

Cloning and Religious Challenges

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Abstract

Genetic Engineering has conquered different arenas and life's various forms and caused drastic changes in them. Today, with the help of biotechnology and genetic engineering, mankind has reached high summits. One such summit is the decoding of human constituting particle which is the source of physical, behavioral features as well as intellectual power. This is nothing but the gene. Today man has known the structure, position and the function of the gene and D.N.A. He also is able to modify the structure, replace the elements, making new links, and programming on the D.N.A. The corollary of programming, combination, and regeneration of human D.N.A is the production of a human being favored spiritually, mentally, and physically. In other words, human being, at the early stage of forming the fetus, till time of birth and after, all his features, the power to think and reason, his skill, inclinations and emotions are under his control; they are also determined and produced by human being. This is calculated as challenging to religion and jurisprudence. This study is an attempt to recite some of the important challenges and answer them according to the principles of religion and jurisprudence.

Introduction

Needless to say, human achievement in the realm of science and technology has unprecedentedly accelerated from 1940 to 1990. The science of genetics has made such advancement over this period of

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time that it made great prospects for the near future. The term 'genetic revolution' and its consequences became conspicuous in human history. The science of genetics witnessed a rapid progress with the molecular analysis of genetic materials since 1940. This progress began with the discovery that the genes are made of D.N.A. More discoveries followed in genetics. This science was completely transformed with the coming of modern technology for manipulating and analyzing the D.N.A which resulted in modern genetics in the middle of the 1970s. The scope of this science and its major role and application in human life is well known. One of the most important issues of the technology of genetics is human cloning,¹ that is the technology of the production of creatures in an unconventional way. In this science, unlike the natural process in which the fetus is formed by the combination of male and female reproductive cells, a somatic cell in a female reproductive cell is produced from multiplying of the nucleus. Using a complex technology, the fetus of a female reproductive cell (before it is fertilized) is removed and replaced by the nucleus of a male somatic cell. This somatic cell multiplies the cell and forms the embryo according to some strict genetic programs. Since the fetus of the host lacks nucleus and reproductive chromosomes, the embryo will have the qualities of the original somatic cell. These somatic cells could be separated and used from human skin , muscle, blood, and hair tissues, because the D.N.A of all cells of human body are identical.²

Cloning has received wide feedback from both worlds of Islam and Christianity. It was severely criticized by Christians. Vatican announced that the production of the first cloned infant indicates a belief in savagery deprived of any moral and human principles. Francis Camp Haus the bishop of Limburg in Germany has also said that when man turns to a research product he will lose his pride and freedom and slavery will be in the air. They assume that human cloning is a gesture against religious beliefs specially the story of creation.

1. Gholam-Reza Nourmohammadi, *Cloning: Fears and Hopes*, 10-11.

2. *Masaele Mostahdeseye Pezeshki (Contemporary Medical Issues)*, Islamic Propaganda Office, Khorasan Razavi Branch, 19.

Cloning has also been criticized in the Muslim world but more often from the Sunni sect. *Al-Moslemun Weekly* which reflects the viewpoints of the *Wahhabbia* group in Saudi Arabia, quoting a member of the board of scholars of Saudi Arabia in its issue no. 633 (5th of Zi Aqdah, 1417 H.Q) writes: Minimum punishment for the originator of cloning is the cutting of arms and legs, that is the punishment for the corrupt on earth (مفسد فى الارض); since this is the biggest corruption on earth. On the long run, human beings will be like animals; one would be issued stupid and the other clever. This would be like a game on human beings.¹

The Research Council of Al-Azhar University in Cairo, as the highest religious authority of the Sunnis, has forbidden cloning. Quoted in Aljazeera T.V channel, the fatwa in this regard is that, "human cloning is *haram* and should be stopped at any price."²

Many Shiite jurists, with some considerations, showed a positive attitude to cloning and issued fatwas in this regard. On the whole, there are three different attitudes on this issue. According to the first attitude, cloning is allowable. The second attitude takes cloning as conditionally allowable, that is the verdict on cloning will depend on its application: its therapeutic and positive uses are allowed while its negative and harmful uses are legally forbidden. According to the third attitude cloning is *haram* or totally forbidden.

