Catholicism and Human Reproduction: an Historical Overview

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Throughout history Catholics held the commonly accepted views of the times regarding human reproduction, and these views changed as advances were made in scientific knowledge. Hence, it would be best to begin with Aristotle’s views on human reproduction.

Aristotle’s theory of human reproduction

Today we know how human individuals are naturally conceived. For thousands of years there was no scientific knowledge of fertilisation nor of the conception of human individuals. It would be interesting to recall the learning curve of our ancestors on the natural conception of human beings. For further reading, I recommend Matthew Cobb’s excellent book, The Sperm & Egg Race. Aristotle (d. 322 BC) was a great Greek philosopher and natural scientist. His thoughts on human reproduction were derived from observation of the way animals propagated. He knew that a woman became pregnant only after semen is deposited in her vagina during sexual intercourse. He also knew that the monthly flow of menstrual blood ceases when a woman is pregnant. These were the facts at his disposal, without any knowledge of the cell theory nor of human

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ova and sperm. He assumed the woman's contribution was passive, like a clay vessel shaped by a potter. Aristotle's views influenced Western thinking for some two thousand years.

For Aristotle, the male initiates the human generative process in the menstrual blood for the formation of an offspring. The matter is derived from the mother, while the father's semen induces the form—the specific life character. He believed the father "... only makes a living creature by the power which resides in the semen." In other words, the father's semen was deemed to have an active power that transforms the mother's menstrual blood into an embryo within seven days. Aristotle thought menstrual blood has the potency to become all parts of the human body once it is acted upon by the specific heat and vital power of the semen, called pneuma (πνεῦμα), which means literally air, breath or wind. He held that it induces the menstrual blood to solidity and form the embryo, without any physical part of the semen becoming part of the embryo. The solidifying of the menstrual blood through the action of the semen's pneuma over seven days enables a woman to conceive and hold the newly formed embryo. The Greek term for conceive is συλλαμβάνειν.4

Aristotle only found evidence of nutritive activity in the early embryo, a sign for him that it only has a nutritive or vegetative soul. This would be replaced by a sensitive soul, along with differentiation of the embryo into distinct parts as a result of the causal action of the semen's pneuma before the fortieth day.

A rational soul would appear some forty days after sexual intercourse, in a mysterious way from outside matter, as though it were divine, to complete the generation of a human offspring.5 This was required by Aristotle because the soul does not need a physical organ for reasoning as the body needs an eye to see. Though a functioning brain is needed for reasoning, it is not the organ of reasoning. In Aristotle's words: 'It remains, then, for the reason alone to enter [from outside] and alone to be divine, for no bodily activity has any connection with the activity of reason." The above account gives the historical origin of the forty day period after which abortion of a foetus was morally regarded as the equivalent of homicide.

Aristotle's influence on Aquinas and Christendom1

The outstanding philosopher and theologian Thomas Aquinas (d. 1274) agreed with Aristotle that the formation of a male child is completed by forty days and a female child by ninety days. This is indicative of the little progress made in reproductive biology during the previous thousand years.

This is a typical text that gives a summary of Aquinas' position:

In the higher animals brought into being through coitus, the active power resides in the male's semen, as Aristotle says, while the material of the foetus is provided by the female. The vegetative life-principle exists in this material right from the beginning, not in its secondary state of actuality but in its primary state of actuality, just as for instance the sense-soul exists in those who are asleep. When, however, it begins to draw upon nourishment then it becomes actually operative. This matter is then transmuted by a power in the husband's semen until the sense-soul becomes actual in it.6

Aquinas stresses the unity of the rational soul and body. It is the one soul that accounts for the corporeal, vegetative, sensitive and rational activities of the human being. He holds there is a second conception for the perfect formation of the body of the human individual required for rational ensoulment or animation in addition to the initial conception of the body from the menstrual blood. A human person cannot be said to be conceived, according to Aquinas, before actually coming into existence through animation by a rational soul.

