

1. Introduction

Introduction

One of the central subjects in the discussion about whether abortion, experiments on embryos and so called therapeutic cloning is licit is that of the status of the embryo. The reaching of the status of a human individual or human person means that the embryo has a connected moral status, a dignity from which come the rights attributed to all human beings. Before reaching this status it is said to be licit to abort the embryo or use it as material for experiments, thereby eliminating it.

The difficulty is that many divergent opinions exist regarding the moment when one should attribute a moral status to the embryo. Thus indicators when an embryo becomes a real human being or a human person are variously identified as conception, nidation (after about two weeks), the beginning of cerebral activity, the ability to feel pain, having life outside the womb (in general from the twenty-fourth week of pregnancy),[1] birth, or a stage of development after birth.

In recent years there has been an increasingly widespread tendency to indicate a precise moment when an embryo is said to become a human individual and thus reference is made to a gradual progressive humanisation or a gradual growth in the dignity of the embryo. This means that a duty is said to exist to protect the embryo that is proportionate to its level of development. This was, amongst other things, the argument used by the Dutch government to legalise experiments with human embryos in 2002 – the early embryo has a dignity of such a character that the advance of medicine can compensate the loss of embryos for research.[2]

Apart from conception, the moments listed above concede few possibilities of attributing to the embryo before implantation the dignity of a human individual. The moments listed above, however, are conclusions that draw their validity from criteria employed to assess the status of the embryo. The criterion used depends upon the vision of man that is adopted as a point of departure. It is therefore necessary to make a net distinction between: 1) the moment when one attributes to the embryo the status of a human individual with all connected rights; 2) the criterion used to assess the status of the embryo; and 3) the anthropology that is the foundation of this criterion.

The great variety of moments that are seen as the beginning of the existence of the human individual makes the discussion about the status of the embryo rather difficult. When it is not clear which criterion is used and which anthropology is taken as a point of departure, the discussion, inevitably, becomes marooned. For this reason, we must first of all consider the various criteria employed, first and foremost in relation to the relevant biological data.

The distinction between extrinsic and intrinsic criteria helps us to clarify the terms of the question. The extrinsic criteria are those that do not derive from the embryo as such but from external factors. Both in the past and still today the following extrinsic criteria are to be encountered in the discussion about the status of the human embryo: 1) human relationships: the embryo becomes a human individual when it establishes relationships with other human beings; 2) positive law: the embryo becomes an individual when it is recognised as such by positive law; and 3) the decision to give to an embryo that has been created through in vitro fertilisation the possibility of further development. The intrinsic criteria, on the other hand, refer to certain characteristics of the embryo itself, namely: 1) independence from the body of the mother: the embryo becomes a human individual when it is no longer part of the organism of the mother; 2) human biological nature: the embryo is a human individual because of the simple fact that it is in biological terms a human being; 3) individuality: the embryo becomes a human individual only when it can no longer divide itself, thereby giving life to a twin or uniting itself

to another embryo; 4) being a person: the embryo becomes a human individual with all connected rights when it becomes a human person; and 5) intrinsic finality: the embryo, even though it is not yet a human individual, must be respected as such because of its intrinsic finality, that is to say because of the fact that it will become a human individual.

Only after establishing the criterion to be employed can one indicate the moment in the development of the embryo when the embryo receives the moral status of being human: conception, the beginning of cerebral activity, the moment of birth or the moment when society recognises it as being a subject of rights. One should bear in mind that the criteria that have been listed above do not exclude each other. Certain currents of thought apply some of them contemporaneously. To achieve a detailed assessment, however, it is necessary to analyse them separately.

2. Extrinsic criteria

Extrinsic criteria

Human relationships: the embryo becomes a human individual when it establishes relationships with other human individuals

In the philosophy of the twentieth century, and especially in structuralism, there exists a strong tendency to look for the specific character of man not in what he is but in his relationships. Some thinkers even see the relationships of man as the only specific characteristic that distinguishes man from other living beings.

In the view of the French moralists Ribes, Pohier and Roqueplo, the embryo reaches a fully personal and human status only by having human relationships. The example is that of an embryo that previously was wanted by its parents and in a certain sense by society as well. When there is not this intentionality on the part of the parents to conceive the child, and they have also tried to prevent conception, the embryo is said not to have a specifically human status.[3] For this reason, the stages of the biological development of the embryo, in this vision, have no relevance.

Obviously, there are important objections to this approach. It implies that one could deny all respect even to an unwanted new born child, with the possibility of eliminating him or her. Indeed, one could not indicate a precise moment when the embryo begins to acquire a human status. In this way one could also deny the status of being human to certain adults. What should we thus think of the elderly Indian woman of Calcutta who was dumped in a garbage heap in a sack of plastic by her daughter? Did she for this reason cease to be a human person? And did she become a human person again when she was brought by the sisters of Mother Teresa to one of their homes to be looked after with love?

On the basis of its obvious shallowness and the extreme conclusions to which it leads, the reduction of the human being to pure rationality does not find many adherents.

Others are of the view that the status of a human being and the personality of the individual emerge at the

moment of nidation: nidation, because it implies the beginning of a close relationship with the mother, makes clear transcendence towards the other, which is considered essential for the human person. The human body, in fact, is the foundation and the real symbol of this transcendence towards the other.[4] On the basis of this, Böckle and others, during the 1960s and 1970s, justified the use of interceptives and the day after pill: the fact that before nidation the embryo, not having human relationships, is not yet to be considered a human individual makes possible a comparative assessment of the values involved: the value of the embryo who is not yet a human person, on the one hand, and the welfare of the mother in situations of emergency, on the other. This implies that the use of the day after pill is acceptable in the case of rape and the use of the coil is also acceptable when there are grave reasons for birth control, such as the need to prevent a pregnancy, or demographic reasons.[5]

However, it is not correct to assign too much importance to the moment of nidation, as though an existential relationship did not exist between the mother and the embryo before this event. Such a relationship is already created with the fusion of the spermatozoon and the ovule following the sexual relationship of the parents. In addition, even before nidation the embryo receives necessary nutriment and oxygen for its growth from its mother. Thus nidation is not the beginning of a transcendental relationship with the mother that is said to characterise the embryo as a truly human individual.

The embryo becomes a human individual when it is recognised as such by positive law

It appears evident that positive law guarantees and protects the objective rights of every human individual. In our pluralistic society the only practical solution to the controversy about the status of the human embryo in the opinion of many is that the status of the embryo should be defined through democratic consensus. Thus whether the embryo merits respect is said to depend exclusively on what has been established in this field by law.

In the majority of cases procured abortion is allowed within the limit of a certain period of time and on certain conditions. In some countries experiments with human embryos before the time when they are implanted in the womb in natural conditions, that is to say up to fourteen days after conception, have been legalised (for example in England and the Netherlands[6]). In our society many people do not dwell upon the question of the objective status of the embryo but adapt to the positive law in force.

Hubert Marktl, formerly head of the Max-Planck-Gesellschaft, who presents as alternative the ideas that a human being is a purely biological fact or a concept that is recognised from a cultural point of view, refers to an act of recognition by which the living being during its development becomes a human being in the full sense.[7]

Civil law

In a democracy, compromise is often inevitable and in many cases acceptable. However, the truth, including that about the status of the embryo, cannot be established by means of a statistical inquiry. It would be extremely dangerous for a society to determine what status should be attributed to human persons or to certain stages of development through the establishment of a consensus. Even if in a nation, in line with a law accepted by the majority, expulsions were to take place, we would not conclude that the members of persecuted ethnic minorities were not persons with a moral status and connected rights.

Thus also the objection to that effect that unborn children, unwanted children or handicapped children have a low quality of life or will constitute a grave burden for their parents is not an objective reason to refuse them a moral status acknowledged by the law. Even people who request asylum in another country in which they have sought refuge are not always well accepted, nor can they expect an easy future. Despite this fact, even if forced to flee from their countries, they remain persons with the right to be aided and helped by the countries that

receive them.

In this area one may notice that a doctrine such as the doctrine of the Church, which is based upon objective reality, is neither authoritarian nor intolerant. Ethical relativism, which is held by many to be an essential precondition for democracy, on the other hand, is. According to the encyclical *Evangelium Vitae*: It is precisely the issue of respect for life which shows what misunderstandings as contradictions, accompanied by terrible practical consequences, are concealed in this position. It is true that history has known cases where crimes have been committed in the name of 'truth'. But equally grave crimes and radical denials of freedom have also been committed and are still being committed in the name of 'ethical relativism'. When a parliamentary or social majority decrees that it is legal, at least under certain conditions, to kill unborn human life, is it not really making a 'tyrannical' decision with regard to the weakest and most defenceless of human beings? (n. 70).

