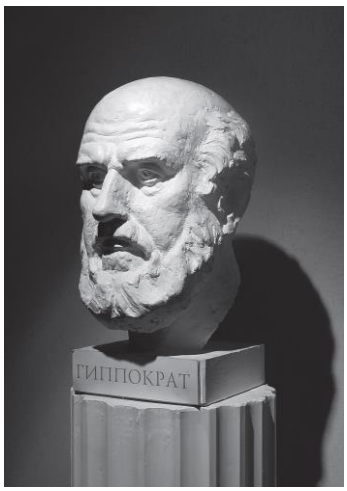

The Metaphysical Foundations of Human Cloning
Os Fundamentos Metafísicos da Clonagem Humana

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Abstract: The presuppositions upon which human reproductive cloning technology relies are examined, in order to address the debate over human uniqueness and identity, as well as dignity and flourishing. To that end, the presupposition of reductionism that animates the modern biomedical sciences is initially explored. As methodological reductionism, reductionism is important for conducting scientific research; but as ontological reductionism, it is often insufficient for interpreting the cultural or social meaning of scientific data. The distinction between methodological and ontological reductionism is necessary to address the debate surrounding reproductive cloning technology and human nature and flourishing. Scientists and others who depend upon empirical research would be better served by shifting from ontological reductionism to holism, when interpreting scientific data on human cloning in terms of their social meaning and impact on public policy.

Resumo: As pressuposições sobre as quais se apoia a tecnologia de clonagem reprodutiva humana são examinadas com o intuito de abordar o debate acerca da unicidade e da identidade humanas, assim como da dignidade e do desenvolvimento humano. Para tal fim, a pressuposição reducionista que anima as ciências biomédicas modernas é inicialmente explorada. Em sua forma metodológica, o reducionismo é importante para conduzir a experimentação científica; mas em sua forma ontológica, frequentemente é insuficiente para interpretar os significados sociais e culturais das informações científicas. A distinção entre reducionismo metodológico e ontológico é necessária para abordar o debate acerca da tecnologia de clonagem reprodutiva humana e a natureza e desenvolvimento humanos. Cientistas e outros que dependem da pesquisa empírica seriam mais bem servidos se trocassem o reducionismo ontológico pelo holismo quando interpretam dados científicos sobre clonagem humana em termos de significação social e impacto sobre políticas públicas de saúde.

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ANGOTTI NETO, Hélio (org.). ***Mirabilia Medicinæ 2*** *(2014/1).*
Os Fundamentos da Bioética
The Foundations of Bioethics
Los Fundamentos de la Bioética
Jan-Jun 2014/ISSN 1676-5818

Keywords: Holism – Human cloning – Methodological reductionism – Ontological reductionism – Reproductive technology.

Palavras-chave: Holismo – Clonagem Humana – Reducionismo Metodológico – Reducionismo Ontológico – Tecnologia Reprodutiva.

RECEBIDO: 23.05.2014
APROVADO: 29.05.2014

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I. Introduction

Although the ethical issues of human cloning are discussed and debated extensively, its metaphysical foundations are addressed only minimally—if at all. What is meant by metaphysical foundations is what R.G. Collingwood calls the presuppositions that motivate questions about the world. Collingwood divides presuppositions into relative and absolute.[2] Relative presuppositions are the background assumptions both for asking questions under one set of conditions and for answering them under another set, whereas absolute presuppositions are the background assumptions for asking questions but not for answering them.

He illustrates relative presuppositions with the notion of measurement, which presupposes that a phenomenon or object can be measured quantitatively (background assumption to asking a question) and that the measurement is accurate and reliable (background assumption to answering a question). For absolute presuppositions, he offers the example of Newton and his followers, who could only presuppose that some events cause others. Importantly, for Collingwood the logical efficacy of an absolute presupposition, i.e. its ability to engender questions about the world, is independent of its truth-value; rather, that efficacy depends upon its being supposed.

In order to address the issue of human uniqueness and identity, as well as dignity and other issues—including the moral status of the embryo, beneficence and malfeasance, and the value and quality of life—the presupposition motivating scientific research on human cloning is examined. To that end, reductionism—the presupposition that undergirds the modern

[2] COLLINGWOOD, Robin G. 1940. *An Essay on Metaphysics*. Oxford: Clarendon Press, 1940.

biomedical sciences—is initially explored.[3] Methodological reductionism as a presupposition is important for asking certain questions about the world and for guiding and conducting scientific research to answer them. Moreover, although ontological reductionism is important for asking questions about what constitutes the world, it is often insufficient for answering questions about the world's constitution, especially in terms of the cultural and social significance and meaning of scientific data.

