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OWNING GENETIC INFORMATION AND GENE ENHANCEMENT TECHNIQUES: WHY PRIVACY AND PROPERTY RIGHTS MAY UNDERMINE SOCIAL CONTROL OF THE HUMAN GENOME*

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ABSTRACT

In this article I argue that the proper subjects of intangible property claims include medical records, genetic profiles, and gene enhancement techniques. Coupled with a right to privacy these intangible property rights allow individuals a zone of control that will, in most cases, justifiably exclude governmental or societal invasions into private domains. I argue that the threshold for overriding privacy rights and intangible property rights is higher, in relation to genetic enhancement techniques and sensitive personal information, than is commonly suggested. Once the bar is raised, so-to-speak, the burden of overriding it is formidable. Thus many policy decisions that have been recently proposed or enacted – citywide audio and video surveillance, law enforcement DNA sweeps, genetic profiling, national bans on genetic testing and enhancement of humans, to name a few – will have to be backed by very strong arguments.

> Each new advance in . . . technology . . . disturbs a status quo. It meets resistance from those whose domain it threatens, but if useful, it begins to be adopted.
>
> Ithiel de Sola Pool, *Technologies of Freedom*

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INTRODUCTION

In recent years the ethical issues surrounding genetic enhancement, gene therapy, cloning, and privacy rights have been hotly debated. With the human genome project accelerating and the advancement of gene therapy we stand on the cusp of a brave new world. In the near future it will be possible to alter one's own genetic profile – maybe a change of eye color or a loss of weight. It may also be possible to affect the genetic make-up of future generations. For instance we may be able to banish diabetes and similar diseases from the human genome.

The ethical, political, and social ramifications of this bio-technological movement are profound and have alarmed many. 'Messing with the human genome' some claim 'is playing God'. Others conjure visions of clone farms, organ banks, and a world where individual distinctiveness has given way to near identical, near perfect, robot-like beings. Some argue that even if good may come from this tampering with nature it will most likely only affect the rich or those who can pay for gene therapy. The general mood of most leaders and scholars with respect to these issues is one of caution.

In this article I will argue that intangible property of this sort can be owned – that the proper subjects of intangible property claims include medical records, genetic profiles, and gene enhancement techniques. Coupled with a right to privacy these intangible property rights allow individuals a zone of control that will, in most cases, justifiably exclude governmental or societal invasions into private domains. I will argue that the threshold for overriding privacy rights and intangible property rights is higher, in relation to genetic enhancement techniques and sensitive personal information, than is commonly suggested. Once the bar is raised, so-to-speak, the burden of overriding it is formidable. In the end, I am not so worried about the prospects of a brave new world brought upon us by gene manipulation – I am much more worried when societies, committees, and concerned citizens use the force of government to tell us what we can do to and in our own bodies.

A LOCKEAN MODEL OF INTANGIBLE PROPERTY[1]

Before offering a defense of intangible property rights, I would like to note a few important differences between intangible

[1] A more lengthy analysis of intangible property rights and privacy rights appear in my articles 'Intangible Property: Privacy, Power, and Information Control' *American Philosophical Quarterly* 35 (Oct. 1998), 'Toward A Lockean Theory of Intellectual Property' in *Intellectual Property: Moral, Legal, and*

property and tangible or physical property – differences that work to the advantage of the Lockean model that I will sketch. Intangible property, which includes intellectual property (copyrights, patents, gene enhancement techniques etc.) as well as information, reputation, and the like, is generally characterized as non-physical property where owner's rights surround control of physical manifestations or tokens of some abstract idea or type. Ideas or collections of ideas are readily understood in terms of non-physical types, while the physical manifestations of ideas can be modeled in terms of tokens. Intangible property rights surround control of physical tokens, and this control protects rights to types or abstract ideas.

Intangible works, unlike tangible goods, are non-rivalrous. Computer programs, genetic enhancement techniques, books, movies, and lists of customers can all be used and consumed by many individuals concurrently. This is generally not the case for cars, computers, VCRs, and most other tangible goods. Intangible property, unlike physical property, is also non-zero-sum. In the clearest case, when I eat an apple there is one less apple for everyone else – my plus one and everyone else's minus one sum to zero. With intangible property it is not as if my acquisition leaves one less for everyone else.

Another difference between physical and intangible property concerns what is available for acquisition. While matter, owned or unowned, already exists the same is not true of all intangible works. What is available for acquisition in terms of intangible property can be split into three domains. There is the domain of ideas yet to be discovered (new scientific laws, mapping the human gnome, etc.), the domain of ideas yet to be created (the next *Lord of the Rings*, *Star Wars*, etc.), and the domain of intangible works that are privately owned. Since it is possible for individuals to independently invent or create the same intangible work and obtain rights, we must include currently owned intangible works as available for acquisition. Only the set of ideas that are in the public domain or those ideas that are a part of the common culture are not available for acquisition and exclusion. I take this latter set to be akin to a public park.

Turning to the question of justification, we may begin by asking how property rights to unowned objects are generated.

International Dilemmas, A. Moore (Rowman & Littlefield, 1997), Cha. 5, and 'Employee Monitoring and Computer Technology: Evaluative Surveillance v. Privacy' forthcoming in *Business Ethics Quarterly*. I would thank the editors of *APQ, BEC,* and Roman & Littlefield for allowing me to present this material here.