Aquinas also believes in a succession of generations from a vegetative soul to a sensitive soul and finally a rational soul which assumes the powers and functions of the lower souls. He goes beyond Aristotle by stating that the rational soul is created by God:

In man, as in the other animals, the final substantial form comes about through many comings-into-being and dissolutions... Therefore it must be said that the intellective soul is created by God at the completion of man's coming-into-being. This soul is at one and the same time both a sensitive and nutritive life-principle, the preceding forms having been dissolved.7

Decline of Aristotle's theory of human reproduction8

The Flemish physician, Thomas Feyens, in 1620, advanced the view that the semen only requires three days to transform the blood by its coagulating action to prepare it to receive the rational soul. This was a radical challenge to the tradition.8 He saw no need to postulate a succession of generations of souls to explain the development of organs and their functions. He believed the rational soul could begin to animate the amorphous coagulated mass of blood and give it shape after its infusion on the third day. He regarded the rational soul as the form

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5. Ford, When did I begin?, 32 and note 32.
of the living body that developed epigenetically from within. He argued that if the rational soul is present after birth—even though rational functions could not begin before the onset of the age of reason—there is no point in delaying rational animation up to the fortieth day after conception. It is the same individual who develops continuously after animation by the rational soul through embryonic and fetal development, gestation to birth and adulthood.

In 1621, Paolo Zacchias, a Roman physician, shortened the gap by saying the rational soul is infused at conception. If a rational soul is present after forty days—though its functions are still in potency—it could be present from conception while its functions are likewise in potency. Both Fienus and Zacchias developed their alternative views within the biological and philosophical framework of Aristotle and Aquinas.

The experiments of William Harvey in 1633 proved that after the mating season of deer, no coagulated mass of menstrual blood had been found following contact with semen. This disproved Aristotle's theory which for some 2,000 years had been taken for granted. Furthermore, Harvey did not find any ova—little wonder since they are too small to be seen by the naked eye. He failed to find a satisfactory explanation for conception. His experiments and observations, however, were important because they first denied biological support for the traditional Aristotelian theory of successive animations in human reproduction.

Professor Roger Short commented on the situation after Harvey's work:

In contrast to the Aristotelian view that the 'female testicles' of mammals played no part in reproduction, Niels Stensen of Denmark in 1667 concluded that they contained ova, like the ovaries of birds, and were therefore involved in the reproductive process, and should be called ovaries. Van Leeuwenhoek's discovery of mammalian spermatozoon in 1678, and his suggestion in 1683 that life began when a male spermatozoon impregnated an ovum, set men thinking along the right lines, although it was not until the nineteenth century that fertilization was actually observed.

Mathew Cobb succinctly summarises the situation:

Using his microscopes, Leeuwenhoek had found the answer to the problem that had so perplexed Harvey and De Graaf: semen could play a direct, physical role in generation, through the action of the tiny animals wriggling their way into the uterus. He had blown apart the egg-centred consensus about generation created by the work of Steno.


Van Horne, Redi, Swammerdam, De Graaf and Kerckring. They had looked at the role of the female; Leeuwenhoek had focused on the other side of the generation equation. Following these contrasting approaches, throughout the eighteenth century biology was divided into two camps—the ovists and the spermists, the names reflecting the structure each group thought was fundamental in generation.

Though it was only in 1827 that Von Baer discovered and described the ovum, some philosophers and theologians had gradually come to know some of the scientific findings of biologists well before the end of the eighteenth century. It was becoming more difficult, but not impossible, to cling to the Aristotelian theory of delayed rational animation.

Two additional interesting developments gave unexpected support to the theory of immediate rational ensoulment. The first was the biological theory of preformation according to which the appearance of different organs and parts in the developing foetus is due to the unfolding and growth of parts already differentiated and existing in the embryo from the outset. This is the opposite of the theory of epigenesis which explains the origin of new organs by a process of differentiation and growth within the embryo where they previously existed potentially.

Joseph Needham comments:

By 1720 the theory of preformation was thoroughly established 'with reports of the sighting of exceedingly minute forms of man, with arms, heads and legs complete, inside the spermatozoa under the microscope.'

