A Biblically Informed Reflection on the Human Cloning Debate

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Preamble

Friends have asked me, "Why did you choose the topic of cloning for your faith-learning paper while knowing that the ethics of cloning is a difficult area and the science behind cloning is not within your primary sphere of academic training?" The question deserves an answer.

It is true that formal training as a biochemist, bioethicist, theologian, or biblical scholar would have better qualified me to write on the topic of the ethics of human cloning (from a Christian perspective) than my training as an physical-organic chemist. But that fact does not remove a situation in which I find myself at Eastern University.

As the faculty member within a small chemistry department who teaches organic chemistry, I also have been assigned the responsibility to teach an introductory third year course in biochemistry. This course covers an introduction to the molecular science and techniques that are used in cloning. This in turn calls for the equipping of these students with some introduction to Christian bioethics. It has been the faith-based questions about cloning technology that the students have asked, should have asked, or will ask, which challenged me to engage the risk of writing this paper.

(Note: The referencing format employed in this Faith-Learning paper is one common to the scientific literature.)

A Biblically Informed Reflection on the Human Cloning Debate

The debate about human cloning rages on. Is the cloning of human beings evil or good? Some people view human cloning as fallen humanity's attempt to access the forbidden "tree of life" via the "tree of knowledge of good and evil." Other people would argue that as part of God's sovereign intentions, God has given humanity this knowledge as progressive revelation so that humanity would participate more thoughtfully in God's continuing provision for His creation. These people might perceive a moral obligation to use this technology to battle human disease. Still others in the debate believe we need to distinguish between appropriate and inappropriate uses of cloning technology? The complexity of the debate is magnified by the technological and social contexts in which the debate lives.[1]

The convoluted human cloning debate has been impacted by government,[2-5] scientific community, media,[5] and religion.[6] The literature is teeming with conflicting ideas about the ethics of cloning technology as applied to humans. Though the debate has been positively influenced by significant scientific, bioethical and theological input, a more Biblically informed Theo-centric voice is less represented in the literature. Perhaps this is to be expected in the larger public arena of the human cloning debate, where the Bible is not widely accepted as relevant to the ethical issues of modern technology. Some debaters have no doubt avoided direct use of the Scriptures because those with whom they debate do not recognize Scripture's authority. The scarcity of published Biblically supported arguments may also be due to the fact that it is not easy to understand how scriptural principles are to guide highly technical issues. While there have been some recent efforts to directly link the relevancy of scripture to the issues of the human cloning debate,[7] the relative absence of this type of exegesis poses certain dangers.

One of these dangers is that Christians and non-Christians alike will begin to believe that the Scriptures have nothing to say on the issues associated with cloning technology. An author in a reputable ethics journal wrote the following:

> "We should perhaps also note for the record that cloning was not anticipated by the Deity in any of his (or her) manifestations on earth; nor in any of the extant holy books of the various religions. Ecclesiastical pronouncements on the issue cannot therefore be evidence of God's will on cloning, and must be examined on the merits of the evidence and argument that inform them, like the judgments or opinions of any other individuals."[8]

Such false declarations of the impotence of the Scriptures to speak to the issues of the human cloning debate deserve a hearing from the Word of God. The purpose of this paper is to reflect in a limited way on the voice of Scripture as it speaks to the moral issues of human (as opposed to animal) therapeutic and reproductive cloning.[9] The progression will be to first describe the technology and to outline the key moral dialogues of the debate. With this context set, the author's reflections on the voice of Scripture will be presented based on the themes of creation, the fall, redemption, and motive.

The Technology

To the biochemist, the technical term "cloning" means copying or replicating any deoxyribonucleic acid (DNA) that may range from a short section of the DNA polymer to an entire nucleus or genome. More often than not, cloning is used to generate DNA material for research that is primarily aimed at treatment of diseases. The popular use of the term "human cloning" is sometimes ambiguous. In most of its uses it means reproductive cloning and involves "nuclear transfer" technology in which the DNA nucleus from one cell is transferred to an enucleated egg (an egg from which the nucleus has been removed) in order to begin an embryo.[1] The President's Council on

Bioethics has provided a glossary of terms that were intended to offer consistency to the use of terms in the debate.[3] In this paper the term reproductive (human) cloning means asexual reproduction of a new human being that is virtually identical genetically to an already or previously existing human. Operationally it would be accomplished with nuclear transfer technology. This is to be compared with biological or sexual reproduction in which the male gamete (sperm) fertilizes the female gamete (ovum) to form a single zygote that contains the DNA from each of its parents. The result of sexual reproduction is a genetically unique being.

The nuclear transfer technology used for cloning is referred to as somatic cell nuclear transfer (SCNT).[10] SCNT cloning technology is significant primarily in that it does not require germ cells (i.e. cells from sperm or ovum). A fertilized egg is never involved in SCNT cloning. The human somatic cell is a body cell from a source other than the sperm or ovum, which contains the full genetic code for the entire human. Somatic cells from a certain part of the body only have the DNA "turned on" for that specific body part. The SCNT technique allows for the somatic cell DNA to be "turned off" generating a quiescent body cell, which is then transferred to an enucleated cell where the entire DNA is "turned on" restoring a pre-differentiation condition called "totipotency" in which the cell is now capable of generating all of the organism. In other words, the cell can behave like an embryo going through cell division, differentiation, and development without ever requiring a fertilized egg. The SCNT technology has potential not only for human reproductive cloning applications, but others as well.

In fact therapeutic, rather than reproductive, applications are currently of greater interest to the scientific community. This includes at least three basic areas: genetic testing or screening,[11] stem cell transplants,[12] and genetic therapy.[12] The new cloning technologies have the potential to move our basic health-care model from one of treating health maladies after they are expressed to a model in which some health problems are anticipated by genetic intervention in order to prevent certain

diseases and illnesses.[11] Genetic medicine moves medical intervention to an earlier stage in life and may even precede life.

The first of these therapeutic cloning technologies, genetic screening or testing, can be used to discover defects in embryos. The underlying assumption of this technology is that the genetically "defective" could be aborted.

