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“Lay” Reduction of The Human Embryo-Individual

by

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Introduction

Through the internal misuse of language, the confusion of biological facts and the distortions of scientific concepts, much of present-day bioethics reduces the status of the embryo *someone* to a pre-embryo *nobody*, and postpones the beginning of the human individual’s existence to a time subsequent to conception.

“Lay” bioethics uses a number of manipulations to undermine the unity and uniqueness of the individual human embryo.¹

First “Manipulation”

Contrary to all the evidence², “Lay” bioethics neglects the existence and the real significance of the *pellucid* membrane that is present at the beginning of the embryo’s development until it breaks down five days after fertilization.

The pre-implemented embryo’s *pellucid* membrane, far from being a mere *extraembryonic* and *extraneous* “zone”,³ is a constitutive and integral part of the entire zygote, as it was of the original mature oocyte. In fact, it is the embryo’s very skin.⁴

Second “Manipulation”

By introducing conceptual confusion between the terms *biological* and *genetic*, as applied to the cells of the embryo, the biological identity of the embryo is reduced to its genetic identity.⁵

From this confusion,⁶ the cells of the embryo, which are only genetically identical (Because they are considered <<a collection of undifferentiated or blank cells>> (J. Walker) <<autonomous and indistinct>> (Ford) and all <<undeclared>> (A. McLaren), <<indistinguishable>> (M. Wertheim), <<equally totipotent”>> (G. Benagiano), <<... equal ... and completely equivalent>> (Vescovi), to the zygote from which they arise by <<multiplication>> [?]⁷ come also to be thought of as *biologically* identical⁸; that is, truly identical⁹.

Consequently, monozygotic twins, which are identical genetically, but not biologically,¹⁰ are declared <<identical and indiscernible>> (Ford) within the embryo, even up to the end of the 14th day of development. From that day it is possible to recognize them, because of the *primitive streak* from which “develops” the corporal part only of the *entire* human individual¹¹. The corporal part of the *entire* embryo, however, only represents the entire body (after the birth) of the entire human individual (at birth).

From these two incorrect hypothesis¹², *each* human pre-implanted embryo – even if the phenomenon of “identical” twins is a fortuitous and rare event which might occur to a *given* embryo¹³ – is inevitably considered, right up to the 14th day of its development, one or – <<at the same time>> (Ford) – *more* human individuals, at least potentially. From this misleading <<paradox>> (Ford), it follows that there is *no-one* yet, in fact nobody.¹⁴

On the contrary, in the case of “identical” twins a study of their fetal membranes soon after birth allows us to infer and to prove that, being *biologically* different and already distinct from the first moment of their autonomous development, they exist and are potentially recognizable long before the 14th day.

By these two “manipulations”, “Lay” bioethics:

- has irreparably undermined the systemic unity (thermodynamically open, but organizationally and morphologically enclosed) of the human embryo;
- has reduced the human early embryo to a simple skinned “clump” of totipotent and autonomous “identical and indiscernible” human cells¹⁵;
- has delayed the beginning of the human individual’s *form*-ation until the appearance, inside the entire embryo – indeed, inside the

entire human individual! – of the form (= **the shape**) of its own *corporal part*. Whereas it is only a *part* of the entire individual, because it is considered apart from its own fetal membrane. As such, it could neither survive in the mother's womb nor continue its own autonomous development.

Third “Manipulation”

Without any good reason the entire embryo's trophoblast is now excluded from consideration as being *extraembryonic*, as was the pellucid membrane in the first “manipulation”.

The trophoblast is treated not only as an *external* but also as an *extraneous* part of the entire embryo; a part which in the early stages of the embryo's development is a layer of cells just under the pellucid membrane. Whereas, following the disintegration of the pellucid membrane – when the embryo is embedded in the uterus about the fifth day after fecundation – this layer of cells becomes the very second skin of the embryo¹⁶.

Fourth “Manipulation”

As a result of the preceding “manipulation”, “Lay” Bioethics has also excluded from the entire embryo its own embryonic membranes (amnios, chorion), and consequently the fetus' own fetal membranes (amniotic sack, fetal placenta, umbilical cord, etc).

Without any basis these membranes are considered *extraembryonic* and *extrafetal*¹⁷; that is, not only external, but also *extraneous* parts of the entire embryo-fetus. In reality, both of these membranes are progressively derived from the trophoblast, which, along with the pellucid membrane, is a constitutive, and integral part of the entire embryo.

