Journal of Applied Philosophy, Vol. 15, No. 3, 1998

Uniqueness, Individuality, and Human Cloning

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ABSTRACT *This paper challenges two main arguments often presented to show that cloning a human being would be morally wrong* per se. *These arguments are that human cloning would be intrinsically wrong 1) because it involves manufacturing a person rather than creating or reproducing one, and 2) because it violates some claim or right that individuals have to be biologically unique. I argue that while cloning may involve genetic selection, it need not always be a decision to select for a certain type of individual. Furthermore, I contend that the notion of biological uniqueness is inadequate to ground either the idea that biologically non-unique individuals are morally worse off than unique ones or that biological uniqueness itself constitutes a criterion of moral value or status.*

The successful cloning of a sheep at the Roslin Institute in Edinburgh has raised the prospect of human cloning [1] to a level that many people — including a U.S. President — find alarming [2]. Even prior to the Roslin announcement in February 1997, Canadian legislators had been working on legislation that would ban almost any attempt to develop human asexual reproduction techniques [3]. Many other European countries also seem to have taken the same approach [4]. Many of these efforts seem motivated by the idea that, even apart from the possible human and social consequences of such technology (popularly believed to be extremely dangerous), there just is something deeply morally objectionable with the entire business of 'duplicating' individual human genomes.

My purpose here is to challenge this negative, deontologically motivated assumption. To do so, I want to focus on the most broad, and hence the most minimal, description of what human cloning involves and then try to determine what might be morally objectionable about such an activity. I will maintain that two standard counter-arguments which purport to show that human cloning is morally objectionable *per se* are generally unsound. The two arguments are that cloning manufactures (rather than reproduces) persons and that it violates human uniqueness. I conclude that if cloning is morally wrong, it could only be because of present or potential harm imposed on the person cloned, on women who might participate in the procedure or on society generally.

The Definition of 'Cloning'

Cloning involves, at the very least, the reproduction of another entity which is, in some sense, identical to an original. Cloning can be achieved, not only with entire organisms, but at the cellular and molecular levels as well. I am, of course, only interested in the first form. The qualification 'identical in some sense' acknowledges straightforwardly that it

simply would be a mistake to suggest or imply that cloning a human being (or any other animal, for that matter) allows the complete 'duplication' or 'xeroxing' of that individual. An organism is the expression, not merely of its genome, but of its interactive development within some particular environment. Thus the only thing that is 'duplicated' by cloning an organism is that organism's genome, along with those features that are unequivocally tied to its phenotypic expression. In fact, this qualified understanding of what is copied requires even further qualification [5]. Some cloning techniques — e.g., the one used in the Roslin sheep experiment — do not always result in the exact duplication of the cloned individual's genome. The reason for this is that such techniques rely on transferring DNA from a cell nucleus to a donor cell or an (empty) egg. But not all of the operative DNA in an organism is found in a cell's nucleus. The mitochondria are part of a cell that passes its DNA along only in the mother's egg. This mitochondrial DNA apparently does not control very many genes — perhaps only 1% of the entire genome — but it does control genes that regulate an organism's metabolism [6]. What this means is that the only ways to get a truly identical clone would be either to have nuclear DNA from a woman put into her own egg or to engage in embryo splitting. (Embryo splitting, which I will explain a bit further below, has the same result because each blastomere that is separated from an early embryo has the same mitochondrial DNA.) In all other cases of nuclear transfer, where another individual's cells or eggs are used, the 'copy' is, strictly speaking, genetically non-exact [7].

There is some resistance in the scientific literature to the straightforward definition that I have just presented [8]. Scientists often tie the definition of 'cloning' more carefully to specific techniques that can be used to reproduce organisms asexually that otherwise reproduce sexually. When this is done, the moral issues surrounding cloning seem to change. In view of my general purposes here, however, these more careful understandings do not add up to any important moral differences. Let me briefly explain why.

There are two standard techniques that have been used to clone organisms: nuclear transfer (or transplantation) and embryo splitting (often referred to as blastomere separation). Embryo splitting involves separating cells from very early embryos and then growing them into separate embryos. Because these cells were derived from a single embryo, each separate embryo has the same genome as the original. In 1993, Jerry Hall and other researchers at George Washington University caused great media uproar when they performed this procedure on human cells, but it has been done repeatedly on other animal species since the early 1930's [9]. Nuclear transfer, on the other hand, involves taking a host cell, removing its nucleus, and then replacing it with the nucleus of another donor cell that is to be cloned. Nuclear transfer can be performed using either a cell taken from an embryo (a totipotent cell, i.e., an undifferentiated cell capable of becoming any other cell) or a cell taken from some other part of the body (a non-totipotent cell, i.e., a cell which has differentiated itself into a particular kind of cell, say of skin or muscle). The nuclear transfer of donor DNA from totipotent cells into host embryo cells (blastomeres) has been performed regularly and successfully on domestic animals since the mid-1980's. These techniques were developed from successful cloning experiments done on amphibians in the early 1950's. The breakthrough in the recent Roslin experiment was that, apparently for the first time, an adult body cell (a cell from the udder of a pregnant ewe) was used instead of an embryonic cell. Adult body cells are, of course, non-totipotent, so the breakthrough here was the demonstration that such cells could be returned to a totipotent state and re-start the process of embryonic development.

