful that he might be carved up before fully dead. He may also have worried about what division might imply for the doctrine of saintly "refreshment," perhaps envisaging his own canonization. His reasons for the decree remain obscure, however, since he published the decree without providing any arguments. In any case, his decree was broadly ignored, though not actually nullified by later Popes. For example, Boniface's successor, Clement V gave Philip the Fair permission to have his corpse divided so as to maximize the number of churches in which his remains could be buried. See Katherine Park, "The Criminal and the Saintly Body: Autopsy and Dissection in Renaissance Italy," *Renaissance Quarterly* 47:1 (Spring, 1994), pp. 1-33, and Elizabeth A. R. Brown, "Authority, the Family, and the Dead in late Medieval France," *French Historical Studies* 16:4 (Autumn, 1990), pp. 803-832. Many thanks to Michael Stack for translating from Latin into English Boniface's bull, and for thorough reading and criticism of my manuscript.

15. See Robert E. MacLaren, et al., "Retinal repair by transplantation of photoreceptor precursors," *Nature* 444 (2006): 203-207. Millions of otherwise normal people are affected by macular degeneration or retinitis pigmentosa and become blind.

16. See Paul M. Churchland, *The Engine of Reason, the Seat of the Soul* (Cambridge, Massachusetts: MIT Press, 1996), and Patricia S. Churchland, *Brain-Wise: Studies in Neurophilosophy* (Cambridge, Massachusetts: MIT Press, 2002).

17. For the best account of this see Carl F. Craver, "Beyond reductionism: Mechanism, multifield integration and the unity of science," in *Studies in the History and Philosophy of Biological and Biomedical Sciences* 36 (2005): 373-396.

18. Michael Tomasello, Josep Call, and Brian Hare, "Chimpanzees understand psychological states: The question is which ones and to what extent," *Trends in Cognitive Science* 7 (2003): 153-156.

19. Carl F. Craver and William Bechtel, "Mechanisms and mechanistic explanation," in *The Philosophy of Science: An Encyclopedia* , ed. Sahotra Sarkar and Jessica Pfeiffer (New York: Routledge, 2005).

20. Tanya Behne, Malinda Carpenter, and Michael Tomasello, "One-year-olds comprehend the communicative intentions behind gestures in a hiding game," *Developmental Science* 8 (2005): 492-499.

21. See Matt Ridley, *The Origins of Virtue: Human Instinct and the Evolution of Cooperation* (New York: Viking, 1996).

22. Charles Darwin, *The Descent of Man, and Selection in Relation to Sex* , 2nd edition (New York: Appleton, 1909 [1877]), chapter V, p. 135.

23. Larry J. Young, Brenden Gingrich, Miranda M. Lim, and Thomas R. Insel, "Cellular mechanisms of social attachment," *Hormonal Behavior* 40 (2001): 133-138.

24. See Owen D. Jones and Timothy H. Goldsmith, "Law and Behavioral Biology," *Columbia Law Review* 105 (2005): 405-502.

25. Michael Gazzaniga, *The Ethical Brain* (Chicago: University of Chicago Press [distributed for Dana Press], 2005).