This is known as the problem of original acquisition and a common response is given by John Locke. 'For this labor being the unquestionable property of the laborer, no man but he can have a right to what that is once joined to, at least where there is *enough and as good left for others.*'[2] So long as the proviso that 'enough and as good' is satisfied, an acquisition is of prejudice to no one. Locke argues that 'Nobody could think himself injured by the drinking of another man, though he took a good draught, who had a whole river of the same left him to quench his thirst . . .'.[3]

Suppose that mixing one's labor with an unowned object creates a prima facie claim against others not to interfere that can only be overridden by a comparable claim. The role of the proviso is to provide one possible set of conditions where the prima facie claim remains undefeated.[4] Another way of stating this position is that the proviso in addition to X, where X is labor or first occupancy or some other weak claim generating activity, provides a sufficient condition for original appropriation.

Justification for the view that labor or possession may generate prima facie claims against others could proceed along several lines. First, labor, intellectual effort, and creation are generally voluntary activities that can be unpleasant, exhilarating, and everything in-between. That we voluntarily do these things as sovereign moral agents may be enough to warrant non-interference claims against others. A second, and possibly related justification, is based on desert. Sometimes individuals who voluntarily do or fail to do certain things deserve some outcome or other. Thus, students may deserve high honor grades and criminals may deserve punishment. When notions of desert are evoked claims and obligations are made against others – these non-absolute claims and obligations are generated by what individuals do or fail to do. Thus in fairly uncontroversial cases of desert, we are willing to acknowledge that weak claims are generated and if desert can properly attach to labor or creation, then claims may be generated in these cases as well.

Finally, a justification for the view that labor or possession may generate prima facie claims against others could be grounded in respect for individual autonomy and sovereignty. As sovereign

[2] John Locke, *The Second Treatise of Government*, Section 27 (italics mine).

[3] Locke, *Second Treatise*, Section 33.

[4] This view is summed up nicely by Clark Wolf, 'Contemporary Property Rights, Lockean Provisos, and the Interests of Future Generations,' *Ethics* 105 (July, 1995): 791–818.

and autonomous agents, especially within the liberal tradition, we are afforded the moral and legal space to order our lives as we see fit. As long as respect for others is maintained we are each free to set the course and direction of our own lives, to choose between various lifelong goals and projects, and to develop our capacities and talents accordingly. Simple respect for individuals would prohibit wresting from their hands an unowned object that they acquired or produced. I hasten to add that at this point we are trying to justify weak non-interference claims, not full blown property rights. Other things being equal, when an individual labors to create an intangible work, then weak presumptive claims of non-interference have been generated on grounds of labor, desert, or autonomy.

The underlying rationale of Locke's proviso is that if no one's situation is worsened, then no one can complain about another individual appropriating part of the commons. If no one is harmed by an acquisition and one person is bettered, then the acquisition ought to be permitted. In fact, it is precisely because no one is harmed that it seems unreasonable to object to a Pareto superior move. Thus, the proviso can be understood as a version of a 'no harm, no foul' principle.

Bettering, worsening, and the baseline problem

Assuming a just initial position and that Pareto superior moves are legitimate, there are two questions to consider when examining a Pareto based proviso. First, what are the terms of being worsened? This is a question of scale, measurement, or value. An individual could be worsened in terms of subjective preference satisfaction, wealth, happiness, freedoms, opportunities, et cetera. Which of these count in determining bettering and worsening? Second, once the terms of being worsened have been resolved, which two situations are we going to compare to determine if someone has been worsened? Is the question one of how others are now, after my appropriation, compared to how they would have been were I absent, or if I had not appropriated, or some other state? Here we are trying to answer the question 'Worsened relevant to what?' This is known as the baseline problem.

In principle, the Lockean theory of intangible property being developed is consistent with a wide range of value theories. So long as the preferred value theory has the resources to determine bettering and worsening with reference to acquisitions, then Pareto superior moves can be made and acquisitions justified on

Lockean grounds. For now, assume an Aristotelian eudaimonist account of value exhibited by the following theses is correct.[5]

1. Human well-being or flourishing is the sole standard of intrinsic value.
2. Human persons are rational project pursuers, and well-being or flourishing is attained through the setting, pursuing, and completion of life goals and projects.
3. The control of physical and intangible objects is valuable. At a specific time each individual has a certain set of things she can freely use and other things she owns, but she also has certain opportunities to use and appropriate things. This complex set of opportunities along with what she can now freely use or has rights over constitutes her position materially – this set constitutes her level of material well-being.

While it is certainly the case that there is more to bettering and worsening than an individual's level of material well being including opportunity costs, I will not pursue this matter further at present. Needless to say, a full-blown account of value will explicate all the ways in which individuals can be bettered and worsened with reference to acquisition. Moreover as noted before, it is not crucial to the Lockean model being presented to defend some preferred theory of value against all comers. Whatever value theory that is ultimately correct, if it has the ability to determine bettering and worsening with reference to acquisitions, then Pareto-superior moves can be made and acquisitions justified on Lockean grounds.

Lockeans as well as others who seek to ground rights to property in the proviso generally set the baseline of comparison as the state of nature. The commons or the state of nature is characterized as that state where the moral landscape has yet to be changed by formal property relations. The moral landscape is barren of such relations until some process occurs – and it is not assumed that the process for changing the moral landscape the Lockean would advocate is the only justified means to this end.

