

**START OF LIFE OF EACH HUMAN BEING. WHAT
MAKES HUMAN THE BODY OF HUMANS?**

Abstract

Biology provides a direct and objective knowledge about how and when life of a human being starts. When zygote appears, a human body is there in the middle of temporal processes of the transmission of life,

Science clearly states that any human individual, while being an embryo, remains being the same individual in youth or old age. Body keeps changing in a continuous way from the very being until the moment of death; however, identity is maintained.

Science provides also an indirect knowledge of the origin of each human being when showing that in the only life of each one dynamism of all biological processes and personal dynamism liberating the body from its enclosure within physiological automatism keep intertwined.

Key words: fertilization, zygote, human embryo, human body

1. The human embryo

Research with human embryos, the implementation of the fertilization techniques *in vitro* and the use of contraception and abortive methods, pose repeatedly the question that has been denominated the "statute of the human embryo". The human body is a peculiar organism between the primate mammals among which it is found so human biology is not merely zoology.

It is obvious from a biological point of view that the life of each human being begins when the process of fertilization is completed, precisely with the appearance of the new reality that is called zygote. Biological science has the last word and has pronounced it with clarity and forcefulness.

The same *in vitro* fertilization techniques has left absolutely no doubt the radical difference that is a given on the one hand between the individual of our species in its initial stages, be it the unicellular zygote, the embryo of two, three or many more cells. On the other hand, the common human cell, or a mass more or less orderly and organized, of those common cells, that lack, however, in one case and in the other the inherent unity of a living creature.

What to some does not seem clear is not that an embryo of a few hours or day does not pertain to the human species, but that that embryo should be comparable to a human person. The debate is then posed about when and in what cases can it be affirmed in a development process that there is already a human being there. That is to say, what characteristics and manifestations are necessary so that a human biological entity in development can be considered a human.

Since to respect the personal dignity of each and every human implicates, among other imperative irrecusables of not providing of any of them as a means, nor deciding about its origin, life, death, be whatever its state of development, its decrepitude or its disadvantages, is of utmost importance to ponder about the inception and the vital process of each human.

This reflection comprises two questions. The first refers to when the conceived being of human progenitors is already a human body; is merely a scientific question that nowadays is already resolved. The second poses the personal character of the entire human body, this is, what is it that makes the body human? Science also has much to say on this particular. Nowadays it says enough to illuminate many questions about the value of life in its extremes: incipient life.

For the two cited questions, the essential key is in comprehending that the corporal dimension is a constitutive element of the human person: a human being does not have its body he is his body.

Each one does not identify with the biological structure and at the same time, the body is a sign of the person's presence. The history of each person is not simply that of its corporal life. The peculiarity of a human body is that it has a "title" with its own name. The body manifests, in the plenitude of each stage, to the being with that own name. The biography of each one has a course in time that is personal, a growing dynamism towards plenitude, of interpersonal relationships with other humans, that always has as a task and tendency to reach plenitude as a human.

Inseparably each human life is the life of a subject that is corporal, biological, and at the same time, is personal along the time path of growth, maturation, aging, and death. They are neither two automated lives nor a double life. Actually an animal life of man does not exist because the body of a man is always a human body. The decadence, the limitation, imminent death, does not entail loss of personal value. In the same way, to an incipient life the dignity that its personal character grants, by the fact of not yet manifesting the peculiarities that correspond to another stage of its life and only reaches such manifestation in that time.

Thus our reflection should take into account that, in each human subject, the fusion of its autobiographical life and the physical-biological life is inherent and elemental, pertains to its essence. The attitude before man depends on how that intertwining is conceived.

In the dominant culture two regressions have occurred. On the one hand, the reduction of the personal and the biological, of mind and brain, leads to confuse the dignity and the value of the human person with the value and dignity of life as an organic process. On the other, the dualist separation of the personal and the biological, of mind and body, leads to consider this as something that one possesses, but not that what one is, and that can be freely manipulated. This is to say that to be a person is conceptually separated from "the biologically human being".

From both perspectives, to pertain to the human species is a biological fact lacking ethic relevance: only the individual of the human species would be considered a person as it expresses certain qualities (autonomy, self-consciousness, rationality, etc.), qualities all of them that require a long period for the maturity of the brain, even after birth.

They talk, therefore, of "emergency" in the sense that the plus of reality that expresses the life of each human being -culture, interpersonal relationships, liberty, etc. - necessarily have to emerge from the materials that carry genetic information. The human embryo would not possess the individual and intrinsic character of the members of our species. The personal character, the inherent dignity of each human being, would be something that others acknowledge in so much as it fulfills certain conditions of development, senescence, capacity to reason, etc.

Now, if man were no more than his physiological and neurobiological processes, the human psychic, the spiritual world that in fact is given in human beings, would not have an explanation. The plus of reality of man over animal is not merely biological, precisely because it reveals itself as the liberation of living enclosed in mere brain processes, instinctively confined to biological necessities that characterize animals.

What is really discussed does not refer to when life begins for each man, but what is the origin of that plus of reality to each human being.

The question of the last origin of each man is not a question that Science can answer nor can it be answered in its name. What can be asked of Science is how much time is necessary, once fertilization of the gametes has been initiated, for the resulting living human entity reaches the sufficient development that, we can reasonably call it body. It has to be kept in mind that all human body, even with deficiencies, has a titular that possesses the specific character of all human beings.

Science cannot give reason of why each man is a free-living being, nor of the origin of that attribute. However, human biology contributes a great wealth of knowledge: the only vital trajectory of each man is intrinsically enhanced by the capacity of personal relationship that it possesses. What is specifically human, come from wherever it comes, is something inherent, linked to the life received from their progenitors; it is not mere information that emerges from development.

2. **Life is a temporal process**

Life is growth, development, flourishing, cell renovation, organ regeneration, and ageing. In living creatures, the individual unit is more than the mere sum of the parts. The most striking and characteristic attribute of a living creature is the capacity to transmit life giving way to individuals of their same species.

This is because each one possesses those peculiar materials that are chromosomes. They are formed by the double helix of DNA, a molecule that not only is informative, but that can be copied to a complementary structure and therefore conserve the message but the same time that it transmits it. In this way, living creatures emerge from the generation of their progenitors and are capable of transmitting their peculiar organization to their descendants.