Ethical relativism is not only a threat to the life of the weakest human beings, especially the unborn, who have no opportunity to vote, but also to democracy itself. Democracy is not an end in itself, but, like every other form of government, a means by which to ensure the common good. Obviously, the common good, which involves all the conditions that are necessary for each individual member of society to be able fulfil his or her destiny, requires respect for life, which is a fundamental good. Although freedom is a higher good than that of physical life, a human being cannot exercise his or her own freedom without being alive. Life is therefore is a fundamental good as regards freedom. The non-recognition of life as a fundamental good constitutes a grave threat to freedom and democracy: The value of democracy stands or falls with the values which it embodies and promotes. Of course, values such as the dignity of every human person, respect for inviolable and inalienable human rights, and the adoption of the 'common good' as the end and the criterion regulating political life. If as a result of the tragic obscuring of the collective conscience, an attitude of scepticism were to succeed in bringing into question even the fundamental principles of the moral law, the democratic system itself would be shaken in its foundations, and would be reduced to a mere mechanism for regulating different and opposing interests on a purely empirical basis. (ibid.).

Positive divine law

Amongst those that invoke Holy Scripture there are some who base the moral status of the embryo on a law held to be revealed, which in turn is based upon a specific translation of Genesis 9:6, that is to say: 'whoever sheds the blood of man in man, his blood will be shed',^[8] instead of the usual translation 'whoever sheds the blood of man, by man shall his blood be shed' (my italics).^[9] Genesis 9:6, translated in the first way, implies a prohibition on procured abortion. In combining a literal exegesis of isolated Biblical texts with a biological criterion, as some groups of Orthodox Jews do, there is an affirmation of the licit character of scientific research with embryos created by means of in vitro fertilisation, but not transferred into the maternal womb, in order to develop therapies for illnesses which as yet cannot be cured by man. The translation 'the blood of man in man' requires, in fact, only respect for the intrauterine embryo and not for the extrauterine embryo. In this way, the creation of human embryos for the purposes of research and 'therapeutic' cloning is also assessed as being admissible.

Does Genesis 9:6 justify therapeutic cloning? The usual translation 'whoever sheds the blood of man, by man shall his blood be shed' implies a general prohibition on the killing of human beings. The 'by man' in Hebrew is 'ba'adam.' The prefix 'be' can have two meanings: 'in', as a preposition to indicate a location, or 'by' in a causal sense. Which is the more correct translation?^[10] First of all it is necessary to observe that the original text allows, in principle, both translations.^[11] The translation 'by man' in the context of Genesis 9:6 is, however, more evident and is used by practically all the versions of Holy Scripture. Two arguments in favour of this interpretation are the following: 1) The phrase 'ba'adam' is found nineteen times and nowhere does it mean 'in man';^[12] 2) secondly, Genesis 9:6 is constructed in the original Jewish text with a chiasm, a rhetorical device

that involves the crossed arrangement of two words that are connected, like a mirror image: whoever sheds the blood of a man; by man shall his blood be shed. The words 'blood' and 'man' are used in an upside down way. This implies that the second part of the word 'man' does not apply to the relative, as appears in the translation 'bled of man in man', but to the principal sentence 'by man shall his blood be shed'.

A second point, which is more important, concerns the use of Holy Scripture in theology in general and in moral theology and bioethics in particular. Even if the translation 'man in man', and thus the unborn human being in the maternal womb, were correct, Genesis 9:6 would not anyway constitute a justification for the killing and the exploitation of human embryos outside the womb:

1. Genesis 9:6 would then say explicitly that it is not licit to kill human embryos outside the maternal womb. But the fact that this is not explicitly said does not mean that it is licit to kill embryos outside the maternal womb. Such a conclusion is a logical error: one cannot draw a positive conclusion from a negative premise.

2. However much the human authors of the Bible were inspired by the Holy Spirit, the Bible is not a source for the natural sciences. For the authors of the Bible the possibility did not exist of creating embryos and saving their lives outside the maternal womb. In Revelation it was not realised that biotechnology would arrive at the point of generating humans outside the womb, in a laboratory. To make a comparison: the principles of the social doctrine of the Church are formulated on the basis of the social questions and issues of the nineteenth century which were characterised by industrialisation and the emergence of the proletariat. These principles without doubt have a Biblical foundation but as they are they were not formulated in Holy Scripture.

3. Biblical texts cannot be interpreted on their own – they must be interpreted in relation to the whole context of the Bible. Holy Scripture does not give a univocal answer to the question of what the status of the human embryo is.[13] Given that within the Bible we do not find explanatory criteria, supplementary criteria are required for a sound interpretation. In the Catholic Church the most important criteria are offered by Tradition and by the documents of the Magisterium.

The choice of giving an embryo created through in vitro fertilisation the possibility of further development

An embryo conceived through in vitro fertilisation which is not then implanted in the womb but which remains in the laboratory will live for at most nine or ten days given current technical possibilities. Only if the embryo is transferred into the womb will it have a possibility of developing. The decision not to implant it has important consequences for the status of the embryo, as Tauer observes: The question of 'normal conditions' for a zygote in a test tube, if one does not intend to proceed with the transfer of the embryo and its implantation, raises doubts. If the normal conditions of a zygote in a laboratory are essentially the same as the oocyte before fertilisation, something that appears to be true, then the zygote will never develop as a person. Thus it would be better to classify it as a 'possible' person, a person who could become such only on certain conditions that are possible from a causal point of view.[14]

If the embryo were destined to be transferred into the uterus it would have a higher status. This means that it should be classified as a 'potential person' because it has a real possibility of developing. It would then have a value that is greater than a purely instrumental value.[15]

After concluding that a human embryo in a test tube, given that it is not able to feel and to act and is not conscious, has a weak moral status,[16] Meyer and Nelson conclude that the status of the embryo is determined by the gametes from which it comes, that is to say from its genetic parents. These last have the exclusive right to decide whether the embryos are to be used for the procreation of their own children, of the children of other people, for research, or whether they must be simply thrown away. The use of embryos created in a laboratory for more than fourteen days must be avoided because some people consider this moment as constituting the

morally significant beginning of the individuation of the embryo.[17]

The status of the embryo, understood in this way, is determined according to the will of people, that is to say in a way that depends on the choices of others, first and foremost the researcher and the parents. One could argue that this choice can be made only during the stage prior to the implantation of the embryo and that in this case the intrinsic possibilities of the embryo are taken into consideration. However, an extrinsic criterion, that is to say the arbitrary decision taken by others, conditions judgement on the question as to whether the embryo has the same status as a gamete or whether it has a superior status. The intrinsic possibilities are thus decidedly denied.

Assessment

The extrinsic criteria are not suitable for indicating the moral status of an embryo because they are secondary to what an embryo is. Only on the basis of intrinsic criteria can one have an objective judgement on the respect due to an embryo. Apart from this and apart from the criticisms expressed above, there is yet another fundamental objection: in the extrinsic criteria biological factors either have no role or have only a marginal role. However, this is inadmissible given that a human being is a substantial unity with a spiritual and material dimension. The material aspect is an intrinsic dimension of a human being and thus it is impossible both to identify a human being with this dimension and to conceive of a human being in a way that leaves aside his or her physical/biological dimension and does not attribute to that dimension an intrinsic role.

3. Intrinsic criteria

Intrinsic criteria

From what has been said above it may be understood that one can employ intrinsic criteria alone to establish a definition of an embryo as a human individual and that these criteria must take into consideration the biological data as well.

The independence of the body from the mother: the embryo becomes a human individual when it is no longer a part of the organism of the mother

At the end of the 1960s and during the 1970s feminist groups upheld the right to procured abortion with the motivation that the unborn child forms a part of a woman's body and thus a woman should be able do with it as she so pleases - 'we are the governors of our tummies'.

This is not a new argument. Roman law laid down that an unborn child, given that he or she was still a part of his or her mother or her organs prior to the act of birth, was not yet a citizen with all connected rights (Ulpian, a Roman jurist, d. 228 AD).[18] This idea was also to be found in other peoples of that age, for example the Jews, and thus Roman jurists held it to be an element of the *jus gentium*. [19] The Stoics (Hempedocles) compared the relationship between the embryo and the womb to the relationship between a fruit and its plant: the fruit, until

it falls or is picked, is a part of the plant. In the same way, before birth the embryo could not have its own existence separately from the existence of the mother. The embryo was said to acquire a soul when it began to breathe, that is to say a little time after birth, but not before birth.[20]

The discussion about the status of an embryo during the first seven days concerns, first and foremost, the ethical problems of in vitro experimentation on an embryo that has been created by artificial fertilisation and thus is not a part of its mother. The biological data provided by modern science, however, have made clear that the embryo, beginning with conception, has its own existence. It relies on its mother for food, liquids and the expulsion of organic matter. However, its development and its growth as an individual are guided from conception onwards by its own genome, which is different from the genome of its mother. For this reason, on the basis of contemporary genetic knowledge, one can in no way argue that an unborn child is a part of the body of the mother. On the basis of this argument it is not admissible for the mother to claim the right to dispose of the life of the embryo.