[5] For similar views see: Rawls, *A Theory of Justice* (Cambridge: Harvard University Press, 1971), cha. VII.; Aristotle, *Nicomachean Ethics*, bks. I and X; Kant, *The Fundamental Principles of The Metaphysics of Morals,* Academy Edition; Sidgwick, *Methods of Ethics*, 7th ed. (London, Macmillian, 1907); R. B. Perry, *General Theory of Value* (New York: Longmans, Green, 1926); and Loren Lomasky, *Persons, Rights, and the Moral Community* (New York: Oxford University Press, 1987).

For now, assume a state of nature situation where no injustice has occurred and where there are no property relations in terms of use, possession, or rights. All anyone has in this initial state are opportunities to increase her material standing. Suppose Fred creates an intangible work and does not worsen his fellows – alas, all they had were contingent opportunities and Fred's creation and exclusion adequately benefits them in other ways. After the acquisition, Fred's level of material well-being has changed. Now he has a possession that he holds legitimately, as well as all of his previous opportunities. Along comes Ginger who creates her own intangible work and considers whether her exclusion of it will worsen Fred. But what two situations should Ginger compare? Should the acquisitive case (Ginger's acquisition) be compared to Fred's initial state, where he had not yet legitimately acquired anything, or to his situation immediately before Ginger's taking? If bettering and worsening are to be cashed out in terms of an individual's level of well being with opportunity costs and this measure changes over time, then the baseline of comparison must also change. In the current case we compare Fred's level of material well-being when Ginger possesses and excludes an intangible work to his level of well-being immediately before Ginger's acquisition.

The result of this discussion of bettering, worsening, and the baseline problem is the following proviso on original acquisition:

> If the acquisition of an intangible work makes no one else worse-off in terms of her level of well-being (including opportunity costs) compared to how she was immediately before the acquisition, then the taking is permitted.

If correct, this account justifies rights to control intangible property. When an individual creates or compiles an intangible work and fixes it in some fashion, then labor and possession create a prima facie claim to the work. Moreover, if the proviso is satisfied the prima facie claim remains undefeated and rights are generated.

PRIVACY

Privacy may be understood as that state where others do not have access to you or to information about you. I hasten to note that there are degrees of privacy. There are our own private thoughts that are never disclosed to anyone, as well as information we share with loved ones. Furthermore, there is information that we

share with mere acquaintances and the general public. These privacy relations with others can be pictured 'in terms of a series of "zones" or "regions" ... leading to a "core self." '[6] Thus, secrets shared with a loved one can still be considered private, even though they have been disclosed.

A right to privacy can be understood as a right to maintain a certain level of control over the inner spheres of personal information. It is a right to limit public access to the 'core self' – personal information that one never discloses – and to information that one discloses only to family and friends. For example, suppose that I wear a glove because I am ashamed of a scar on my hand. If you were to snatch the glove away you would not only be violating my right to property – alas the glove is mine to control – you would also violate my right to privacy; a right to restrict access to information about the scar on my hand. Similarly, if you were to focus your x-ray camera on my hand, take a picture of the scar through the glove, and then publish the photograph widely, you would violate a right to privacy.

Having said something about what a right to privacy is we may ask how such rights are justified. A promising line of argument combines notions of autonomy and respect for persons. A central and guiding principle of western liberal democracies is that individuals, within certain limits, may set and pursue their own life goals and projects. Rights to privacy erect a moral boundary that allows individuals the moral space to order their lives as they see fit. Privacy protects us from the prying eyes and ears of governments, corporations, and neighbors. Within the walls of privacy we may experiment with new ways of living that may not be accepted by the majority. Privacy, autonomy, and sovereignty, it would seem come bundled together.

A second but related line of argument rests on the claim that privacy rights stand as a bulwark against governmental oppression and totalitarian regimes. If individuals have rights to control personal information and to limit access to themselves, within certain constraints, then the kinds of oppression that we have witnessed in the twentieth century would be near impossible. Put another way, if oppressive regimes are to consolidate and maintain power, then privacy rights (broadly defined) must be eliminated or severely restricted. If correct,

[6] Alan Westin, 'Privacy in the Modern Democratic State' in D. Johnson and J. Snapper, *Ethical Issues in the Use of Computers* (Wadsworth Pub.: 1985), p. 187.

privacy rights would be a core value that limited the forces of oppression.[7]

Arguably any plausible account of human well being or flourishing will have as a component a strong right to privacy. Controlling who has access to ourselves is an essential part of being a happy and free person. This may be why 'peeping Toms' and rapists are held up as moral monsters – they cross a boundary that should never be crossed without consent.

Surely each of us has the right to control our own thoughts, hopes, feelings, and plans, as well as a right to restrict access to information about our lives, family, and friends. I would argue that what grounds these sentiments is a right to privacy – a right to maintain a certain level of control over personal information. While complete control of all our personal information is a pipe dream for many of us, simply because the information is already out there and most likely cannot or will not be destroyed, this does not detract from the view of personal information ownership. Through our daily activities we each create and leave digital footprints that others may follow and exploit – and that we do these things does not obviously sanction the gathering and subsequent disclosure of such information by others.