The Shia on Human Cloning

Human cloning has become a challenging issue from a Shiite perspective too. People were expecting a response in the form of official statement or fatwa from Islamic jurists or foqaha in Najaf, Qum and Lebanon. Islam is meant to be dynamically responsive in all ages. New problems with the unfolding of modern life arise and they call for solutions in religion. Therefore, Shiite jurists should always be ready to have a say on issues that touch human life and consequently religion. Of course, the majority of the jurists made comments on the issue of human cloning in a general way. Seeking advice on human

1. Gholam-Reza Nourmohammadi, *Cloning: Fears and Hopes*, 81.

2. Ibid.

cloning, people usually heard general statements made by the jurists: human cloning is allowed, it is not allowed, ... The technique, according to the majority of the Shiite scholars is allowed but because of the ramifications it has it is described as forbidden (*Haram*): the disappearance of distinction between individuals, lack of a family identity, ambiguity in the relation between the clones and finally disorder and confusion in this regard.

Animal and human cloning do not cancel out God's power of divinity and creation. The geneticist is merely a mediator who prepares the conditions. The raw/primary materials (such as the ovum, cell, etc.) already exist in nature. Scientists do not create the natural materials. Shiite jurists do not regard this as interference with the creation of God who Himself has given man permission to discover the secrets of nature. Human cloning is not against creation in Islam because we are witness to cases in the Holy Quran of the creation of a snake (when Moses' staff, after he is ordered to throw it down) turns to a snake) and of Adam and Eve (without father and mother) and Jesus (without father). The Holy Quran refers to the natural way of creation here: « يا ايها الناس انا خلقناكم من ذكر و انثى ... » (49:13) (O you men! surely We have created you of a male and a female, ...) That refers to the normal process of human creation, with male and female. Thus, according to this verse most people are created by sperm and ovum. What man does now through cloning is to create another human being through another method but by using the creation of God. In other words, another way of reproduction is introduced in human cloning: a creature is made of another creature already created by God. Scientists cannot work independently when creating another human being. Ultimately, they depend on a being already created by God. According to the Holy Quran, a human being is of two lives, an animal life and a human life: « و لقد خلقنا الانسان من سلالة من طين ثم جعلناه نطفة في قرار مكين. ثم خلقنا النطفة علقه فخلقنا العلقه مضغة فخلقنا المضغة عظماً فكسونا العظام لحماً ثم انشأناه خلقاً آخر النطفة علقه فخلقنا العلقه مضغة فخلقنا المضغة عظماً (23:12-14) (And certainly We created man of an extract of clay, Then We made him a small seed in a firm resting-place, Then We made the seed a clot, then We made the clot a lump of flesh, then We made (in) the lump of flesh bones, then We clothed the bones with flesh, then We caused it to grow into another creation, so blessed be Allah, the best of the creators.)

The first creation refers to the animal life of human creation while

the final creation is the human creation, that is the creation of the soul which is of the same quality as God's soul. Scientists could not create the latter or the soul. In the process of cloning, animal life is produced; nevertheless, the soul is bestowed by God. Therefore, cloning is not interfering in God's work, according to the Shiite scholars. Man, in human cloning, is merely creating the physical part which is itself derived from another body already created by God. The human soul is a creation of a different kind.

However, Shiite scholars always consider the moral aspects of the problem too. As mentioned earlier, when one gives it a second thought human cloning might endanger the natural bond of marriage. The family system would collapse. A mother-daughter relation might be read as twins. So it is logical that the general morality would reject human cloning because it would lead to the disappearance of the family system and many other long-established values. The technique of human cloning is permissible in Shiism (*jayez*) but it is really important to ask this question: why do we want to clone human beings? The intention is important and therefore it is a determining factor in whether we are allowed to practice human cloning or not. If an Islamic government has forbidden human cloning due to its various effects, people are supposed to follow the same.

Once this technology is in vogue, it might be misused by dictators. Nowadays, very many discoveries and technologies are used against human beings and for the destruction of the world. The nuclear arsenal in the world could destroy the whole earth for ten times. There are many dictators in the world who could like to rule forever over the oppressed people. So it is reasonable to oppose human cloning, from a Shiite viewpoint, since its spread might bring disorder to human society, although they primarily do not reject it. This is where we have the secondary understanding or assessment of the issue of human cloning coming into the scene: although permissible it is not allowed because it might seriously and badly affect the society.

