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The Identity of Clones

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ABSTRACT

A common concern with respect to cloning is based on the belief that cloning produces identical individuals. This is a fundamental misunderstanding of what type of identity-relation cloning involves. The concept "identity" is ambiguous, and the statement that cloning produces "identical" individuals is not meaningful unless the notion of identity is clarified. This paper distinguishes between numerical and qualitative; relational and intrinsic; logical and empirical identity, and discusses the empirical individuation of clones in terms of genetics, physiology, perception, cognition and personality. I argue that the only relation of identity cloning involves is qualitative, intrinsic and empirical: *genetic indiscernibility*, unlikely to include identity under other aspects mentioned. A popular argument against cloning claims our "right" to a "unique identity". This objection either implies (absurdly) the right not to be an identical twin, or assumes (incorrectly) that cloning involves identity other than genetic. Either way, the argument is untenable.

Key words: cloning, identity, indiscernibility, individuation, uniqueness.

I. THE NOTION OF IDENTITY

Ever since a group of British embryologists, headed by Ian Wilmut, published an article revealing that they had succeeded in cloning a mammal, a sheep called Dolly (1997), there has been a heated debate amongst scientists, politicians and the general public about whether or not cloning should be allowed. One of the most frequently expressed worries with respect to cloning, in particular to the possibility of cloning human beings, is that it would produce "xerox copies" of living organisms, identical creatures, and, fearfully, one envisions an army of indistinguishable individuals: *homo xerox*. Yet what this means, what this alleged relation of "identity" amounts to is often left unspecified.

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This concern is based on a misunderstanding of the type of identity-relation which cloning involves: it is based on the false belief that cloning produces individuals that are totally identical, physically as well as mentally. The image of cloning as a way to produce armies of identical individuals will appear unreal and lose its power once the true nature of cloning has been understood.

From a philosophical point of view, the assumption that cloning would produce "identical individuals" is not immediately intelligible. The concept "identity" is ambiguous; accordingly, the statement that a cloned organism is "identical" to another organism will neither be meaningful nor informative until the notion of identity has been clarified.

A classical philosophical distinction differentiates *numerical* identity (the number which a given object instantiates) from *qualitative* identity (the qualities which the object instantiates). An old query is whether qualitative identity entails numerical identity: can objects which have all their properties in common be numerically distinct? Or must "indiscernibles" (qualitatively identical objects) be numerically identical? A related question is whether numerical identity entails qualitative identity: need "identicals" (numerically identical objects) also be indiscernible?

Leibniz (1686) raised both these questions, and in response to them he formulated what has since been known as *Leibniz's Law*. This is really two laws, two logical principles of identity, which can be described as follows (Evers, 1991, p. 120):

> That is Leibniz' principle of the *identity of indiscernibles*: if x and y have all their properties in common, then x and y are identical…whatever property A possesses is possessed by whatever is identical to A…if x and y are identical, then, by Leibniz' law of the *indiscernibility of identicals*, x and y have all their properties in common. In a formulation without plural terms: *whatever holds of A* (whatever is true of A, whatever property A possesses) *holds of* (is true of, is a property of) *whatever is identical to A.*

When talking about qualitative identity as a relation between distinct objects, I shall henceforth use the term "indiscernibility," for it is more natural than "qualitative identity" and invites less confusion with numerical identity.

The proposition under analysis is,

P: A clone is an organism that is identical to another organism.

Two organisms are mentioned in P, hence numerical identity is not assert-

ed. Thus the alleged identity must be of a qualitative kind. In other words: P assumes *the indiscernibility of clones*.

But "indiscernibility" in what sense? By Leibniz's Law it is not possible for two things to differ numerically only, there must be a qualitative distinction between them. Distinct objects must have some feature which the other does not possess, by virtue of which they are distinct. Accordingly, *clones cannot be strictly indiscernible*.