A second area, stem cell transplant technology, is controversial in part because the stem cells used in this technology are currently obtained from embryonic or fetal tissue. The technology has the potential to allow for the growth of cells to replace damaged cells. For example, one might replace damaged brain cells that resulted from injury or disease with brain cells grown from stem cells. Though not currently demonstrated, stem cell technology in theory could lead to the ability to grow entire organs to replace damaged organs.

As of the year 2000, more than five thousand patients worldwide have participated in experiments in the third category of genetic therapy.[12] In the Spring of 2000, severe combined immunodeficiency patients were successfully treated with gene transfer into bone marrow cells to restore immunity.[12] The gene transfer involved the patient's own bone marrow cells, which were genetically corrected, thereby eliminating the possibility of transplant rejection that is a concern with donor cells. These experiments have involved somatic cell gene transfers, where a correct gene is inserted in place of a mutated gene so that the protein, which the gene was encoded to synthesize, can now be synthesized. This technology has potential applications with diseases such as hemophilia B and cystic fibrosis, where protein synthesis is disrupted due to gene mutation. Another type of genetic therapy involves germ line genetic modification.[12] Germ line genetic modification is less developed and differs from somatic cell gene modification in that a modification to germ line cells has the potential to alter the genes of the individual's descendents indefinitely.

From this brief overview, it is clear that cloning technologies are integrated into a matrix of genetic technologies. It is helpful to understanding the controversies surrounding the cloning debate to make the two sets of distinctions pictured in Scheme I (below). Reproductive human cloning is far more controversial in the public debate than therapeutic human cloning because of the issues to be discussed in the next section of this paper. Likewise, germ line genetic therapy is more controversial than somatic cell genetic therapy because of the likelihood that in germ line modifications the gene modification will be carried on to future descendents.

Therapeutic Cloning	Reproductive Cloning

Somatic Cells	Germ Line Cells

Scheme I

This overview of cloning technologies is not exhaustive or technically detailed, but it sets the stage for moving from the technology to some of the key moral issues surrounding the cloning debate.

Key Moral Issues of the Debate

Because cloning technology is key to more than just the primary topic of reproductive human cloning, an overview of the moral dialogues surrounding cloning technology in general is helpful to identifying the key issues affecting the more specific debate on human reproductive cloning. The mere quantity of moral dialogues necessitates that each dialogue be visited briefly. The intent here is to utilize a balanced format to succinctly introduce these discussions as they currently exist, without

comment on the cogency of a particular position, before considering some of the moral dialogues more thoroughly in the light of Scripture.

The news[13] is full of headlines about the stem cell research controversy surrounding the use of embryonic tissue as a primary source for stem cells. While there is some potential for using adult stem cell tissue as a source, the major source of stem cells currently is from fetal or embryo tissue.[15] Because the process of isolation of stem cells destroys the embryo, which is viewed by many as an immoral termination of life, the age-old question is raised, "When does a human embryo become a human life?" Some have suggested a cut-off of a certain number of days to distinguish between mere tissue in early blastocyst stages of development and a human life. It is clear that the time-line of development of early stage blastocysts into life is a continuum through which no clear line can be drawn between mere tissue and life. For this reason, a time line approach to the issue is untenable to many in the debate. A further concern arises for those who grant the status of life to early stage embryos in their concern that stem cell research may lead to embryo creation for the sole purpose of using embryos as research subjects (i.e. the fear that there might become a market for embryos[16]). On one end of the spectrum, there is the position that any stem cell research that uses embryos is immoral as it amounts to the destruction of one human life for the purpose of another human life. On the other end of the spectrum, there is the position that early stage embryonic tissue is not life but merely tissue, matter without personality or spirit, which should be used to better human life. To someone holding this position, it is immoral to discard this "extra" tissue when it could be used to relieve human suffering. Gareth Jones[17] offers an interesting middle position on the "moral status of the blastocyst" in which he presents some of the Biblical support for the value of prenatal life, suggests that there is more than one position which Christians can adopt on the issue, and challenges Christians not to divorce their moral commitment to prenatal life from their moral commitment to all human life.

Often the medical time-line debate of when life begins is described in more philosophical terms by asking the question, "When does human 'identity' begin."[18] The idea of identity will be addressed in more detail later.

Another point of contention is the risk or safety factor. For those who grant the status of life to early stage embryos, reproductive human cloning would be immoral on the grounds that the proposed process would lead to large losses of early stage embryos. The cloning of the sheep Dolly by Ian Wilmut and his team in 1997 required 434 ewe eggs (many times more than an ewe's lifetime ovulation production). Only 277 of these eggs were successfully fused with DNA from somatic cells. Of the 277 nuclear transfers, only 29 divided sufficiently for implantation. Of these 29 eggs, only 13 were successfully implanted to produce only one pregnancy, which resulted in Dolly.[19, 20]

Weighing risk verses benefit has been central to the somatic vs. germ line therapy debate.[21] Human germ line modification (HGLM) is considered by many to be too risky to be morally acceptable therapy because of current problems with the technique in animal studies and the danger that latent problems could show up for multiple generations since the genes that are modified are passed on to future generations. (Recall that somatic cell gene therapy affects only the genetic composition of the patient.) On the other side of this debate are those who see the moral obligation to relieve human suffering with this novel technique. HGLM has the potential to eliminate the inheritance of genetically based diseases. Rather than treating cystic fibrosis patients with somatic gene therapy generation after generation, cystic fibrosis could be eliminated from a family line with HGLM.

The somatic vs. germ line debate is further complicated by the merging of this gene-therapy debate with another debate about the ethics of using these cloning-based gene-therapy technologies for therapeutic versus enhancement applications. At issue in all these dialogues is the question, "How do we distinguish between appropriate and inappropriate uses of these technologies?"[22] Most people

believe it is morally permissible to intervene after birth to correct the genetically inherited abnormality of a cleft palate. Some of those who believe this would then take the next step of viewing somatic therapy as justified. And amongst those who understand somatic therapy to be morally permissible, some would argue, "Why not use the germ-line extension of that to prevent it before the birth?" In practice, the line between somatic and germ line applications may not be easily drawn.

A similar "slippery slope" issue, where it is difficult to draw a line between the moral and immoral, exists in the debate between therapeutic vs. enhancement applications. This debate begins with the assumption that we have a moral duty to use cloning technology to relieve human suffering by the application of therapeutic gene therapy, but not enhancement gene therapy. Enhancement therapy is taken here to mean a genetic alteration intended to improve "normal genes."[21] The question is what is the standard for normal and abnormal. Most people would agree that it is good to help the lame to walk normally and the blind to see normally. But what is normal?