In the Shiite sect jurists rely on three sources for finding solutions to new issues: the Holy Quran and the tradition of the prophet and the infallible Imams, and the law of deductive logic or Ijtihad. So they have to search in the first two sources to help the mujtahed (the jurist) to find solutions for new problems. The natural process of making children, as mentioned in the Holy Quran, that is through mother and

father. Although human cloning seems to be unnatural it does not imply that it is forbidden in Islam. We have such out-of-the-way examples in the cases of the creation of Adam and Eve at the beginning and also the creation of Jesus. Thus the window has been opened by God which could help the Islamic jurists issue their primary statement on this issue as not forbidden (not *haram* but *jayez*). So by the primary understanding or assessment human cloning in itself is allowed.

So there is reason enough for Muslim states to allow the cloning of human embryos for research into possible medical treatments — the so-called therapeutic cloning — while maintaining a ban on the reproductive cloning of human beings.

The proposed code addresses the relationships between physicians, their patients, and wider society from the perspectives of both Islam and medical ethics. It takes into account Islamic views on new medical techniques such as in vitro fertilization and gene therapy.

Any decision to endorse therapeutic cloning could have international implications. Here we reiterate that there is a group of Shiite Muslims that treat the subject of cloning cautiously and conditionally. The ideas of the Islamic countries might be very important to reach a world final resolution on this crucial issue.

This group of Muslim scholars (those who believe in permitting cloning) use three principles, Practical Principles or *Osoul-e Amali-ye* (a set of formula used at the time of doubt) to substantiate their theory:

First Principle: Studying and knowing the subject and comparing it to principles of Islamic law we conclude that cloning itself is not forbidden. So this formula is used and based on *helleyat* (religious leave) it is said that because cloning is not forbidden, it is *halal* or allowed in Islam.

Second Principle: The second principle is *Isalat Al-Ebaha*, that is when doubtful about whether something is *halal* or *mobah* it would be *mobah* (may or may not be performed). Thus the doubtful act is allowable and permitted.

Third Principle: The third principle is *Isalat Al-Baraa*, that is since there are no traditions available on the subject it should not be *haram*. In fact, when one is doubtful about what to do or what his or her responsibility is s/he applies this principle. Accordingly, when doubtful about responsibility and when there is no reason to forbid

something, the criterion is that the act is innocent and the subject is allowed and permitted.¹

Those jurists who have allowed the process of cloning, have also mentioned some conditions for it which are as follows:

First Condition: Man and woman who give the cell should be identified because there would be no religious, legal or even customary genealogy for an unknown individual.

Second Condition: There should be no haram label which would null the religious genealogy. For instance, if the sex cell is obtained from the seed that is the result of unlawful intercourse, religious genealogy will not be proved since it is a violation of a religious code.²

Third Condition: At the stage of getting reproductive or somatic cell, impregnating and enticing the seed, there should be no defect or mistake with other cells or seeds, or the legal parentage would not be proved.

Fourth Condition: Those who are involved in doing cloning are supposed to be expert and aware of the secrets of the process to prevent any possible future harm to the infant or human society, otherwise Islam forbids such activities in terms of reason and religion. This law is taken from a statement:³ It says when there is no necessity for an act it should not be done in case it inflicts harm.⁴

The point I want to make at the end is that a function of genetics for man is human cloning. This means the production of creatures with the same components of individual identity such as genetic structure, blood, cell, feeling, reason, complexion, color, height, and body in general. This would naturally lead to some problem. For example, there would be economic, social, matrimonial, problems and issues regarding crime, judgment, representation, executorships, surety and procuration. Thus identity of the subject or human being is

1. *Masaele Mostahdeseye Pezeshki (Contemporary Medical Issues)*, Islamic Propaganda Office, Khorasan Razavi Branch, 42.

2. Ali Meshkini, *Mostalahat Al-Fiqh*, 289.

3. Muhammad Ibn Hassan Hur Ameli, *Wasaal Al-Shia*, Vol. 17, 340.

4. *Masaele Mostahdeseye Pezeshki*, Islamic Propaganda Office, Khorasan Razavi Branch, 56.

the first condition for the realization of such a matter. For instance, the identity of husband and wife has to be defined in terms of age, stature, color, height, education, parentage and blood group. This would draw a distinction between this individual and others.