The organization of each cell is based on the existence of simple molecules, and common to all living creatures, combined in infinite different forms. Two of these macromolecules, the nucleic acids -DNA and RNA- and the proteins, contribute to the identity of each one of the species. Each individual of a species possesses a set of both bimolecular that is distinctive of the species it belongs. The structural complexity of living creatures is always associated to a determined function. Each component and each part of a live organism -the ear, a flower, a cell's membrane-, has its own function and, at the same time, its performance is harmonized so that the unit, the individual, lives.

To remain alive requires an ongoing exchange with the natural environment that varies with time. This continuous movement keeps away the living creature from the deadly balance: without exchange of material and energy there is no life. For each part of the organism and each cell, the medium is the rest of the body or of the organ that it forms part. During embryonic development, the natural medium is the mother. After birth, that natural medium is external. Life of all organism has a trajectory from start to finish because it is in continuous exchange with the own medium of each stage.

The functions of living creatures depend on its interaction with the medium. Even the most modest organism is capable of taking simple materials of its surroundings and employs them in obtaining energy to grow, to move, etc., and those simple materials are transformed into the structures with which to build its own organism. The interaction of the living creatures with the environment does not end there; not only do they transform and receive energy from it, but the living creatures adapt to the environment, auto-regulating its capabilities according to what the environment offers them

Biology has reached a clear comprehension of the vital processes, understanding them as a *dynamic cooperation of genes and medium* that gives way to the regulated gene expression during the constitution and development of a new being. Each living creature has its own life with a beginning and an end; and a temporal development where it finalizes, grows, adapts to several circumstances, and transmits life.

Life is dynamic; active in an orderly way, progressive and continuous; and in each moment of its existence, only the potentialities that deal with this stage is activated. The continuous change that always induces to keep away from the equilibrium is what permits that the vital trajectory does not

detain.

From this perspective, the start of an individual's life can be defined as a *constitutive process* with a net beginning. While posterior development is a *consecutive process* of construction, with differential growth, maturation and aging; and natural death as an end also net- of the process.

3. Our species' zygote is a human body

Fertilization is a dynamic and temporal process by which each individual constitutes it from the ones provided by its progenitors. The inherited genetic information increases during the hours that the fertilization process lasts, thanks to the interaction of the genes with the components of the intracellular medium, with the resulting end that the zygote is more than the mere sum or fusion of the gametes.

Fertilization begins with the specific recognition of species and the mutual activation of the paternal and maternal gametes, mature, and in the adequate medium. From the point that the spermatozoid reaches the ovum a calcium ion liberation is produced that are disseminated like a wave towards the opposite zone; and at that point its remains fixed to the dorso-ventral axis of the body. Perpendicular to it, the head-tail axis is established, in the absence of ascertaining what pole will be the head and which one the caudal, which will happen in the second week of development, by which the left-right axis will be determined.

The concentration of calcium ions in the cellular space of the ovum that is being fertilized regulates the processes that occur throughout the time of fertilization. The essential process that is regulated by these molecular signals is the structure of the chromosomes; the changes that occur prepare for the regulation of gene expression. In this way new information is generated which is called *epigenetic information*.

The fertilization of the maternal and paternal gametes that results in an individual is an epigenetic process due that the inherited genetic information feeds itself throughout the hours that the process lasts and the result, the zygote, is more than the mere sum of the fusion of the gametes. The zygote is an organism in the state of a cell and at zero time. It has the sum genetic patrimony of the maternal and paternal chromosomes, equal to each one of the cells that will constitute the organism, but it is not a mere cell with genetic information of that individual of that given species. Its genome possesses the characteristic and inherent state of the start of a program of an individual life.

The cell with the phenotype zygote is doted of a cellular organization that constitutes it in an inherent and different reality from the reality of the gametes, the biological starting materials. It possesses polarity and asymmetry in such a way that it has the outlines of the dorso-ventral axis and perpendicular to it the head-tail axis that will establish the corporal structure. It has been constituted through a process of auto-organization of the biological material resulting from the fusion of the paternal and maternal gametes.

All the processes that take place inside the fertilizing egg are regulated by the levels of calcium ions reached in each specific zone of the cytoplasm. In this way, the process of the formation of the zygote is regulated in space and in time.

On its part, the paternal pronucleus attracts the maternal pro-nucleus towards the center of the zygote that is being constituted and there they reunite. While they are nearing, the nuclear membranes disintegrate; the paternal and maternal chromosomes are constituted, mix and orderly align in a plane that is jointly determined by two points: the place occupied by the genetic material of the ovum and the entry point of the spermatozoid. The genetic materials are in this way prepared

for the first division of the zygote that gives origin to the embryo of two cells.

The diverse components of the cellular interior is classified in an asymmetric distribution following the gradient of calcium ion concentrations and that offers one rich zone and another poor zone of these ions. This feature makes the zygote different from any other cell, it confers it polarity and asymmetry, which means that its components are reorganized according to the layout of the axis that will establish, in time, the corporal structure.

4. The genome of the zygote is in its initial state of the development program

DNA, that forms/forma all and each one of the zygote's chromosome pairs, has a spatial structure and some chemical markings different from the ones that the genetic material had from the vector gametes of the paternal and the maternal inheritance.

During the hours that fertilization lasts, the DNA of both progenitors changes until it reaches the structure and the pattern of the own markings of a new individual in the phase of initiating the expression of the own genes¹. With it, a new genome is created that is its characteristic and inherent state of a program of individual life.

It is well known that the DNA sequence of each inherited chromosome pair does not change throughout the individual's life. It is the genetic endowment present in all and each one of its cells that forms the diverse organs, tissues, and systems. However, each cellular line acquires, especially during embryonic development, some proper characteristics of liver cells or of kidney, etc.

This process of cellular differentiation entails that in each case some genes are expressed while others are silenced in such a way that the proteins are different and, with it, the functions that the cells of the different organs carry out in the unity of the organism. The selective regulation of gene expression requires the action of certain molecular signals; it especially requires that the strands of DNA of the chromosomes acquire in different regions a different spatial organization that is achieved by the incorporation or the elimination of a methyl group in the cytokine one of the four ashlar of the DNA strands.

If a cytokine finds itself methylated in a specific regulatory region, the expression of the genes associated to that sequence remain silenced. Thus, the change of the methylation pattern of the cytokine is in the base of the cellular differentiation that accompanies the embryonic development, the same as the maturity and aging of the organism. At the same time, this process is rigorously regulated: diverse factors that influence it, as, for example, the chemical modification of the histones, a type of protein that packs and spatially organizes the double strand of DNA.