This distinction between methodological and ontological reductionism is necessary to address the debate surrounding reproductive and therapeutic cloning. Scientists and others who depend upon scientific research, especially the United States President's Council on Bioethics who was responsible for the 2002 report on human cloning, would be better served by shifting from ontological reductionism to holism, when addressing questions concerning the cultural and social significance and meaning of scientific data obtained from cloning research.

II. Reductionism

A large part of the success of the contemporary biomedical sciences is founded on the presupposition of reductionism, the idea that complex phenomena can be investigated and described in terms of their basic or fundamental components or properties. The presupposition allows scientists to simplify complex phenomena and to explain them in terms of their basic components and properties. For biomedical scientists, then, the presupposition that living organisms are reducible to organs and then to tissues and cells and finally to biomacromolecules enables them to explain and treat diseases.

This type of reductionism that scientists base their practice on is methodological, i.e. it is an assumption that authorizes them to investigate natural phenomena.[4] The result of research based on methodological reductionism in the natural sciences is often the elucidation of the material and molecular mechanisms that serve as explanations of phenomena and

[3] SACHSE, Christian. *Reductionism in the Philosophy of Science*. Frankfurt: Ontos Verlag, 2007.
[4] JONES, Richard H. *Reductionism: Analysis and the Fullness of Reality*. Cranbury, NJ: Associated University Press, 2000.

permits scientists to manipulate them in a controlled fashion.[5] Moreover, these mechanistic explanations empower scientists to predict the behavior of phenomena under well-defined conditions.

Although reductionism is an important methodological assumption for the natural sciences and is responsible for much of their progress, it can often lead scientists and others astray when used as an ontological assumption or commitment to interpret scientific data, especially in terms of their cultural and social significance and meaning.[6] Specifically, ontological reductionism presumes that natural phenomena are composed only of the basic individual components and their properties. Such a reductionist perspective often yields a truncated world picture. For example, assuming ontological reductionism human behavior or even personhood is often equated with genetic makeup.[7] However, this type of reductionism in the biological sciences impoverishes the notion of human behavior and personhood and leads to disputes over the relative roles of nature and nurture in accounting for them.[8]

Ontological reductionism, then, is particularly relevant to the debate surrounding human cloning; since individuality and uniqueness—including personhood—are generally defined in terms of genetic makeup, and the moral status of the embryo often hinges on the perspective taken towards the genome or a group of cells.[9] Along with methodological reductionism, it is certainly a powerful assumption for generating and interpreting biomedical data mechanistically; however, it is often inadequate for interpreting the social and cultural meaning and significance of data generated from such research.

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[5] BECHTEL, William and ARAHAMSEN, Adele. *Explanation: A Mechanist Alternative*. Studies in History and Philosophy of Science Part C: Studies in History and Philosophy of Biological and Biomedical Sciences, 36(2), 2005, pp. 421-41; SALMON, Wesley C. *Four Decades of Scientific Explanation*. Pittsburgh, PA: University of Pittsburgh Press, 2006.

[6] BRANDON, Robert N. *Concepts and Methods in Evolutionary Biology*. Cambridge: Cambridge University Press, 1996.

[7] MONTAGUE, Gerard P. *Who am I? Who is she? A Naturalistic, Holistic, Somatic Approach to Personal Identity*. Piscataway, NJ: Transaction Books, 2012.

[8] TORCHIA, Joseph. *Exploring Personhood: An Introduction to the Philosophy of Human Nature*. Lanham, MD: Rowman & Littlefield Publishers, 2008.

[9] CHAN, Roland. 'Biological Essentialism and the Person'. In: CHAN, Mark and CHIA, Roland (eds.), *Beyond Determinism and Reductionism: Genetic Science and the Person*. Hindmarsh, SA: ATF Press, 2003, p. 171-89.

Moreover, ontological reductionism is not empirically justifiable, as is methodological reductionism; for, it represents—in Collingwoodian terms—an absolute presupposition. In the next two sections, the impact of ontological reductionism on the debate over reproductive and therapeutic cloning is examined.

III. Reproductive Cloning

In the 2002 report on human cloning, the United States President's Council on Bioethics condemned unanimously reproductive cloning on several grounds. One, if not the most important, objections listed is the cloned person's identity and individuality. According to the President's council,

> Cloned children may experience serious problems of identity both because each will be genetically virtually identical to a human being who has already lived and because the expectations for their lives may be shadowed by constant comparisons to the life of the 'original'.[10]

Although the second objection—comparison of a clone to its original—is regrettable, it is not necessarily unique to cloned individuals and pales in comparison to the first objection—identity. The first objection presents the most serious challenge to the defense of reproductive cloning. However, the objection based on identity is problematic from both biological and philosophical perspectives.