By these last two manipulations “Lay” bioethics unambiguously:

- reserves the term “embryo” for the inner part¹⁸ only of the entire embryo which is subsequently labelled the *pre-embryo*¹⁹;
- because of this false hypothesis, the human individual, during its development until birth, is identified solely with its own corporal inner part; namely that which “originated” from the *primitive streak*. This part devoid of its own fetal membrane²⁰, which can survive as such, separated from its umbilical cord, only after its birth – but not *before* birth!– is called the <<entire>> embryo²¹ or <<true fetus>>, ignoring the fact that the *entire* embryo is present in the mother's womb.

Fifth “Manipulation”

“Lay” bioethics has also succeeded in performing a fifth “manipulation” in addition to the four already mentioned: all equally wrong in their assumption of a pre-embryo.

Although each cell of the embryo possesses *nuclear* totipotency²² during the first days of its development – though rarely expressed – “Lay” bioethics assigns erroneously to each cell of the embryo exactly the same *cellular* totipotency²³ (i.e. the ability to develop as a new embryo) as that possessed exclusively by the entire zygote.²⁴

This latter totipotency is an exclusive *capacity* (potency) of the entire zygote because, in contrast to those cells, it is the only human cell that is covered – or rather constituted! – with its own particular pellucid membrane. Once again “Lay” bioethics presents a false hypothesis.

Sixth “Manipulation”

From its zygotic stage “Lay” bioethics considers the human embryo stripped of its own pellucid membrane (see First “Manipulation”); and so until the sixth day of its development it is presented as a “clump” of cells, all equally totipotent and autonomous, equally undifferentiated, genetically and biologically identical.

Consequently each (stripped) embryo, because it is considered to be as many (stripped) zygotes as there are cells, has the same natural intrinsic totipotency (of the entire zygote) for ... “identical” twinning²⁵.

By these latter two “manipulations”, “Lay” bioethics:

- has confused the natural *potential* (a totipotential) of a human embryo for “identical” twinning²⁶ with a natural *potency* (the totipotency), as if were an actual-active and intrinsic capacity²⁷ biologically possessed by *each and every* embryo²⁸;
- has completely undermined the systemic and unitary (individual) nature of the human embryo, right at the very beginning of its development.

So, “Lay” bioethics, very simply, reduces the embryo – *someone* – to an embryo – *nobody*. In fact, if:

- the mature oocyte, the zygote and the pre-implanted embryo are considered apart (stripped) (?) from their own pellucid membrane; and

- if the cells inside the embryo are considered to be equally totipotent (?), genetically and biologically identical (?) and, consequently, completely identical (?) to the zygote (considered, as such, stripped of its membrane) (?); and
- if the *nuclear* totipotency of each cell of the embryo is considered exactly the same (?) as the *cellular* totipotency of the entire zygote; then

the human embryo, as it *can* divide (?) to give identical (?) twins, has ceased to be a unitary system of heterogeneous parts, because each part possesses the same and identical property of the *whole*; and the *whole* is simply the sum of its *parts*.

So, the embryo becomes a simple homogeneous *clump* – an *aggregate*, a *heap*, a *lump*, a *cluster*, a *blob*, a *bunch* – of “zygotic” cells; neither a system nor an organism and even less a human individual, but a <<sub-individual>> (Mori) or a *pre-individual*; in other words a *pre-embryo*.²⁹

Conclusion

“Lay” bioethicists, and Ford in particular, can only validly assert the thesis of the *pre-embryo* by applying the previous six “manipulations” on the embryo, beginning with the embryo’s own pellucid membrane.

Even though we do not possess a detailed and rigorous knowledge of all the scientific data, it is possible – as Serra correctly suggests – by <<una rigorosa logica sostanzialmente induttiva>>, to demonstrate that all the fundamental hypotheses of that thesis reveal semantic and conceptual ambiguities, and internal contradictions.

Being incoherent, the thesis of the *pre-embryo* can be invalidated and shredded. Nonetheless, to demonstrate complete falsity, it is absolutely necessary to contest not some but all of the false hypotheses on which the thesis is based. Otherwise, the thesis of the *pre-embryo* could remain plausible, and the doubts persist that the human embryo, at the very beginning of its development, is not yet an individual – and even less a *person*³⁰.