Nor are they. Clones are living organisms occupying a unique place in space and time. Their lives form unique spatio-temporal sequences, and by virtue thereof every clone has a part of its identity which nothing else can possibly share. The belief that clones are indiscernible must consequently be given a more modest interpretation.

This naturally introduces another distinction separating *relational* from *intrinsic* properties. Relational properties an object possesses in relation to something other than itself, they constitute its identity relative to its environment. The intrinsic properties of an object are those which it possesses independently of other things, they form the object's identity in itself. It is easily seen that *clones cannot be indiscernible in all their relational properties*: by virtue of being spatio-temporally distinct, they necessarily differ relative to their environments. Every spatio-temporal object has a unique identity in relation to its environment. The numerical distinction of clones entails their qualitative distinction with respect to their relational properties, and the question can accordingly be further specified: *are clones intrinsically indiscernible?*

This question can be understood either logically, or empirically. By a logical reading, it would ask about the logical properties of the clone, its logical identity. There is only one logical feature that a material object must possess, and that is *self-identity*: every object must be identical to itself. That, however, is tautological, hardly a matter of controversy. The question should consequently be read empirically.

Thus far, we have reached the logical conclusions that the identity of clones that P assumes is (a) qualitative and (b) intrinsic. We now add that it is (c) empirical.

The properties which an object possesses as a matter of *fact* constitute its empirical identity. This is where the heart of this controversy over clones lies. The relation of identity which worries some people with respect to the possibility of cloning (above all, human beings) is not primarily a logical relation but a factual one: they are concerned that the clone will be empirically identical to another.

The term "individuation" will here be used as a synonym to "empirical identity" (that which empirically individuates an object from everything

else). The question "Are clones intrinsically indiscernible?" is reformulated in less technical language: *does the clone have any properties in itself that individuate it from all other organisms?*

II. ASPECTS OF INDIVIDUATION

How are organisms individuated? This question arises within numerous perspectives. We shall focus on aspects of genetics, physiology, perception, cognition, and personality.

(a) *Genetic individuation*. Most organisms can be individuated by their genetic structure. A clone, in contrast, is supposedly *genetically indiscernible* from another organism. In the cloning process, the genetic material (the DNA) of an egg is replaced by the DNA of another organism. The resulting organism — the clone — is an almost exact genetic copy of the DNA-donor (and of other clones derivative of the same source of donor cells). They are not perfect copies: clones will never be completely genetically identical because mitochondrial DNA, which accounts for approximately 1% of the DNA in the cell, will be distinctive (e.g., Gottfried Brem, 1997). Sperm are superfluous in the context, and in so far as the cloned organism grows in and is born from a womb, it inherits few genetic properties from that female. The DNA-donor (male or female) determines most of the clone's genetic properties. Genetically indiscernible organisms exist already in nature as so-called "identical" twins (about 1.5% of all births are of twins).

It has been pointed out (e.g., Feinsilber, 1997) that genes can change, and thus reduce the similarity between the donor and the clone, or between distinct clones: "genes take a beating going through life, and that damage could make the clone a different person." Even so, it would seem that the donor at the moment of donation, and the clone(s) at the moment of birth (or conception) are indeed genetically very similar. Nevertheless, they will be discernible irrespective of their genetic resemblance, since, by Leibniz's Law, entities with at least one property not in common are discernible.

But how similar will a clone and a DNA-donor, or distinct clones derived from the same source of donor cells, be *beyond* their genetic structures?

Who, or what, someone or something is, is a far more complex subject than mere genetics. Ian Wilmut (1997) strongly emphasises that an individual is made up of a lot more than genes, and that genes only decide limited aspects of the individual's nature. Likewise, Ruth Hubbard writes:

> Dolly is not a true copy, or clone, of the original ewe. True, Dolly has the same DNA (or genes) in the nucleus of her cells. But, although embryologists have a way of forgetting it, an egg is not an empty bag containing nothing but a neucleus, transplanted or not. Eggs also contain structural and metabolic equipment, including a complement of extraneuclear DNA specific to that individual. The second ewe did not contribute her nucleus, but she did contribute the rest of the contents of her egg. The reconstituted egg was then gestated in the uterus of yet another ewe. Dolly is, indeed, a nuclear DNA clone, but there is more to life than DNA, even for sheep.