Very different is the process of the genesis of masculine and feminine gametes. The genome of the sperm is very condensed and methylated many of its cytokines. With the start of fertilization, the paternal genome is decondensed and demethylated and immediately it is reorganized and it folds on the histones. The changes in the distribution of the histones continue during the first divisions².

In the diploid genome of the zygote, the methylation pattern of each one of the chromosomes that form each pair, what is called *parental imprinting*, is different according to its origin, paternal or

¹ Weaver, JR, Susiarjo, M, Bartolomei, MS. "Imprinting and epigenetic changes in the early embryo". *Mamm Genome* 20, (2009), 532-543.

² McLay DW, Clarke HJ "Remodelling the paternal chromatin at fertilization in mammals". *Reproduction* 125(2003):625-633; Ooi SL, Henikoff S "Germline histone dynamics and epigenetics". *Curr Opin Cell Biol* 19 (2007) 257-265; Okada, Y., Yamagata, K., Hong, K., Wakayama, T. Zhang, Y. "A role for the elongator complex in zygotic paternal genome demethylation". *Nature* (2010) 463, 554-559.

maternal. During fertilization a series of methylation and demethylation that cause the DNA pattern of the zygote to be specific and very different from the specific pattern that the gametes which originated it had.

However, the methylation pattern remains unaltered in a set of genes, called genes *with imprinting*. These, differently from the rest, are regulated during the development in such a way that can only be expressed one of the two copies of the gene, denominated alleles, be it that they come from the father or the one that the mother carries. Although these genes are few they are essential for the normal development of the individual.

Thus, in the zygote they merge, this is that they integrate and reprogram, two genomes highly specialized in such a way that it allows for the totipotentiality, an exclusive property of the zygote. The genome of the zygote, with its peculiar genetic structuring will permit for the formation and the development of an organism in a harmonious and coordinated manner, so much so in the corporal space as in the time of life.

With fertilization an "ignition" has been produced, a put forthwith, of the expression of the information of the genes, that is the patrimony of the new individual. The mere fusion of the gametes as carriers are not sufficient as each one carries half of the genetic patrimony. Fertilization is an active process, epigenetic in that it requires the molecular signals generated in the course of the same process, that initiates with the reciprocal activation of the gametes of the progenitors and that end up generated the zygote, a cell with a unique phenotype.

If, in humans, the fertilization process does not finish correctly, or it would consist simply in a stimulation of the egg, the result would be a cell capable of suffering some divisions. It could even occur that the cells generated of that division would reach morphology very similar to that of the embryo that is a few days old but they would never give origin to an individual. It is a being in its unicellular stage that without a solution of continuity begins its development.

The zygote is the only totipotent unicellular reality able to develop into a complete organism following the vital trajectory generated that allows for growth as an organism according to its axis. A differential and orderly growth where cellular multiplications are accompanied by cellular differentiation depending on the place they occupy.

If all the cells that are formed by the successive divisions of the first of the early fetus remained the same and are uniformly distributed it would not form a living being but a group of cells without vital unity. However, development is a growth accompanied by cellular differentiation and the spatial distribution of the cells according to the corporal axis. It is not enough that the liver is formed, or the lungs, but that each functional structure occupy the place that it corresponds to in the unity of the organism that possesses the corporal form as an individual of the species.

The zygote is the only totipotent unicellular entity, capable, thus, of developing until reaching a complete organism, following the vital trajectory that it generated. It is, then, a body in a unicellular state in zero time. It is a being of the species of its progenitors with its proper characteristics of the initial moment, zero time, of its life. It is an entity that cannot be confused with a common cell that would live in a medium where it would be allowed to grow and to originate a group of living cells. The zygote is a body, not a simple cell.

5. We have memory of our first day of our life

The understanding that the corporal design of mammals begins to be determined at fertilization, has

supposed a surprising change in the thinking of Embryology³.

Only ten years ago, such an affirmation would have been considered a scientific heresy. It was thought then that mammal embryos in their first days were a group of cells practically the same amongst themselves and the same as the zygote from which they proceeded. They were the result of symmetric divisions, of mere segmentation. Although it was known with quite precision the existence of molecules in the membranes of cells derived from the first divisions that permitted the structuring and functioning as a unitary organism, it was thought that later on, in the moment of implantation in the uterus' wall, that the cells acquired differentiated "destinies". This was determined by its position in the embryo, and that in turn determined its position in the future body.

The asymmetry of the zygote establishes the plane of the cellular division that, in turn, orients the bi-cellular embryo according to its corporal axis. From the first division two unequal cells amongst themselves and different from the zygote, that also follows diverse paths in the ulterior development. They both constitute an organic unit, the embryo in its bi-cellular state and specifically interact amongst themselves through molecular components of its membranes.

The two cells have different calcium ion concentrations; these regulate the expression of the genetic information and the velocity of cellular multiplication. Thus, the richest cell in said ions divides before, in an equatorial plane, perpendicular to the first division and therefore generates the tri-cellular embryo. Later on, the other divides but it does so in a southerly plane. As a result of the first day of life, the embryo is constituted by four cells arranged in a precise spatial orientation.

Two recent investigations give information of the first day of life of each individual. According to the first one, the two cells that form the bi-cellular embryo have, in fact, different content of the messenger RNA⁴, which brings to light once again the inherent asymmetry of the zygote.

The cells derived from the cell poor in calcium ions begins to differentiate under the own action of the specific genes of an extra-embryonic tissue called trophoctoderm. On the contrary, the ones that come from the one richer in calcium ions are pluripotent, capable, while they form part of the embryo, of producing all the cellular body types. This capability is conferred by the specific genes of the pluripotency, that is activated by the calcium ions and that for some time give commands to the cells that remain undifferentiated without still defining in what direction to continue the maturation.

If these cells separate by dissection of the embryo, they convert to the so-called embryonic stem cells (generally called adult stem cells), they stop being under the control of the organic unit and it becomes possible to artificially conduct its maturation towards certain cellular types.

Embryonic stem cells, so much so if they are separated from the embryo as if they form part of it is not totipotential, as some have affirmed, but are only pluripotential. The totipotentiality is the capacity to originate a complete and structured organism, body and placenta; while the pluripotentiality is the capacity to differentiate cells and tissues of many or all the existing varieties that exist in the body, but not a complete organism.