The choice of either the <<autonomy>> (Ford) of the cells of the embryo or the contrary view of the <<very strong interaction>> (Serra) between them – deduced from <<the incipient vital cycle>> or <<the activity of the new embryo’s genome>> (Serra) – is presented as the topical conflict between “lay” and “catholic”³¹ bio-ethicists on the unity, identity and individuality of the pre-implanted embryo. Unfortunately, based on these false options, experts from both sides have polarized the debate.

The sole option to solve all doubts about the “status” of the human embryo is to recognize the existence and significance of the pellucid membrane of the mature oocyte, the entire zygote and the entire pre-implanted embryo, and not to consider it as only <<peri-ovular>> (Serra) or as <<extra-zygotic>> (Ford).

Only this recognition preserves the human individual’s life (“skin”) from the very beginning of its existence, as that membrane is the very skin of the embryo³². Only with its own skin is the early human embryo able to begin and continue its development in the mother’s womb as a unique and unrepeatable human being (individual), with the absolute right to live from the very first moment of its existence (*fecundation*).

References

1. These “manipulations” are accomplished by using subtle linguistic artifices and conceptual misunderstandings. About them, see A. Fisher, “Individuogenesis and a Recent Book by Fr. Norman Ford,” in *Anthropotes*, 7 (1991): 199-244; D. N. Irving, “When Do Human Beings Begin? Scientific Myths and Scientific Facts”, in *International Journal of Sociology and Social Policy* 19:3/4 (February 1999): 22-47; J. P. Hubert, “Intermediate” or “Special Status” for the *Human Embryo is Invalid*, The Moral Status of the Human Embryo, FACS *Biomedical and Health Care Policy Ethicist* Advisor to Common Good © CCWVA Catholic Online, Defending Human Embryonic Life – Essay 2/27/2006; LINACRE CENTRE for Health Care Ethics, David Jones (2000): *A Submission to the House of Lords Select Committee on Stem Cell Research*.
2. Taking advantage of semantic ambiguity of the word *extra* permits the so-called *extra-zygotic*, *extra-embryonic* and *extra-fetal* membranes, which are the *external* part of entire embryo – fetus – but essential (vital organs!) for the beginning of its development in tubal environment and for the continuation of its normal growth – long before their natural disintegration in uterus or their natural detachment (just *after* birth), to be considered as mere parts belonging to *maternal* environment, i.e. *extraneous* to the entire embryo-fetus.
3. A membrane – otherwise called: *covering*, *holder*, *envelope*, *capsule* (Serra, Colombo), *pushchair* (Serra), *cummerbund* (Sica), *mechanical barrier* (De Carli), *non-cellular barrier*, *letter box* (Giuli), *micro incubator* (Shapiro), *protective shell*, *nonliving (glycoprotein) capsule in non-cellular form* (Ford), etc.– inside which, the embryo as such (?) develops. Flamigni, in fact, asserts that <<si è formata nell’ovaio>> (C. Flamigni, *Lo sviluppo della struttura embrionale*, in *Le Scienze*, quaderni, 100 (1998), 23). For this reason, all the experts cited assert it would not be a product of the oocytes, but – as Serra suggests – <<preparata con grande cura dalla mamma stessa>>. That is: an exclusive product of maternal environment; a part completely *extraneous* to the mature oocyte, as if it belonged to the external ovary tissue.

4. B.M. Sapiro, "Control of Oxidant Stress at Fertilization," in *Science* 252 (1991), 533-536.

5. *Biological* identity (biological *individuality*) of the human embryo is represented by the dynamics and open *self-organization* of cellular DNA in its interaction with an environment (nuclear, cytoplasmic cellular, intercellular, embryonic, maternal). This self-organization – a conceptual term that is very different from *order* or *structure*! – is a four dimensional, coherent and autonomous net of biochemical processes which involve, in a singular and unrepeatable interaction, all cells of each human individual from the first moment of its development till death. It expresses the so-called "biological information" (or *biological form*), which is unique (singular) for each cell of an individual and for each individual, even for monozygotic (so-called "identical") twins. *Genetic* identity (genetic *individuality*) of the human embryo, instead, is represented only by the molecular structure of DNA. A structure that is given by the sequence of bases of each gene and by the arrangement of genes within that molecule (see HGP = *Human Genome Project*). It expresses the <<genoma o l'informazione genetica>>, or the <<contenuto informativo [...] che determina la struttura ("forma molecolare") [...] di DNA>> (Serra and Colombo). It is unique (singular) for each human zygote, while it is identical for each cell of an individual and each "identical" twin of the same zygote.