There is more to life than DNA: a comforting thought realistically expressed. On closer examination we shall find that this "extra" denotes a good part of what we normally refer to when speaking about someone's "identity": her physiology, experiences, memories, thoughts, feelings, and personality.

(b) *Physiological individuation*. An organism's genetic structure partly determines its physiology, at least at the moment of conception and (unless the environment has altered things in the meantime) birth. However, just as there is more to life than DNA, there is more to our physiology than our DNA is able to determine. Our physiology is profoundly influenced by our environment and by our experiences, already in the womb. Every minor event influences the future individual.

Clones need not resemble one another any more than twins do, and twins — even the so-called "identical" ones — can exhibit impressive dissimilarities. They *must*, as a matter of fact, differ inasmuch as their environments and experiences do; notably, in terms of physiology and character. The actual neurological structure of their brains will also be distinguishable because neurological development is in part a function of experience.

In the cloning-debate, it has often been pointed out that twins live in more similar surroundings than the clone and "its" DNA-donor, for (unlike twins) the clone and the DNA-donor are born in different wombs, at different times, and, accordingly, in radically different environments. Consequently, it is highly probable that they resemble one another far *less* than twins do. As Ruth Hubbard (1997) points out:

> …the donor of the neucleus and the "cloned" baby would be related less closely than so-called identical twins, because such twins develop from the same egg and are gestated simultaneously by the same woman.

Distinct individuals derivative of a single source of donor cells could likewise develop in profoundly dissimilar circumstances, and therefore resemble one another far less than twins.

There is a general argument that goes to show how, independently of genetic facts, spatio-temporally distinct organisms must have different physiology and different experiences because they live in different worlds (or within different perspectives in the same world). Every living organism occupies a unique location in space and time; each life constitutes a unique spatio-temporal sequence. This makes individual experience unique and, strictly speaking, impossible to share. A person can tell another about her experiences, but the other can never *live* them, being "bound" elsewhere, imprisoned in another spatio-temporal region, and therefore unable to view the first person's perspective from within. These differences grow with time, as the organism "grows into" its perspective and develops an individuality in this mold. It follows, that even genetically indiscernible individuals must differ physiologically already by virtue of their spatio-temporal uniqueness — assuming that their life is long enough for them to be influenced by, or experience their environment. (The necessity asserted here is empirical, not logical. It is logically possible to imagine distinct organisms existing in a vacuum without anything around to influence them, or for them to experience in essentially distinct ways; or perhaps a machine that would enable one to live the experiences of another; however, such possibilities are remote from our present context.)

Above we concluded (logically, abstractly) that numerical distinction entails qualitative distinction. We may now conclude by the same principle (though empirically, concretely) that spatio-temporal distinction (numerical) distinction entails physiological (qualitative) distinction. In other words: complete physiological identity cannot exist between spatio-temporally distinct individuals, regardless of their genetic structure.

(c) *Perceptual and cognitive individuation.* Two individuals who are born at different times in different places will have different experiences, upbringing, education, etc. and will consequently think and feel differently. This is the situation with respect to the clone(s) and the DNA-donor: typically, they (unlike the twins) share neither womb, upbringing, nor era. The DNA-donor has experiences, knowledge, memories, etc., which are not transmitted to the clone, who will instead in due course acquire its own experiences that are not necessarily similar. Even if genetically indiscernible individuals (whether they be twins, clones with the same source of donor cells, or clone and DNA-donor) are born simultaneously from the same womb and grow up together, their spatio-temporal distinction will entail perceptual and cognitive variations by the general argument stated

above. There is only so much that the DNA is able to determine, and judging by the studies that have been made of "identical" twins, the genetic influence is insufficient to warrant an assertion of indiscernibility in terms of perceptual and cognitive experience. The divergences will be comparable in the case of distinct clones with the same DNA-donor who are born and grow up together, and they will be far more pronounced in the relation between a clone and her/his DNA-donor, if (which is typically, though not necessarily, the case) they grow up in radically different environments.