The line between therapy and enhancement is fuzzy. If we can correct poor vision to 20/20, then why not make it better? Why should 20/20 remain the standard? If gene therapy allows us to improve the mental capacity of an Alzheimer's patient, then while we are at it, why not make them even smarter than they were originally? This technical capacity could quickly lead to eugenics. There is a concern among some, that if such technology was available for therapeutic purposes, a market driven eugenics would soon develop from parents' desires for their offspring to be more competitive intellectually or physically. A lack of accepted standards creates a healing-design continuum through which it is difficult to draw a dividing moral line between acceptable and unacceptable applications. The line between genetics and eugenics is obscured by moral ambiguity. Some fear that moral ambiguity could lead to a legal platform where parents demand their rights to use cloning technology to design and have a perfect baby.[23] Taken one step further, one can imagine a scenario where a child

sues his or her parents for the trauma introduced into the child's life due to the consequences of gene enhancement therapy employed by the child's parents.[21]

If a Christian accepts the underlying assumption that there is a moral duty to use cloning technology to relieve human suffering by the application of therapeutic gene-therapy, but not enhancement gene-therapy, then the search for a standard for "normal" becomes problematic. Is the standard Adam's pre-fall physical state (whatever that may have been)? [22] Can one be certain that such a state was a "final" state and not a starting point that God intended to improve upon? This in turn raises the question, "Is it possible that God in His sovereignty has chosen to further develop the design of humanity through our implementation of this technology?"

The cloning technology debate also enters into the arena of social justice. The question has been asked, "Is it just to allocate this magnitude of resources to genetics when it is well known that the primary cause of morbidity and mortality worldwide is poverty?"[11] Inequalities of access to health care also suggest that once cloning technologies became accepted practice, they would only be available to the wealthy and powerful, which would make them even more competitive (genetically); which, after multiple generations, would amplify the inequalities between the poor and the privileged rich and powerful.[21] A further concern for injustice is envisaged where the insurance industry might pursue a practice of genetic discrimination and implement mandatory germ line modification to preclude the birth of a child with a genetic disease.[21]

Largely within Christian circles there is the question about how reproductive human cloning should be viewed. Should it be thought of as merely manipulating created matter or would human cloning amount to "creation" (man as "co-creator) or "pro-creation?"[7] Should biotechnology "be seen as instruments in the creator's hands, by which God will continue to sculpt Adam's clay, refashioning life in the universe so that it might give greater glory to its maker…?"[24] D. Gareth Jones[7] follows a line of logic that leads to a similar question. If God is at work through creation and the basic

processes described by genetic mechanisms to facilitate genetic change, and if there is no reason why God should not work through human's appropriation of genetic technologies to achieve intentional genetic change, then, if all this is true, might not genetic intervention at the hands of humans be understood as an appropriate extension of the work of God.

For some people the direct intentional genetic-intervention and control, which would likely be available through reproductive human cloning, raises the issue of compromising human identity and dignity.[18, 20, 25] Sexual reproduction allows for only a limited control over the attributes and identity of the child to be born. The sexually born child has a clearly unique identity and dignity as one brought forth by God. The concern is that a cloned child may not be granted the same dignity because they are in some respects the product of another person's design and/or identity through the excessive control afforded to that individual through cloning technology. Some fear that in the extreme, cloned humans could be given a lesser status by society.

Closely paralleling the issues of identity and dignity is the concern that human cloning technologies will lead to the commodification of children where they become products of our making that we use for our purposes- a type of despotic control of another person through one's own will.[26]

A biological argument against reproductive cloning is concern for the loss of genetic diversity since only one set of DNA is typically used.

A final issue in the debate over the appropriateness of reproductive human cloning is the challenge to family structure. How would familial relationships be understood? Theoretically, a single woman could provide both the somatic cell and an enucleated egg, which could then be fused together and the resulting embryo placed in her uterus, so that she could give birth to her genetic clone. The resulting relationship is genetically a type of twin delayed by one generation. This might require redefining the term single parent.[10] The fact that the clone is both sister and daughter, may create difficulties in how the clone and the mother/sister relate to each other.

While not all of these issues apply directly to human reproductive cloning, the concern that cloning technology available to genetic therapy will eventually be used for human reproductive cloning tends to bring all the issues under one umbrella. Clearly there are many layers of issues which need to be filtered through a set of moral criteria to evaluate acceptability. What moral criteria should be used?

Moral Criteria

God reveals truth about Himself through creation and the scriptures; therefore, there can be no real conflict between the two. While a study of creation itself (as suggested by Romans 1:18-20) can lead to truths relevant to the human cloning issues, the limitations of this paper necessitate that it be directed at a selective analysis of Biblical revelation. Albert W. Wolters has suggested that a Christian worldview shaped and tested by scripture should be based on central scriptural categories such as creation, sin, and redemption.[27] This approach is adopted here to seek moral guidelines for issues defining the human cloning debate from the biblical narratives on creation, sin (the fall), and redemption (resurrection and grace). The analysis will focus on the issue of reproductive human cloning and is intended to be representative, not exhaustive.

The Voice of Scripture: Creation

What truths are revealed in the creation narratives of scripture that shape a moral base from which to evaluate the ethics of human reproductive cloning? Genesis 1 & 2 contain the two most prominent accounts of the creation narrative and offer the best place to start. When comparing God's creative actions to man's potential efforts at human reproductive cloning, there is one glaring difference. In Genesis 1, God created *ex nihilo* (in the absence of anything); whereas all of human cloning technology merely involves the manipulation of God's created matter and is subject to the

mechanisms God has put into place that govern that matter. In this respect, mankind cannot truly act as “co-creator” by implementing cloning technology, because mankind can at most manipulate what God has already created. This does not answer the question whether or not it is moral or immoral for mankind to conduct such manipulations, but it does suggest that human reproductive cloning efforts are not on par with God’s creative acts. Thus the term “co-creator” is misleading at best.