6. It is also referring to *genetic* identity, instead of *biological* identity, that each human individual, at the very beginning of its development, becomes a mere "clump" of "identical" cells, all autonomous and ontologically distinct. Consequently, each individual and each "identical" twin becomes indiscernible inside the embryo, until the distinct *primitive streak* "appears" – only visible under the optical microscope at the 14th day! See note 8 and 9.

7. This serious mistake, among many others, are Finkel's own "dreadful distortions of the science" (Finkel E., *Stem Cells. Controversy at the Frontiers of Science*, ABC Books, Sydney, NSW, 2005: 1, 47; in the same essay, see her correct description on p. 26). Concerning them, compare my *Notes on the Mistakes and the Ambiguities Found in E. Finkel's Book* (not yet published). The same mistake it is found in the Spinner Press, *Stem Cell Research*, Sydney: Ed J. Healey, Issues in Society, 2003 (see schemes n? 1,3 and 4) and in Vescovi A. L., *La cura ache viene da dentro*, Mi: Mondatori, 2005: 58.

8. Ford, in his most famous book (N.M. Ford, *When did I Begin? Conception of Human Individual in History, Philosophy and Science*, New York 1988) repeatedly (regularly) creates confusion between the terms *biological* and *genetic*, "jumping" from one meaning to the other. Very many times he identifies both terms with <<or>>, sometimes he distinguishes them with <<and>>. E.g. (emphasis added): "Biologists speak about one's genetic or biological identity or [?] *genome* being established at fertilization [...]" ; "genetic or biological individuality" (Ivi, 117); "understood in a genetic or [?] biological sense"; "speaking genetically *and* biologically"; "same *constitution* or *nature*"; "*biological human nature*"; "human

genetic constitution or [?] nature” (Ivi, 126, 127, 128, 129). A succession of “jumps” that is particularly repeated on p. 262 and more subtly on p. 192 (in heavy type, the page number of the Italian edition: N.M. Ford, *Quando comincio io? Il concepimento nella storia, nella filosofia e nella scienza*, Milano, 1997); an exclusive use of the term *genetic* (or *genetically*) until p. 62 and, later on, a prevalent use of it (xii, xv, xvi-xvii, 6-7, 17, 52, 60-62... 97-103, 109, 111, 124-125... 179).

9. In Ford’s understanding the embryo’s cells are all identical (?), totipotent (?) and autonomous (or only “in a weak interaction”) and, consequently, inside each human embryo there are as many “identical and indiscernible” cells as there are potential and identical (?) twins. Ford, in his cited book always writes the term *identical* without inverted commas and he uses it persistently (N.M. Ford, *When did I...* , op, cit, xvii, 61, 92, 102, 109, 111-112, 117, 119-120, 122-123, 125, 128, 136) and apparently in a needless manner. The term, in fact, in case of monozygotic twins, is not used correctly, because it is not understood in the meaning of *genetically identical* only. That is, *identical* (in cursive), or “identical” (within inverted commas), or “humanely” identical (Ford). Very often, he uses it in the meaning of <<very similar>>; <<identical from every point of view [...] with exactly the same characteristics>> (Ivi, 92, 122); <<identical as molecules of water>> (Ivi, 74); <<equal>> (Ivi, 117, 121, 139); <<the exact copy>> (Ivi, 103)... i.e. in the – wrong – meaning of the *exactly (perfectly, very) identical*.

10. Although a zygote <<si distingue da ogni altro zigote>> (see A. Serra, *Lo stato biologico dell’embrione umano. Quando inizia l’essere umano?* In PONTIFICA ACADEMIA PER LA VITA (a cura di) *Commento interdisciplinare alla “Evangelium Vitae”*, Città del Vaticano 1997: 587) <<per la sua nuova e singolare struttura informazionale>> (Ivi, 578), it is never genetically identical to any other, the use of the term *genetic* instead of *biological* to define the identity (individuality) of the human embryo during the development, is wrong. Genetic understood as biological involves an important conceptual mistake, which gives rise to serious misunderstanding. This misunderstanding has been skillfully exploited by “lay” bioethics experts (especially by Goldberg, Mori). Even the most authoritative “Catholic” experts (Ford, Colombo and Jesuits McCormick and Serra) have failed to sufficiently highlight this conceptual mistake. Compare with note 14.