(d) *Personality*. If the shared identity of genetically indiscernible individuals is neither physiological, perceptual, nor cognitive, these individuals will also have a personality of their own. Our personality is not totally genetically determined but also a result of our environment: upbringing, education, culture, era, and so forth. Twins are known to have different personalities, and clones with the same genetic origin need not have more in common. Indeed, they may well have less in common, if, say, they do not grow up together but in different environments in which they are likely to develop individual ideas and attitudes and form a personality of their own. The generation gap that would typically exist between the clone and the DNA-donor would certainly exclude their having indiscernible personalities.

The alleged — and feared — indiscernibility of clones has turned out to have definite limits: far from being xerox-copies replicated in desired numbers, clones are, like everyone else, creatures with unique physiology, experiences and personality (ideas, views, feelings, knowledge, memories, etc.). Only their DNA is approximately the same as their DNA-donor's (and possibly as other clones', if several clones have been produced with the same DNA-donor).

Is that really something to worry about? Might not the *social* "cloning" that we experience every day be more dangerous, albeit less conspicuously so? All over the world people are "taught" (more or less forcibly) to behave according to set norms, eat a certain type of food, watch the same television programs, dress alike, think and feel alike, or at least try to appear as if they do and hide the most pronounced individuality. Numerous countries are governed by a homogenous class of people who come from similar backgrounds and have the same type of education where they have learned similar ideas and values, etc. May not such social factors produce even greater similarities between individuals than genetic cloning? The social *homo xerox* is with us already – might not this give us still more cause for concern?

III. THE "RIGHT TO A UNIQUE IDENTITY" ARGUMENT

The idea deliberately to produce genetic copies of human beings strikes some people as being "unnatural." A common objection to cloning asserts that cloning is "unnatural," and that it should therefore not be pursued. But what is meant by "unnatural" here, and on what grounds should the unnatural be rejected?

Gorovitz (1982, p. 171) distinguishes between three senses in which "an action or process can be said to be natural:" (1) conformity to the laws of nature, (2) freedom from human intervention, and (3) conformity to some natural moral law. Cloning cannot possibly be unnatural in the first sense, because "*everything* we do or could do — the good and bad alike — is natural in this sense." We are part of nature and cannot but comply with its laws. In contrast, cloning cannot *fail* to be unnatural in the second sense: "*nothing* we do is natural in this sense, for our action is itself a mark of the unnatural." Trivially, cloning is, like any other human activity, unnatural by virtue of *being* a human activity. That by itself provides no basis for rejection. We interfere dramatically with the "natural" course of events when we use contraception, artificially inseminate, abort, and so on. All human societies are *based* on endeavors to control and often counter-work human nature, and medical science (notably) continually struggles to counter-act nature by curing illness, preventing disease, etc. This is, admittedly, not natural (in the second sense), but few would criticize it for that reason. To object that cloning is wrong because it involves human interference is accordingly misconceived. Consequently, if the objection is to carry any weight we must assume the third interpretation, by which cloning should fail to conform to some natural moral law. But this is a notoriously opaque argument: the existence and contents of such an alleged law would have to be established. Its existence is not self-evident, and *prima facie* cloning could just as well agree with as violate a natural moral law. In other words, cloning could be *either* natural *or* unnatural by conforming (or failing to conform) to some natural moral law, the existence of which remains to be proven.

In this light, arguing either for or against cloning by appealing to what is "natural" does not seem promising. The objection that cloning is "unnatural" in some morally objectionable way appears to be either false, misconceived, or obscure.