Genesis 1:27 declares, “And God created man in His own image, in the image of God He created him: male and female He created them.” This implies that human identity and dignity is the result of being made in the image of God. It has been suggested that human dignity, humanity, is not a result of some “likeness to God’s image”, but rather is derived from the created human’s relationship to God.[28] The author of Genesis uses the phrase “in the image of God” to indicate that human identity is defined by relationship to God. Humanity loses its purpose apart from relationship with God. Genesis 2 further supports this meaning of “in the image of God” by describing the creation of man as an encounter with God. In a related interpretation, Bonhoeffer understood “in His image” to be in part a reference to the freedom to worship God.[29] This limited account of creation suggests that potential human reproductive cloning, as a manipulation of God’s created mechanisms, might not directly threaten the human dignity of the cloned individual, because it would not directly hinder a worshipping relationship with God. While these interpretations speak about the basis of human identity, which is entangled in the cloning debate, they still do not help to answer the question of the morality of human reproductive cloning.

As part of being in a relationship of praising and worshipping the Creator, Genesis 1and 2 set forth the role of humanity to “rule over” all that God created, “to cultivate” and “to keep” the garden, and to name the living creatures. The role of steward was set forth from the beginning with certain limits. Does human reproductive cloning overstep the intended limits of human dominion as established by God?

Jones[17] challenges the argument that humans are not given the authority to alter their nature or the manner into which they came into being. He asks the question, "Why would altering some aspect of our nature exceed such a limit?" Jones notes that it is typically inferred that human biological nature is morally off limits, but that this "untouchable" status is selectively applied to prenatal existence and not postnatal existence. He wonders, "Why the distinction?" If there is no distinction then every routine medical procedure becomes unacceptable.

Jones points out that the limited dominion of stewardship was exceeded in the story of Eden (Genesis 1,2) when a *desire to be like* God led Eve and Adam to eat the forbidden fruit of the tree of the knowledge of good and evil. Likewise, he points out that in the story of Babel (Genesis 11), the people's *desire to be like God* led them to set aside their stewardship and replace it with an effort to control and master. The accounts of Eden and Babel clearly present the concept of limits which when crossed brought chastisement for a *desire to be like God*. While acknowledging that boundaries are set to mankind's dominion, Jones states, "it is not self evident that these boundaries provide infallible guidance to cloning," because he does not necessarily see human reproductive cloning as a *desire to be like God*.

If human reproductive cloning is not judged immoral as an expression of humanity's *desire to be like God* (which may or may not be true), then does the vocation of steward, in particular naming the living creatures, grant humanity the authority to legitimately implement human reproductive cloning technologies as part of God's endowment of human beings with unique knowledge, creativity and powers to fulfill our calling? In the context of Semitic peoples, the power to name someone indicated some degree of authority over them. Does the authority to name go far enough to authorize reproductive cloning? While Genesis 2 links human identity to the God given vocation of stewardship, and we are to be faithful to God in this purpose, this is not the main point of Genesis 2.[28-30] The stretch to find biblical justification for reproductive human cloning in this passage would

require a certain side stepping of the primary message of the passage. The primary message of Genesis 2 is that human identity is realized in relationship to God and His intentions. The main point of the passage is not the gift of "rationality and the authority"[30] to name, but the gift of intimate relationship with God and other people. Thorson describes the limits of mankind's vocational authority in the larger context of science in the following way:

> "Science is an enterprise whose aim is to offer understanding and explanation of created things in the (limited) context of cultivating and keeping them. It is a response to what the natural world is, as manifested in certain kinds of mundane, controlled experience which are subject to our rational scrutiny; and it is also uniquely a result of human intelligence and its creative powers of naming." [30]

At face value, the limited contexts of cultivating, keeping, and naming appear to fall short of the level of intervention necessary in human reproductive cloning. There is a level of determinism (i.e. control over human antecedents) and dominance present in cloning technology that is not present in cultivating, keeping, and naming.

The limits of authority in the Genesis vocations are in proportion to mankind's knowledge of creation. There is concern among some, that human reproductive cloning is inappropriate because it oversteps mankind's knowledge and the ability to use cloning technology with adequate insight. This is especially of concern because of the limits our scientific creaturely-knowledge places on our metaphysical views. Thorson points out that, "No matter how extensive it may be, our knowledge of creation remains *our* knowledge – creaturely in its character, its limits, and its intentions."[30] C. S. Lewis describes a similar concern with those he calls the "conditioners."[31] The "conditioners" are those who conquer nature or human nature. He argues that the "conditioners" lack an adequate conception of 'good' to decide on what conception of good to produce in us. Once again, the lack of a true standard is a problem.

While the isolated biblical accounts of Eden and Babel may not directly answer the question whether to accept or reject human reproductive cloning technology, they may, in concert with the whole counsel of scripture, help us to ask questions of ourselves and our motives, which in turn may lead us to a correct response. Beyond the notion of mankind's assigned vocation, does the larger story of creation in any way provide moral guidance to the question of reproductive human cloning?

O'Donovan argues that moral law belongs not to history, but to creation.[32] He calls attention to the "created order" of Creation as a divinely given order within which human nature is located.[32] The fact that this order is unchangeable is indicated in Jeremiah 31:31-37 where God ties to the new covenant the following promise to His people:

> Thus says the Lord, who gives the sun for light by day, and the fixed order of the moon and stars by night, who stirs up the sea that it roars; the Lord of hosts is His name: "If this fixed order departs from before Me," declares the Lord, "Then the offspring of Israel also shall cease from being a nation before me forever." (Jeremiah 31:35-36)

This order contains certain differentiations that are for all times, such as the distinction in Genesis 1 and 2 between day and night, land and sea, and man and woman. Humanity is designed to live within this ordered world and the divine purposes that define it; but fallen humanity persistently either rejects the "created order" or functions with a twisted perception of it. The notion that moral law is embodied in the "created order" suggests that further analysis of creation is warranted (beyond the issue of human vocation already discussed).