It is easy to imagine how these ideas and the use of early microscopes would influence people's imagination to effectively support the theory of immediate animation: 'If a fully formed human being in miniature is present in the embryo, derived from the egg or the spermatozoon, immediate rational ensoulment would be assumed to have taken place.' Indeed, the use of primitive microscopes coupled with a lively imagination and a desire to establish rational ensoulment from the start led to claims that a completely formed miniature human being [Latin homunculus] could be seen in the sperm head.

The second interesting development that helped establish immediate animation was the decline of Aristotelian-Thomist philosophy along with the
publication in 1637 of Descartes’ book *Discourse on Method* which proposed his dualistic theory of the human being. He held the soul and body were two distinct substances that formed a union of two realities, but not the unity of one being. His dualism enabled philosophers to think of the soul as present from conception, not as animating the body, but as a separate reality in close relationship with the body. If the ‘self’ is only the soul, it would not matter whether the body linked to the soul is small and undeveloped. Descartes’ dualism continued to provide support for immediate rational ensoulment even after preformation was discarded.

The discovery of the active part played by both ovum and sperm in the process of fertilisation coupled with the active role played by genes also lent support to the theory of immediate rational ensoulment. John Noonan rightly summarises majority thinking late in the nineteenth century:

A change in organism was seen to occur at the moment of fertilization which distinguished the resultant from the components. It was easier to mark this new organism off from the living elements which had preceded it than it was to mark it off from some later stage of its organic growth in the uterus. If a moment had to be chosen for ensoulment, no convincing argument now appeared to support Aristotle or to put ensoulment at a later stage of fetal life.18

In the light of contemporary scientific embryology it is clear that there is sufficient organisation present in the chromosomes and genes to reasonably hold that the fertilised egg is a living human individual, and a human person. Most contemporary Catholic scholars in the tradition of Aristotle and Aquinas, including myself, support the position of immediate rational ensoulment from conception.

**Definition of an embryo**

The term *embryo* comes from the Latin *embryon* and the Greek ἐμβρυον, év, in and ἐμβρύος, ‘to swell or grow’. Its original meaning is the one swelling inside, the young one growing inside. The successful fusion of human sperm and egg at syngamy results in the formation of a new diploid cell, the zygote, derived from the Greek word, ἱαμβρύος, yoked together. Being the first cell formed, the zygote marks the beginning of the embryo formed by natural conception, an IVF procedure or by human cloning.

The zygote is said to be totipotent because, in virtue of its human genome, it is naturally capable of giving rise to a whole offspring once it begins in the fallopian tube and a few days later finds its way to a favourable uterine environment. A single cell from a two-cell embryo, and possibly a four-cell embryo, is likewise totipotent because it also has the inherent potential to form the entire offspring, in a continuous, coordinated biological process, once it is placed in a favourable uterine environment. This implies a cell removed from a four-cell embryo could also be deemed an embryo. The cells of a two-cell embryo are not two embryos, but potentially two embryos unless they are separated.

A human totipotent cell has the natural capacity to develop and form a whole human offspring. From a philosophical perspective and for ethical purposes, the zygote is an embryo which may be defined as ‘a totipotent cell or a group of cells or a multi-cellular organism, which in virtue of its genome, has the inherent actual potential to continue organised human development in a suitable environment’.19

Clearly a living blastocyst is an embryo. A frozen embryo exists in suspended animation, but it is an embryo because it still has the inherent actual potential to continue development once it is successfully thawed. But failed fertilisation does not result in the formation of an embryo nor does a disorganised embryonic teratoma: these do not have the intrinsic potential to develop as an embryo and to become a foetus. This does not imply that every embryo with a congenital lethal abnormality that will die before birth is not an embryo.

A totipotent cell or group of contiguous cells is an embryo because of what it is with its actual potential, not because of what it may in time become as is the case of a sperm or an egg. An embryo cannot exist before human development begins. On the other hand, once a blastocyst is disaggregated and loses its inherent potential for development, it ceases to exist, even though the embryonic stem (ES) cells that are derived from it can live on and multiply in culture for some time. A clump of ES cells left alone on a dish cannot produce trophoblast or placental tissues nor form a body plan. It cannot develop in a co-ordinated way, isolated from a suitable female reproductive tract: it would cease to be totipotent and an embryo.20

