

3. Intrinsic criteria

Embryo mens vanaf conceptie

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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 (384/383-332 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 inequity becomes cruel towards their own children, generated against their wishes, a clear inequity 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 importance 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.