The alleged totipotential capacity of the blastomeres would go against the embryo's identity. If each blastomere were totipotential, the embryo would not initiate its life as an individual being, whose components are integrated in a singular totality; but as a fluid entity, potentially plural, multiple in which various zygotes would stay extrinsically reunited by the pellucid zone. There is no data, at

³ Pearson H. "Your destiny from day one". *Nature* 418 (2002), 14-15.

⁴ Roberts, R.M. Katayama M., Magnuson, S.R. Falduto, M.T., Torres K. E.O."Transcript Profiling of Individual Twin Blastomeres Derived by Splitting Two-Cell Stage Murine Embryos" *Biology of reproduction* 84 (2011), 487-494.

least at the moment, that show that the isolated blastomeres of four to eight celled embryos are able to on their own give way to a complete organism without the help of others.

The other paper came from studies of human *in vitro* fertilization⁵. The authors looked for determining the criteria that would permit to know if there had been, or if there had not been produced, a complete fertilization. Therefore they could then distinguish between apt embryos to be transferred to the uterus and non-viable embryos. For this, they analyzed the time needed for each stage of the first day of life.

Eleven hours after the complete division of the zygote, the bicellular embryo has transformed itself in a tree-celled embryo. One hour later, there already are four cells that have situated themselves according to the vertices of a tetrahedron. At that moment, the messenger RNAs of maternal origin have already been degraded, yielded by the ovocyte and that synthesized the proteins of the membranes that unite between themselves the first cells of the embryo to form a corporal unit and that have been substituted by the mRNA generated by the expression of the embryo's own genes.

Another interesting observation of that paper in that the individual blastomeres of a good part of the intact human embryos in the phase of two to ten cells, or of the abnormal embryos that have detained its development in those phases, have an expression of genes that correspond to different ages of development. The paper therefore suggests that this could indicate that some blastomeres suffer long halts in its development while other blastomeres go ahead at a normal speed proper to these phases. This signifies that, within the organic embryonic unit, the different blastomeres maintain an autonomous growth rate.

This finding, according to the investigators, seems to contradict the idea that is generally accepted that the blastomeres of the embryo with two, four, eight and sixteen cells would be identical amongst themselves and would be synchronized, even intercommunicated in the morula, to develop into a unit. This is, it would be a uniform group, and to some extent shapeless, of cells without a differentiated organization. The fact that blastomeres would not be equivalent between themselves from the start of the zygote's development is another feature that accentuates the differences that exists between the "classic" image of the embryo and the one that is being delineated the actual molecular embryology. The new image is incompatible with the outdated notion of the "amorphous" embryo, homogenous, made from the same elements among themselves, breakable from which casual cellular groups could even separate capable of establishing in whatever moment of two new systems.

From the first division of the zygote to a bicellular embryo the growth is accompanied by a differentiation of the diverse cells following a unitary pathway, programmed in a temporal and spatial manner.

6. Continuity in the development according to the corporal form given by the axis

In perfect continuity with the fertilization process, the zygote initiates its development with the construction of the diverse parts of the body. The individual is inseparable from its development.

In day three, the embryo consists of eight cells, four that are immature, pluripotent and another four that have begun their maturation. On day four in the embryo a cavity begins to form that displaces towards an end the immature cells and on day five the embryo, now called blastocyst, has developed during its course through the mother's Fallopian tubes, in the direction of the uterus.

⁵ Wong, CC, Loewke, KE, Bossert, NL, Behr, B, De Jonge CJ, Baer, TM, Reijo Pera, RA. "Non-invasive imaging of human embryos before embryonic genome activation predicts development to the blastocyst stage". *Nature Biotechnology* 28, (2010), 1115-1121.

The asymmetric auto-organization, initially of two disparate cells is maintained throughout development. Each cell possesses a spatial and temporal history, which, in a certain mode, informs it that it is part of a unique organism, alive and precise, with a defined time of development.

If the cells were maintained the same and uniformly distributed would not form part of a living creature: they would simply be a group with a vital unit. Of the totipotent zygote, diverse types of pluripotent embryonic stem cells are derived; these are capable, in turn, of maturing towards diverse types of multipotent stem cells; and these of originating cells progenitors of tissue. These finally generate the differentiated cells of the organs and the tissues capable of organizing in spatial structures of functions more or less complex.

In all the stages of development it is essential that the immature cells receive a signal, generated in a prior stage, sent from another cell more or less distant, or mediated by intracellular contact. Each cell- if it finds itself in the state of maturation that corresponds to it and, also, situated in its own niche- processes that signal. Through molecular interactions and chemical reactions organized in a signaling pathway, which interprets it and executes it.

Thus, the construction of the organism is hierarchically organized in space and in time, with a natural Early Start calendar and term for each of the organs, tissues, etc. The asymmetric distribution of the cells according to the cephalic-caudal, dorso-ventral and bilateral (right-left) axis gives way to the precise location of the different organs in the body.

While it nests, throughout the second week, the embryo structures itself in two layers of cells and generates new stem cells. On day eight the cells that form the internal cellular mass transforms into one layer, that will be the dorso of the embryo and in which the cephalic-caudal axis is defined. The cells that limit it form the second layer and are the progenitors of extra-embryonic structures.

7. **The embryo goes on to the fetal stage**

On day fifteen evolution of the embryo finishes with two to three layers and the blastocyst is renamed gastrula. This process is a massive movement of cells that are cut off and descend from the second to the third layer through a provisional structure known as line or primitive streak. Between both layers, the cells that constitute the third layer are located.

This three-layered structure organizes the complete development of the organism. The logic of the sole pathway of each level involves that in the first place systems as the nervous and the circulatory system are formed and carries out functions of integration of the parts.

There is evidence that sixteen days after fertilization the vessels, the blood and the neural cells begin to be formed. Around day twenty-one, a cardiac draft appears as the central motor of the blood circulation and the first beat is produced.

It can be defined that at the end of the human embryonic stage⁶ and the beginning of the fetal occurs when the primitive streak appears and has not reached the eight weeks of development from the first mitotic division. The appearance of the primitive line or of the neural crest from which brain cells are derived, does not assume a special milestone that changes the ontological reality of the individual. When the brain is structured and is matured following that individual's vital pathway the corresponding potentialities will be actualized and the specific manifestations of the neuronal circuits, in the same manner as when the lungs are constituted and are mature will they be able to

⁶ Findlay, JK, Gear, ML, Illingworth, PJ, Junk, SM, Kay, G, MacKerras, AH, Pope, A, Rothenfluh, HS, Wilton, L. "Human embryo: a biological definition". *Human Reproduction* 22, (2007), 905-911.

begin to exercise their respiratory function.