11. *Primitive streak* represents the sketch (the *vestige*) of that *part* of the entire human individual human *at birth*, which, being deprived of his own fetal membrane, can survive, as such, only *after birth*.

12. Ford, in this way, has succeeded in ascribing to the *corporal shape* of the human being – after birth! – <<the *criterion*>> to establish the moment – the “mystical moment”, in the “chaotic microcosm [?]” (J. Walker) – of *ontological* beginning of each human being – before birth! Yet, he has only succeeded because he has *reduced* (has made to *coincide*) the *biological* form of the human individual to its genetic form, which, being identical for “identical” twins, makes them “visible” and distinguishable (inside the entire embryo) only when the initial sketch of what will be their distinct

corporal part only (the *shape* of the primitive streak) appears. A synchronic *shape*, that is singular for each human individual, but that would render it distinguishable (*individualize*) inside the “clump” of *identical* (?) cells – that would render *identical* (?) twins distinguishable (*individualize*) inside the pre-embryo – only from the 14th day on. Ford’s *criterion*, besides, is based on semantic confusion between: the “*embryo’s development*” (already human individual) and “*embryonic development*” (into a human individual); “*embryo’s formation*” (already human individual) “*embryonic formation*” (into a human individual) (so, the Anglican Primate Peter Carnley quoted in the Editorial of *The Australian*, 2 April 2002, p. 8); “(individual) human life” and “(cellular) human life”; or rather between the “*formation*” of the human individual (the moment of its *constitution*, when it is *in act* and its *existence* begins at fertilization) and the “*form*” (the “potential” to the “*form*”) of his (own) *corporal* anatomic/body part only *marked*, from 14th day of the embryo’s development on, by the primitive streak. As well as Cryosite (www.cryosite.com.au), *Stem Cell Storage: the Facts*, The Spinner Press, *Stem Cell Research...* p.11; MyDr, *Stem Cells Research and Cloning: What You Need to Know*, The Spinner Press, *Stem Cell Research...* p. 8. The *formation* of the human individual, in fact, coincides with the moment when its *biological form* begins (see again note 5). A diachronic *form*, as singular as *genetic form*, but which renders human individual recognizable and distinguishable – which renders “identical” twins identifiable, localizable and distinguishable (*individualizes*) inside the embryo – long before the “appearance” of primitive streak. *Biological form*, in fact, is a *self organization dynamic form* which includes the *genetic form* (“static”, “invariable” molecular *order* of genome) and which always precedes the *corporeal “form”* (i.e. the *corporal shape*). This last, in fact, is the fruit – visible by optical microscope only from the 14th day on! – of the previous invisible unitary biological processes which have their very beginning, for each human individual – even if “identical” twins!– always and in any case, from the zygote (about this last assertion, see G. BOZZATO, *El embridón no es nunca nadie, es siempre alguien*, in *Berit Internacional, Istituto de la Familia*, 1 (2003), 69-88).

13. A singular *potential* (natural, passive and extrinsic *possibility*), that Ford and the experts of Italian CNB (National Committee for the Bioethics) have succeeded in transforming into a true *potency* (natural, actual-active and intrinsic *capacity*). Compare notes 23, 24, 25, 26, 27 and 28.

14. As “lay” bioethicists have confused *genetic* with *biological*, so, too, have Savulescu and Finkel (see note 27) have also confused *potential* (a *possibility*) of the embryo’s cells with the exclusive *potency* (the *capacity*) of the zygote-embryo to develop and acquire its definitive human shape. Based on this double confusion, Savulescu even claims that (emphasis added): <<... we now know that every cell in our body has a chance of producing a baby. Every cell – every skin, heart, lung, liver cell – has the complete genetic code or blueprint (just like an embryo) to produce a human being. There is no moral difference between a fertilized egg sitting in a laboratory and a skin cell. Both could produce a baby if very advanced technology were applied to them>> (Savulescu J., *Why Human Research Cannot be Locked in a Cell*, The Spinner Press, *Stem Cell Research...*, p. 31). This is not true! The “very advanced technology” is essential only for cells.