**Human reproduction—Christian tradition and Catholic Teaching**

**Moral Respect for Early Human Life**

The Didache, one of the earliest non-biblical Christian writings, was written in Syria and contains moral instructions for Christians.21 The following are

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samples of instructions for new Christians to live virtuously and avoid common sins: ‘You shall not murder... You shall not practise magic. You shall not mix poison. You shall not murder a child, whether by abortion or by killing it once it is born.’ In the second century Clement of Alexandria wrote: ‘Women who conceal their sexual wantonness by taking stimulating drugs to bring on an abortion wholly lose their own humanity along with the foetus.’ Some years later Tertullian (160-240) wrote:

For us, murder is once for all forbidden; so even the child [conceptum] in the womb, while yet the mother’s blood is still being drawn on to form the human being, it is not lawful for us to destroy.

Though many in the Greco-Roman world used or approved the use of abortifacient drugs or procedures, Christians did not.

Throughout the following centuries it was held to be seriously immoral to destroy a child from conception because every human being belongs to God, in whose image it is made. Direct intentional abortion is, and was, always considered to be immoral. In 1679 when it was held that animation occurred some forty days after conception the Church condemned the proposition that it would be permissible to induce abortion before animation for a young woman who was pregnant and feared for her life. Quite different is the loss of a foetus as a side-effect when a non-viable foetus is surgically removed from the uterus of a pregnant woman to save her life. This could occur if she has a life-threatening cancer of the uterus and it becomes medically necessary to remove her uterus before the unborn child is viable. However, it would be unethical to deliberately terminate the gestation of any unwanted child prior to viability since this would be direct abortion.

The greatest witness to the moral inviolability of early human life was given by the world’s Catholic bishops assembled in Rome for the Second Vatican Council in 1965, when the Church had not yet taught that the human individual begins at fertilisation: ‘Life must be protected with the utmost care from conception: abortion and infanticide are abominable crimes.’

In 1974 the Church stated the following in the Declaration on Procured Abortion:

In reality respect for human life is called for from the time that the process of generation begins. From the time that the ovum is fertilized,

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a life is begun which is neither that of the father nor of the mother; it is rather the life of a new human being with his own growth. It would never be made human if it were not human already. (para.12)

The Church’s 1983 Charter of the Rights of the Family states: ‘Human life must be respected and protected absolutely from the moment of conception. The benefit of any doubt should go in favour of the embryo from conception.’

Once assisted reproductive technology had become established, the Church published an Instruction named Donum Vitae in March 1987. It gave moral guidance on the use of reproductive technology for human procreation, and called for absolute moral respect to be shown to human embryos from fertilisation onwards. This Instruction defined a zygote as ‘the cell produced by the fusion of two gametes.’

The Catechism of the Catholic Church authoritatively teaches: ‘Since it must be treated from conception as a person, the embryo must be defended in its integrity, cared for, and healed, as far as possible, like any other human being.’

There is no moral justification to deny personhood to those who are not yet capable of exercising rationally self-conscious acts. A rational human nature must already exist before a child could for the first time begin to reason or exercise any rationally self-conscious acts. A living individual with a rational nature is a human being, a person. This rational human nature is the foundation of a human person’s dignity and moral inviolability.

In 1995 Pope John Paul II taught in his Encyclical Letter the Gospel of Life:

...that the result of human procreation, from the first moment of its existence, must be guaranteed that unconditional respect which is morally due to the human being in his or her totality and unity as body and spirit.

In ancient Egypt as few as three births out of ten reached adulthood. Fortunately, with better infection control and access for pregnant women to obstetric facilities and neonatal intensive care units, the survival rate of newborn infants has risen dramatically. Catherine Racowsky states that the probability of a viable conception per menstrual cycle is 20-25% for a healthy, fertile couple.