The specific individual, inseparable of its development, goes acquiring the phenotype that corresponds to it in each moment of life: it upgrades the plenitude of its biological being in each specific stage. None of those states of life possesses a different level on ontological reality. It is the same individual that exists in the peak of embryonic life or fetal, young or old.

8. **Biological identity-personal identity**

The living creature conceived of our species is a new unit of information on the spot, “ignited” and that will go on actualizing systematically the potentialities that it possesses. The inherited information consists of an order -the sequence of the four DNA nucleotides- that, in turn, create orderly organic structures, the RNA and proteins that are functional. The order of the collocation in the DNA, of the four bases, is the genetic information, the patrimony or genetic background of the individuals of each one of the species. It is present in each one of the organism's cells and does not change throughout life.

The inherited genome contributes the belonging to the species and the biological identity of the individual. This also happens in the human being. In addition, therefore, the biological identity is sign of personal identity. In such a way that the criteria to determine who is a human being is an external criteria; in effect, it is the identity of the body as continued existence in space and in time. The body “says who it is”: the face, gestures, the voice, even the way of moving, identifies the titular of that body.

We are capable of recognizing the face of a loved one in a crowd, and we are capable of recognizing the relatives of a friend by their similarities. If a person loses consciousness and memory, if they forget who they are, it is the rest who can say, “You are so and so, husband of, engineer, born in...”, because they can perceive in their features the corporal continuity before and after the accident. Corporal continuity, biological identity is a sign of the continuity of the person, personal identity. Moreover, before the doubt of “who it is” someone can go to the analysis of his or her genetic peculiarities and determine technically his or her biological identity.

In spite of the nucleotides of the inherited genome, the genotype, does not change throughout the individual's existence, the supporting material of the genetic information is modified by the interaction with the medium, throughout its life: it changes the structural state with time and it changes the states of DNA in diverse parts of the body. The interaction of the components of the medium, internally and externally of the living being, is constantly changing and with it the state of the living being, the phenotype.

Information appears as such, that grows with the vital process that temporally and spatially organizes the development and the life, in regulating the expression of the genetic information, the construction of the organism. This information, that is called epigenetic, is not inherited but is generated in the constitution of the individual and it extends custom-built as that development moves forward. Thanks to this information, the life of the living being is a unitary path and discontinuous in time, with stages that takes place in an orderly fashion: zygote, embryo, fetus, newborn, youth, etc.

The cells become more and more different from each other and specializing, organizing in tissues and organs, maturing and aging at the same time that they maintain the information concerning their own history.

Life requires a development program that organizes the messages of the genes in time and that is

coordinated in organic space and in this way permits the harmonious and synchronized formation of the diverse parts of the body, of the diverse organs, tissues and systems. Program that each human being is boosted with the liberty that allows for it does not remain confined in corporal biological processes.

9. **The existence of identical twins does not assume that the early embryo is not one**

Each individual is one in which his existence follows a particular path of the expression of the genetic message. It is different and unique to any other not only by the unique combination of genes inherited by the progenitors but by the own fluctuations of its pathway, that make different even twins with identical genetic patrimony.

We know in an unmistakable manner that in the zygote there is a layout or map that makes that the organization of the embryo is created at its start, before implantation. This assumes a profound change in the idea of the embryo, and invalidates the doubt about that the existence of identical twins assumes a lack of individuality of the embryo in the period of time prior to implantation in the mother's uterus.

Frequently, the spontaneous generation of twins is considered lack of unitary organization in the state prior to implantation, lacking oneness. Such a lack of individual character has been used to put into question the nature of individuality of the human species of the embryo a few days old.

However, the current information makes it very difficult to admit that an organism which is not a formless mass of cells, can split in two. Twins arise from the formation of two zygotes from the same fertilization and not as the fission of an embryo to originate two embryos.

It is known that the frequency of twins occurs in situations of a low level of calcium in the mother. While an ovum is fertilized with a low content of calcium ions, the synchronization of two processes that usually are synchronized can be altered: cellular division and polarized intracellular organization that culminate with the generation of a zygote. The division of an ovum during the period of fertilization and before it finishes would give way to two symmetrical cells, the same amongst themselves and the same to the ovum in fertilization.

Obviously, this is not a bicellular embryo since two cells are not unlike that if each one of them continued the fertilizing process and would reach the result of asymmetric zygotes, a sole fertilization would give way to two identical zygotes.

In any case supposing that twins would be generated from one sole embryo, the process would not consist in the simple partition of an individual in "halves" or "quarters". The existence of axis that organizes the group of cells derived from the multiplication of the zygote does not permit to refer to fission of the embryo as if it dealt with a symmetrical and homogenous biological reality. This is to say, that in the case if from an embryo some cells would separate, this cellular material would be the starting material that only after constituting itself in a totipotential cell, in a new zygote, would it then initiate a new and different unitary vital path.

10. **Relationship with the mother and embryo autonomy**

From the first day of life, a molecular dialogue is developed between the embryo and the mother that is initiated because of the embryo. The latter liberates molecules, interleukins that receive the specific receptors of the uterine tubes. As response, the tubes, produces various substances that permit growth, inject the vitality that the embryo needs, complementary of the ones of the embryo, that permit it to rotate throughout the route and indicate the place where it can detain itself to nest.

In response to the natural process of gestation, the mother's brain changes developing the social brain and turning into a maternal brain. These changes prompt in it the bond of affective-emotional attachment.

During years, it was assumed that the human embryo initiated in belatedly the expression of its genes. During the first days of life, it depended on the proteins and the RNA present in the cytoplasm of the ovule. However, thanks to the better quality of the analytical techniques revealed the expression of genes of the Y chromosome in masculine embryos in the first day of life, The expression of at least some 30 own genes is prior to the four celled stage. In addition, more than 700 are expressed in the passage from four to eight.

Recently it has been accomplished to quantify the products of metabolism of individual embryos as a medium to identify its health. The embryo before implanting uses substrates of the medium, oxygen, sugars and energy sources; it has its own metabolism.

The dependency of the relationship with the mother does not assume a lack of autonomy as an individual. The gestation contributes, in the manner of a natural nest, the molecular signals and cells necessary for the development stages of the embryo. The relationship with the medium differs in the diverse stages of the individual's life without it assuming in none of the stages a difference in ontological entity.