Human biological nature: the embryo is a human individual because of the simple fact that it is biologically a human being

The Wilkes based their rejection of procured abortion on the fact that human life, from a biological point of view, begins with conception. For them, theology and philosophy were of no use in solving the question of the status of the embryo given that in both disciplines there exist many divergent opinions on the subject.[21] The biological definition of the beginning of life, that is to say conception, which cannot be called into doubt by anyone, was, in the view of the Wilkes, thus the most solid criterion by which to attribute a moral status to the human embryo starting with conception.

This conclusion, however much it may be held to be interesting by the 'pro-life' movements, meets certain objections that are insuperable. It does not take into account the fact, for example, that, as will be seen below, many modern ethicists make a distinction between human beings in a strictly biological sense and human persons. The embryological and biological facts, in themselves, interpreted in various ways in the various visions of man, cannot provide a definitive answer about the status of the embryo. According to certain visions of man it is to be excluded that the embryo is a human being from conception. In addition, a purely biological definition would lead to a biologicistic and materialistic conception of man which holds that man cannot have an intrinsic dignity but at the very most an instrumental value. An appeal to the mere biological presence of a human being, leaving aside other aspects such as the spiritual dimension and its intrinsic finality, is insufficient, as we will see below.

Individuality: the embryo becomes a human individual only from the moment at which it cannot divide itself and thus give life to a twin or unite itself to another embryo

In England in 1990, on the recommendation of the Warnock commission, a law was passed that allowed experiments on in vitro embryos on certain conditions until the fourteenth day after conception. In its report, which was published in 1984, this commission concluded that the early embryo, because it still had the possibility of dividing, could not be considered as being an individual being and thus could not be considered as being a human individual either.[22] Even some Catholic ethicists have adopted this approach.[23] The moralist Häring has stated that: 'the greatest objection to the theory of animation at the moment of fertilisation is raised by the phenomenon of identical twins'.[24]

The Warnock commission held that the beginning of the individuality of the embryo was the moment of the formation of the primitive streak, after which the embryo is no longer able to divide into two individuals that are genetically identical. The primitive streak is the oblong concentration of cells at each end of the embryonic disk which emerges on the fourteenth or fifteenth day after conception. It is the first manifestation of the

anteroposterior axis of the embryo and appears in the place where the nerve tube will develop after a short period of time, and from which the brain and the spine will form. In this place a number of strata of differentiated cells form after their migration. At the most two primitive streaks can form in the embryonic disc but because of the differentiation that has just begun this will not lead to the division of the embryo.

This period of two weeks coincides roughly with the period before the implantation of the embryo in the mucous of the embryo, which is completed between the eleventh and thirteenth day after conception. Nowadays, reference is often made to a 'pre-embryo', a term that suggests that the embryo is not yet a human individual and thus does not deserve to be respected as such.[25] This line of reasoning has its origin in the presumption that the embryo is not an individual as long as the possibility of scission exists and thus cannot even be considered a person because a person is the most complete individual being.

The question is: does the possibility of the separation of the embryo really exclude its individual being and thus its being a person? There is another interpretation that is possible, that is to say that man is able to procreate in an asexual way until the formation of the primitive streak. When I, when digging in the garden, cut a worm in two, both the parts of the worm carry on in their own way in an apparently undisturbed fashion. It appears a rather unattractive thought that something of the same kind can happen in man, but who can prove that the contrary is the case?

That asexual procreation is possible in man as well would appear to be demonstrated, or so assert Ashley and O'Rourke in the third edition of their textbook *Health Care Ethics*, by scientists who are able to clone human adults, who are without doubt seen as persons, through nuclear transplant.[26] We now know that is a concrete possibility given the success in the application of this technique to human beings. In the month of February 2004 a team of researchers at the National University of Seoul (South Korea) managed to produce thirty embryos from two-hundred and forty-two oocytes by using the method of nuclear transplant.[27]

A further argument that is said to exclude that the embryo during the first stages of its development is an individual focuses on the possibility of the recombination of embryos. In experiments with animals it has been demonstrated that it is possible to combine two or at the most three embryos into a single embryo that contains genetically different cells which come from the original embryos.[28] The discovery at the end of the 1960s of the existence of men with cells with a twofold chromosome X and cells with one chromosome X and one chromosome Y was an indication that recombination also takes place in human embryos.[29] But not even this phenomenon constitutes proof that the embryo during the first stages of its existence is not an individual. One could also well object that in the case of the recombination of the two embryos the body of one has been absorbed by the other, which managed to conserve its individuality, and thus the first embryo ceased to exist as an individual and died from a metaphysical point of view.

Many people see proof of the individuality of the early embryo in the fact that the composition of the genetic material of the chromosomes is established at the moment of fertilisation. Others object that the development programme that the chromosomes contain is not immediately active after conception. At the outset the energy in the embryo is provided by the Altmann's granules, which come from the mother. Thus the development of the very first stages of the embryo is not guided by the DNA of the zygote but by the DNA of the Altmann's granules which come from the mother, from the messenger RNA and from the proteins that were present in the spermatozoon and the ovule.[30] This, too, is not in itself a valid reason for doubting the individuality of the embryo. The development programme in the chromosomes, although it becomes active immediately or after only a few days, is established from conception onwards and will guide or regulate the successive development of the embryo if factors of disturbance do not intervene. The results of the most recent research indicate, however, that the DNA of the embryo begins to guide its development practically at the zygote stage, when a first gene that is responsible for gonadic differentiation is already active.[31]

The criterion for the individuality of the embryo is often likened to the criterion which observes that the embryo will become a person. This point will be discussed later in this paper. This implies that the embryo cannot be considered a person until it is an individual, an assumption that in itself is obviously right. Thus it is that Ford identifies the formation of the primitive streak with the moment of animation.[32]

The person being: the embryo becomes a human individual when it becomes a person

The question whether the embryo is a person or not seems to be a clear and simple one. If it is a person, it deserves respect as such. If it were only a 'pre-embryo' or a 'potential person', it would have less rights. However, the moment when the embryo becomes a person is very much debated. It depends first of all on the vision of man that one takes as a point of departure. In addition, even when there is a single vision of man there can be different ideas about the moment when the human embryo has to be seen as a person.

The criterion of animation

Until the recent past in the Catholic world the discussion about the moment when the human embryo becomes a person was connected with the moment of animation. For that matter, the traditional Christian vision of man, too, defending both direct animation and indirect or delayed animation, did not provide a definitive answer to the question as to when the embryo becomes a person.

The theory of direct animation which implies that the embryo is animated by a human soul from conception onwards has its origin in the writings of Hippocrates. In the view of Hippocrates (460?-370? BC) the embryo was born from the sperm of the father which coagulated in the womb. The blood that was there, not secreted during pregnancy as it is during menstruation, was used by the embryo to nourish itself.[33] The embryo was a human individual from the very beginning and thus had a human soul.

The opposing theory was that of 'indirect' or 'delayed' animation espoused by Aristotle (384/383-322 BC). In his thought the body of the embryo arose from the menstrual blood retained in the womb during pregnancy. This blood, understood as the material cause of the embryo, in Aristotle's view, was coagulated by the sperm as an efficient and formal cause, like milk under the influence of fig juice or the curd of cheese.[34] Thus the blood was transformed into the body of the embryo. Through the sperm the menstrual blood received a vegetative soul: 'thus the physical part, the body, comes from the woman and the soul from the man'.[35] In this way, at the end of the first week, the blood became a living being, comparable to a plant. The vegetative soul was replaced a little time afterwards by a sensitive soul, and this was borne out by the formation of sense organs. This soul was in turn replaced by a rational soul which came from outside and had to have a divine origin.[36] The rational soul could not be present from the outset because its activity required a certain level of development of the organs, especially the sense organs: 'the soul is, therefore, the first act (perfection) of a body that has a life potentially. The body is such when it possesses organs...If we want to mention something common to every soul, it is that the soul is the first act of natural bodies that possess organs'.[37] On the basis of his observations of aborted embryos, Aristotle concluded that the male embryo was animated by the rational principle of life on the fortieth day and the female embryo on the eightieth day.[38]