The point here is that these different techniques could have very different moral implications [10]. First, embryo splitting requires two progenitors; nuclear transfer (in principle) requires only one. Second, embryo splitting produces only limited numbers of the original; nuclear transfer allows large numbers of duplicates. Third, embryo splitting does not entail direct manipulation or selection of genetic material, whereas nuclear transfer does [11]. Since embryo splitting is standardly done on a genetically unique, undeveloped individual, the decision to clone is usually made in the absence of detailed information about what features that individual will come to have. Nuclear transfer, on the other hand, can be done on an adult (as was the case in the Roslin experiment) where selection could be made on the basis of traits that the adult might possess. Hence cloning by nuclear transfer raises more acutely the moral spectre of eugenics, allowing many more opportunities for 'positive' or 'negative' selection. Finally, embryo splitting is not nearly as technically difficult as nuclear transfer. As a result, it is a much less risky procedure offering fewer chances for things to go wrong. This alone might make a moral difference, since many important concerns about cloning are based on issues surrounding the safety of the procedure. Taking a cell from an adult as opposed to a newly fertilised embryo, for example, means starting a new life from a cell that has acquired genetic mutations over an individual's lifetime. These mutations are often believed to be the basis of both aging and cancer. It is therefore unclear at the present time whether undue health risks or diminished life expectancy will be one of the serious risks involved in the procedure. Again, embryo splitting, since it proceeds from sexual reproduction, and hence its development is based on the event of a new and unique genetic code, is much more like the natural procedure of twinning, and hence seems to present us with fewer unknown risks.

The point is that if we were to accept cloning and then pursue the issue of *how* we should clone an individual, the differences between these procedures might become morally important. But since any of these procedures effectively allow the biological duplication of another individual, they raise the same general issue of whether it is right to do this sort of thing. Hence, for my purposes, it is not necessary to attend to the otherwise important moral differences that might hold between cloning techniques.

Why is Cloning Morally Wrong?

Cloning is an instance of assisted reproduction. As such, it could be morallly condemned for reasons that could be raised against any form of assisted reproduction. I will refer to arguments that employ such a strategy as global anti-assisted reproduction arguments. These arguments, again, appeal to a *general* position about the immorality of assisted reproduction and then apply this general claim to particular cases of it. Recent philosophical and theological literature on the ethics of assisted reproduction presents many examples of such arguments. Paul Ramsey, for example, a pioneering bioethicist, reasons that since God's creative activity was performed and motivated by love, '. . . neither should there be among men and women, whose man-womanhood . . . is in the image of God, any lovemaking set out of the context of responsibility for procreation or any begetting apart from the sphere of human love and responsiveness' [12]. The idea here is that since most forms of assisted reproduction are not reasonably seen as expressions of inter-personal love, they become morally suspect. Some feminists, too,

seem to defend global arguments against assisted reproductive technologies. A standard argument here is that most forms of assisted reproduction are morally wrong or should be banned because they play into existing patterns of patriarchal power and sexist oppression. The main work of such an argument then becomes showing how this general principle applies to each particular case of assisted reproduction. Whatever the value of this type of argument, I mention it only by way of contrast with the approach that I want to adopt here. My approach begins by looking much more specifically at the particular case of assisted reproduction and then trying to determine whether this would present moral concerns, even a positive social context where sophisticated social or legal regulations might surround the practice, and where there are no serious, known harms associated with it. And, again, what I want to defend now is the claim that human cloning passes this methodological threshold.

If cloning is to be singled out among the forms of assisted reproduction as being wrong *per se*, its wrong-making property must be connected to the fact that cloning is minimally the attempt to intentionally duplicate, as closely as possible, some individual's genome. Why would this intrinsically be wrong or evil? Two main responses are standardly given to this question: Cloning is wrong 1) because it involves the intention to produce a person with a certain genome, and 2) because it violates some right or value that humans have in being biologically unique. I will refer to the former as the manufacturing argument, and the latter as the uniqueness argument (or the non-uniqueness objection). I will consider each of these proposals in turn.

The Manufacturing Objection

When you think about it, cloning a human would be a very simple, and yet enormously efficient way to select for an individual with certain biological features. The other way to do this would be to engage in genetic alchemy — gene therapy as it is now (perhaps euphemistically) called — and try to change that individual's genome. But this technology is nascent, uncertain, risky, complicated, enormously expensive, and to date, not terribly successful. This fact alone seems to be why certain forms of mammalian cloning in domestic animal husbandry have been largely favoured over biotechnology that involves manipulating genomes. You simply find the cow that you like, and then go about producing 'copies' of it. Human cloning would seem directly to involve these same 'manufacturing' or selection opportunities. Indeed, someone might suggest that these capacities are built right into the decision to clone. It is inherently a decision to produce an individual of a certain type, with certain features that we hope are based in his or her genome. This is how Jeremy Rifkin, a popular biotechnology critic, sees the matter. As he puts it: 'It's a horrendous crime to make a Xerox of someone . . . [because] you're putting a human into a genetic straitjacket. For the first time, we've taken the principles of industrial design — quality control and predictability — and applied them to a human being' [13]. The moral idea here seems to be that in manufacturing people, we devalue them; we treat them as objects to be designed rather than as potential subjects or agents capable of their own making.