Engineering D.N.A has made it almost possible to produce human beings who share the same blood, genes, body and complexion. With the success of this project, identity distinction will not be possible. A Husband or wife would be standing in front of dozens of identical men and identical women who are unable to identify his or her spouse. It would also be difficult to distinguish between customer and seller, lawyer and the accused, judge and complainant, and so on.

This way, jurisprudence would be challenged in terms of subject matter as well as precept and execution. The answer to such a problem is as follows:

Firstly, with the advancement in genetic engineering man has reached a level of knowledge to exactly identify individuals. This is very beneficial to law and jurisprudence by way of approaching justice and reducing mistakes.

Secondly, as mentioned earlier the result and product of cloning would not lead to complete uniformity of human beings. On the other hand, their genetic function would not be the same since geographical, cultural, educational and other factors would affect their function. Thus there is no logic which says they would have the same knowledge, functions, reasoning, feelings and emotions.¹

However, although cloning is allowable according to a considerable number of Shiite jurists, the precept faces some challenges which require explanation. This study is a review of some important challenges and brief relevant explanations:

First Challenge:

The problem is that when the embryo is placed in a woman's womb who will be its father and mother? Will the child bear any relation to other human beings?

1. Seyyed Hossein Homayun Mesbah, *Fiqh Journal*, No. 47, 'Human Cloning and Religious and Legal Challenges

Explanation: What is important is the true meaning of one's 'child'. Who is one's child? Naturally, one's child is born of one, that is one's offspring or progeny. Traditionally, a child is one born of a man's sperm and a woman's ovum. Thus two or more children born of a wife's ovum and a husband's sperm would be the children of the same couple. Another important thing is the question 'who is called mother?' Is the mother one who carried and delivered – even if the ovum does not belong to her? It is definitely not like that. We read in the Holy Quran, 'Their mothers are no one but those who have delivered them.' (ان امهاتهم الا اللاتي ولدتهن)¹ The true delivery is not merely placing the fertilized ovum in her body and bringing it out. 'One's true child is someone who is delivered and born from that one.' Therefore, the true father and mother of a child are those who have provided the sperm and ovum.²

In addition, when we consult the etymology of the words and books on jurisprudence, it becomes clear that the meaning of the word mother in Arabic (ام) is the essence of something.³ The definition applies to the woman who possesses the reproductive cell from which the cloned child is produced, especially when the sperm is implanted in the wife's womb, because this woman or wife is the mother and origin of the child. Considering the lexical meaning and the confirmation of the legal authority and absence of adultery in cloning would be enough to make the cloned child the mother's. Legally, she would be the mother especially when her child is developed in her womb.⁴

But what is the relation between the mother, who fed the sperm for nine months in her body, and the child? According to the rule of deduction of definite priority, if an infant is fed by a woman whose milk caused the growth in body and bone, that infant would be *mahram* or 'of close relationship' (with whom marriage is prohibited). So for a woman who has fed and carried the infant for nine months in

1. The Dispute, 2.

2. Hassan Javaheri, *Fiqh Journal*, Vol. 47, 'Dividing Embryo and Cloning', 90.

3. Mohammad Firouzabadi, *Al-Qamous Al-Mohidh*, Vol. 4, 103.

4. *Masaele Mostahdeseye Pezeshki*, 50.

her body that would be like a close relative.¹

The criterion for proving legal parentage is basically the fact that the infant is the result of the seed. Of course, adultery is exempted here. Accordingly, the infant which is the result of the cell would be the child of the one who provided the cell. While the form of the seed and the cell is different, it does not change the subject. What is directly involved in creating and producing the infant are the genes which exist in both; a somatic cell – used in cloning – contains all necessary genes for creation and the transfer of the qualities as a sperm does. It is concluded that the basis and criterion for legal parentage exist in the cloned infant. Then parentage is legally confirmed.²

Now that the motherhood of the wife who provides the reproductive cell is confirmed for this infant, all other legal observation on marriage apply to this infant too. After proving legal parentage all religious precepts and requirements such as the forbidding of incest marriage, all commandments related to close a relative would apply to this infant, who would enjoy a legal and lawful position like other children in families.

Another ramification which follows the confirmation of legal parentage between the cloned infant and husband and wife and the verdict that they are the parents is that the inheritance laws will apply here too and the infant will have his share like other children. Relevant verses in the Holy Quran (Women, 11 and The Clans 6) apply to the case.