32. Ford, The Pronatal Person, 32.
Although the moment when a human soul is created is not known the Church rightly teaches that even ‘... supposing a later animation, there is still nothing less than a human life, preparing for and calling for a soul in which the nature received from parents is completed.”34

The developing human embryo is endowed with human dignity and should enjoy the moral inviolability of the adult human being who consciously relates to God and to others through acts of knowledge and love. Hence the Church adopts a position of prudential certitude in relation to the presence of individual and personal life once the process of fertilisation results in the constitution of a zygote. With the approval of Pope Benedict XVI the Congregation for the Doctrine of the Faith in 2008 published an Instruction on Bioethics, Dignitatis Personae, which endorsed and developed the teaching of Pope John Paul II:

Although the presence of the spiritual soul cannot be observed experimentally, the conclusions of science regarding the human embryo give ‘a valuable indication for discerning by the use of reason a personal presence at the moment of the first appearance of a human life: how could a human individual not be a human person?’... The human embryo has, therefore, from the very beginning, the dignity proper to a person.35

Reproduction and marriage in the Catholic Christian tradition

Human procreation essentially differs from the reproduction of animals because of its close causal links to the conception and birth of children who have the same personal dignity and rights as their parents. It belongs to our genetic identity to have this father and mother, this brother and sister, these cousins and grand-parents. Our relationships are important for us, and are determined by our genetic and biological origins—but this does not imply a sperm or an ovum is a child’s parent. Experience shows that when biological parents are also the social parents, family bonding and beneficial relationships are usually formed and strengthened. In Dignitatis Personae the Church teaches:

Marriage, present in all times and in all cultures, ‘is in reality something wisely and providently instituted by God the Creator with a view to carrying out his loving plan in human beings. Thus, husband and wife, through the reciprocal gift of themselves to the other—something which is proper and exclusive to them—bring about that communion of persons by which they perfect each other, so as to cooperate with God in the procreation and raising of new lives.”36

34. Declaration on Procured Abortion, n.19.
35. Congregation for the Doctrine of the Faith, Instruction, Dignitas Personae on Certain Bioethical Questions (Vatican, 8 September 2008), n. 5.

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Natural law, which is at the root of the recognition of true equality between persons and peoples, deserves to be recognized as the source that inspires the relationship between the spouses in their responsibility for begetting new children. The transmission of life is inscribed in nature and its laws stand as an unwritten norm to which all must refer.37

Catholic teaching holds that marriage enshrines a right and a duty for couples to have children through marital love expressed in conjugal acts which confirm their irrevocable commitment to each other and their children. In virtue of spouses’ mutual intimacy and inter-personal love, conjugal acts are pre-eminently suited and required to generate their offspring. Children need to have responsible parents who raise them in a suitable environment of mutual love, care and support within the family circle.

Referring to infertile couples, Pope Pius XII taught that the begetting of children for infertile couples ‘does not necessarily proscribe the use of certain artificial means destined solely either to the facilitating of the natural act or to ensuring that the natural act normally performed achieves its proper end.” Catholic teaching also adds:

The procreation of a new person...must be the fruit and the sign of the mutual self-giving of the spouses, of their love and of their fidelity. The fidelity of the spouses in the unity of marriage involves reciprocal respect of their right to become a father and a mother only through each other.”38

Hence, their newborn infants are children of the marriage union.

Out of respect for their dignity and personal nature, children should have a fully human origin and ‘be conceived and born within marriage and from marriage.” Indeed, the Second Vatican Council solemnly declared that:

By its very nature the institution of marriage and married love is ordered to the procreation and education of the offspring and it is in them that it finds its crowning glory...The intimate union of marriage, as a mutual giving of two persons, and the good of the children, demand total fidelity from the spouses and require an unbreakable unity between them.”39

40. Donum Vitae, I, 6 and foot note 32.
The Church also teaches that:

it is ethically unacceptable to dissociate procreation from the integrally personal context of the conjugal act: human procreation is a personal act of a husband and wife, which is not capable of substitution.  

Pope Paul VI solemnly confirmed the traditional procreative purpose of marriage acts in his landmark Encyclical Letter Humanae Vitae:

Each and every marriage act must remain per se destined to procreating human life. That teaching, often set forth by the Magisterium, is founded upon the inseparable connection, willed by God and unable to be broken by man on his own initiative, between the two meanings of the conjugal act: the unitive meaning and the procreative meaning. Indeed, by its intimate structure, the conjugal act, while most closely uniting husband and wife, makes them capable of generating new lives, according to laws inscribed in the very being of man and of woman. By safeguarding both these essential aspects, the unitive and the procreative, the conjugal act preserves in its fullness the sense of true mutual love and its ordination towards man’s most high calling to parenthood.