There are several familiar problems with this familiar line of argument. First, let us assume that the decision to clone is inherently a manufacturing choice (I will question this assumption in a moment). The problem is that these sorts of choices seem to typify so

many choices that people make which, even if they are not conscious choices of this sort, at least have the effect of shaping or selecting the traits of their child. The process, for example, of selecting a partner where children could arrive in the future, while it surely is not (and I would hope it never should be) *merely* a decision to select the traits of one's children, it does in part present an opportunity for just this sort of selection. Additionally, if we really do believe that 'manufacturing' choices are morally objectionable, then it becomes difficult to imagine why people seeking to adopt a child should have to be consulted about the adoption of any particular child once they have expressed a general interest in adoption. The same might hold for a woman seeking to have a child through artificial insemination by donor. It seems rather strong to hold that her moral qualities as a future parent are seriously diminished by any interest in the general features of the donor, or that she would be an ideal parent if she were to accept sperm only if she could know nothing at all about the physical appearance, family medical history, etc., of its donor.

Furthermore, even if it were just false that people really do make many choices that have the effect of trait selection prior to the birth of their children, they certainly do go to considerable trouble to see that their children develop certain traits after they are born. All of this 'manufacturing' seems appropriate, however, given certain standard moral assumptions — e.g., when it is at least not harmful to the child, when it does not severely restrict her opportunities to become an autonomous, self-affirming individual or when it is in her interest to have (or avoid) certain characteristics (say, a debilitating disease). The same could be said about pre-conception selection decisions. Many of these decisions could indeed be frivolous, selfish, and so on. But many of them might be capable of moral defence by showing how they might be important for cultivating the capacities and opportunities for a person's self-development.

What tends to upset many of us about manufacturing decisions, I suspect, is not really that *some* of them might occur in ordinary choices about having a child, but rather that *too many* of them might be present. What might be objectionable, then, is the total quantity of the same sort of choice. Too many manufacturing choices, it might be suggested, push us to the point where we would be treating a (potential) child as an object of his or her parent's desires and goals, rather than a person in his or her own right. Furthermore, being able to determine a person's traits to a very considerable extent might raise concerns about whether that parent is capable of valuing or loving a child unconditionally, or loving him for the person that he might become through self-development. It could also raise questions about whether the potential person would be able adequately to develop her own sense of self and personal agency. In this regard, Joseph Fletcher, another early bioethicist, surely overstated his response to the manufacturing argument when he enthusiastically *celebrates* our potential to manufacture people. 'Man,' he writes, 'is a maker and a selecter [sic] and a designer, and the more rationally contrived and deliberate anything is, the more human it is.' Fletcher even goes so far as to claim that laboratory reproduction is 'radically human compared to conception by ordinary heterosexual intercourse' because the manufacturing is willed, chosen, purposed, controlled; it is a matter of 'choice, and not chance' [14].

Whatever merit there might be in responding to the manuacturing objection by arguing either that manufacturing is a standard decision most parents make or that it is not itself morally objectionable, let us for the moment set both of these suggestions aside. There is another consideration that is, I would suggest, even more decisive. The decision to clone

is not *inherently* a choice to manufacture a particular individual in a certain way, even though this consequence may be foreseeable. It can simply be a choice to have a child of one's own in the only way possible. The familiar examples standardly offered in the literature as morally defensible reasons to clone illustrate this point. These examples can usually be classified under two main categories: 1) the prevention (by bypassing) of infertility and 2) the avoidance of genetic disease. Given either one or both of these situations, some cloning technique may be the only way that some people might be able to have children of their own. In these cases, however, the decision to have a child could be only that of having a child of one's own; it need not be a detailed manufacturing decision — a point which seems particularly true with respect to bypassing infertility. This is just the sort of outlook that we might arguably suggest is the ideal outlook that couples having children through sexual reproduction should have. Cloning, of course, does come with biological foreknowledge; one would have a fairly good idea of what the child's genome would be, and all that this entails. But, again, simply because there is foreknowledge that a duplication of one's genome will be the outcome of one's decision to have a child, it simply does not follow that the decision to have a child involves or entails a determination to have a child for these reasons. Imagine an analogy with a couple where infertility and genetic disease is not a known consideration, but who may know in advance (say due to some established medical condition) that all of their offspring will be female. It is not obvious that their choice to have a child should be regarded as an instance of sex-selection. If this is right, then there is simply no reason to regard all instances of cloning as instances of manufacturing humans. Other more general, recognizable, and morally defensible motivations, I would suggest, can be present.