It can be argued that the role of man, woman, and sexual reproduction is part of God's created order, whereas the asexual reproduction invoked in human reproductive cloning is a perversion of the created order. Genesis 1:27-28 seems to link sexuality ("… in the image of God He created them: male and female He created them.") with the role God gave mankind within creation ("And God

blessed them; and God said to them, 'Be fruitful and multiply, and fill the earth, and subdue it; and rule over the …'"). The tight linking between the creation of sexuality, the blessing and procreation command, and the stewardship command of Genesis 1:27-28, seems to indicate that in God's "created order", He has set forth the structure of sexual reproduction between a man and a woman as the means for fulfilling the mandates to procreate, subdue, and rule.[33] If this is true, then reproductive human cloning is not consistent with this structure as it hitchhikes on the use of only the enucleated female egg and does not necessarily require anything from the man.

Numerous authors have written about the negative impact of technology in general on mankind. In 1967, Jacques Ellul warned that "technique" emphasizes efficiency and yield while losing site of moral purpose. When human reasoning enters, he argues that reason becomes technology in disguise.

> "The intervention of rational judgment in the technical operation has important consequences. Man becomes more aware that it is possible to find new and different means. Reason upsets pragmatic traditions and creates new operational methods and new tools; it examines rationally the possibilities of more extensive and less rigid experimentation. Reason in these ways multiplies technical operations to a high degree of diversity."[34]

In response to questions surrounding *in vitro* fertilization, Oliver O'Donovan draws attention to the importance of the male and female roles in procreation[18] by pointing out that the "twin goods of marriage" (relationship and offspring) are designed to remain together. He distinguishes between reproductive technology that allows something to be "made" ("the product of our own free determination, stamped upon the material which is used") and the concept from scripture of "begetting" ("the possibility that one may form another being who will share one's own nature, and with whom one will enjoy a fellowship based on radical equality"). He believes the importance of the

male-female relationship in human 'begetting' to be significant and at jeopardy in our current technological culture of 'making.' Like Ellul, O'Donovan also acknowledges the failure of our scientific and technology culture to recognize the 'teleological' order within nature, that is, the natural order of purpose rather than mechanism.[32] These arguments challenge the appropriateness of human reproductive cloning, because it is seen as a technology which fails to submit to God's "created order" and its divine purposes.

An issue related to the notion that the procreative roles of man and woman are part of an unalterable "created order" is the confusion and ambiguity that human reproductive cloning technologies might bring to familial relationships. Because the asexual reproduction of somatic cell nuclear transfer reproductive cloning produces single parent offspring in a way that radically departs from the natural sexual reproduction, some see it as a violation of the parent-child relationship.[23] It is argued that biological kinship is wedded to social identity and order by God's design. Without the normal ties of relationships as defined by sexual reproduction and biological kinship, societal relationships become ill defined and unhealthy. In other words, the heart of the matter is not "the raw biochemistry of genetic identity," but "the moral character of human relationships within the family."[35]

To revisit the case of self-cloning, a woman who seeks reproduction by nuclear transfer cloning is simultaneously the biological single parent and genetic sister of her cloned offspring. Similarly, self-cloning for a male, which requires a donor womb, results in an offspring who is both genetic brother and son. Kass even suggests that this amounts to being the parent of one's sibling and recognizes it as incest without coitus.[23] Is this 'genetic' incest? And if so, what is the moral status of such incest? Incest is typically defined to mean the "sexual union between persons who are so closely related that their marriage is illegal or forbidden by custom."[36] Biblically, this usually meant coitus between a parent and offspring. 'Genetic' incest lacks coitus and by this definition would seem to be

a different beast than the case described here. The ambiguity which human reproductive cloning technology might bring to biblical definitions of familial relationships goes beyond this case. With self-cloning, should the one cloning relate to the cloned as a parent or a sibling? Could cloned sisters and brothers marry each other? Could cloned offspring marry and have sexual relations with a parent? There may be reason for concern that such technology will distort parenting in a number of ways.

Additionally, there is the danger that reproductive human cloning technology could cause those impacted to view the Bible and certain social orders as irrelevant since familial relationships will no longer have meaning to them. What would it mean to a cloned individual to honor his or her father and mother when a cloned individual has either no genetic father or no genetic mother? What does 'God the Father' mean to someone who has no biological father? A society influenced by human reproductive cloning would have additional barriers to unpacking the truths of Scripture in a number of ways, but most directly the scripture centered on familial relationships.

The Voice of Scripture: Sin

Scripture makes no mystery of the fact that human reproduction is good when, in response to God, it results from a marriage relationship between a man and a woman. The creation mandate in Genesis1:28 to "be fruitful and multiply" is good and stands apart from sin.[27] Sin does not negate God's created order, but sin has affected all of creation (Genesis 3:17, Romans 8:19-22). While sin and creation remain distinct in Scripture, sin attempts to distort or twist the good of creation.

Albert Wolters employs two formations in order to evaluate between good and evil at the interface of creation and sin.[27] The first is 'structure', which has already been called 'created order' in this paper. The second is 'direction', which designates the movement or tendency of a particular practice or issue in its application to be for or against God. He argues that it in order to avoid naming

a good of creation as evil, one must distinguish between structure and direction. For example the structure of reproduction is a created good, but if exercised in the context of adultery, its direction is against God and it is sin. Likewise, prostitution does not eliminate the goodness of human sexuality. Sin often operates by twisting an application within a created order. Of course this is not a new concept. The apostle Paul exhorted Timothy to consider 'structure' and 'direction' when he wrote concerning the ascetism of his day:

> "But the Spirit explicitly says that in later times some will fall away from faith, paying attention to deceitful spirits and doctrines of demons, by means of the hypocrisy of liars seared in their own conscience as with a branding iron, men who forbid marriage and advocate abstaining from foods, which God has created to be gratefully shared in by those who believe and know truth. For everything created by God is good, and nothing is to be rejected, if it is received with gratitude; for it is sanctified by means of the word of God and prayer." (1 Timothy 45:1-5)

When the ascetics of Paul and Timothy's era forbade marriage, they were in essence saying that there is a problem with the way God made mankind, male and female. In fact there is nothing wrong with the created order or the direction of marriage. The deception was rooted in the understanding that one could get closer to God by abstaining from marriage. The ascetics misunderstood the created good of marriage for evil, because they falsely perceived that the order of marriage led in a direction away from God.