11. Symbiosis of two lives: immunological tolerance

The molecular dialogue converts the maternal immunological system in tolerant towards the embryo, half-maternal and half-paternal. The atmosphere of immunological tolerance created in the molecular dialogue makes that the mother's defenses against what is foreign is deactivated, the mother perceives the embryo as something that is not proper, different from her and, however, without the danger signals that would activate her defenses against the child.

This natural biological process of immunological tolerance, takes place through a network of substances that harmoniously liberates both, mother and child. It acts locally silencing all the maternal cells that would generate the natural rejection towards what is foreign: the cells denominated "natural assassins", the lymphocytes T, toxic for the foreign cells; and the lymphocytes B, that produce the antibodies of rejection.

Therefore, gestation is converted in a cohabitation of two lives: the child is neither a part of the mother nor a graft that would be rejected.

12. Exchanges of cells between the fetus and the mother: maternal microchimerism

In the cohabitation of the gestation, each fetus contributes to the mother immature cells that rejuvenate her body. These "young" cells go on to the bone marrow and in some cases; it has been observed that they participate in the regenerative processes of the maternal body. The mother also passes cells on to the fetus. The exchange via of cells in two directions generates a microchimerism in both.

The microchimerism is very frequent and also occurs in subjects to those that have had blood transfusions or in those that have received transplanted organs. The cellular exchange is active in the case of some monochorionic twins, in whose placentas there are communicating. These twins are always chimeras of blood cells and of other tissues.

The genetic chimeras are organisms where cellular populations coming from two or more individuals coexist. It was supposed for a time that it came from the fusion of two or more embryos by which meanwhile the possibility of embryonic fusions would not be closed the embryo would not possess unity.

It is possible that the phenomenon of embryonic fusion can exist: from two twins if one died the other could incorporate some of its cells. What could then be assumed as an embryonic transplant from a dead to a live person. An organ transplant or the transfer of cells would not be considered a loss of the corporal unity.

13. The personal character of the human body: what makes it human?

13.1 What makes the genome human of each man? No more genes.

At the moment, we can count with a complete catalogue of the genetic differences between man and the chimpanzee. The most characteristic, and that powerfully draws attention, is that each human being has more creativity- an own personal identity and different from others- than any other animal, with less biology. So much so, that it is said that the interpretation of the human genome has constituted a humiliation: the humiliation of the genes.

13.2 The morphological and physiological characteristics distinctive of the human body is not a matter of having more genes

On the one hand, there has been a “loss” of genes. This implies a reduction of the capacity of adapting to the medium. It conspicuously is an increase in the possibility of manifestation of the personal character. For example, a mutation in the myosin gene, MYH16, is translated in a thinner muscular fiber that permits man the typical human gesture of the smile, in exchange of a lessening of the musculature of mastication. It will compensate with culinary art the biological poverty of a weak grinding machine of food.

Changes in the genes in the human line are characterized by having a high repercussion in the phenotype, exactly because they have taken place in regions of the chromosomes that contain regulatory elements. The most striking modifications are the ones of gene expression that regulate the construction of the brain during embryonic development. For example, the gene FOXP2 in the human line has acquired two mutations that convert it in an important regulatory factor, essential in the specific moment of human embryonic development where neuronal structures of speech and language.

The critical event that leads to the establishment of the greatest differences between the human brain and that of the primates is associated with the changes in the reorganization of the sexual chromosomes, X and Y. In the evolution of mammals the sexual chromosomes has followed a process of passing information of chromosome Y to X. Chromosome Y has gone reducing in size. Reaching in only containing only the specific genes of masculinity, while X has become enriched storing important genes, especially genes to construct the brain. In females, XX, one of them is inactivated in the diverse tissues and in this manner; it equates the genetic doses with XY males.

Therefore, this process is inverted right at the moment of the apparition of the first men, with a passing of genetic information of chromosome X to Y. The region of X-Xq21.3- that passed to Y-Yp11- contains a gene that codifies a molecule of adhesion expressed in the brain that is implicated in the specific interactions between neurons. It is an essential protein to create the specific cerebral architecture with lateralization of the cerebral hemispheres, an exclusive human property. Also, the two gene copies, one localized in the X chromosome (PCDHX) and the other in the Y (PCDHY), is

expressed at a different moment in the development of a female embryo and that of a male embryo, regulated by sexual hormones and that cause sexual dimorphism of the human brain.

13.3 Biological poverty: budget of the reality plus of each human

The human body shows very peculiar morphological and functional features, all of them linked to the peculiar human brain, which brings to light the biological poverty that characterizes it. For being on foot and having to support the hip musculature, the pelvis acquires a form that makes the canal narrow for childbirth in the woman. The human creature is always born, because of this, in a premature birth, without being finished, and needing of a “finishing” in the family.

The construction and maturing of the brain of each human is not closed, but open to interpersonal relationships and its own behavior. It has an enormous neuronal plasticity and above all, it is needed of, to be viable and to reach its plenitude, the attention, and relation with others. Neurosciences take into account the necessity of that mode of maternal-familiar acceptance, in the first stages of life, for brain development and the harmonization of intellectual and affective life.

Psychophysical development, learning etc., requires a scope of personal relationships of familiar texture, without the child suffering delays in his intellectual and personal maturation. The development of the cerebral cortex is not initiated, nor are the functions distributed in the two own hemispheres of the human brain if they do not reach, at an early age, the connections that the limbic system emits towards the cortex when it “processes” emotions.

The characteristics of the human brain contributes to the biological estimate of a living being, that requires personal relationship and sense of life for its natural development.

13.4 A non-specialized living being that humanizes biological needs

“Superior” animals possess an intense operability: tendencies, behavior modes, etc. that is linked and is parallel to the development and maturity of its nervous system. The animal brain processes the information that it receives from the outside always and when the specific stimulus of its species is present. The inherited genetic information contributes to the animal a disposition to learn and enables them to acquire knowledge and give instinctive answers, or behavior modes, that are automatism directed from the functional unit of the organism.

Nature perfectly ties the survival mechanisms, in such a way that only with violence it can be unleashed. It configures instincts to the mode of a Gordian knot, knots that cannot be untied because they are fastened or tied to the extremes of the rope. The animal brain functions so perfectly that it is capable of adjusting very well the response to the stimuli directed towards those biological needs that depends on the survival of the individual and of the species. They therefore reach such a specialization to what suits them to survive, that the species has its own ecological nest where all its needs are covered. The animal in this way is enclosed, specialized, in the vital space of its ecological niche, and in the present, since the stimuli –triggers of a response in that it has a biological significance- cause behaviors that are specific and automatic.