The Non-Uniqueness Objection

The other main reason that many bioethicists give as a principled objection to cloning is that it creates a biologically non-unique individual. Daniel Callahan, along with other prominent bioethicists, has strenuously voiced this particular concern. He writes:

> For all of its haphazard qualities, there is one enormous advantage in the current lottery: save for the occasional natural twinning, it gives each of us our own unique identity. There is no one else in the world like us. This is a precious gift of nature. It allows us to become our own person, to have some of our parents' genetic traits, but to have even more of our own. Nature does not make us in our parents' image; it makes us in our own unrepeatable image. Cloning would deprive the products of an engineered conception of that gift [15].

There are two ways of reading Callahan's statement here. He could be claiming either that human cloning would result in 1) an *objective* loss of uniqueness/individuality for the clone or 2) a *subjective* (i.e., a perceived or believed) loss of uniqueness or individuality by the clone. In either case, of course, Callahan seems to be suggesting that the respective loss of uniqueness or individuality is morally significant. The most natural interpretation of Callahan's argument seems to be 1), but as we shall see, this really is an implausible line of argument. I will also argue that even if 1) were true, and human cloning could result in duplicating persons and their characters or temperaments, cloning would still not be morally objectionable (at least not solely on the grounds that it creates similar persons). I

will also hold that while it seems reasonable to think that 2) is empirically unlikely, it seems more plausible to expect that at least some clones would come to feel this way about their situation. I will maintain, however, that this feeling, even if it occurs, is still not a sufficiently morally serious reason not to clone — something more serious would need to be presented, and this probably cannot be found solely in an argument from the moral value of uniqueness.

I have already suggested above why it is a mistake to believe that human cloning would result in an objective loss of uniqueness/individuality for the clone. The reason is that if this claim were true, some very strong kind of biological determinism would also have to be true. For the only thing that we are really considering in cloning humans is the duplication of an individual's genome (and perhaps this too is only partial). So the only way that we could duplicate a person by duplicating that person's genome would be if most, if not all, of what makes up a person comes from the genes. Although there are exceptions, most biologically inclined psychologists seem to resist this idea, and posit that environment plays some role in shaping personality. Furthermore, however similar two persons might be genetically, they clearly would have different experiences, and it seems reasonable to believe that these different experiences would have some differential effect on a person's character and personality.

My focus in this paper, of course, is not on psychology or philosophy of mind. So I do not want to defend rigorously the claims that I have just suggested. Let us, then, for the sake of argument assume that in duplicating a person's genome, we really would be duplicating a person in some interesting sense. Is there something morally objectionable about this? I do not believe so, for three main reasons. First, Callahan's suggestion that non-uniqueness implies repeatability does not lead in any interesting philosophical direction. Secondly, if we accept a that non-uniqueness is a moral wrong or evil for persons, then we must entertain rather bizarre beliefs about the moral status or situation of natural clones — i.e., twins, triplets, etc. Underlining both of these arguments will be a third reason — viz., that individuality or uniqueness yields no interesting account of what makes persons or their lives morally valuable.

As we have seen, Callahan suggests that there is a connection between the idea of an individual's uniqueness and the idea of that individual's non-repeatability. If the possibility of repeating another person is to be morally troublesome, it must imply that in being repeated (or in being rendered non-unique) the original and the repeated individuals are somehow devalued as persons. This suggestion, however, is going to need some further explanation, since it is not obvious why non-repeatability should be considered a morally significant feature.

One way that it might take on some importance would be to suggest that a person's repeatability implies that he or she is replaceable. Viewing a being as replaceable does not seem to denote a very strong notion of that being's moral worth or value. It seems to imply that we would not be doing anything wrong if we 'removed' a particular individual provided that we 'replaced' that individual with a new one. Intuitively, at least, many people (I include myself) are unwilling to consider persons in these moral terms, and hence do not want to think of humans as beings whose value as individuals is replaceable. So one way of expanding on Callahan's notion of human value being linked to an individual's non-repeatability is to claim that individuals have value or status when they are viewed as being non-replaceable.

This is the way that Immanuel Kant has conceived of the value of persons. In the

Groundwork for the Metaphysics of Morals, Kant notes a difference between the concepts of the value and dignity of persons. He claims that the idea of value involves the notion of replaceability. Something that is of one value can always replace some other thing of the same value. Value, then, is something that admits of equivalence and hence of exchange. But exchange value is only relative value — i.e., value relative to the interests that some other being takes in that thing. When something possesses dignity, however, it is not merely valuable, it is beyond all value. Such a being is, therefore, not replaceable. It seems appropriate, then, to think of persons as non-replaceable, and hence to think of them as possessing a dignity rather than intrinsic value.

The argument from uniqueness suggested by Callahan implies that we must think of persons as unique — i.e., that we should find their dignity in their uniqueness. It is worth noting that this is a considerable distance from Kant's general position, since Kant insists that the idea of dignity is formal and abstract. The idea is not that every person is valuable in virtue of being *empirically* different from everyone else. Rather, dignity is grounded in the rational capacity to conform one's will to the moral law, and there is no reason to think that this capacity would be diminished by duplication. So for Kant, dignity certainly comes from being non-replaceable, but this is simply not the same thing as claiming that every human being finds their dignity in being non-identical.