Whatever kind of information we are considering there is a gathering point that individuals have control over. For example, in purchasing a new car and filling out the car loan application, no one would deny we each have the right to demand that such information not be sold to other companies. I would argue that this is true for any disclosed personal information whether it be patient questionnaire information, video rental records, voting information, or employment applications. In agreeing with this view, one first has to agree that individuals have the right to control their own personal information – i.e., binding agreements about controlling information presuppose that one of the parties has the right to control this information.

If I am correct about all of this, then there is a fairly strong presumption in favor of individual privacy rights. What justifies a photographer taking pictures of me about the house or a news agency publishing sensitive medical information about me is my

[7] For more about privacy rights see, Charles Fried, 'Privacy,' *Yale Law Journal* 77 (1968): 477; A. Westin and M. Baker, *Databanks in a Free Society,* (New York: Quadrangle Press, 1972); J. Rachels, 'Why Privacy is Important,' *Philosophy and Public Affairs* 4 (Summer 1975): 323–33; and Paul Weiss, *Privacy* (Southern Illinois University Press, 1983).

consent. Most would agree that absent such consent a serious violation of privacy would have occurred.

Privacy: controlling your genetic information

In 1976, John Moore began treatment for cancer at the University of California Medical Center.

> His doctors quickly became aware that some of his blood products and components were potentially of great commercial value. They performed many tests without ever telling him of their commercial interest, and took samples of every conceivable bodily fluid, including sperm, blood, and bone marrow aspirate .... In 1981, a cell line established from Moore's T-lymphocytes was patented by the University of California, with Moore's doctors listed as the inventors. At no time during this process was Moore told anything about the commercial exploitation of his genetic material. The likely commercial value of the cell line is impossible to predict exactly, but by 1990 the market for such products was estimated to be over $3 billion.[8]

Alarming as this case appears we can easily imagine cases that are more troubling. What if the tests on Moore's genetic material found, along with certain advantageous traits, defects that would likely cause him to be hospitalized for lengthy periods of time. Upon publishing their findings and maybe patenting certain cell lines, Moore's insurance company drops his policy and other companies refuse coverage.

The case of John Moore and the patenting of cells produced from his blood-products is interesting because it brings up a number of important issues related to controlling personal information and body rights. At one level this case raises the question of what information doctors should disclose to their patients, especially when the information in question is about the patient. But at a more general level, this case is concerned with the ownership of genetic information and other personal information. Doctor patient confidentiality agreements are based upon the patient's rights to control certain kinds of sensitive personal information. Binding agreements though, presuppose prior entitlements.

[8] James Boyle, *Shamans, Software, and Spleens: Law and the Construction of the Information Society* (Cambridge, Mass.: Harvard University Press, 1996), p. 22. The prediction of market value comes from Beverly Merz, 'Biotechnology: Spleen-Rights' *The Economist*, 30 (August 11, 1990).

If Moore had agreed to the gathering and disclosure of the genetic information found in his T-lymphocytes, then this case would lose much of its moral impact. What bothers most of us is the deception that occurred – Moore's doctors repeatedly asked for a signed waiver and Moore repeatedly asked why they wanted such a waiver. More generally however, we can ask if Moore actually owned the information that was found in his T-lymphocytes. As self-owners it may be the case that we each own our own bodies, capacities, and powers. It does not follow from the notion of 'self-ownership', however, that we each own the genetic information found in our cells. Ownership of a token does not entail ownership of a type. In other words, I may own a copy of *The Sun Also Rises* (a token), but this does not mean that I own the intangible work (the plot, characters, theme, and style – or types).

Also, it is not even clear in this case that a privacy interest was at stake. The cell line, or discovered intangible work, established from Moore's T-lymphocytes may contain no personal information at all. If there were no privacy interest at stake, no information about sexual preferences, possible future ailments, and the like, then it would be difficult to maintain that Moore's privacy was violated. Thus, it is arguably the case that no prior entitlement claims existed.

A different case, but one that is even more alarming than the Moore case, is what happened in a small village in Greece. In Orchemenos Greece, there are many individuals who have a gene that causes sickle-shaped red blood cells. The problem is that when two parents both carry the gene their offspring may develop sickle-cell anemia. In an effort to prevent this disease researchers tested everyone in the village so that marriages between gene carriers could be avoided.

> A group of researchers tested the villagers at Orchemenos, assuming that carriers would behave rationally and would pair with noncarriers in order to mix the genes safely and protect the community's children. The noncarriers, however, refused to cooperate. Even though the gene is harmless on its own, carriers became stigmatized and noncarriers refused to marry them. In the end, the carriers became a shunned subclass who was forced to marry among themselves, making the situation even worse than before.[9]

While the researchers' goals were noble, they obviously failed to foresee the ramifications of disclosing this kind of personal

[9] Charles Platt 'Evolution Revolution' *Wired Magazine* (January 1997), p. 200.

information. If we are to take privacy rights seriously, there should be general prohibitions against disclosing information of this sort – prohibitions independent of likely gains in social utility.

Current American practice allows companies and individuals to gather, sell, and buy almost any kind of information, including sensitive personal information. Moreover, access to personal information stored on databases held by companies and other citizens is purely voluntary – companies do not have to show you the information that they have gathered about you. And in any case, you have very little control over what can be done with this information. If a company or the government wants to sell this information, there is little that you can do about it.