The choice between the theory of indirect animation or the theory of direct animation was clearly determined by a difference at the level of the vision of the development of the embryo. Differently from Hippocrates, Aristotle, thinking that the body of the embryo arose from the menstrual blood, could not assume that the embryo was animated starting with conception. His belief that only an organic body could be animated made it unthinkable, in fact, that an amorphous piece of blood contained a human soul as a principle of life. Here Thomas Aquinas followed Aristotle, although not without modifications and additions to Aristotle's thesis.[39] Until the last century there were still Thomists who supported the theory of delayed animation on the basis of the requisite of

what they called a sufficient arrangement of matter to be animated by a rational soul, as is stated in number 15 of the twenty-four Thomist theses published by the Sacred Congregation of Studies on 27 July 1914: 'On the contrary, the human soul exists on its own and when it can be infused in a subject sufficiently disposed, it is created by God, and by its nature it is incorruptible and immortal'.[40]

In 1827 Karl-Ernst von Baer discovered the ovule in mammals and in man and also the mechanism of fertilisation, as a result of which it was definitively proved that the human body does not begin as a coagulate of blood but as a fertilised ovule. For the majority of theologians this was the reason to believe that animation took place at the moment of conception and not later.[41]

However in order to defend procured abortion, theologians, moralists and ethicists took up the theory of delayed animation again from the 1960s onwards.[42] And given that today researchers have to deal with a fertilised ovule, with an embryo brought about by in vitro fertilisation, the theory of delayed animation also acts to justify experiments on embryos.

To support this theory, on the one hand reliance was placed on an Aristotelian argument according to which animation requires a certain development of the sensorial system: 'the minimum that we should suppose before admitting the presence of a human soul is the availability of these organs: the senses, the nervous system, the brain and especially the cortex. Given that these organs are not yet mature during the very first stages of pregnancy, I think it is certain that a human person only exists after a few weeks'.[43]

On the other hand, theologians and ethicists often referred - and they still refer - to certain scientific discoveries in the field of embryology that were made last century: 1) the spontaneous loss of fertilised ovules to a notable degree; 2) the formation of monozygotic twins; and 3) the possibility of recombining two or three embryos into a single individual. This paper has already discussed the last two phenomena, but not the first.

On the basis of experimental observations, in the 1920s and 1930s Needham postulated that up to 50% of fertilised ovules were lost spontaneously. For many people this makes it improbable that the fertilised ovule is already animated.[44] This, in fact, would mean that one half of human persons with a soul created directly by God are lost during the first weeks to the first months of pregnancy. For that matter, this objection is not new but goes back to Anselm.[45] In the view of the time it was unthinkable that a conceived human at the very first stages of development was already animated because this would mean that such individuals did not have the possibility of being reconciled with God through baptism. This argument as such, however, is not necessarily in contrast with direct animation. The high mortality rate of children, which until the nineteenth century was around 50%, did not constitute an argument by which to call into question the fact that they were persons.[46]

From the moment when it is animated the embryo becomes a person and thus attains the highest level of a human being. The division of the embryo into twins, which is possible until the formation of the primitive streak at the fourteenth or fifteenth day after conception would, according to the Warnock Report, as we have seen, prove that the embryo during the first stages is not an individual and thus not even a person. The moral philosopher Norman Ford concludes, therefore, that animation can only take place after the formation of the primitive streak.[47] We have observed, however, that the possibility of twinning, or of recombination with other embryos, does not exclude the early embryo being a human individual.

The criterion of the manifestation of activity that is specifically human

In contemporary secular bioethics, discussion about the status of the embryo is shaped above all else by the anthropology of identity theory. This theory, which originated in Australia and which is accepted by many ethicists in the Anglo-Saxon world and - albeit unconsciously - by many medical doctors as well, is characterised

by a strong dualism which separates the biological nature of man and the specific functions that render him a person. That which is specifically human is psychological consciousness, the rational faculty and the capacity for social communication. It is clear that in this vision the embryo could never be a person before a certain development of its nervous system.

Tauer thinks that when the nervous system has developed to the point of registering certain experiences that come from the environment the embryo has matured a 'mental personality' which draws the embryo near to being a person in the strict sense. These experiences can be unconscious but as we know from psychoanalysis they can already lead to the formation of memories that act subsequently on the consciousness. On the basis of this, Tauer thinks that there are sufficient reasons for attributing to the embryo in the seventh week not only a moral value but also the beginning of being a person in a morally significant sense.[48]

Others, such as McMahan, believe, instead, that the embryo becomes a human being at a subsequent moment: 'I believe that the most credible view is that we are embodied minds... I began to exist when the brain of this body - my body - acquired for the first time the ability to have consciousness'.[49] This implies that the human being begins his or her existence between the twenty-eighth and the thirtieth week.

Engelhardt, on the other hand, in order to be able to speak about a person requires the actual presence of self-awareness, a manifest rational activity and a manifest capacity for social communication. Given that such functions are probably present only a notable time after birth, the unborn and the newly born - including mentally handicapped people who have never had a rational capacity - are said not to be human persons to the full with the accompanying connected moral status. Before being persons they are said to be only human beings in the biological sense.[50] This demonstrates the urgent need for careful anthropological reflection on the human biological nature of the early embryo.

This vision has various practical consequences for other fields of medical ethics as well. If applied strictly, a patient in a permanent vegetative state could no longer be seen as a person. And some have suggested that he or she could thus be seen as a donor of organs.[51]

A fundamental objection to identity theory is that it encounters difficulty in explaining the human person as a unity. The human being is considered in antithesis to the human person, like biological nature and spiritual nature, that is to say the rational capacity.

The intrinsic finality: the embryo, even were it not yet a human individual, must be respected as such because of its intrinsic capacity to become that individual

Assuming that the early embryo is not a human individual, would it not be obvious to conclude that its elimination by means of procured abortion and its use in research or in 'therapeutic' cloning are licit, specifically because of the fact that they do not involve the killing of a human individual? McMahan's view is that 'this would not amount to the killing of one of us but only the prevention of their existence'.[52] As an argument in favour of the licit character of procured abortion or experiments with embryos, reference is made to the fact that the Christian tradition preferred the theory of delayed animation until the nineteenth century.[53] This raises the question why Christian theologians, although accepting this theory, unanimously rejected abortion - until the second half of the century - even when it took place before the assumed moment of animation. Here the famous text of Tertullian is indicative: Given that killing is always forbidden, the destruction of a foetus during the period in which the blood is transformed into a human being is also illicit. The prevention of birth is the same as early killing; it makes no difference whether one kills life already born or interrupts life already on its way to birth and being developed: he who will be a man is already a man, just as the fruit is already in the seed.[54]

By the transformation of blood, Tertullian was alluding to conception as understood by Aristotle, in whose view the blood that was in the womb was not expelled during pregnancy, as was the case in normal periods of menstruation, but remained there and was transformed within the body into an embryo under the influence of the active force of the male semen. When this process was still under way, Tertullian affirmed, there was something in the womb that should be respected as a human individual, at least because it would become a human individual. As an argument to strengthen this thesis it was added that every fruit is already virtually present in the seed.

The fundamental argument in this text is that the process of the development of the embryo takes place in a way that has a purpose. In the conceived human being, and above all in the semen, there is the intrinsic finality of becoming a human individual. From this springs the need for respect. In his commentary on the Gospel According to St. Luke, Ambrose says that 'to check your levity you recognise the hands of Your Author who forms a man in the womb. He is working and you violate with your lasciviousness the secret of the sacred womb?'[55] Here one is not dealing with abortion. Ambrose seems to state that unchecked sexual passions lead to sterility. Whatever the case, he teaches us that the formation of the embryo in the plan of the creative action of God is a process with a finality. We can find the same thought in St. Augustine: 'And yet in all men who are born ill, God, in forming the body, in giving them life and nourishing them, does that which is good'.[56] He is not thinking of a direct intervention on the part of God upon the biological development of the embryo but of a transcendental causality that includes the direct biological causes (the *causae secundae*).[57] The same finality linked to the doctrine of the creation is evident in the way in which St. Thomas Aquinas describes the origin of man.[58]

The prevention of procreation has been seen by Christian theologians as a rejection of the fulfilment of a purpose of marriage which is established in the order of the Creation. And it was on the basis of this thought that the Fathers of the Church and medieval theologians placed on the same level the use of means to bring about sterilisation (contraceptives), the killing of a (both an animated and not yet animated) foetus, and infanticide: However they betray themselves when they reach the point of exposing their own children born against their will. They hate raising and keeping near to themselves those children that they feared to generate. When, therefore, dark iniquity becomes cruel towards their own children, generated against their wishes, a clear iniquity is brought to light and a secrete turpitude is bared by a manifest cruelty. At times, this voluptuous cruelty, or, if one wants, this cruel voluptuousness, is pushed to the point of obtaining contraceptive substances and in the case of failure to the killing in some way in the womb of the conceived foetuses and their expulsion, with the desire that their own child perishes before living or, when it is already living in the womb, that it is killed before being born. There can be no doubt: if both of them are of the same stamp, they are not spouses; and if they behave like that from the outset they do not unite in marriage but in lustfulness. If then it is not both of them who behave like this, I would venture to say that either she in a certain sense is the prostitute of the husband or he is the adulterer of the wife'.[59]