Defenders of the argument from uniqueness (like Callahan) seem to extend to Kant's notion of dignity much further than what he had in mind. They maintain that humans are properly seen as possessing dignity rather than merely possessing value, that this dignity comes from being non-replaceable, and that the only way we can properly understand non-replaceability is in terms of genetic uniqueness. That is, the argument from uniqueness contends that humans are rightly seen as non-replaceable only when they are valued as unique, individual, persons. If they were the same, then they would not really be non-replaceable.

This, however, is not a promising line of argument. It is simply implausible to conceive of non-replaceability solely or even mainly in terms of uniqueness. This, again, is not the way that Kant thinks of the matter, and since he defends the idea of human worth as linked to the idea of non-replaceability, his position is worth considering as an alternative. Kant claims that our dignity comes from our capacity for rational agency, for legislating our lives by universal moral laws. In fact, he insists that it is morality — or moral action — which has dignity. Humans acquire dignity by being rational beings who can act morally. As he puts it:

> Nothing can have any worth other than what the law determines. But the legislation itself which determines all worth must for that very reason have dignity, i.e., unconditional and incomparable worth; and the word 'respect' alone provides a suitable expression for the esteem which a rational being must have for it. Hence autonomy is the ground of the dignity of human nature and of every rational nature [16].

The point here (quite apart from Kant's more controversial claim that only the moral law has dignity) is that psychologically normal clones would surely have the capacity for moral agency which Kant refers to here and hence, under his moral schema, would possess dignity. The problem with the uniqueness argument, then, is that it is far too narrow in its implications for an account of the moral status or worth of persons.

What would be helpful now would be a thought experiment imagining the situation

that clones might find themselves in, and how we might regard their moral value. The fact is, however, that we really do not need to speculate about such matters. Cloning, even in human reproduction, is a naturally occurring event. Identical twins or triplets regularly appear in the human population. And it is important to stress just what a threat natural clones (monozygotic twins, triplets, etc.) present for concerns about the moral value of individual uniqueness. They are clearly the most serious threat to human uniqueness that we can find, much more so than would be the case with technologically assisted clones. Monozygotic or 'identical' twins not only share the same nuclear DNA, but have the same mitochondrial DNA as well [17]. They are usually gestated in the same woman at the same time and circumstances in her body, and are standardly raised in the same cultural and familial contexts. So with natural clones (identical twins) both genetic and environmental forces standardly conspire to make them relatively non-unique individuals.

In contrast, clones resulting from technically assisted reproduction would probably not face this convergence of standardizing forces. They might not, and probably would not, be strictly genetically identical (e.g., they could easily not share the same mitochondrial DNA); they probably would not have the same gestational mother at the same time and circumstances in her body, and they could be raised temporally and spatially apart from their 'siblings.' The point here is that if cloning is morally objectionable because it would produce non-unique human beings, then it must be the case that identical twins are either 1) less morally valuable or 2) somehow worse off than the rest of us.

Before we consider the defensibility of these two claims, we should pause and reconsider the analogy that I am drawing between technologically assisted clones and natural ones. My claim is that if there is a serious threat to non-uniqueness worthy of our moral attention, it seems to point more to natural rather than technically assisted clones. Even if someone accepts this argument, however, it might still be pointed out that, setting aside differences in the technical methods involved in cloning (for reasons that I have set out above), a significant moral difference between these two cases still remains. Whereas the production of non-unique genomes in technically assisted cloning would be intentional and deliberate, in most cases of natural twinning it is not. Moreover, it seems that in many contexts we do right by accepting circumstances as we find them, but it would often be clearly wrong to set out to bring about such circumstances. Thus the analogy that I want to draw between technically assisted and natural clones (twins) fails because there is a relevant moral difference between these two cases: intentionality.

This objection, however, really does not point to a significant disanalogy. The problem is that intentionality and deliberateness do not, *on their own*, add any moral significance. The only way that they could would be if natural twins either possessed a different moral status or are somehow worse off than genetically unique individuals — i.e., only if either option 1) or 2) above is true. If the two cases are otherwise morally similar, then intentionality points to no important moral difference between them.

To clarify this argument further, consider a similar analogy. Imagine two situations, one of a couple who, through no avoidable fault, awareness or intention of their own, have a child with a severely disabling genetic disease, and another of a couple who, by clear intentional means (say by direct genetic manipulation of an embryo), set out to have a child with the same disease. We probably would want to say that the former couple has not done anything wrong, but the latter arguably has. But the mere fact that in the latter case the action is intentional adds no moral weight unless it is already true that the disease

makes either child somehow worse off than healthy individuals. If all else is equal between two cases like this, it is simply unclear what makes intentionality morally significant. Intentionality is morally significant only if there is an intention to do something that is *otherwise* morally good or bad, right or wrong. The analogy, therefore, between natural and technically assisted clones stands up.

We are left, then, with suggestions 1) and 2). If twins are somehow morally worse off than the rest of us, we need to be shown exactly what it is that twins are deprived of and its moral nature needs to be explained. It is very difficult to accept that twins are deprived of something essentially related to their inherent moral value as persons. And it does not seem any more obvious that in not being biologically unique twins are made worse off.