Enter the EU privacy model which grants individuals robust privacy rights.[10] Unlike the American economic model where most kinds of information can be bought and sold with no strings attached, the EU model prohibits the unconstrained buying and selling of personal information. Simon Davies of *Wired Magazine* writes:

> Under this regime, known as the European Data Protection Directive, any country that trades personal information with the UK, France, Germany, Spain, Italy, or any of the other 10 EU states will be required to embrace Europe's strict standards for privacy protection. No privacy, no trade. It's that simple.[11]

European citizens have the right to access their data, the right to know where the data originated, the right to have inaccurate information rectified, the right of recourse in the event of unlawful processing, and the right to withhold permission to use their data for direct marketing. Like the moral rights afforded authors and inventors,[12] I applaud the recognition of these

[10] For a fairly detailed analysis of the EU model of privacy protection see Fred Cate, *Privacy in the Information Age* (Brookings Institution Press, 1997), p. 32–48.

[11] Simon Davies, 'Europe to U.S.: No Privacy, No Trade' *Wired Magazine* (May 1998), p. 135.

[12] 'Moral rights' are generally thought of as rights that go beyond the economic rights granted in Anglo-American institutions of intellectual property. For example, the moral rights of an author may prohibit alteration of some intangible work even after the first sale – thus an author of a black and white movie may prohibit color being added. For more about the moral rights of authors and inventors see *Intellectual Property: Moral, Legal, and International Dilemmas*, ed. A. Moore (Rowman & Littlefield, 1997), p. 6–7, and M. A. Roeder, 'The Doctrine of Moral Right: A Study in the Law of Artists, Authors, and Creators,' *Harvard Law Review* 53 (1940): 554.

privacy rights concerning personal information. It would seem that on two fronts the Europeans are well ahead of their American counterparts.

To briefly summarize the first two sections, I think it is plausible to maintain that intangible works, like genetic enhancement techniques, can be owned and that there is a fairly strong presumption in favor of individual privacy. Nevertheless, intangible property rights and privacy rights are not absolute. To take a simple example, my property right in a Louisville slugger does not allow me swing it at your knees, nor can I throw it at your car. Property rights are generally limited by the rights of others. Furthermore, this restriction – call it the harm restriction – fits well with the Lockean model under consideration. The proviso, a no harm no foul rule, allows individuals to acquire unowned goods. The harm restriction limits harmful uses of those goods.

A second constraint on what can be done with intangible works has to do with privacy and information control. Without your consent and independent of harm, I may not publish sensitive personal information about you on my website, use your image to promote an international product line, or listen in on your phone conversations. The question now becomes when, if ever, can these fairly strong presumptions, or rights, be overridden by other considerations.

PRIVACY, PROPERTY, AND GENETIC ENHANCEMENT TECHNIQUES

In this section I will consider several common arguments that purport to show how easily the property and privacy presumptions already established may be undermined. Please note that what follows is not an exhaustive examination of every point and counterpoint that may be offered with respect to these presumptions. My goal is simply to show that privacy rights and intangible property rights, once established, are not so easily swept aside as some might think. Thus many policy decisions that have been recently proposed or enacted – citywide audio and video surveillance, law enforcement DNA sweeps, genetic profiling, and national bans on genetic testing and enhancement of humans, to name a few – will have to be backed by very strong arguments.

Interference with Liberty and Privacy Argument

Let us begin with a fairly simple case. Suppose that Ginger has discovered the genetic markers for diabetes and has developed a

gene therapy technique that will correct this condition. In fact her technique will eliminate the gene or combination of genes that cause diabetes in mature cells (somatic cells) as well as cells that may be passed on to one's offspring (germ line cells). Fred, who has been suffering from the complications of diabetes since childhood contacts Ginger and arranges to have genetic therapy. Moreover, suppose that Fred has privacy rights that allow him a certain kind of control over personal information as well as his body and capacities. Fred undergoes the procedure, pays Ginger, and forever alters the genetic profile of his descendants.

Given that Fred and Ginger could be members of any society or culture and assuming that presumptive rights to privacy and intangible property ownership have been established, we have an immediate prima facie case against sweeping governmental or societal interference with this conduct. Ginger's love of science and desire to help others drives her to burn the midnight oil and produce a revolutionary new technique. Fred's right to privacy allows him, within certain constraints, to decide what happens to and in his body. It would seem that there are no grounds for third party interference in this case – nothing that would override the presumptive rights already in place.

Now if Fred and Ginger had conspired to change his genetic profile in such a way that caused his descendants *to have* childhood diabetes, then surely interference or sanctions are warranted (assuming, of course, that Fred is going to go on to father children). I would hope that such activity would fall under the umbrella of child protection laws. Those individuals who do things that endanger the health and well being of dependents will have sanctioned interferences with private domains and ownership. A similar example is the individual who is playing Russian roulette with someone who does not care to take part in this activity – surely this would bump against the harm restriction or a similar restriction; the 'risk of great harm' restriction.

A few staunch defenders of religious freedom argue that fundamentalists should be able to adhere to certain rules even when doing so will cause a child to die. For example some religious views forbid blood transfusions while others may forbid access to medical doctors altogether. These practices are clear violations of the harm standard, and according to my view, may be justifiably prohibited. Moreover, those who disagree with me on this matter and with respect to genetic enhancement seem to stand on shaky ground – they will allow parents to harm their children by adhering to religious principles while forbidding

other parents to help their children though genetic enhancement.