Catholic teaching on contraception within marriage also excludes deliberate temporary or permanent direct sterilisation for the purpose of preventing procreation. This teaching refers to pills that prevent conception. Catholic teaching is opposed to using pills that achieve their effect by terminating the lives of human embryos already conceived. Paul VI declared that:

the direct interruption of the generative process already begun, and above all directly willed and procured abortion, even if for therapeutic reasons, are to absolutely excluded as illicit means of regulating births. (n.14)

Assisted reproductive technology

As a logical follow-up, Catholic teaching disapproves of all ways of creating human embryos other than through freely performed marriage acts. Effectively this proscribes pre-marital and extra-marital acts of sexual intercourse, regardless of any intention of procreating children. Catholic teaching excludes all extra-corporeal methods of conception, such as in vitro fertilisation or the use of donor gametes. Pope John Paul II wrote: “...they are morally unacceptable

since they separate procreation from the fully human context of the conjugal act.  

The underlying rationale of Catholic teaching could be put as follows: to the extent in which the use of ART excludes offspring being conceived and born within marriage it is deemed to be immoral in the Catholic Christian tradition.  

The simple case of a married couple having recourse to ART is not as bad as using donor gametes, or worse, giving their spare embryos for destructive therapeutic research. Following Pius XII’s lead the Church does, however, admit that if “the technical means facilitates the conjugal act or helps it reach its natural objective, it can be morally acceptable.”

The systematic use of ART outside marriage, including same sex couples, could blur children’s sense of personal identity by distorting the notions of parenthood, family and extended family relationships. In short, disrupting the natural links between marriage, conception within marriage, gestation, birth and the rearing of children does not serve children’s long term interests.

The cloning of Dolly, the sheep, proved that it is technically possible to clone human offspring. However, cloning a human being would be unethical as it would be contrary to children’s dignity as human persons to deprive them of the genetic basis of their fathers, mothers and other family relationships. In this way human cloning could be compared to a biological act of natural injustice against children. Each child should be treated as a person in his or her own right, a subject and not an object to be created and used for the benefit of others. Cloning could also risk unreal expectations being placed on the growing child to mirror the adult somatic donor. Human cloning for therapeutic purposes would be worse since it would involve cloning an embryo destined for destruction, e.g., by becoming the source of tissue for a sibling. Catholic teaching is explicit:

Attempts or hypotheses for obtaining a human being without any connection with sexuality through ‘twin fission’, cloning or parthenogenesis are to be considered contrary to the moral law, since they are in opposition to the dignity both of human procreation and of the conjugal union.

42. Dignitatis Personae, n.16.
43. Humanae Vitae, n.11-12.
45. Donum Vitae, II, 4-5.
47. Donum Vitae, I, 6.
personal identity by distorting the notions of parents, family and family relationships. Children should not be deliberately deprived of their natural genetic mothers or fathers: they ought to be loved and raised by them and not abandoned.

Legalising access to surrogacy arrangements tends to weaken the stability of marriage and the family as fundamental institutions of society. Marriage enshrines a right to seek to have children conceived and born of the marriage union. In reality, couples who enter into altruistic surrogacy arrangements mean no harm, but growing children are likely to be confused or troubled by their atypical family origins or wonder why their birth mothers gave them away. Commercial surrogacy agreements should be banned: it is immoral for a natural mother to bear her child—only to be traded for financial profit.

**Sex discrimination in human procreation**

For believers, parents cooperate with God’s creative gift of their children. There are serious moral reservations about applying to human procreation the techniques of sex selection legitimately employed for the breeding of animals. Children are always a precious personal gift entrusted to their parents who should act as their trustees and responsible stewards, not proprietors! The personal dignity of children requires that married couples accept them with all their natural endowments as the fruit of their own love with its in-built equal opportunity for procreating a girl or a boy. Human procreation should be free from sexual manipulation and discrimination, regardless of contrary practices traditionally accepted in some cultures. Children are to be begotten as sons or daughters, and not engineered as products.