In its own environment of the specie, it has its life set, by being perfectly adapted, or specialized, to living in this environment. This dynamism enclosed in the automatism of the biological laws dictates the life of all non-human animals. The specialization of the niche is biological richness. In fact, to possess a niche is a question of the individual's survival and of the species. In such a way that if the characteristics of the environment changes, that some individuals of the population have traits that permits them to adapt to new circumstances and to leave descendants, or on the contrary extinguish the species. This is the mechanism of natural selection, the law of natural life of all non-

human living being.

The animal “knows” what is good for it and does not make mistakes. Stimulus, for example smell, color, texture of a product, if it is hungry sets in the system of recompense of its brain, that in the way as a traffic light, gives it a green light and directs itself to said aliments. They know it by the emotion that it awakens, and that it processes in its brain. That signifies the Gordian knot: that what is convenient is pleasurable and generates the desire to go for it, while what is inconvenient is unpleasant and makes it run away, or attack. From the emotion experimented a memory is stored in the brain. They learn in this manner and do not trip on the same rock two times. The animal functions with a “then, yes” but does not understand reasons, it does not need them. Instinct is its “reason”. Very well adjusted and tied the Gordian knot. It is in this way that biology dictates its life and you cannot ask for reasons for its acts.

The behavior of animals is given by the genetic endowment since the brain is constructed according to the expression of the genetic information that it possesses. Those that possess intense operative capacities -mammals and amongst them primates-, possess circuits of connections between neurons, the regulation of the flow of information, a good metabolism that contributes the sufficient energy for neuronal activity, etc. For this more genes are required and above all an excellent regulation of the expression of those that contribute information to construct and mature a “good brain”. More genes and more capacity to regulate its expression is what permits that individuals of that species to possess more autonomy of the medium; or said in another manner, a more ample ecological niche.

To be “more with more genes” is the law of non-human nature. That greater intensity of life -more autonomy- is achieved capitalizing on the genes, combining them through a good regulation. This is what the idea of “vegetal soul” and “animal soul” refers to according to the classic nomenclature and practically obsolete. Only animals, and because they have genes to produce neurons, have senses, sensibility. To capitalize on the genes assumes that with them an organism is auto-constructed with a nervous system organized by a “good brain”.

However, the performance of man reveals, up to the level as close as possible to biology that is not strictly submitted to the material conditions. In the first place, it does not have a fixed group of stimuli but that can get interested in including for things that do not exist. Once that the stimulus is engaged, it can react to it in diverse forms, not biologically determined, sometimes cultural and at times “countercultural”, and even does not react. In addition, it does not automatically get under way the response when significant biological events pass; or, if it does, it can liberate that automatism. We can express it saying that each man loosens the bonds that tie the genes: the Gordian knots.

Human conduct is not only instinctive nor automatic but that also humanizes the necessary natural tendencies. Thus, for example, it is a universal human gesture to show affection, acceptance and hospitality inviting to eat; the celebration of parties is usually accompanied by a banquet, it is offered, etc. It is also a typically human gesture to voluntarily deprive oneself of food, even going on a hunger strike if there are reasons to do so. The natural inclination to satisfying hunger if the conservation of life and however, the inclination does not necessarily oblige: there can be motives to not follow it. It is not obligated to eat something strictly determined in the species, but that it is capable of doing culinary art, to prepare the food. In addition, it is possible to poison by mistake.

The existence of each human is not dictated by biology, nor resolved by it, but that appears liberated by biological automatism governed by the instinct of satisfying the inclination. It opens to personal relationship the natural end of the inclination.

13.5 A biology not determined by the maintenance of the species

The constitution of all-individual of whatever animal species is scheduled by the biological cycles of the transmission of life: the efficient cause and the sufficient of the constitution of the animal zygote is the fertilization process of the gametes of its progenitors. This biological process causes the life of an individual that like all non-human animals is concluded exclusively and necessarily to live -construct and mature the organism- and transmit life. A vital cycle not closed upon itself and guided by nature and only in order for the maintenance of the species. For this, the Gordian knot that dictates reproduction has it well adjusted with the mating season. Some changing event -the smell of the female's genitals, the color of the peacock's tail, the sounds that deer emit, etc. happen exactly in the fertile period of the female. These stimuli, olfactory, visual, auditory, processed in the brain, determine that sexual instinct leads to the copula precisely when the female can get pregnant. In this way, zoology dictates reproduction in function of the species. It dictates the frequency of the birth of the progeny adapted to the continuance of the generations, well adjusted the knot. If it breaks, the species would extinguish.

Each non-human living creature lacks an end to it and does not require a final cause that realizes its individual existence: its existence is submerged in the dynamic of life of the species that it pertains to and the species that populate the Earth. Transmitting life for animals is to contribute with its own gametes the base material that contains the genetic information of the species. It is to give way to life to a congener that will realize its own and new vital cycle, repeating the content of the message.

On the contrary, the corporal union in the transmission of life, as all natural human gestures, has personal character. Human biology shows that the transmission of human life is not in function of the species, adjusted by instinct, reduced to the best-doted individuals by biology, or guided by natural selection to the adaptation of the species of its environment.

The human spawning is liberated from the automatism of animal reproduction. It does not exist in human beings the temporal biological determinism that blends in with the "mating season" with the female's fertile period. On the other hand, the time of human feminine fertility is short, in relation with the number of years lived. It is a sign that a living being has the sufficient age for the use of reason to educate their children, and the sufficient youth for family life with children, which is necessarily long, since the human being is born unfinished and prematurely.

In addition, feminine menstruation has sense of reason of the peculiar significance of human sexuality, open and liberator of zoological automatism. It is the only external sign perceptible of the feminine fertility cycle, a difference of the animals in that the fertility is alerted by the physical changes and by the behavior that guide the instinctive lure. It is an occult sign for the biological automatism and only rationally can it be looked for and known, making paternity a personal project of one with another, to who nature does not impose the obligation of begetting children, nor does it establish the number.

Human parents are not simple and efficient donors of gametes. It is human natural law that sexuality is an innate personal sphere. It requires no humanization by the culture. The mode of expressing sexed affection is always and in all places, a mode that makes generation possible. Satisfaction of sexual attraction is not a necessity and, in turn, is a fully natural and less cultural scope than others. This can be seen by the way of dressing or by showing with gestures the situation of fiesta, where conduct guidelines are variable according to the culture.