It might be suggested that they are psychologically damaged in some way because of their biological non-uniqueness. But evaluations of the 'similarity' of twins are often psychologically and morally ambivalent. In many cases this similarity can be an *advantage* in that they can share an enviable sense of empathy and human relatedness. Given this ambivalence, it is not clear how one could strongly maintain that non-uniqueness is objectionable, something to be avoided as a matter of moral principle.

It could be simply denied, of course, that twins or triplets are morally worse off than the rest of us. But if the defender of the argument from uniqueness were to do this, she would have to claim something like the following: Twins, although biologically identical, have not been wronged or are not worse off than people who are unique *and* being non-unique is morally worse than being unique. This is, of course, inconsistent. To address this inconsistency she might claim that what is wrong here has nothing to do with the twins, their state of mind, or even their state of being, but (again) with someone else's *intention* to create biologically non-unique individuals. But now it is just not clear what work the appeal to non-uniqueness is doing in the overall argument. If there is nothing wrong with (the fact of) non-uniqueness itself, it is not clear why intending to do it would be wrong. That is, it is not obvious how some action or state of affairs, X, could *never* be bad (either instrumentally or intrinsically), whereas intending to do X or to bring about X, would *always* be wrong or bad. As a result of this problem, I see no sound way for someone to defend both a) the claim that twins are not worse off than the rest of us in being non-unique and b) the claim that non-uniqueness for clones is morally bad.

Cloning may diminish the cloned person's subjective sense of uniqueness, but no more, perhaps, than an adopted child's sense of alienation when she is totally genetically unrelated to her (social) parents. The threat of this sense of alienation and lack of self-identity — and I admit it can often be very real and painful — do not seem to be any more sufficient reasons for arguing against adoption than is the risk of a lack of sense of uniqueness which might arise in a person who is totally unrelated (genetically) to her mother.

Adoption, of course, is not strictly analogous to the decision to clone. Adoption is the best solution to an apparently much worse situation — i.e., being raised without a deep, lasting relationship with at least one adult guardian. As such, the risk of self-alienation may be worth taking because the alternative is much worse. Cloning, on the other hand, is not the solution to a graver outcome. The alternatives are either not being born or parents not having genetically related children — neither of which seems nearly as bad as a child going through her childhood without a relationship to a loving and committed guardian (or guardians). But this difference does not seem important. At least it does not

take away from my claim that the risk of feeling non-unique is no more morally decisive against cloning than is the risk of feeling alienated in adoption.

It is also worth stressing that, as the practice of adoption shows, the relation of father or mother and child is also a profoundly *social* relation; it cannot be reduced merely to biological relations. There seems to be no compulsion for a child who is a clone of the person who has raised her to understand or interpret that relation as a sibling one. And it is not clear that the cloned individual, like any other natural twin, needs to see her individuality as importantly connected to her genome, or even to phenotypic similarities with others. Furthermore, there is some evidence that identical twins separated from birth tend to show comparatively more divergent personalities and behaviours than twins who are not separated [18]. It seems reasonable, then, to believe that identical twins separated by temporal distance will show even more differences. Hence a psychological sense of uniqueness may not be seriously threatened. All of the differences implied in temporal distance would probably give rise to sufficient grounds for a feeling of difference. Thus it seems that the claim about felt identity being psychologically damaging is not very plausible.

The argument that I have just made, however, is an empirically based one, and I could simply be wrong about the relevant facts. Even if this kind of negative feeling with regard to one's individuality could arise, it still does not seem that it *must* arise, nor that if it does arise, it raises serious moral concerns in relation to the basic value of persons. This lack of necessity is morally relevant because in the case of most adults it is the individual him/herself who is probably best seen as the person who takes some final sense of responsibility for self-understanding and self-development. Where this is not an appropriate allocation of responsibility, this is usually due to the way that the individuals have been raised by their parents or guardians. Parents can, and often do, raise genetically non-identical children to be and appear like other persons. There is surely no need to clone someone in order to threaten his feeling of uniqueness and individuality. A parent, then, who is acting as I would suggest a good parent should, will address this issue, and will encourage difference and individuality.

Suppose, however, that a cloned child has all of these environmental counterbalances in place and still comes to feel non-unique. It is again not clear that this consequence finally renders cloning immoral. The problem now is that whatever the foundation of an individual's inherent moral worth is, it surely must not rest importantly on being genetically different from other people. If it did, then the disparate value of twins problem that I have just been discussing resurfaces. Since there seems to be every reason, intuitively at least, to regard twins as possessing equal moral status or value as the rest of us, we should reject the idea that there is anything of any great moral import to be found in possessing different or unique genomes (or perhaps even unique phenotypes). So if I am right about the ground of inherent moral worth, duplicating a person's genome (or phenotype) cannot morally violate or affront that worth.