15. The mistake is found in schemes n° 1, 3 and 4 on The Spinner Press, *Stem Cell Research...*, pp. 4, 5 and 6.

16. As the pellucid membrane is an *external* part of an embryo, but not *extraneous* to it, because it is vital at the very beginning of its development inside the tubal necessary – even though the embryo at *nestle* must “lose” it, as it is no longer necessary – so the trophoblast is an *external* part of the embryo, but not *extraneous* to it, because it is vital inside the uterine environment – even though the newborn, at birth, in order to survive outside its mother’s womb, must lose it (or rather, must lose its own fetal membranes, which descend from that trophoblast), as they are no longer necessary. Cytoplasmic membrane is the real skin of any cell. Since the zygote is different from any other human cell, because it is the entire human individual at the beginning of its growth and development – oriented to acquire its definitive shape – the pellucid membrane (which covers the zygote’s cytoplasmic membrane) is its very skin. In fact, during pregnancy: not only the fetus would die, if we removed its own fetal membrane – not only <<il processo di sviluppo si arresta immediatamente se il disco embrionale viene separato dai suoi annessi, *amnios, chorion*>> (A. Serra, *Lo stato biologico...*, p. 582) – but contrary to what all the experts quoted in this article claim, the pre-implanted zygote-embryo would also die if we removed (or, if we considered it, as such, devoid of) its (own) pellucid membrane.

17. Ford, in this way, *reduces* the entire human individual which, during its development in the mother’s womb (until birth), includes its own fetal membranes, to its inner *part* only. The more strictly *corporal* part, deprived of those membranes – because considered <<non-animate tissues>> (?) also by Finkel (Finkel E., *Stem Cells...* p. 25) – is only able to survive, as such, after birth!

18. A part (a half, a piece) of the entire embryo, that “Lay” bioethics continues to refer to as the *embryo* (rarely <<entire>> or <<true and proper embryo>>) masks the unique (*true*) entire embryo – which begins its development at the zygote stage – with its “entire” (*half, a piece, false*) embryo – which, instead, begins its own development (begins to form its *corporal shape*) inside the so-called *pre-embryo* (the entire embryo!) – from the 14th day onwards (As well in Finkel E., *Stem Cells...* p. 26-27)

19. This is why for Ford the embryo, at very beginning of its development, is not yet! And, obviously, it is not yet because the sketch of that *corporal* part has not yet begun to *form* itself inside the entire embryo, neither at the zygote stage nor at the blastocyst stage. Ford’s rationality forces him to “detach” from the entire pre-implant zygote-embryo – which, at beginning of his development is still in the mother’s womb! – its (own) pellucid membrane; then to “detach” from the entire embryo – already during pregnancy! – its (own) trophoblast; then to “detach”, from the entire fetus – already before birth! – its (own) fetal membrane. In Ford’s logic, therefore, only the butterfly is the *entire* insect, while the same insect at larval stage from which the metamorphosed butterfly emerges (losing its own empty exoskeleton as it is no longer necessary), is a *pre-insect*, i.e. nobody. A simple (living) thing that precedes the butterfly and takes its origins from it. By exactly the same odd argument Ford and “lay” bioethics experts view the entire zygote-embryo simply as biological <<human

material>> (as well in Yeo J., "A Christian Role in Stem Cell Research," in *The Sydney Morning Herald*, 29 August 2002, p.11). The refuse of two human beings, floating and roving in uterine fluid, fortuitously organizes itself to make a "nest" (Ford). A useful receptacle, still empty, of a possible (*potential*) <<entire embryo>> that is totally extraneous to it till the 14th day of embryo (!) development. when all of a sudden and only after that day – <<and not before it>> (Ford) – a human individual begins (sic!). Compare next note.