The openness, or capacity of an interpersonal relationship, is a new element not present in animals. The plus of reality of each one is the capacity of slackening this type of restraints that are enclosed in the biological specialization cycles that assure its survival and that of the species.

13.6 The plus of each human's reality

What is genuinely human of men appears as a group of capacities, specific all of them and due to its liberation of biological automatism. This liberation reveals the natural deficiency in the instinctive field. Human beings are capable of technique, education and culture with what solves the vital problems that biology does not resolve for them. Its vital cycle of interests-behavior is open “beyond the ecological niche”. It is done to work and work. If it did not work, it would have to submit itself automatically to the material conditions of the ecological medium.

Each man has life experiences, not only habitat, in that it relates with others and takes over the responsibility of reality in itself, objectively, and not only in a subjective mode in function of its biological situation. It is not that it has an ample ecological niche but that it has the world as its habitat. To be worldly-wise is to project a future, leave the niche. To not always be in the present, although the present can be “rich”. The technique is the use of instruments and the construction of instruments for an ends. It is to project for a future use. It requires projecting towards one’s own initiative, therefore solving what instinct does not give it, or learning from the congeners. The technique requires leaving the obligated and exclusive present as lifetime.

What permits each human to liberate itself from what is dictated by biology is the capacity of dilating in time so much so the instinctive satisfaction as all types of satisfactions, precisely difficult the good work, but also does not determine a mode escaping the confinement in the present. Each man leaves in this way the instinctive imprisonment of the animal in the “it is advisable” or “it is not advisable”, until the “good” or the “bad” in it genuine of human action. It can decide to act in favor of the principles that all man can know and cannot follow. The education received the culture in which it develops influence, facilitates or impedes expertise but also does not determine a way of proceeding.

This independence, liberation from “I like it, I feel like it, or even I need it”, is autonomy in itself or liberty. Autonomy in itself, freedom, needs as a necessary requirement not having biological specialization, nor having biological poverty that does not resolve life, but has to work to resolve problems with culture, with technique and with work.

The liberation of the confinement in the ecological niche converts the life of each one in a task to carry out and thus a moral enterprise. It is a “longer life”, a plus of reality of each man.

13.7 The biological base or prerequisite of freedom

How is automatism broken and liberated from confinement? Alternatively, said in another way, how does one loosen each of the bonds of the Gordian knots?

Science's response is splendid: it is precisely the capacity of slowing down the dynamism of the brain circuits. Inhibiting -mediated by the chemical neurotransmitters- the excitation of the neuronal circuits breaks the automatism of the response. Neuronal excitation is a discharge of the flow of the neuronal circuits, but there is an own brake. Each one can “stop and think” other alternatives. It can dilate the satisfaction of pleasurable responses, of responses induced by wrath, etc. The brain of each one has a gearbox; it does not direct itself instinctively or automatically, or at a constant velocity: it brakes and stops. Time is for each one the space of personal responses.

Moreover, without new genetic information, but employing the genetic information especially in developing with the proper life the cerebral connections inhibitors involved in regulating and “stopping” the flow of information of the neuronal circuits.

Connections that expand and speed up with the repetition of acts of control of natural inclinations.

13.8 Two dynamisms and one unique vital principle

Thus, the specifically human faculties -language, intellectual knowledge, willpower, the capacity to love, religious sense-, is not directly linked to an organ. This is demonstrated by the fact that they are open to development and to feedback through habits and not merely with the passage of time or organic development. In fact, the vital trajectory of each one has a different path, because each one is he and not the other.

These skills are natural instruments of man, through which each man reveals a part of himself. This is the baggage with which we come into the world, the skills for personal manifestation. The body of each man is a sign of the presence of the person that is its “bearer”. The human body has a language that reveals the person. It talks about a reality that does not wear down the description of the physiological processes, but that refers further on, to the person. Thus, it obviously does not indicate that they proceed without the body, nor without the adequate brain. On the contrary, this is the prerequisite condition. This prior supposition is not to be confused with the brain being the seat of the human soul.

In each man concurrence in the unity of its vital principle of two different constituting dynamisms: the proper of its biological nature and the proper of its personal liberty.

It does not deal, as we have stated, only with that, each man does not possess more genetic information in its genome, nor that each one as an individual of the species capitalizes more of its genes. It deals with that each human body is in fact constructed by a vital principle that is potentiated with liberty giving way to that plus, that indeterminate biological life and converts it in personal biography.

As for each animal, the vital principle of each man is generated in his conception: the human plus is reinforcement of the genetic information of each living human. It communicates liberty at the beginning of transmitted life by its parents with the constitution itself of the genetic patrimony. What is specifically human is therefore inherent and originary, linked to the life received from its progenitors and not mere information that emerges from development.

Human liberty is located in the highest and most intimate of the human being. That corporal dimension, open and relational that is precisely the constitutive element of human personality, is a sign of the presence of the person and not the cause. Liberty that enables each one to adhere his own aims and to decide comes from the person. It makes human the body when it liberates each one from remaining enclosed in the automatism of what is merely biological.

A “biological property” does not exist that explains the free intellectual and loving receptiveness towards other beings. The notes described by biology that describe the character of the person and with it the basis of human dignity, is not granted by the actions of the subject but that is something prior to these. Biological poverty of the human body is the prerequisite, not the cause, for it to liberate itself from the determinant automatism of biological processes.

Biological science cannot give reason of why each man is a free-living being, nor of the origin of that capacity. It cannot give explanation of the origin of that plus or “live more”, that it is not mere biological life more complex but having life as a task, a moral enterprise. However, biology contributes a great richness of knowledge: the only vital principal of each man is intrinsically potentiated by the capacity of personal relationship that it possesses.

Independently of the religious beliefs, human biology, as a science, acknowledges the presence in individuals of the *Homo sapiens* species a vital open dynamism and deprogrammed and inherent of the individual of that species.

Finally, we can conclude that the conceived of our species, the human zygote, is a person because it is a body of a man in the initial phase of its development. The human embryo is the same human individual that exists in embryonic life, in youth or in old age.

In the conception of each zygote, the beginning of life generated from the inherited genetic endowment from the parents is liberated from the biological automatism. Obviously, the manifestations of the person can only be made explicit to a determined and gradual level of development and corporal maturity. Each human zygote develops as man not as a man.