Top-down laws that seek to regulate genetic therapy will almost always interfere with individual liberty and privacy. Consider the case where Fred flies off to some foreign country to receive genetic therapy from Ginger. It is difficult to imagine how laws or similar kinds of regulation are going to prohibit this activity without also sanctioning severe violations of liberty and privacy.

Moreover, with better technology and less invasive techniques undergoing genetic therapy may become as simple as getting a shot. Here there is little ground to stand on between draconian laws that clearly cross into private domains and interfere with individual liberty or emasculated regulations that have little force. A ban on genetic testing in the United States will not prevent independent researchers in less regulated countries from this sort of experimentation. With the possibility of massive profits there will always be companies and universities eager to fund such projects.

While it may be the case that certain types of genetic enhancement are immoral it does not automatically follow that they should be regulated. There are many actions, both moral and immoral that arguably fall outside of the domain societal regulation. Lying and helping the poor are two obvious examples.

Certainly there are types of actions should be prohibited on grounds that they present an unjustifiable harm to others – these actions violate the harm restriction. Other actions or policies may be prohibited because they unjustifiably invade private domains. Genetically predisposing your offspring to live in pain or to grow a third arm, causing your child to become afflicted with cancer, poor eyesight, and diabetes, are all actions that prima facie warrant prosecution. Moreover, if there is evidence that someone is about to produce these harms then surely intervention is warranted. Put another way, property rights and privacy rights are justifiably overridden in these cases. But even if genetic harm is done to some child it may be possible to correct defects by modifying mature cells though somatic gene therapy.

None of this, however, sanctions a national database containing individual genetic profiles or outlawing somatic and germ line therapy simpliciter. The norms that guide us as to when and where it is appropriate to interfere with family life should guide us in genetic modification cases as well. If a parent takes action that will result in serious harm to his descendants, for example using genetic modification techniques to cause them

to develop inoperable throat cancer, then the privacy presumption would have been overridden. Moreover, those who develop such enhancement techniques should be liable as well. While the threshold for overriding the presumptions of privacy and property is contentious, it is not as if we have to reinvent the wheel with each new advance in technology. Simply put, the arguments that establish a strong presumption in favor of privacy and property in the last two sections set a fairly high threshold for the justified violation of these rights. Happily, these claims generally accommodate current moral and legal norms.

In presenting these cases I hope to establish the futility of national, or even international, laws prohibiting gene enhancement in human subjects. Such laws are unenforceable and would almost certainly sanction unjustifiable interferences with individual liberty and privacy. Sending a child to a parochial school is a form of environmental enhancement that many find distasteful. Nevertheless, this activity is generally recognized as falling outside the domain of legitimate government regulation. A father who incessantly pushes his child to become a tennis star may be doing something questionable from a moral point of view. Parents who teach their children to be intolerant or genetically predispose their offspring to grow seven feet tall may also be engaging in immoral behavior. It does not automatically follow that this type of behavior ought to be legally prohibited. We may continue to argue about the ethical status of particular kinds of genetic enhancement as we do about certain kinds of environmental enhancement. Nevertheless, I think that it is important to note the high threshold that must be passed for justifiable interference in private domains.

The social nature of intangible works

A common view about the information found in the human genome, one that may undermine property rights, is that this information is publicly owned – thus ownership claims to genetic enhancement techniques may be undermined. Even if this view were any good it would still not automatically sanction sweeping government regulations concerning genetic enhancement techniques. UNESCO's International Bioethics Committee has urged government regulation of all genetic research because the humane genome is the common heritage of humanity. One view is that you may have the right to change your own genes but you may not make changes that will be inherited by future generations. 'The draft UNESCO resolution doesn't rule out

somatic therapy, which alters the DNA only in mature cells. Germline therapy is the no-no, since it changes DNA in sperm or ova, and those changes will be passed on to every subsequent generation.'[13]

Property rights are justifiably limited because of the inherent social nature of intangible works. Individuals are raised in societies that endow them with knowledge, which these individuals then use to create intangible works of all kinds. On this view the building blocks of intangible works – knowledge – is a social product. Individuals should not have exclusive ownership of the works that they create because these works are built upon the shared knowledge of society. Allowing rights to intangible works would be similar to granting ownership to the individual who placed the last brick in a public works dam. The dam is a social product, built up by the efforts of hundreds, and knowledge, upon which all intangible works are built, is built up in a similar fashion.

Similarly, the benefits of market interaction are social products. The individual who discovers crude oil in their backyard should not obtain the full market value of the find. The inventor who produces the next technology breakthrough does not deserve full market value when such value is actually created through the interactions of individuals within a society. Simply put, the value produced by markets and the building blocks of intangible works are social products. This would undermine any claims to clear title. A. John Simmons notes that Locke may be sympathetic with this view.

> Locke himself uses examples that point to the social nature of production (*The Second Treatise of Government*, Section 43). But if the skills, tools, or invention that are used in laboring are not simply the product of the individual's effort, but are instead the product of a culture or a society, should not the group have some claim on what individual laborers produce? For the labor that the individual invests includes the prior labor of many others.[14]

A mild form of this argument may yield a justification for limiting the ownership rights of authors and inventors – alas, these individuals do not deserve the full value of what they produce

[13] Charles Platt 'Evolution Revolution' *Wired Magazine* (January 1997), p. 201.