What does human reproductive cloning look like through the filters of order and direction? Reproduction itself is established by Genesis1:28 as part of the created order, so it is good. But does reproductive human cloning move in direction for or against God? Reproductive human cloning technology has already been described in this paper as possessing attributes that can be seen as distortions that work against God either structurally or directionally. These include distortions to the

stewardship role, sexual reproduction, and familial relationships. It is sufficient to note here that the questions raised earlier in this paper, have already identified the potential effect of sin to act as an agent which twists an existing created order by altering its direction away from God's original intent. What has not yet been addressed is what impact redemption or the resurrection may have on the fallen condition.

The Voice of Scripture: Redemption

Fallen mankind is predisposed to reject the created order and to perceive it imperfectly. This means mankind will naturally be uncertain about the ability to evaluate the created order correctly. This flawed understanding of the created order requires that one remain guarded about decisions with respect to the created order; but there is also good news. God has reconciled all things to Himself through the person of Jesus (Colossians1: 20). The redemption achieved in Jesus restores the whole of creation. The resurrection of Christ carries a promise that all should be made alive (1 Corinthians 15:20-28). Thus through Christ, there is a ministry of reconciliation (2 Corinthians 5:18-19) wherein mankind has a place within God's established created order. In this way, the resurrection of Jesus helps to define this created order as an order of life and restoration.[32]

This redemptive restoration is not a return to the Garden of Eden before the Fall (i.e. not repristination), because God introduced culture after the Fall (Genesis 4:20-22) and God has orchestrated creation's development through culture as part of His good plan for the filling and subduing of the earth. Wolters argues that this restoration includes society and culture, including technology.[27] In this way, he exhorts Christians not to reject biotechnology, but to reform biotechnology so that it is in submission to the created order and the Creator's ordinances.

This returns the discussion full circle to the (now redemptive) question, "What criteria should be used to judge the acceptability of human reproductive cloning technologies?" Jones answers,

"…improvement of the human condition, as long as the bottom line is an enhancement of people's capacity to relate better to God and one another."[7] Jones and others highlight Christ's works of restoration and healing as a model which calls humanity to responsible intervention. He points out that with biomedical manipulation, "the crucial issue is to decide what sort of intervention with nature will advance human welfare, while at the same time respecting the dimensions of what it means to be human."

The criterion of "improvement of the human condition" is problematic because the human condition is determined both biologically and spiritually. It can be argued that at times a worse biological state is necessary to bring about a better spiritual state and an overall enhancement of the human condition. Numerous Biblical accounts give evidence to this fact (e.g. Jacob, Job, Moses, Paul). The problem here is that the reproductive human cloning technology is based on a temporal time frame, whereas God's redemptive efforts through Christ's death and resurrection are based on an eternal time frame. The interest in reproductive human cloning technologies is driven by a temporal concern for extending life (delaying death), overcoming barrenness, or improving the physical quality of life. It fails to recognize that God in His love and mercy may give a person a lesser life on earth as part of His provision for that person's reception of the gift of eternal life. This opens up to the larger question, "Did God intentionally create the world in such a way that genetic uncertainties and disease would have their role to play?" The apostle Paul's presentation to the Corinthians of the doctrine of the resurrection (I Corinthians 15: 1-58) acknowledges (vs. 43) that the perishable (corruptible) physical body "is sown in weakness" whereas the resurrected imperishable (incorruptible) spiritual body "is raised in power." In the context of this passage, it follows that this "weakness" is a reference to physical weakness rather than a moral or spiritual weakness. While the passage does not define exactly what is meant by "weakness," it does make it clear that victory over this "weakness" will occur when "this perishable (corruptible) will have put on the imperishable (incorruptible), and this

mortal will have put on immortality". The mortal's condition of physical weakness, as described in this passage, leaves the door open for an interpretation that views genetic uncertainties as a part of the created order of mortal weakness.

There is a surprising scarcity of literature that uses Scripture to address the impact of the doctrines of redemption and resurrection on the human reproductive cloning debate, though D. Gareth Jones has attempted to make a limited contribution to this literature.

The Voice of Scripture: Motive

In Genesis 3, God instituted a level of control in the created order when, after Eve and Adam had eaten from the forbidden tree of the knowledge of good and evil, God displaced them from the garden so that they would not also eat from the tree of life and live forever like God. God, in His mercy, set into place a control for all times that mankind should not live forever in a fallen state. This limited freedom for fallen mankind was a preemptive move by God, not in response to a further action by mankind toward the tree of life, but in response to the fallen condition of mankind. This implies that certain limitations to mankind's freedom within the created order are a consequence of the intended actions of fallen mankind. If this is true, the limiting structure of the created order is tightly linked to mankind's motives. Scripture portrays the intentions and motives of fallen mankind as constantly under the scrutiny of God's judgment and as flowing from the heart of mankind (See also Prov. 16:2, Heb. 4:12, Gen. 8:21):

> "Therefore repent of this wickedness of yours, and pray the Lord that if possible, the intentions of your heart may be forgiven you." (Acts 8:22)
>
> "… until the Lord comes who will both bring to light the things hidden in the darkness and disclose the motives of *men's* hearts…" (1 Corinthians 4:5)

God not only judges the actions of mankind, but also the intentions and motives of the heart.

When the writer to the Ephesians (Ephesians 4:17-6:9) instructed them on how they should live in Christ and the nature of family relationships, the writer bridged from the specifics of the Ephesians' errors to a more general description of the state of mankind in Christ (light) and mankind without Christ (darkness), as well as linked family and church structure back to the first principles of the created order (e.g. Eph. 5:31 and Gen. 1:24, Eph. 6:2,3 and Exodus 20:12). If one accepts the context of this passage to be closely linked to the broader scope of the created order, then Ephesians 4: 17-19, 20-25 carries a timeless message:

> "This I say therefore, and affirm together with the Lord, that you walk no longer as the Gentiles also walk, in the futility of their mind, being darkened in their understanding, excluded from the life of God, *because of the ignorance that is in them, because of the darkness of their heart;* and they, having become callous, have given themselves over to sensuality, for the practice of every kind of impurity with greediness." (Eph. 4:17-19)

Mankind's failure to walk as mankind should walk is a consequence of both ignorance and darkness of the heart. The passage continues with an exhortation for redeemed mankind to walk a different path based on the likeness of God: based on "truth" (Eph. 4:21) and "righteousness and holiness of truth" (Eph. 4 24). The passage identifies a key issue as the issue of truth (Eph. 4:25). Therefore, fallen mankind's problem is not merely ignorance, but a condition of the heart, where, in darkness, it functions from a motivation that is not true to the character of God. In this condition, it is possible that an action, which in and of it-self is not unrighteous, may be deemed morally inappropriate based solely on the motivation of the person conducting the act.