Although in the view of these theologians abortion before animation could not be held to be murder, nonetheless they refer to an illicit intervention because this violates the intrinsic finality of the embryo to reach the moment of animation. At the most in certain circumstances the abortion of the foetus, seen as being inanimate, is assessed in a less severe way[60] or, in a case where the life of the mother is in danger, it is explicitly allowed.[61]

The return of the theory of delayed animation amongst Christian theologians with the passing of the centuries does not in any way, however, support the conclusion which holds that on the basis of Christian Tradition abortion or the elimination of embryos for research purposes is legitimate. This Tradition also attributed to the inanimate embryo a moral status and a connected dignity because of its intrinsic finality. According to contemporary biology, this is to be found in the development programme that is carried out under the guidance of the chromosomes, whose composition has been established since conception. If one wanted to use one

element from Tradition, why are the other elements of Tradition neglected, elements that are compatible with the data of contemporary embryology?

Assessment

Which intrinsic criterion and which basic anthropology should we take as a point of departure in considering the embryo during the first week after conception? From what has been observed hitherto in this paper it emerges that the embryo during the first seven days of its life is 1) a being with its own life that is separate from the life of the mother; 2) a human being from a biological point of view; 3) an individual and 4) a being with an intrinsic finality.

However, can we also conclude that the embryo before implantation is a human individual or a human person? In his assessment of the status of the embryo in his encyclical *Evangelium Vitae* John Paul II, avoiding declaring expressly that the moment of animation coincides with conception, refers to the conclusions of modern biological science with a rhetorical question: Even if the presence of a spiritual soul cannot be ascertained by empirical data, the results themselves of research on the human embryo provide a 'valuable indication for discerning by the use of reason a personal presence at the moment of the first appearance of human life: how could a human individual not be a human person? [*Donum Vitae* I,1][62] (*Evangelium Vitae* n. 60).

Taking as a point of departure the contemporary knowledge of embryology and above all of modern genetics, how can one not identify, by the use of reason, the early embryo with the human individual or with the human person?

The identification of the early embryo with the human individual or the human person

A solely materialistic explanation, such as that which typifies 'identity theory', on the specific functions of the human mind, is insufficient. The process of thinking, which is developed with abstract ideas, although dependent upon sensorial information, is in the final analysis an immaterial function. The same may be said of freedom: material processes, like chemical processes, which unfold according to a pre-determined model, do not explain freedom. Without a spiritual dimension, human freedom would not exist. Both man's capacity for reason and his freedom pre-suppose that in him there is a spiritual principle of life. To be a human individual or a human person, the embryo must have both a spiritual dimension and a physical dimension. However, the presence of a spiritual dimension cannot be demonstrated through the method of research of the positive sciences. In an empirical way the spiritual dimension is ascertained only in the actualised capacity to perform functions that have in the final analysis their origin in the spirit of man.

In the embryo before implantation and after conception, manifest signs of a spiritual dimension are lacking. The process of thinking and the process of willing are functions in which both the spiritual dimension and the corporeal dimension of man have their own role, but in an integrated way. The content of rational consciousness is the symbols that derive from the sensorial experience of the environment and a person's own body. The fact that this content is absent in the early embryo because of the fact that the sensorial organs are not sufficiently developed does not in itself exclude the possibility that the capacity to think and to will are already present in potential terms, a potential that will be gradually actualised in a way that is proportionate to the development of the senses. Indeed, we will attempt to demonstrate that it is difficult to think that the spiritual dimension is not present from the moment when the embryo manifests itself as a human being in a biological sense, that is to say from conception.

The specific identity

To return to the embryo before implantation, we must ask ourselves the following question: can we identify a being whose human biological nature alone is observed as a human individual or human person or not? According to the passage from the encyclical *Evangelium Vitae* quoted above, the contemporary knowledge of embryology and of genetics can provide a 'valuable indication for discerning by the use of reason a personal presence at the moment of the first appearance of human life' (EV, n. 60). How can these sciences be useful in discovering a personal presence in the human embryo from conception?

Whatever the case, the contemporary knowledge of embryology contradicts the classic notion in opposition to direct animation (and thus humanisation), a notion according to which the human embryo is said to begin its development as a coagulate of blood, that is to say as a non-living being, and thus a being that is not animated. Contemporary embryology confirms the view which holds that the human embryo, from conception, is a biologically human living being. To this should be added the fact that from conception the development of the embryo takes place in an autonomous, co-ordinated, continuous and gradual way.[63] There are no caesuras in the successive process of development as there could be if there intervened during the course of the development of the embryo another mechanism of co-ordination or integration of the life of the embryo, to be interpreted as a moment when the embryo truly becomes a human individual by receiving a spiritual dimension.

Genetics has discovered the mechanism of this development of the embryo: beginning with conception the embryo is guided by the genome, the conception constitutes the result of the fusion of the chromosomes of the ovule with the chromosomes of the spermatozoon. Knowing that the genome is the most important foundation of the biological identity of a human being, we can ask ourselves what indications genetics can provide, in addition to the indications provided by embryology, to hold that the human embryo is a human person from fertilisation. In other words: is the presence of a fundamental biological identity conceivable without there being present the spiritual dimension that makes the embryo a human person?

The answer to this question depends on the anthropology that is taken as the point of departure. A dualistic anthropology such as identity theory identifies the human person with the mind or the human spirit. From this point of view, the presence of a biologically human being in itself does not imply the presence of a human person. A certain biological development can and must take place before the biological human being becomes a human person with a mind or human spirit. The physical/biological dimension is not seen as an intrinsic dimension of the human person.

According to the doctrine of the Church, which sees the human spirit (the soul) as the substantial (or better subsistent) form of the human individual,[64] both the human spirit and the body are intrinsic dimensions of the human person. The genome as the deepest biological foundation of the body has, therefore, an intrinsic 'role' as regards the specific identity of man as an 'embodied spirit'. Within this framework it is difficult to think of a stage in the development of the human embryo when the spiritual dimension does not exist, whereas the material dimension of the specific identity of man, or at least the biological-genetic identity, is already present. It is difficult to think this above all else because the human genome, as has already been observed in this paper, guides a development that is biologically human that is gradual, continuous and co-ordinated and which does not involve some caesura that could be indicated as the moment when a principle of truly human life, that is to say spiritual subsistent form, from that moment on takes on the guidance of further development.

The numeric identity

This argument also applies to the numeric identity, that is to say the identity by which human persons are distinguished from each other. In reading in a newspaper of the death of ten people because of a train crash I come to know about the generic character, the specific identity, of the victims, that is to say that they are human beings. In fact, however, they are individuals who, in having their own numeric identity, actualise this generic identity in a different way. In essential terms, the numeric identity means that this concrete individual

with his or her own characteristics is a human person, independently of the state of his or her development, of his or her physical perfection, of his or her success or his or her defects.[65] The numeric identity, at least from the external angle, can differ considerably during the various different stages of life. The cause of this is that the numeric identity depends upon the material/biological dimension of the human person.

Thomas Aquinas illustrates this when he explains a particular aspect of the numeric identity, that is to say intellectual capacity: this can differ notably between the various individuals of the human species and in the same human individual during the various stages of his or her development.[66] What explains these differences? Taking as a premise that the human spirit (the soul) is the substantial form (or better the subsistent form) of the human individual, a human spirit that was different between human beings would have as a consequence that they, in not having the same generic identity, would not belong to the same species. Whatever the case, the capacity to think employing abstract concepts and the capacity to act freely are not in themselves different amongst human beings. The difference in intellectual capacity is explained with reference to the differences in the neuronal networks of the brain as a result of which the capacity to compute sensorial data can vary notably. In the final analysis the difference lies not in the capacity to think employing abstract concepts in itself but in the disposition of the material dimension of the human individual. The material dimension, therefore, is of determining important for the numeric identity.

Although the numeric identity, anyway externally, differs during life, what determines it fundamentally, although not solely, is the human genome, which is present and active from conception onwards. One understands that during the pre-implantation stage the embryo does not yet possess these neuronal networks given that the nervous system begins its development from the twenty-first day onwards. However, all the neuronal structures are already present in a virtual sense in the DNA from conception, including their contribution in a biological sense to the numeric identity of the human individual. We know that the neuronal networks are present in a virtual sense in the genome (even though other environmental factors also probably have their role in the anatomical and functional development of the brain). The DNA contains the biological basis of all the features that characterise the human being from conception until death.