Second Challenge

In juridical texts, one way of recognizing parentage and confirming the relation between father and child is that the time span between fetus fertilization and child birth should be minimum six months and maximum nine months and sometimes one year.

This meaning is obtained from a Quranic verse (حمله و خصاله ثلاثون)

1. Ibid.

2. Muhammad Taqi Hakim, *Osoul Al-Amah Lel-Fiqh Al-Moqaren (General Principles of Comparative Jurisprudence)*, 301.

شهرًا¹ and also many traditions. But with the advent of genetic engineering² this method will be questioned. With the engineering of D.N.A it is possible that the primary seed goes through the process of change and perfecting much faster, and become as perfect human being ready to be born within a period of much less than six months.³

Explanation:

One way of relating a child to parents or one of them is the genetic and natural method. According to this method, a child is related to parents only when possessing three characteristics: 1) Child is produced from their fetus. 2) From the time of sexual intercourse there should be a minimum period for six months to childbirth. 3) Maximum time after sexual intercourse when the fetus is formed till childbirth is 9-12 months.

Of the three characteristics mentioned, the first one is basic and unchangeable. According to many Shiite jurists the criterion is the interaction between wife and husband even if by artificial methods such as fertilization, provided that no sin or unlawful action has happened in the introductory stages. Some jurists like Imam Khomeini assert: The fertilization of a wife by her husband's sperm is allowable when there is no problem involved although it is *wajib* to prevent the *haram* at an early stage ... Even if man's sperm is implanted in a forbidden way, such as it is implanted by a stranger, or the sperm is obtained in a forbidden way, the child will be theirs though it is done in a *haram* way and they are sinful.⁴

Then what is significant and regarded as the measure is the interaction and combination between reproductive cells of husband

1. The Dunes, 15.

2. Exploiting techniques for producing clones of special molecules, man could introduce a discipline named genetic engineering with the technology of combining D.N.A (Recombinant D.N.A Technology). It is a way for designing and producing needed D.N.A. In other words, D.N.A from different creatures could be obtained.

3. Seyyed Hossein Homayoun Mesbah, *Fiqh Journal*, Human Cloning and Religious and Jurisprudential Challenges, Vol. 47, 115-8.

4. *Tahrir Al-Wasilah*, Vol. 2, 559, problem 1.

and wife, and the born child will belong to both parents. The way the combination takes place is not fixed. Even the time required for the fetus to turn to a human being is also changeable. It all depends on the method, whether it is natural, scientific or genetically engineered. Therefore, determining the minimum or maximum time for relating a human being to his or her father, in Shiite jurisprudence, shows the method not the law. It expresses traditionally the natural way under certain conditions. Thus genetics does not create a problem for jurisprudence. In this regard Imam Khomeini points out:

If an infant has artificially grown before the minimum period (six months) has passed, that is the natural process has been hastened through some rays, or on the other hand, his growth has artificially slowed down; or when he is born after the maximum period (one year), in both cases the child belongs to the father provided that he is essentially from his sperm. In addition, if in some geographical areas the maximum and minimum periods are different from our area, the child will be related to the parents and not compared to conditions in our area.¹

Third Challenge:

One quality for taking social position like the responsibility of leading the Muslim society is to be legitimate, as the right to be a judge, leader of communal prayer and standing as a witness all require the same condition. So those who are not born in a legal way do not enjoy such a right. There are many traditions recited in sources of jurisprudence in this regard.²

In genetic engineering, despite the possibility of producing morally, intellectually and physically more developed human beings, the quality of legitimacy and illegitimacy has no significance in human identity. Then what is the legal responsibility mentioned above.

1. Ibid, 560, problem 9.

2. *Wasael Al-Shia*, Vol. 18, 'Book of Al-Shahadat', Chapter 31.

Explanation:

To be legitimate or illegitimate is a contractual label regarded by the legislator when legalizing laws. If husband and wife begin their matrimonial life according to legal laws and have a child later, the child will be legitimate. In cloning, a human being is produced genetically in a natural way then the resulting child will not be illegitimate. Then the child will be subject to the mentioned rights circulated in Shiite jurisprudence.¹

Fourth Challenge:

Cloning also challenges the principle of man's responsibility to God. Responsibility follows servitude which is materialized when man sees himself possessed by God who has bestowed upon him his being and creation. But when genetic engineering owns the act of creation, man then will replace God. The corollary is that when man assumes that he is not created by God he will not obey God. With the rejection of servitude responsibility will lose its meaning. Then human beings will not feel responsible or responsive before God. All religious precepts will lose their significance and function. Furthermore, there will be no answer to all commands and forbidding appearing in the holy books.