From a biological perspective, research in developmental biology demonstrates that organisms are not simply reducible to genomic DNA.[11] For example, the unfolding of the expression of an organism's genes during development depends upon environmental—particularly cytoplasmic—factors. Unique individuality and identity are not just a product of genes but also of the way those genes unfold in terms of their expression during development, not only *in utero* but also post-parturition. Certainly genetic makeup is essential for determining human identity and individuality, but it is not sufficient; rather, human identity and individuality depends upon cytoplasmic or environmental factors. Moreover, most people would not

[10] PRESIDENT'S COUNCIL ON BIOETHICS. *Human Cloning and Human Dignity: An Ethical Inquiry*. Washington, DC: President's Council on Bioethics, 2002, p. xxviii.
[11] LEWONTIN, Richard C. *The Triple Helix: Gene, Organism, and Environment*. Cambridge, MA: Harvard University Press, 2001.

question the individual uniqueness of genetically identical twins. Consequently, this reason offered by the President's council to condemn reproductive cloning is unconvincing biologically.

In addition, the argument offered by the President's council depends upon a reductionist assumption that human identity and individuality are a function simply of genetic makeup. Although assuming methodological reductionism is adequate to support recent advances in the biomedical sciences, as discussed above, this success cannot necessarily justify assuming ontological reductionism to interpret the cultural and social significance and meaning of the experimental observations and data generated with such an assumption.

Because ontological reductionism is an absolute presupposition, it is not justifiable empirically. Society ultimately decides on whether it is reasonable to make this or another assumption to determine the cultural and social significance and meaning of the experimental observations and data obtained by assuming methodological reductionism. However, part of the process for determining the reasonableness of an absolute assumption is pragmatic. Since what constitutes a human being is more than simply genetic makeup, assuming ontological reductionism is insufficient for determining the meaning and significance of cloning data. Thus, the council's report on reproductive cloning is also unconvincing from a philosophical perspective.

IV. Therapeutic Cloning

The United States President's council was divided over the issue of therapeutic cloning. The majority (10 out of 17 members) were opposed to this type of cloning for several reasons. Although these members argued that the embryo is an important stage in the development of a person, their opposition to therapeutic cloning was founded on a reduction of personhood to genetic makeup.

The majority argued that since the full complement of genetic material is present from the beginning, i.e. in the words of the council, 'the embryo's human and individual genetic identity is present from the start',[12] then full moral status must be conferred on the embryo. Yet the council admitted that the embryo is only potentially, not actually, a person. An inconsistency exists

[12] PRESIDENT'S COUNCIL ON BIOETHICS, p. 154.

in the argument for opposing therapeutic cloning grounded on an ontological reductionism that equates human personhood with the genome. However, as noted above, a person is more than simply a genome.

A significant minority (7 out of 17 members) of the United States President's council found therapeutic cloning acceptable. In the minority report, the council proposed two positions to defend this type of cloning. One of the positions affords intermediate moral status to the blastocyst, while the other confers none. To defend the position that confers no moral status for the embryo, the minority report offered the following argument,

> Because we accord no special moral status to the early-staged cloned embryo and believe it should be treated essentially like all other human cells, we believe that the moral issues involved in this research are no different from those that accompany any biomedical research.[13]

The minority report assumed ontological reductionism not to oppose but to defend therapeutic cloning. Specifically, the blastocyst is reduced to a group of cells, particularly the important inner mass cells, which are then harvested as embryonic stem cells. Obviously, a slip from methodological to ontological reductionism occurred in the report, in order to devalue the human embryo for scientific research and clinical protocols. The problem with this defense is that it depends almost completely on an arbitrary decision not to confer moral status on the embryo, as the majority report pointed out. No empirical evidence supports this position, only an ontological commitment to reductionism.

V. From Reductionism to Holism

As evident from the above discussion, ontological reductionism has contributed to the debate surrounding human cloning. To resolve the problems associated with assuming this metaphysical presupposition, I propose a shift from ontological reductionism to holism. Holism is a more suitable presupposition for interpreting the social and cultural meaning and significance of the data generated from cloning technology and for guiding public policy concerning its application to humans. Assuming ontological reductionism is prone to a slippery slope that may ultimately result in the devaluation of every stage of human development, whereas assuming holism

[13] PRESIDENT'S COUNCIL ON BIOETHICS, p. xxxii.

yields respect for these stages and results in the bestowal of dignity and value on them.[14] According to holism, properties of the whole are not reducible to its individual parts.[15] These properties are the result of a higher level of organization, as well as the environment in which the whole is embedded. Importantly, the whole does not represent simply the individual but also the society in which the individual functions and derives its moral status.