We have seen that the presence of the genome from conception onwards is a sign of the presence of the spiritual dimension of that event. If this principle of human life is present the embryo from conception onwards has the specific identity of a human person. This means that the embryo is a human person under way, not a human person potentially, as regards its specific identity. The basis of the numeric identity is also actualised. This does not remove, however, the fact that the numeric identity involves a broad potential that is to be actualised. All the changes during the development of the numeric identity, because they do not involve a change in the specific identity, are not, however, substantial, but accidental.

An objection of Lanza and Donceel to this argument is that this implies a coincidence of a formal causality with an efficient causality of the spiritual dimension: the spiritual dimension, if present since conception, would be both the formal cause and the efficient cause of the human body.[67] The formal cause cannot be the efficient cause of the generation of the thing of which it is the substantial form. Here it is useful to distinguish between generation and growth.[68] Development subsequent to the moment of the beginning of existence is different from generation – it is growth. Growth is a process of a living being that has already been generated. The spiritual dimension, once the human body has been formed, is the moving principle, that is to say the efficient cause, of life. It is the root of all the processes of life, including the process of growth of the embryo.

In reflecting on this we can find a response to identity theory which is today the most widespread theory in secular bioethics and which says that there is a human person only when there is a presence of a manifest rational consciousness. The error of identity theory is that it confuses the manifest rational and autonomous consciousness, an aspect of the numeric identity that develops much later than conception, with specific identity, which has already been actualised since conception. It seems to be a contradiction but the manifest

rational and autonomous consciousness is an accidental characteristic: an adult human person remains a human person with all connected rights even when the rational and autonomous consciousness has not yet developed or has never developed because of a grave mental handicap or has been irreversibly lost because of an injury to the higher part of the brain (the cortex or the higher cerebral nuclei). It is significant here that the adherents of identity theory on the basis of the belief that a human being deprived forever of a rational and autonomous consciousness is not a human person have proposed that anencephalic fetuses[69] and patients in an irreversible coma (that is to say in a state of partial brain death) should be sources of organs for transplants.[70] Although the numeric identity of anencephalic fetuses and patients in an irreversible coma differs a great deal from the numeric identity of human persons who have developed a normal rational and autonomous consciousness, they have, nonetheless, the actualised specific identity of a human person.

4. Conclusion

Conclusion

In the assessment of the various and different criteria that are employed to assess the status of the human embryo it is of essential relevance that this embryo has a biologically human status from conception. This status already implies the intrinsic finality of the generation of a human person, leaving aside the question of whether the embryo is a human person from conception. Whatever the case, the embryo is a living being whose development, guided by the genome that is present and active from conception onwards, takes place in an autonomous, co-ordinated, continuous and gradual way. An indirect humanisation is hardly compatible with the fact that the specific identity of the human being is intrinsically made up both of the spiritual dimension and the material dimension, above all given that the biological foundation of the physical dimension, the DNA, is present from conception onwards. Embryology and genetics provide indications that the embryo is a person under way. With respect to the specific identity, it is a human person. In addition, the DNA is the biological basis of the numeric identity. As regards its numeric identity, the embryo has a broad potential that still has to be actualised. This, however, does not remove the fact that it is already a human being under way. Although it is impossible to demonstrate empirically a personal presence from conception, philosophical reflection on the bio-anthropological state of the human embryo indicates an incongruence of indirect or gradual humanisation with the vision of the human individual as a substantial unity of spirit and body.

5. Notes

Notes

1. This is what the American Nobel prize winner, Harold Varmus, asserts. In his view one cannot provide an answer to the question as to the moment when a human being begins to exist. He agrees with the idea proposed by those who see the embryo as a human from the moment the neurons begin to develop, the blood begins to circulate, and the embryo can then survive outside the womb. 'One can state that there is full individuality only after birth', see the interview with him in 'Ich sehe eine moralische Pflicht zum Embryoverbrauch', Frankfurter Allgemeine Zeitung (2001), 25 August, p. 43.
2. Tweede Kamer (Dutch Parliament), vergaderjaar 2000-2001, 27 423, n. 5, pp. 4-6. This assessment of the status of the embryo is also very widespread in the Protestant world, see M. Honecker, 'Divergenzen in der evangelischen Ethik beim Untergang mit Embryonen', Zeitschrift für Medizinische Ethik 49 (2003), n. 2, pp. 123-136, especially p. 127.
3. Avortement et respect de la vie humaine (Colloque du Centre catholique des médecins français, commission conjugale) (Editions du Seuil, Paris, 1972), pp. 93-104, 174-184, 194-204.
4. F. Böckle, 'Um den Beginn des Lebens', Arzt und Christ 14 (1968), p. 70; P. Sporken, Voorlopige diagnose. Inleiding tot een medische ethiek, (Ambo, Utrecht, 1969), pp. 68-69 (Sporken uses other arguments to indicate that nidation is the initial moment of human life: the possibility of the division of embryos which then gives rise to twins and the large loss of embryos prior to nidation - these are subjects to which I will return later in this paper. In his book Ethiek en Gezondheidszorg, (Ambo, Baarn, 1977), p. 118 he moderates this idea and argues that nidation is a first, albeit fundamental step, in the gradual process of the hominisation of the embryo side by side with the stage of the differentiation of the neurons of the brain.
5. F. Böckle, 'Um den Beginn des Lebens'; P. Sporken, Voorlopige diagnose. Inleiding tot een medische ethiek, op. cit., pp. 94-97; P. Sporken, Ethiek en Gezondheidszorg, pp. 154-158.
- 6.
7. 'Von Caesar lernen heißt forschen lernen', Frankfurter Allgemeine Zeitung (2001), 25 June, p. 52.
8. The Dutch Rabbi Evers, for example, is convinced that the human embryo, on the basis of this particular translation of the text of Genesis 9:6, when outside the womb does not deserve to be protected: 'Analysing the text one reads only 'whoever sheds the blood of man in man, his blood will be shed'. The obligation to protect life is subordinated to staying in the maternal womb'. see R. Evers and A.P. Evers, 'Bijbel positief over klonen van embryo's', Trouw (2004), 19 February, p. 14. The authors see the embryo before forty days after conception as 'inanimate life'. In vitro embryos, because they cannot go on living without artificial aid, are thus said not to be living humans. As regards the experimental use of in vitro embryos being inanimate is not, however, important - embryos within the maternal womb are not yet animated. What is important is the translation of Genesis 9:6 in which the authors see a law that attributes the right to protection only to the embryo that is in the maternal womb.
9. Taken from Bibbia di Gerusalemme (Edizioni Dehoniane, Bologna, 1996; 14a ed.).
10. W.J. Eijk, 'Therapeutisch' kloneren nog problematischer dan reproductief kloneren: een bijdrage vanuit katholiek-bijbels perspectief', Pro Vita Humanae 12 (2005), n. 2, 47-53.
11. Cf. J. Connery, Abortion: The Development of the Roman Catholic Perspective (Loyola University Press, Chicago, 1977), p. 13.
12. Gen 6:3; 9:6 ; Ex 8:13,14; 9:10; 13:2 ; Num 8:17; 17,15; 31:11,26 ; Lev. 24:20; 2 Sam. 23:3 ; Jer. 32:20; 9:15; Mic. 7:2; Ps 68,18; 78,60; 118,8; Qo. 2:24. On this point I have consulted J. Liesen, Professor of Exegesis at the Higher Seminary of Rolduc and member of the International Theological Commission who bases his reply on Abraham Eben-Shoshan, Qonqordantsia chadasha (Kiryat-Sefer, Jerusalem, 1986).
13. W.J. Eijk, 'Embryo en christelijke mensvisie: wanneer wordt het embryo een menselijke persoon?', Pro Vita Humana 1 (1994), n. 3, pp. 107-116.
14. Carol A. Tauer, 'Personhood and Human Embryos and Fetuses', The Journal of Medicine and Philosophy 10 (1985), p. 264.
15. Ibid., pp. 263-264.
16. This conclusion is based upon the seven intrinsic and relational criteria advanced by Warren to indicate the