Mankind's motivation for human cloning (both therapeutic and reproductive) should be scrutinized. Why clone a child? What might be the motives for people who would want to clone a

child? Some of the announced motives have been summarized to include the following:[17] (1) to replace an aborted fetus, dead baby, or child killed in an accident; (2) to produce a sibling who can serve as a compatible tissue or organ donor for a child dying of leukemia or kidney failure; (3) to produce a genetically related child to a couple with a recessive lethal gene; (4) to create a new child for a mother whose husband and children were killed in an accident; (5) for a wife who wishes to have a biological offspring of her dying husband; (6) the desire of infertile or lesbian couples to have genetically related children; and (7) an individual attempting to cheat death. Each motivation has its own attraction and deception. Is the motivation altruistic or egotistical?

While identifying the motivation of autonomy, Kass skeptically says, “Cloning personifies our desire fully to control the future, while being subject to no controls ourselves.” He also believes that, “ For this new dispensation, the clone is the ideal emblem: the ultimate ‘single-parent child.”[23] Kass seems to leave no door open for a righteous motivation for cloning technologies.

In the context of an analysis of the morality of *in vitro* fertilization, Oliver O’Donovan characterizes the motivation behind medicine’s level of intervention as an idolatrous self-determination to free mankind from limits that were designed to constrain and direct us.[18] He describes this quest for freedom from the natural limits of the created order as one which has led to a redefinition of the constraints honored in earlier Western Christian medicine, where the previous sharp distinction between interfering in a healthy body and curing a sick body, has given way to self-determinant intervention into a healthy created order.

Another author[37] reminds us that the 4th century St. Basil of Caesarea was directed by two questions when applying medicine, science, and technology to treat disease: (1) "Is it therapeutic?” and (2) “Does it parallel the care of the soul?” The author goes on to raise the question with respect to the therapy of reproductive cloning, “What condition would it be treating?” In the absence of a condition in true need of therapy, the intervention of cloning is in stark contrast to “care given the

soul" which was defined as "practicing whatever discipline is necessary to reach the goal God has set for us- union with Him." The author concludes that "to create a child that is genetically identical to oneself strikes [him] as the ultimate expression of self–love." This classical motivation for medicine, which was centered on one's relationship with God, is significantly different from the self-centered motivation perceived by some to be driving contemporary genetic medicine.

As introduced earlier, Jones, in a less skeptical view of mankind's motives, puts forth a transformative view in which "humans may have a role to play as creators" as a consequence of being created in God's image as His instruments for continuing His unfinished creative activity.[7]

> "Neither is there any reason in principle why God should not work through humans to achieve intentional genetic change, and therefore make use of appropriate genetic technologies. If this is true, the next step is to affirm that genetic modification has the potential for extending the work of God, who routinely seeks genetic change as an integral part of [H]is creative activity."[7]

In which case, genetic intervention may then be obligatory and motivated by a faithful response to mankind's mandate to restore and heal God's fallen creation. Jones recognizes that the fallen human condition will taint the use of genetic technologies, but suggests that Christians have the ability to recognize God's good hand in these technologies when he says, " What is beginning to emerge is that the Christian's major task is not that of objecting to scientific developments, but of seeing them as one way in which God is demonstrating [H]is grace through creation." [7]

At the very least, the correctness of the transformative position described by Jones assumes (1) a continuing act of divine creation at some levels (rather than creation as a finished task), (2) mankind's authorized participation as co-creator in this continuing creative process, and (3) mankind's ability to participate righteously in this creative process to transform the world for better, not for worse. The previous Biblical analyses of this paper, place in question the sum of these

assumptions and suggest more caution than Jones' articulates. The Ephesians 4-6 passage alone casts enough doubt on the adequacy and foresight of fallen mankind to implement technology for better and not for worse, that greater scrutiny is justified. At the very least, where Jones has accepted that "… the Christian's major task is not that of objecting to scientific developments, but of seeing them as one way in which God is demonstrating [H]is grace through creation.", the analyses of this paper would dictate that Christians ask 'if' scientific developments demonstrate the grace of God, and that Christians object when they do not.

The guiding principle of Christian ethics is love, but in the hierarchical order of love of God followed by love of mankind. An apt motivation will reflect this truth.

Conclusion

Both therapeutic and reproductive human cloning technologies have been described and much of the debate about the morality of human reproductive cloning technology has been visited. The voice of Scripture has been reflected on in a limited way in terms of principles set forth in the biblical themes of creation, the fall, redemption, and motive. Many more questions have been asked than have been directly answered in the process of this exercise. And so the question is asked again, "Is the cloning of human beings evil?"

There is perhaps more gray than black-and-white in the color that shades much of these dialogues. However, overall, this biblically informed reflection on the human cloning debate has painted a picture of human reproductive cloning as one which is under a dark shadow of structural, directional, and motivational twisting of God's purposes in mankind's roles in stewardship, sexual reproduction, and familial relationships. If there is a single concept from the scriptures that gives insight into a direction to move in further search of truth regarding human cloning, it is that of "relationship": firstly, the value and purpose which Scripture places on God's creation of mankind to

be in an eternal relationship with Himself; and secondly, the value and purpose which Scripture places on mankind's relationships with one another.