We have seen that even a philosopher with Kantian convictions, who values the role of moral principle to a high degree, might not object to cloning, since he or she would find inherent moral worth in the possession of rational agency. Surely clones would have this in spite of their biological identity. Someone defending the uniqueness objection, however, could put forward a non-Kantian notion of rationality, something much less formal or abstract. Perhaps, to connect back to the manufacturing objection, the claim could be made that a non-unique genome imposes limitations on an individual's capacity

for self-development, leading to a sense of disempowerment, and personal inadequacy. It would be odd, however, to suggest that inherent human worth is somehow connected to being born without these limitations. Whether I have this sense of empowerment or not, it seems that it should never diminish my claim for others to respect my value as a person. Forms of social oppression usually have the effect of diminishing self-respect or self-empowerment in their victims which seriously impedes their own self- and social development. But, again, this fact should never detract from their abstract moral worth [19]. Thus it would provide no good reasons for treating a person lacking this self-empowerment badly, nor for holding that such persons should not be born simply because they will come to lack this quality.

Conclusion

It is understandable why individual uniqueness might be seen as morally significant. It certainly seems *biologically* important. Evolution by natural selection benefits considerably from individual genetic diversity, and sexual reproduction by and large ensures that this diversity will continue. Hence, given this biological norm, and the role that it has played in our own evolutionary history, it seems understandable why we might see moral significance in it. This may equally explain why many people are disturbed by the prospect of human clones, and for that matter, why we are in awe of twins, triplets, and so on. But claiming that individual uniqueness is of paramount moral importance is another matter entirely, and we have seen that it does not present much philosophical promise as a way of soundly articulating moral concerns about human cloning.

The argument that I have defended here should never provide a defence for further research and experimentation into the prospects of cloning. It is important to stress this point since it might seem like a very easy step from the argument that some particular activity is not wrong in itself to the argument that it is at least not impermissible to try to realise it. This is a misguided assumption, however, for two main reasons. First, it should be obvious that merely showing that something is not intrinsically wrong goes nowhere to show that it would not have morally bad consequences, and if it were readily available, that it would not provide some people with what Ruth Macklin has described as a tremendous 'opportunity for mischief'.

The second reason is that the research or clinical procedures necessary to provide any opportunities to clone human genomes could simply be immoral. This seems to be the case with human cloning at the present time — especially if the procedure under consideration is nuclear transfer using somatic cell nuclei. The Roslin experiment was so dreadfully inefficient that an attempt to try the same procedure on humans would almost certainly raise very serious moral questions. Ian Wilmut and his colleagues began with 434 eggs — many times the number of eggs in a ewe's lifetime ovulation. Fusion with the DNA from somatic cells was successful only 277 times. Worse still, only 29 of these transfers divided sufficiently for implantation. And of these 29, only 13 were implanted in ewes. Only *one* of these ewes became pregnant and then gave birth to the only successful clone.

Now since domestic animals are much more fertile than humans — perhaps three or four times — it would follow that about 1,200 to 1,500 human eggs would be needed to conduct a similar experiment in humans — several times more than a woman's entire lifetime supply. Furthermore, the procedure would probably require that about 50

women should be willing to be impregnated and possibly give birth at a very high rate of implantation failure and miscarriage [20]. These estimates assume, of course, that there would be no species-specific obstacles in using the Roslin procedure in humans. But there have been such problems. In 1981, Karl Illmensee and Peter Hoppe cloned mice by nuclear transfer [21]. For reasons that are not really understood, other scientists have had considerable difficulties reproducing this experiment. It is widely believed, however, that there is something specific in the reproductive cycle in mice that has prevented the widespread cloning of mice by nuclear transfer. Similar problems might arise if the procedure were tried in humans, resulting in a much more severe rate of pregnancy failure, and of increased health risks for either the mothers involved or the individuals who were cloned.

My point is that these, and many other issues, pose questions about risk assessments which, it seems to me, would never be outweighed by the argument that I have presented above. Thus it would simply be a misuse of my argument to suggest that it in any way implies that research on humans would be justified. Rather, the argument assumes a counterfactual context in which there are no serious risks attending to the procedure of nuclear transfer itself. The counter-factuality of this procedure, however, may not always be present. Sadly, in my view, scientific research proceeds without anywhere near the same moral reservations in its use of non-human animals as with human experimentation. It could well be that the gap between the applicability of this procedure in animals and humans could narrow severely through research conducted on non-human animals, even primates. There is currently a considerable interest in promoting this sort of research in non-human animals in order to produce genetically engineered pharmaceuticals and even organs for human benefit. Indeed, this, and the commercial benefits likely to follow from such discoveries, are the main reasons why the Roslin Institute conducted its experiment in the first place. If so, the possibility of developing this sort of technique through experiments in humans may not present as many difficulties as it now seems to. If I am right about the argument presented above, however, only harm or other consequentialist considerations should give us reasons for moral pause on this issue.

Acknowledgements

I am grateful to Phil Gosselin, Stephen Clark, and one of the reviewers for this journal for helpful comments on earlier versions of this paper. I am particularly indebted to Eldon Soifer for detailed written comments and lengthy discussions about the issues raised in this paper.

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NOTES

[1] See Ian Wilmut et al. (1997) Viable offspring derived from fetal and adult mammalian cells, *Nature*, 385, 27 February, pp. 810–813, and K. H. S. Campbell et al. (1996) Sheep cloned by nuclear transfer from a cultured cell line, *Nature*, 380, 7 March, pp. 64–66. I will use the term 'cloning' in this paper to refer exclusively to human cloning.