- moral status of every being: 1) the living being should not be killed without good reason; 2) a feeling being should not be treated cruelly; 3) moral agents have full and equal rights to life and freedom; 4) human beings who can feel but not act have the same moral rights as those human beings who act morally; 5) ecologically important (living or non-living) entities have a stronger moral status than the status they would have if they were independent of the eco-system; 6) animals that are a part of human community have a stronger moral status than the status they would have on their own; and 7) within the framework of the first six criteria moral agents must respect the recognition of moral status by other ('transitivity of respect'), see Mary Anne Warren, *Moral Status: Obligations to Persons and other Living Things* (Oxford University Press, Oxford, 1997), pp. 148-177.
17. M.J. Meyer and L.J. Nelson, 'Respecting what we Destroy. Reflections on Human Embryo Research', *The Hastings Center Report* 31 (2001), n. 1, pp. 16-23.
 18. Ulpian, *Digesta*, 25,4,1,1: 'Partus, antequam edatur, mulieris portio est vel viscerum'.
 19. J. Connery, *Abortion: the Development of the Roman Catholic Perspective*, pp. 22-23.
 20. Tertullian, *De Anima*, 25,2 (CSEL 20, pp. 340-341).
 21. J. Wilke and B. Wilke, *Abortion: Questions and Answers* (Hayes Publishing Company, Cincinnati, 1988), pp. 5-6.
 22. The Warnock Report, nn. 11.5 and 11.22, in M. Warnock, *A Question of Life. The Warnock Report on Human Fertilisation and Embryology* (Basil Blackwell, Oxford, 1985), pp. 59 and 66.
 23. N.M. Ford, *When Did I Begin?* (Cambridge University Press, Cambridge, 1988); T.A. Shannon and A.B. Wolter, 'Reflections on the Moral Status of the Pre-embryo', *Theological Studies* 51 (1990), pp. 612-614; L.S. Cahill, 'The Embryo and the Fetus: New Moral Contexts', *Theological Studies* 54 (1993), pp. 127-130.
 24. B. Häring, *Medical Ethics* (St. Paul Publications, Middlegreen, 1991, 3rd revised edition), p. 73.
 25. Some are of the opinion that the term 'pre-embryo' does not suggest this because according to classic embryology one can speak of an embryo only after its implantation in the mucous of the womb. Before that moment one should speak about blastogenesis and subsequently of the genesis of the embryo. However, the term 'pre-embryo' was never used in classic embryology and was introduced recently.
 26. B.M. Ashley and K.D. O'Rourke, *Health Care Ethics. A Theological Analysis* (The Catholic Health Association of the United States, St. Louis, 1989, 3rd ed.), p. 212.
 27. Online edition of *Science*: www.sciencemag.org/cgi/content/abstract/1094515; G. Vogel, 'Scientists Take Step Toward Therapeutic Cloning', *Science* 303 (2004), 13 February, pp. 937-938.
 28. W.J. Eijk, *The Ethical Aspects of Genetic Engineering of Human Beings* (Kerkrade, 1990), pp. 37-39.
 29. A. Hellegers, 'Fetal Development', *Theological Studies* 31 (1970), p. 5.
 30. T.A. Shannon and A.B. Wolter, 'Reflections on the Moral Status of the Pre-embryo', *Theological Studies* 51 (1990), p. 608.
 31. E. Pergament, M. Fiddler, N. Cho, D. Johnson, and W.J. Homgren, 'Sexual Differentiation and Preimplantation Growth', *Human Reproduction* 9 (1994), pp. 1730-1732; M. Fiddler, B. Abdel-Rahman, D.A. Rappolee, and E. Pergament, 'Expression of SRY Transcripts in Preimplantation Human Embryos', *American Journal of Medical Genetics* 55 (1995), pp. 80-84.
 32. N.M. Ford, *When Did I Begin?*, pp. 170-177.
 33. Hippocrates, *Du foetus de sept mois*, 7 (E. Littré, Paris, 1851), tome 7, p. 492.
 34. Aristotle, *The Generation of Animals*, ed. and transl. by A.L. Peck (Harvard University Press/William Heinemann, Cambridge/London, 1979) (The Loeb Classical Library no. 366), I, XIX-XX, 727 a -729 a, pp. 95-111
 35. *Ibid.*, II, IV, 738 b, pp. 184/185.
 36. *Ibid.*, II, III, 736 b, pp. 170/171.
 37. Aristotle, *De Anima*, II, I, 412 a 27 - 412 b 1, and 4-6, in *Aristotelis de anima*, ed. and transl. by Paulus Siwek, Romae: apud sedes Pont. Universitatis Gregorianae 1954, vol II, (Series Philosophica 9), pp. 92/93.
 38. Aristotle, *De animalibus historiae*, VII, III, in *Aristotelis, Opera omnia* (Paris, 1927), vol. III, pp. 137-138.
 39. St. Thomas discusses these issues in the following works: *Scriptum super libros sententiarum Petri Lombardi*, 2, d. 18, q. 2, a. 3; *De potentia*, q. 3, ad 9; *Summa contra gentiles*, 2, 87-89; *Summa Theologica*, 1, q. 76, a. 3, ad 3, and 1, q. 118, a. 2, ad 2; *De spiritualibus creaturis*, a. 3, ad 12.
 40. *Sacra Studiorum Congregatio*, 'Theses quaedam, in doctrina Sancti Thomae Aquinatis contentae, et a

philosophiae magistris propositae, adprobantur,' no. XV, AAS 6 (1914), p. 385: 'Contra, per se subsistit anima humana, quae, cum subiecto sufficienter disposito potest infundi, a Deo creatur, et sua natura incorruptibilis est atque immortalis', DH n. 3615. Cf. Hyacinthus-M. Hering, 'De tempore animationis foetus humani', *Angelicum* 28 (1951), 18-29; Antonio Lanza, *La questione del momento in cui l'anima razionale è infusa nel corpo* (Istituto Grafico Tiberino, Rome, 1939).

41. J.P. Gury, *Compendium theologiae moralis*, Romae/Taurini, 1866 (17e ed.), vol. I, p. 431; E. Genicot, I. Salsmans, *Institutiones theologiae moralis* (Leuven/Brussel, 1931), 12th ed., vol. I, n. 375; D.M. Prümmer, *Manuale theologiae moralis* (Herder, Barcelona, 1945), 10th ed., vol. II, n. 138.

42. J.F. Donceel, 'Immediate Animation and Delayed Hominization', *Theological Studies* 31 (1970), pp. 76-105.

43. *Ibid.*, p. 101.

44. Karl Rahner, 'The Problem of Genetic Manipulation', in *Theological Investigations* (Darton, Longman and Todd, London, 1981) 2nd ed., vol. IX, p. 226, footnote on page 2. Cf. J.F. Donceel, 'Immediate Animation and Delayed Hominization', pp. 99-100; J.J. Diamond, 'Abortion, Animation, and Biological Hominization', *Theological Studies* 36 (1975), pp. 312-313.

45. Anselm, *De conceptu virginali*, 7 (PL 158, 440): 'Quod autem mox ab ipsa conceptione rationalem animam habeat, nullus humanus suscipit sensus. Sequitur enim ut quoties susceptum semen humanum, etiam ab ipso momento susceptionis perit antequam perveniat ad humanam figuram; toties damnetur in illo anima humana; quoniam non reconciliatur per Christum: quod est nimis absurdum.'

46. N.M. Ford, *When Did I Begin?*, p. 180-181.

47. *Ibid.*, pp. 170-177.

48. C.A. Tauer, 'Personhood and Human Embryo and Fetuses', pp. 253-266.

49. J. McMahan, 'Cloning, Killing, and Identity', *Journal of Medical Ethics* 25 (1999), n. 2, pp. 77-86, quotation from p. 83.

50. H. Tristram Engelhardt, 'Viability and the Use of the Fetus', in *Abortion and the Status of the Fetus*, ed. W.B. Bondeson, H. Tristram Engelhardt et al., (D. Reidel, Dordrecht, 1983) (*Philosophy and Medicine*, vol. 13), pp. 184-191; H. Tristram Engelhardt, *The Foundations of Bioethics* (Oxford University Press, New York/Oxford, 1996), 2nd ed., pp. 135-140.

51. R.D. Truog and J.C. Fletcher, 'Brain Death and the Anencephalic Newborn', *Bioethics* 4 (1990), pp. 199-215.

52. J. McMahan, 'Cloning, Killing, and Identity', p. 83.

53. G.R. Dunstan, 'The Human Embryo in the Western Moral Tradition', in *The Status of the Human Embryo. Perspectives from Moral Tradition*, ed. by G.R. Dunstan and M.J. Seller, (King Edward's Hospital Fund for London, London, 1990), p. 55.

54. Tertullian, *Apologeticus adversus gentes pro christianis*, c. IX (PL 1, 319-320): 'Nobis vero, homicidio semel interdicto, etiam conceptum utero, dum adhuc sanguis in hominem delibatur, dissolvere non licet. Homicidii festinatio est prohibere nasci; nec refert natam quis eripiat animam, an nascentem disturbet: homo est, et qui est futurus; etiam fructus omnis jam in semine est.'