References and Notes

1. Ronald Cole-Turner, "The Era of Biological Control," in *Beyond Cloning: Religion and the Remaking of Humanity*, ed. Ronald Cole-Turner (Trinity Press International, Harrisburg, PA, 2001), pp1-13.
2. http://www.nih.gov/news; June 2002
3. The Presidents Council on Bioethics, http://www.bioethics.gov/news; May 2002.
4. The National Bioethics Advisory Committee, http://www.bioethics.georgetown.edu; May 2001.
5. Arlene J. Klotzko, "The Debate about Dolly," in *Responsible Science or Technomadness? Cloning,"* ed. Michael Ruse and Aryne Sheppard (Prometheus Books, Amherst, NY, 2001), pp19-30.
6. Mary Jo Iozzio, *Considering Religious Traditions in Bioethics* (University of Scranton Press, Scranton, 2001).
7. D. Gareth Jones, "Biomedical Manipulation: Arguing the case for a Cautiously Optimistic Stance," *Perspectives on Science and Christian Faith*, 52(2), 2002, pp. 93-102.
8. John Harris, "Cloning and Human Dignity," *Cambridge Quarterly of Healthcare Ethics*, 7 (Spring 1998), pp. 163-67.
9. The author was trained as a chemist with no formal training as a theologian, Bible scholar, or bioethicist. This paper will therefore reflect these limitations.
10. Nancy J. Duff, "Seeking the Significant in the Factual," in *Beyond Cloning: Religion and the Remaking of Humanity*, ed. Ronald Cole-Turner (Trinity Press International, Harrisburg, PA, 2001), pp. 84-96.
11. M. Theresa Lysaught, "From Clinic to Congregation: Religious Communities and Genetic Medicine," *Christian Scholars Review*, 23, no. 3 (March 1994): 329-48.

12. Kenneth W. Culver, "A Christian Physician at the Crossroads of New Genetic Technologies & the Needs of Patients," in *Beyond Cloning: Religion and the Remaking of Humanity*, ed. Ronald Cole-Turner (Trinity Press International, Harrisburg, PA, 2001), pp. 14-34.
13. http://www.biotechpolicy.org/biotechpolicy/channelroot/home/; July 2002.
14. http://www.wilberforce.org/wilberforceforum/channelroot/home/; July 2002.
15. Often stem cells are isolated from "extra" embryos, which remain after *in vitro* fertilization procedures are used to help infertile couples and which would otherwise be destroyed.
16. John Austin, "Egg Donors Find High Demand from Infertile Couples," in Knight Ridder Newspapers, June 9, 2002; http://www.macon.com/mld/macon/news/nation/3434094.html, July 29, 2002.
17. Gareth Jones, *Clones: The Clowns of Technology?* (Paternoster Press, Carlisle, Cumbrie, UK, 2001), pp. 102-107.
18. Oliver O'Donovan, *Begotten or Made?* (Oxford University Press, New York, 1985), pp 62-65.
19. David Elliott, "Uniqueness, Individuality, and Human Cloning," in *Responsible Science or Technomadness? Cloning*, ed. Michael Ruse and Aryne Sheppard (Prometheus Books, Amheart, NY, 2001), pp. 103-120.
20. Gilbert Meilaender, "A Case Against Cloning," in *Beyond Cloning: Religion and the Remaking of Humanity*, ed. Ronald Cole-Turner (Trinity Press International, Harrisburg, PA, 2001), pp. 77-84.
21. Audrey R. Chapman, "Religious Perspectives on Human Germ Line Modification," in *Beyond Cloning: Religion and the Remaking of Humanity*, ed. Ronald Cole-Turner (Trinity Press International, Harrisburg, PA, 2001), pp. 64-77.

22. James C. Peterson, "Ethical Standards for Genetic Intervention," in *GeneticEthics: Do the Ends Justify the Genes?* eds. John F. Kilner, Rebecca D. Pentz, & Frank E. Young, The Center for Bioethics and Human Dignity (Paternoster Press/Wm. B. Eerdmans Publishing Co., 1997).

23. Leon R. Kass, "The Wisdom of Repugnance," in *The New Republic* (June 2, 1997), pp. 17-26.

24. Ronald Cole-Turner, "Towards a Theology for the Age of Biotechnology," in *Beyond Cloning: Religion and the Remaking of Humanity*, ed. Ronald Cole-Turner (Trinity Press International, Harrisburg, PA, 2001), pp. 137-151.

25. Paul Ramsey, *Fabricated Man: The Ethics of Genetic Control* (New Haven, Yale University Press, 1970), p. 88.

26. Eric B. Beresford, "Making All Things New," in *Beyond Cloning: Religion and the Remaking of Humanity*, ed. Ronald Cole-Turner (Trinity Press International, Harrisburg, PA, 2001), pp. 50-64.

27. Albert M. Wolters, *Creation Regained. Biblical Basics for a Reformational Worldview* (William B. Eardmans Publishing Co., 1985), Ch.1.

28. Claus Westermann, *The Genesis Accounts of Creation* (Fortress Press, Philadelphia, PA, 1964), pp. 12-34.

29. Dietrich Bonhoeffer, *Creation and Fall. Temptation* (MacMilan Publishing Co., Inc., 1959), pp. 35-41.

30. Walter R. Thorson, "Legitimacy and Scope of 'Naturalism' in Science," in *Perspectives on Science and Christian Faith*, Vol. 54(1), March 2002, pp. 2-11.

31. C. S. Lewis, "The Abolition of Man," in *On Moral Medicine*, ed. Stephen E. Lammars and Allen Verhey (2nd Ed., Eerdmans Publishing Co.), pp. 270-276.

32. Oliver O'Donovan, *Resurrection and Moral Order* (Intervarsity Press, Leicaster , England, 1986).
33. It is perhaps significant that when Eve and Adam desired to be like God and defied God to eat the fruit from the tree of the knowledge of good and evil, that it was their reproductive sexual organs which they then saw and sought to cover with fig leaves. If there is a link between sexuality and original sin, then this link would seem to support the idea that sexuality is significant to God's intended created order.
34. Jacques Ellul, *The Technological Society* translated from French by John Wilkinson (Alfred A. Knopf, Inc. 1964).
35. Sondra Wheeler, "Contingency, Tragedy, and the Virtues of Parenting," in *Beyond Cloning: Religion and the Remaking of Humanity*, ed. Ronald Cole-Turner (Trinity Press International, Harrisburg, PA, 2001), pp. 111-123.
36. The American Heritage Dictionary, ed. William Morris (Houghton Mifflin Co., Boston, 1981).
37. Demetri Demopulos, "A Parallel to the Care Given the Soul: An Orthodox View of Cloning and Related Topic Technologies," in *Beyond Cloning: Religion and the Remaking of Humanity*, ed. Ronald Cole-Turner (Trinity Press International, Harrisburg, PA, 2001), pp. 124-136.