[2] See Meredith Wadman (1997) White House bill would ban human cloning, *Nature*, 387, 12 June, p. 644.

[3] Bill C-47 'An act respecting human reproductive technologies and commercial transactions relating to human reproduction.' The Bill, which did not pass, proposed to make it illegal, on a maximal fine of $500,000 or 10 years (or both), to 'manipulate an ovum, zygote or embryo for the purpose of producing a zygote or embryo that contains the same genetic information as a living or deceased human being or a zygote or embryo or foetus, or implant in a woman a zygote or embryo so produced' (section 4.1a).

[4] See DECLAN BUTLER (1997) European ethics advisers back cloning ban, *Nature*, 387, 5 June, p. 536, and ROBIN HERMAN (1997) European Bioethics Panel Denounces Human Cloning, *The Washington Post*, 10 June, p. Z19. An interesting exception to this is Australia, where the Infertility (Medical Procedures) Act (Victoria) passed restrictive legislation much earlier (1984) than many other countries. This Australian legislation, it seems, was the product of a similar flurry of concern about technological developments in the late 1970's surrounding the success of in vitro fertilisation techniques. For more about this legislation see MARGARET BRUMBY and PASCAL KASIMBA (1970) When Is Cloning Lawful? *Journal of In Vitro Fertilization and Embryo Transfer*, 4, pp. 198–204. See also PETER SINGER and DEANE WELLS (1985) *Making Babies: The New Science and Ethics of Conception* (New York, Scribner) pp. 146–149 for discussion of an important background report on which this legislation was based. In 1990, Britain introduced legislation (the Human Fertilization and Embryology Act) which ostensibly banned human cloning. But there have been concerns raised about whether this law forbids cloning only human embryos, and if so, whether it would thereby allow cloning adults by nuclear transfer as per the Roslin experiment, since such a procedure does not initially involve manipulating embryos. For more on this see EHSAN MASOOD (1997) Cloning technique 'reveals legal loophole', *Nature*, 385, 27 February, p. 757.

[5] I will use terms like 'duplicate' and 'copy' throughout this paper in terms of the two qualifications that I have just noted in the previous sentence.

[6] See *A Dictionary of Biology* (New York, Oxford University Press, 1996, 3rd ed.), p. 325.

[7] For more about such matters, see RICHARD LEWONTIN (1997) The confusion over cloning, *New York Review of Books*, 23 October.

[8] For more about this dispute see REBECCA VOELKER (1994) A clone by any other name is still an ethical concern, *Journal of the American Medical Association*, 271, p. 331, and J. COHEN and GILES TOMPKIN (1994) The science, fiction, and reality of embryo cloning, *Kennedy Institute of Ethics Journal*, 4, p. 194.

[9] See J. L. HALL et al. (1993) Experimental cloning of human polypoid embryos using an artificial zona pellucida, The American Fertility Society conjointly with the Canadian Fertility and Andrology Society, Program Supplement, Abstracts of the Scientific Oral and Poster Sessions, Abstract 0–001, S1.

[10] For more on this see National Advisory Board on Ethics in Reproduction [NABER] (1994) Report on human cloning through embryo splitting: an amber light, *Kennedy Institute of Ethics Journal*, 4, p. 252.

[11] An exception to this might be where several blastomeres are produced by separation and then cryopreserved for possible implantation after one of them has developed to a stage where distinct features can be observed and expected. But even here the initial decision to clone by blastomere separation must still be done in the absence of detailed phenotypic information. And this decision would have to be aligned with the decision whether to discontinue cryopreservation or to implant the embryo.

[12] (1970) *Fabricated Man: The ethics of genetic control* (New Haven, Yale University Press) p. 88.

[13] Quoted in JEFFREY KLUGER (1997) Will we follow the sheep? *Time*, 10 March, p. 40.

[14] (1971) Ethical aspects of genetic control, *New England Journal of Medicine*, 285, pp. 780–781.

[15] (1993) Perspective on cloning: a threat to individual uniqueness; an attempt to aid childless couples by engineered conceptions could transform the idea of human identity, *Los Angeles Times*, 12 November, p. B7.

[16] (1993) *Groundwork for the Metaphysics of Morals*, trans. James W. Ellington, (Indianapolis, Hackett), p. 41 (436, Academy pagination).

[17] This point is stressed by STEPHEN JAY GOULD (1997) Individuality: cloning and the discomfiting case of Siamese twins, *The Sciences*, 37, September/October, p. 16.

[18] For more about this see RICHARD C. LEWONTIN (1982) *Human Diversity* (New York, Scientific American Library).

[19] I do not intend to suggest here that moral worth should be seen as an exclusively abstract, objective property of persons, and never a subjectively felt or valued empowerment. I only intend to commit myself to the view that an account of moral worth or value should be at least *in part* objective and abstract.

[20] The numbers in this, and the previous, sentence are from STEPHEN STRAUSS (1997) Hello Dolly, it's so good to see you, *Globe and Mail*, 1 March, p. A5.

[21] See JEAN L. MARX (1981) Three mice 'cloned' in Switzerland, *Science*, 211, p. 375–376.