55. Ambrose, *Expositio Evangelii secundum Lucam*, l. I, 44 (PL 15, 1632): 'Ad cohibendam petulantiam tuam, manus quasdam tui auctoris in utero hominem formantis advertis. Ille operatur, et tu sacri uteri secretum incestas libidine?' An indication of this thought is already to be found in the first Christian texts, for example in the Letter of Barnabas (between the first and second centuries) XX, 2, in which the author says that those who follows 'the way of the shadows' are, amongst other things 'killers of children, destroyers of the plasma created by God' (PG 1,1230; here quoted from *I Padri Apostolici*, translated by A. Quacquarelli (Città Nuova Editrice, Rome, 1986) 5th ed., [Collana di Testi Patristici 5], p. 213). Cf. *Didachè* (+ 100 d.C) V,2: on the way of death there walk amongst others 'killers of children, destroyers of the creatures of God' (PG I Padri Apostolici, p. 33).

56. Augustine, *Sermo CLVI*, c. II (PL 38, 851): 'Et tamen in omnibus qui nascuntur infirmis Deus quod bonum est operatur, formando corpus, vivificando corpus, alimenta praebendo' Cf. *Idem*, *Contra Julianum Pelagianum* l. V, 34 (PL 44, 804): 'Ut autem concipiatur fetus atque nascatur, divini est operis, non humani.'

57. Augustine, *De anima et ejus origine*, l. I, c. XVI (PL 44, 488-489).

58. Thomas Aquinas, *Scriptum super libros sententiarum Petri Lombardi*, 2, d. 18, q. 2, a. 3; *De potentia*, q. 3, ad 9; *Summa contra gentiles*, 2, 87-89; *Summa Theologica*, 1, q. 76, a. 3, ad 3, en 1, q. 118, a. 2, ad 2; *De*

spiritualibus creaturis, a. 3, ad 12; De anima, a. 11.

59. Augustine, *De nuptiis et concupiscentia*, l. I, c. XV (PL 44, 423-424): 'Produntur autem quando eo usque progrediuntur, ut exponant filios, qui nascuntur invitis. Oderunt enim nutrire vel habere, quos gignere metuebant. Itaque cum in suos saevit, quos nolens genuit tenebrosa iniquitas, clara iniquitate in lucem promitur, et occulta turpitudine manifesta crudelitate vincitur. Aliquando eo usque pervenit haec libidinosa crudelitas, vel libido crudelis, ut etiam sterilitatis velenam procuret; et si nihil valuerit, conceptos fetus aliquo modo intra viscera exstinguat ac fundat, volendo suam prolem prius interire quam vivere; aut si in utero jam vivebat, occidi antequam nasci. Prorsus si ambo tales sunt, conjuges non sunt: et si ab initio tales fuerunt, non sibi per connubium, sed per struprum potius convenerunt. Si autem non ambo sunt tales, audeo dicere, aut illa est quodammodo meretrix mariti, aut ille adulter uxoris; Petrus Lombardus, *Sententiae*, l. IV, d. 31, c. 3-4; Thomas Aquinas, *Scriptum super libros sententiarum Petri Lombardi*, IV, d. 31, *Expositio textus*.

60. J. Connery, *Abortion: The Development of the Roman Catholic Perspective* (Loyola University Press, Chicago, 1977), pp. 142-148.

61. G. Grisez, *Abortion: the Myths, the Realities, and the Arguments* (Corpus Books, New York, 1970), pp. 165-184.

62. Congregation for the Doctrine of the Faith, *Donum vitae*, l.1, AAS 80 (1988), pp. 78-79.

63. A. Serra and R. Colombo, 'Identità e statuto dell'embrione umano: il contributo della biologia', in *Identità e statuto dell'embrione umano*, J. Carassco de Paula, R. Colombo. M. Cozzoli, L. Eusebi, J. Lafitte, S. Leone, R. Lucas Lucas, L. Melina, L. Palazzani, A. Pessina, E. Sgreccia (Task-Force of the Pontifical Academy for Life) (Libreria Editrice Vaticana, Vatican City, 1998), pp. 143-146.

64. This Aristotelian-Thomist thesis was taken up by the doctrine of the Catholic Church during the Council of Vienna of 1312 (DS n. 902), during the Lateran Council of 1512-1517 (*ibid.*, n. 1440) and in the encyclical *Veritatis Splendor* (nn. 48ss).

65. Many people, hearing the word 'identity', spontaneously think of identity cards or police records. This meaning of identity involves data such as skin colour, hair colour, eye colour, height and weight, physical size and possible mental characteristics. Sociology makes a distinction between 'natural identity' and 'conventional' identity. By natural identity is meant the ability of people to say 'I', to see all things in relationship to themselves and to enter into conversation with other people. Conventional identity or role identity is the result of the social integration of a human individual which makes him or her a member of a community. A third concept of identity could be added to these two, that is to say the concept of the 'identity of the autonomous self', which is derived from the Kantian conception of an autonomous person: this concerns the identity of the person who manages to subject himself or herself freely to the laws and the general conventions of society. All the various kinds of identity hitherto listed which we think of spontaneously or which are employed by sociology do not apply to the embryo before implantation. For this reason the early embryo, because it cannot appeal to a feeling of solidarity between individuals or to society with other human beings in general is in a situation that in a certain sense is disadvantaged. The foundation of solidarity, in fact, is that one recognises in one's neighbour something of oneself. However, all these types of identity cannot be seen as being totally independent of what the embryo is: they do not concern, in fact, the deepest level of the identity of the human person. The physical and mental characteristics of police records, the natural and social identity of the description provided by sociology, and also the identity of the autonomous self, which must grow in all of us, can change and indeed they do change during life. These types of identity are accidental. It is necessary to find the ontological identity of the person who is the subject of all these changes. The concept of identity of the social sciences and the ontological concept of Boethius complete each other. The human individual is perhaps able to develop various social identities but only thanks to his or her generic identity and numeric identity, which also provide the limits to the possibilities of developing a social identity. In limiting oneself to social identity and forgetting about ontological identity one runs the risk of attributing being a person only to those people who are able to achieve a social identity in line with a certain standard.

66. In relation to this whole question Thomas Aquinas has fascinating and inspired ideas. For him, the subsistent form is the same for all human persons. Indeed, beings with a different form belong to different species. However, although it is true that all men have the same form, how then can the differences between them be

explained? This question is a fascinating one and concerns above all else the evident difference between human beings in their capacity to understand things, a capacity that is directly linked to the spiritual form of man. The answer of Thomas Aquinas is that the difference in form between men can only be accidental: 'There is a dual formal variety. There is the variety of the form in itself as regards its essential contents; and such diversity leads to a variety of species: However, there is also a variety of the form not in itself, but in an accidental way, which derives from the variety of matter, in the sense that a better arranged matter will participate in the form in a more worthy way; and such variety does not cause a distinction between species and this is the variety of souls' (*Scriptum super libros sententiarum*, II, d. 32, q. 2, a. 3, ad 1). This provides the basis for his explanation of the differences between individuals within the same species, that is to say the 'numeric distinction' of individuals: 'the difference of form that comes solely the different arrangement of matter does not make a diversity according to the species but only according to the number. Indeed, there are different forms of different individuals, diversified according to matter' (*Summa Theologica*, 1, q. 85, a. 8, ad 3: "... differentiae formae quae non provenit nisi ex diversa dispositione materiae, non facit diversitatem secundum speciem, sed solum secundum numerum; sunt enim diversorum individuorum diversae formae, secundum materiam diversificatae"). Thus it also explains why a man can understand himself better than someone else, even though they have the same spiritual form: intellectual capacity also depends on the disposition of the lower faculties which the intellect needs for its activity, that is to say the imagination, the cognitive faculty and the sense memory (*Summa Theologica*, 1, q. 85, a. 7 in c.).

67. A. Lanza, *La questione del momento in cui l'anima razionale è infusa nel corpo*, pp. 230-231; J.F. Donceel, 'Immediate Animation and Delayed Hominization', p. 101.

68. A. Chollet, 'Animation', in *Dictionnaire de Théologie Catholique* (Paris, 1923), vol. I, 2, p. 1314.

69. R.D. Truog and J.C. Fletcher, 'Brain death and the Anencephalic Newborn'. *Bioethics* 4 (1990), n. 3, pp. 199-215; J.W. Walters, 'Anencephalic Infants as Organ Sources', *Bioethics* 5 (1991), n. 4, pp. 326-341.

70. J. McMahan, 'The Metaphysics of Brain Death', *Bioethics* 9 (1995), n. 2, pp. 91-126