[14] A. John Simmons *The Lockean Theory of Rights* (Princeton, N.J.: Princeton University Press, 1992), p. 269.

given what they produce is, in part, a social product. Maybe rules that limit intangible property rights can be justified as offering a trade-off position between individual effort and social inputs. A more radical form of this argument may lead to the elimination of intangible property rights and privacy rights as well. If individuals are, in a deep way, social products and market value and knowledge are as well, then the robust property rights found within the Anglo-American tradition are suspect. Moreover, privacy is overrated given that individuals should be seen as parts of communities – why should there be secrets?

This argument, in either version, is deficient for several reasons. First, I doubt that the notion of 'society' employed in this view is clear enough to carry the weight that the argument demands. In some vague sense, I know what it means to say that Lincoln was a member of American *society* or that Aristotle's political views were influenced by ancient Greek *society*. Nevertheless, I think that the notion of 'society' is conceptually imprecise – one that it would be dubious to attach ownership or obligation claims to. Those who would defend this view would have to clarify the notions of 'society' and 'social product' before the argument could be fully analyzed.

But suppose for the sake of argument that supporters of this view come up with a concise notion of 'society' and 'social product'. We may ask further, why think that societies can be *owed* something or that they can *own* or *deserve* something? Notions of *ownership*, *owing*, or *deserving* don't appear to make sense when attached to the concept of 'society'. If so and if different societies can *own* knowledge, do they not have the problem of original acquisition?[15] Surely, it does not follow from the claim that X is a social product that society owns X. Likewise, it does not follow from the claim that X is produced by Ginger, that Ginger owns X. It is true that interactions between individuals may produce increased market values or add to the common stock of knowledge. What I deny is that these by-products of interaction, market value and shared information, are in some sense owned by society or that society is owed for their use. Why assume this without argument? It is one thing to claim that information and knowledge is a social product – something built up by thousands of individual contributions – but quite another to claim that this knowledge is owned by society or that individuals who use this information owe society something in return. Lysander Spooner argued that one's culture or society plays almost no role in the

[15] See Nozick, *Anarchy*, p. 178.

production of ideas. 'Nothing is, by its own essence and nature, more perfectly susceptible of exclusive appropriation, than a thought. It originates in the mind of a single individual. It can leave his mind only in obedience to his will. It dies with him, if he so elect.'[16]

Suppose that Fred and Ginger, along with numerous others, interact and benefit me in the following way. Their interaction produces knowledge that is then freely shared and allows me to create some new value, V. Upon creation of V, Fred and Ginger demand that they are owed something for their part. But what is the argument from third party benefits to demands of compensation for these benefits – why think that there are 'strings' attached to *freely* shared information? If such an argument can be made, then it is plausible as well to maintain that burdens create reverse demands. Suppose that the interaction of Fred and Ginger produces false information that is freely shared. Suppose further that I waste ten years trying to produce some value based, in part, on this false information. Would Fred and Ginger, would society, owe me compensation? The position that 'strings' are attached in this case runs parallel to Nozick's benefit 'foisting' example. In Nozick's case a benefit is foisted on someone and then payment is demanded. This seems an accurate account of what is going on in this case as well.

> One cannot, whatever one's purposes, just act so as to give people benefits and then demand (or seize) payment. Nor can a group of persons do this. If you may not charge and collect for benefits you bestow without prior agreement, you certainly may not do so for benefits whose bestowal costs you nothing, and most certainly people need not repay you for costless-to-provide benefits which yet *others* provided them. So the fact that we partially are 'social products' in that we benefit from current patterns and forms created by the multitudinous actions of a long string of long-forgotten people, forms which include institutions, ways of doing things, and language, does not create in us a general free floating debt which the current society can collect and use as it will.[17]

I would argue that this is also true of market value. Given our crude oil example, the market value of the oil is the synergistic

[16] Lysander Spooner, *The Law of Intellectual Property: or An Essay on the Right of Authors and Inventors to a Perpetual Property in Their Ideas*, in *The Collected Works of Lysander Spooner*, edited by C. Shively (1971), p. 58.

[17] Nozick, *Anarchy*, p. 95.

effect of individuals freely interacting. Moreover, there is no question of desert here. Surely the individual who discovers the oil does not deserve full market value any more than the lottery winner deserves her winnings. Imagine we set up a pure lottery where the payout was merely the entire sum of all the tickets purchased. Upon determining a winner, suppose someone argued that the sum of money was a social product and that society was entitled to a cut of the profit. An adequate reply would be something like 'but this was not part of the rules of the game, and if it was, it should have been stated before the investment was made'.

On my view common knowledge, market value, and the like, are the synergistic effects of individuals freely interacting. If a thousand of us *freely* give our new and original ideas to all of humankind it would be illicit for us to demand compensation, after the fact, from individuals who have used our ideas to create things of value. It would even be more questionable for individuals ten generations later to demand compensation for the use of, the now very old, ideas that we freely gave. Lysander Spooner puts the point succinctly. '*What* rights society have, in ideas, which they did not produce, and have never purchased, it would probably be very difficult to define; and equally difficult to explain *how* society became possessed of those rights. It certainly requires something more than assertion, to prove that by simply coming to a knowledge of certain ideas – the products of individual labor – society acquires any valid title to them, or, consequently, any *rights* in them.'[18]

But once again, suppose for the sake of argument that the defender of this view can justify societal ownership of general pools of knowledge and information. Even in this case we have already paid for the use of this collective wisdom when we pay for education and the like. When a parent pays, through fees or taxation, for a child's education it would seem that the information – part of society's common pool of knowledge – has been fairly purchased. This extends through all levels of education and even to individuals who no longer attend school.