Lee Silver (1997) quotes an argument with reference to Daniel Callahan, which suggests that "engineering someone's entire genetic make-up would compromise his or her right to a unique identity,", a belief which Dorothy Wertz (1997) labels "genetic essentialism." Werz objects:

> Actually, we are far more than our genes. Nature clones people all the time, and rather frequently. One in 67 births is a twin. Ask any twin if he or she is an individual or a carbon copy of someone else…Cloned children would likely be even more different from their parents than twins are from each other, because the cloned child would be raised in a different historical period. The argument that cloning robs people of their individuality therefore does not hold…

Silver raises a similar objection: "But no such right has been granted by nature — identical twins are born every day as natural clones of each other." I agree. The argument of genetic essentialism can only escape the absurd implication that we have a right not to be identical twins by making the false assumption that cloning involves some stronger form of identity-relation, which would comprise the alleged right to a unique identity in a way which being an identical twin would not. This, however, is a mistaken belief about the kind of identity-relation that might exist between the clone and the DNA-donor; a misconceived view on the identity of clones.

IV. CONCLUSION

With scientific progress, new and unfamiliar situations continually emerge, creating circumstances in which our traditional concepts (for example, of truth, reality, space-time, mind, human nature and morality) are called into question. Classical notions may no longer seem applicable to reality by the new descriptions offered, and our habitual, accustomed attitudes or ways of life may come to appear threatened. There is often a dramatic tension between "good" and "bad" uses of new scientific concepts, theories and methods; as well as the notoriously tricky problem of deciding who is to determine what is good or bad: scientists? politicians? the general public? This is nowhere more apparent than in the advance of biotechnology.

The standard account is that cloning outstrips our moral sensibility and judgment. However, I have here shown that our philosophical tools and sensibilities are decisively not inapplicable to new scientific advances. Indeed, an important part of the conceptual apparatus that we need to address cloning comes to us from 17th century philosophy: Leibniz's Law. Hence, to this extent, the standard account is just wrong.

Mammal cloning is a relative new-comer in the scientific arena, and it will take time before its nature and implications are fully grasped. There are a number of risks involved, abuses of various kinds; a possibility that is dangerously present in all human affairs. (One unattractive "use" sug-

gested is the production of brain-dead clones to provide spare human parts.)

However, whether cloning is a blessing or a curse (presumably, it is both, under different aspects), it is *not* a method by which egocentric humans can duplicate themselves, nor a way of producing armies of indistinguishable individuals. Each clone would have properties that neither its DNA-donor, nor other clones with the same source of donor cells, could possibly share. This is a matter both of logic, and of empirical fact.

As a matter of logic (Leibniz's Law), entities with at least one property not in common are discernible. As a matter of fact, every individual has some unique characteristics: genetic, neurological, physiological, emotional, etc. Genetically similar individuals may have similar potentials, but how they actually come to develop their genetic material is open to variations from case to case largely due to differences between the space-time regions of their life-spans. Every human or non-human being is a unique individual, and clones are no exceptions to this rule.

There are certainly dangers accompanying cloning: social, moral, and maybe genetic, but the fact that clones are genetically very similar seems to me to be among the least of our worries.

REFERENCES

Brem, G. (1997). Presentation at the XXXVIth Meeting of the Group of Advisers on the Ethical Implications of Biotechnology, the European Commission.

Evers, K. (1991). *Plurality of Thought*, Library of Theoria, Berlings Förlag, Arlöv.

Feinsilber, M. (1997). 'Sheep boggles the human mind,' *Washington Post,* April 6.

Gorovitz, S. (1982). *Doctors Dilemmas*, Oxford University Press, India.

Hubbard, R. (1997). 'Irreplaceable ewe,' *The Nation*, March 24.

Leibniz, G.W. (1686). *Discours de Métaphysique*.

Silver, L. (1997). 'Who says Mother Nature knows best?' Focus, *The Sunday Times*, March 2.

Wertz, D. (1997). 'Cloning humans: Is it ethical?' *The Gene Letter*, Vol. 1, Issue 5, March.

Wilmut, I. et al. (1997). 'Viable offspring derived from fetal and mammalian cells,' *Nature* 385, 810–811.