According to ontological reductionism, human uniqueness and individuality are assumed to be equated with the genome.[16] From such a commitment, reproductive cloning is generally condemned. According to a holistic perspective, the genome alone does not define human uniqueness and individuality. Although the genome is required for defining human uniqueness and individuality, it is not sufficient. Rather, human uniqueness and individuality depend also on the organizational structure composed of the individual parts and of the environment in which that structure is embedded.

Simply because two people share identical genomes does not mean that they are identical—or even virtually identical—as *persons*. Rather, individual uniqueness depends also upon a person's narrative, upon the time and place in which a person's life is lived out.[17] As evident from the uniqueness of genetically identical twins, who share the same culture and time, a cloned individual would not be simply another (or even virtual) copy of the somatic cell nucleus donor.

The President's council assumed ontological reductionism to equate personhood with the genome to oppose therapeutic cloning. Even though the council recognized that the embryo is simply a stage in the development of a person, it argued that the presence of the full complement of genetic material from conception is adequate to warrant full moral status for the embryo.

[14] MAZZOCCHI, Fulvio. *Complexity and the Reductionism–Holism Debate in Systems Biology*. Wiley Interdisciplinary Reviews: Systems Biology and Medicine, 4, 2012, p. 413-27.
[15] MARCUM, James A. *The Conceptual Foundations of Systems Biology: An Introduction*. New York: Nova Science Publishers, 2009.
[16] GAMBLE, Denise. *Potentialism and the Value of the Embryo*. Public Affairs Quarterly, 19, 2005, pp. 265-99; PETERS, Ted. *Embryonic persons in the cloning and stem cell debates*. Theology and Science, 1, 2003, p. 51-77.
[17] HOLSTEIN, James A. and GUBRIUM, Jaber F. *The Self We Live By: Narrative Identity in a Postmodern World*. New York: Oxford University Press, 2000.

However, as noted previously, this position leads to an inconsistency in its argument *vis-à-vis* the embryo's potential personhood. From a holistic perspective, the continuum of an individual's development is important but by itself, this continuum is insufficient to establish the moral worth of any one stage. Rather, from a holistic perspective the complete developmental continuum not only of the individual but also of society itself must be included before conferring full moral status of personhood on any one stage, especially on a stage that exhibits personhood only potentiality.

To apply holism competently, not only the biology of human development *vis-à-vis* therapeutic cloning must be considered but also the divergence between beneficence and malfeasance. On the one hand, use of embryonic stem cells for therapeutic purposes destroys an embryo or even kills an embryonic person. The moral gravity that underlies the potential use of therapeutic cloning cannot be ignored or marginalized. On the other hand, it may provide healing for persons with chronic diseases. From a holistic perspective, the embryo is not so much destroyed, which is too weak an evaluation of the embryo's moral worth. Moreover, an embryonic person is not so much killed, which is too strong of an evaluation of the embryo's moral worth. Rather, embryos are sacrificed for the benefit of another's health just as surplus embryos are sacrificed for the benefit of infertile couples.[18]

Of course, sacrificing a biologically mature person, i.e. one able to reproduce, or even an embryonic person for another is a serious moral occurrence in any society, but there are precedents for it. For instance, people are asked or even commanded to sacrifice themselves for their country during war, for the greater good of the community. So, would it not be helpful to think of therapeutic cloning in terms of sacrificing? May not embryonic persons be thought of being sacrificed for the greater good of a community, even though they have no direct voice in the decision?

The answer from a holistic perspective is a qualified yes—qualified in the sense that society closely regulates such sacrifice, with a sense of gratitude and reverence for the loss of the embryonic person. Such an answer maintains the value of the embryonic person and does not lead to a degradation of life as would happen if sanctioned *via* ontological reductionism. With assuming

[18] DEVOLDER, Katrien. *Creating and sacrificing embryos for stem cells*. Journal of Medical Ethics, 31, 2005, p. 366-70.

holism, the dignity of the embryonic person is not ignored or marginalized, as in assuming ontological reductionism, but is acknowledged and celebrated.

VI. Conclusion

By shifting from ontological reductionism to holism human cloning—both reproductive and therapeutic—can be justified. Nevertheless, this is not a facile or careless justification. Society is faced with difficult choices to make and limits to what can be done concerning human cloning. The overriding issue is the moral path a society wants to take. Holism, in contrast to ontological reductionism, helps it to make a better and more informed choice by assuming that human life at each stage of development is unique and worthy of dignity and respect.

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