Finally, it is obviously the case that the information found in the human genome is discovered rather than created. These facts may be discovered by anyone who cares to look hard enough. The genetic enhancement techniques that will be built upon this information are created rather than discovered – alas, there may be infinitely many ways to modify human genetic structure. Thus,

[18] Spooner, *The Law of Intellectual Property*, p. 103.

even if an argument could be marshalled that justified societal ownership of the information found in the human genome this would not automatically yield claims to control every subsequent invention based on this information. Thus if I am correct, the social nature of intellectual works argument will not undermine intangible property rights to creations like genetic enhancement techniques.

The inequality argument

One argument commonly given against allowing individuals the liberty to undergo genetic enhancement procedures is that such technology is expensive and will only impact the rich. Those with the financial resources will genetically engineer their offspring to eliminate defects while the poor will be left what nature gives them by chance. This inequality in health care will lead to further economic and social inequalities. It may also lead to longer healthier lives for some, ultimately creating a class based society and discrimination against those who are genetically challenged.

This view is subject to several decisive objections. Almost every medical advancement at its beginning was available only to the rich. By refining these advancements and techniques prices dropped which opened up new markets for those less financially fortunate. In the end, procedures that were once cost prohibitive are now available to everyone. There is no reason to think that genetic enhancement procedures won't follow this same course. In fact our entire market system seems to necessitate this kind of inequality. Most inventors and companies burn the midnight oil and create or discover new and revolutionary medical procedures in order to make a profit. This process requires large up front investments that in turn necessitate higher initial prices when a viable commodity does come to market. Nevertheless sooner or later the 'high priced' market becomes saturated and in order to maintain profits prices are dropped. If this system yields everyone better prospects in the end, the resulting initial inequality of distribution is hardly objectionable.

Moreover, even if gene therapy techniques remain expensive the leveling effect assumed in the inequality argument seems indefensible. Suppose that aspirin-plus is invented and cures with great efficiency headaches and colds. The cost of aspirin-plus, however, is very high – suppose $500 per pill. Are we to prohibit the manufacture and administration of aspirin-plus because it is unfair that some will be able to forgo the suffering bought on by colds and headaches while others will not? This sounds like

simple envy and mean spiritedness to me – 'if I can't have it, then no one can' or 'if I have to suffer, then so does everyone else'. Let us dispense with the notion that individuals who hold these sentiments are actually concerned with lessening human suffering.

Now it might be argued that my aspirin-plus case and the social ramifications of allowing genetic enhancement to proliferate are wildly divergent. Curing headaches and colds does not impact an individual's entire life in the way that genetic manipulation does. But here again we bump against other forms of enhancement – teaching your child to read, learning to play chess, going to college, playing sports, nurturing musical abilities, developing the virtue of self-control – that it would seem illicit to legally prohibit even though they each impact an individual's entire life. Many of these examples are purposely ambiguous in that they may be things we do to ourselves or things that we do to others. Few would deny that parents who create environments that produce these characteristics should be stopped. What if these enhancements could be genetically produced – why would environmental enhancement or manipulation be permitted yet the genetic based counterpart prohibited? One answer is that the former is temporary, ending with the life of the person involved, while the latter will be passed down to all subsequent generations. But this is clearly false given that environmental enhancements may be passed on to one's children and it is possible that genetic enhancements may be altered with somatic therapy.

One sort of reply to this view is given by The Council for Responsible Genetics, which opposes germline modification unconditionally. 'The cultural impact of treating humans as biologically perfectible artifacts would be entirely negative. People who fall short of some technically achievable ideal would be "damaged goods". And it is clear that the standards for what is genetically desirable will be those of society's economically and politically dominant groups. This will only reinforce prejudices and discrimination in a society where they already exist.'[19] Obviously I disagree. There is no reason to think that gene modification of any sort will necessarily lead to 'treating humans as biologically perfectible artifacts' or that those who don't live up to some ideal will be viewed as 'damaged goods'. Maybe genetically manipulated individuals will be labeled as 'unnatural'

[19] Council For Responsible Genetics, Human Genetics Committee (Fall, 1992) in T. Beauchamp and L. Waters, *Bioethics*, 4th ed. (Wadsworth, 1994), p. 671.

rather than superior. Moreover, who would know if fairly strong rights to privacy were in place?

CONCLUSION

If I am correct there is a fairly strong presumption in favor of privacy and intangible property rights that will limit the kinds of legislation that have recently been offered concerning genetic research and gene therapy. Furthermore, two commonly cited arguments, the social nature of intellectual works argument and the inequality argument, fail to justify overriding these rights. While there is much more to be said concerning these issues I would urge caution in a different direction and put the burden of proof in a different place. Let property rights and privacy rights stand in the absence of strong overriding reasons. In the end, it seems that we are headed toward a world that includes clone farms, organ banks, and genetic manipulation. If so, let us at least face this future with our basic rights of property and privacy intact.

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