Explanation:

Scientific and genetic advances in the field of cloning especially human cloning could never question God as creator. What is done is not of the nature of God's creation, although it could parallel the divine creations. But it could never interfere with it. Because the science of genetics depends on earlier existence of stem and reproductive cells and the genetic map with chemical, biochemical, and biological qualities and laws. None of them are man-made but they are located within the framework of God's creative arena of science and power. Human achievement in this respect is the

1. Seyyed Hossein Homayoun Mesbah, *Fiqh Journal*, 'Human Cloning and Religious and Jurisprudential Challenges', Vol. 47, 138-43.

recognition of laws governing these life units which reflect their function and biological identity. Based on this recognition, scholars and engineers of genetics are able to make changes and combinations in stem cells and reproductive cells, and ultimately design and offer special programs in the interaction between biological units.¹

Geneticists could not do anything without the fetus cell and the laws governing it, the absence of a mature cell from another organ as well as its genetic map with all its characteristics and capabilities. They cannot create, that is bring to being, the zeugma cell with all its information, the D.N.A of tissue cell with all they contain of information and delicacies, or the stem cell. They merely use the modern advanced technology to discover the laws, characteristics, and their capabilities, and based on them they re-combine and program them.

Fifth Challenge

Does cloning smear the position observed by the Holy Quran for a human being? (و لقد كرمنا بني آدم)² If cloning is possible and allowable what ways should be adopted for preserving human dignity? God has facilitated human beings with this dignity and superiority. Therefore if human beings are born in an unnatural way, and since the term 'human being' (بني آدم) mostly refers to those born naturally, conventionalizing the new method of cloning will hinder God's will regarding human beings. Such an act then would be *haram*.

Explanation:

Firstly, what is intended by the dignity God has given to man is the reason and intellect given to them for reaching perfection. Thus cloning will not waste this God-given dignity, because it is bestowed on the cloned individual who is the offspring of human being.³

Secondly, God's intention in the verse ostensibly is that God has

1. Ibid, 140-43.

2. Isra', verse 70.

3. Hassan Javaheri, *Fiqh Journal*, 'Dividing Embryo and Cloning', 98.

preferred this group to others. Thus this superiority over other creatures is fixed. It does not make this superiority exclusive for human beings born in the conventional way; it only is fixed for this group.¹ What is meant is human species whether conventionally born or born in a different way like cloning. Therefore, this challenge, like earlier ones, is no reason to make cloning forbidden or *haram*.

Conclusion

After consulting the original elements and principles of inference which are God's Book and the Prophet's Sunna (tradition) no convincing reason could be found to forbid cloning. So it is believed that human cloning is legal and allowable but the point that utilizing it on a large scale could have some ramifications in the society should also be kept in mind. Then some limitations should be set. However, this group of Shiite scholars says that cloning by itself is legal pointing out that after inspecting legal principles in inference no valid reason was found to make it *haram*. Thus according to the Quranic verse nobody is allowed to judge whether something is haram or halal without legal documentation. (ولا تقولوا لما تصف السنتكم الكذب هذا حلال و هذا)² (حرام)

On the other hand, this act does not mix up lineage or put an end to the family system. The cloned child would be the child of a man who has contributed the nucleus of his somatic cell. Like his other children, the cloned one also would inherit his father. If he is from the nucleus of a woman's cell he would be her child and inherit from her like her other children. Here neither lineage is violated nor family system is abolished nor is the social system harmed.³

Lineage or parentage would be violated in case a cell nucleus bank is established, and the owner of the cell's nucleus from which a woman is pregnant is not known.⁴ Jurisprudents who have allowed cloning all have the same opinion that when cloning is done on a

1. Mohammad Momen, *Fiqh Journal*, Vol. 46, 40.

2. Nahl, 116.

3. Ayatollah Jannati, *Fiqh Journal*, No. 46, 16.

4. *Ibid*, 17.

massive scale it would have dire consequences. However, when it is carried out on a small scale it would have no corollary.

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