20. Ford considers the embryonic membrane, and corresponding fetal membrane as simple <<support tissues>>, external – and *extraneous!*– with respect to <<entire embryo>> and to <<true and proper fetus>> (N.M. Ford, P. Herbert, *Stem Cells...*, pp. 10, 36; Ford N., *When did I...*, pp. 133, 143. So that, these membranes, even if they are essential (vital organs) to the embryo-fetus during development in the mother's womb, are not considered essential and integrant parts of the entire (true) human individual (Ivi, 20). Ford, in fact, does not consider them – as they really are – as *essential* and *integrant* parts of embryo and fetus because they are soon <<nascoste>> and <<non battezzate e private di sepoltura>>(!?) (Ford N., *Quando comincio io...*, p. 203 and, only in the Italian edition, also on p. 233). These justifications, though they may be anthropologically acceptable, are simply incoherent from a scientific point of view.

21. As Ford says <<An embryo cannot exist before human development begins>> (M.N. Ford, P. Herbert, *Stem Cells*, Strathfield (NSW) 2003, 74), then the "entire" human individual – i.e. the <<entire embryo>> – is (*is in act, is in existence, begins to exist*) only from the 14th day on, when, inside the inner cell mass (ICM) of *entire* blastocyst (which is, with its own pellucid membrane, the *entire* human individual!) the primitive streak begins to develop (or rather, only when it "appears" under optical microscope!). See M.N. Ford, *The Prenatal Person...*, pp. 66, 55, 244, 56; M.N. Ford, P. Herbert, *Stem Cells...*, p. 10).. We must understand only the meaning of *inside* – avoiding the semantic equivocation *inside/entire* – for the term "entire" that we find in Ford's recent book. As well in A. L. Vescovi and L. Spinardi, "La natura biologica dell'embrione," in *Medicina e Morale* 1 (2004), 55-58; 60).

22. <<E' sufficiente ricordare, allora, che le prime 2 o 4 cellule (blastomeri) dell'embrione sono quelle che definiamo "totipendenti" [within inverted commas! (author's note)], vale a dire che ciascuna di esse possiede *nel suo genoma* [!] la capacità di generare un intero organismo>> (emphasis added) (C. Sureau, *Come la clonazione riproduttiva umana può cambiare la nostra vita: alcuni scenari*, in A. McLaren (ed), *La clonazione – uno sguardo etico* – Rm: Sapere 2000 edizioni multimediali: 93).

23. Using this conceptual reduction (*confusion, exchange, substitution, identification*), between *nuclear* totipotency (clearly underlined in previous note) and *cellular* totipotency, "Lay" bioethics may – artfully – maintain that (naked) cells of the embryo, would be, till the 6th day of development (CNB), as totipotent as the (entire) zygote. That is, each of them would have not only the *potential* but exactly the same (spontaneously, actively, inherently, naturally, biologically, deterministically) *potency* of zygote to develop as a new embryo (inside the original embryo!).

24. The same error is found in: Aboud A., *The "Brave New World" of Cloning*, Sydney: CAEC, Inform n° 99; US National Institutes of Health, *Stem Cells: A Primer* (see also schemes 1, 3 and 4), from the web site, May 2000, www.nih.gov. MyDr, *Stem Cells Research and Cloning: What You Need to Know*, in last updated 20 September 2002 © Copyright MyDr. 2002, www.mydr.com.au; Savulescu J., *Why Human Research...* in the work quoted (see *The Sydney Morning Herald*, 27 August 2001, p. 10); Wertheim M., "Let Us Debate, not Demonise," in *The Age*, 3 March 2002, p. 17; Shea J. B. M.D. "The 'Pre-Embryo' Question" (Issue: January 2005), *Catholic Insight*, Sunday July 02, 2006; The Spinner Press, *Stem Cell Research...*, (on Glossary p. 41). And – not unexpectedly! – is found in Ford's book (Ford N., *When Did I...* p. 119): "Like the zygote these first two cells or blastomere are totipotent – each one can [might!] develop into a complete living human individual"). Compare with the next notes.

25. *Natural* (as a mere possibility or potential) should not be confused with *natural* as a biologically determinate capacity or potency. *Natural* is also what may accidentally (rarely and fortuitously) happen. "Identical" twinning, which has a very low incidence, is exactly the same in every human population in the world (unlike fraternal twinning), is *natural* only in this last meaning.

26. A *toti-potential* which, as such, is only a *passive* and *extrinsic possibility* that may take place in a *given* embryo by a rare and fortuitous *natural* event – <<a noise in the genetic programme>> (H. Atlan) – or by an artificial experimental operation of *embryo splitting* (but then only by including each "part" of the dead embryo into an artificial pellucid membrane!). Compare last note.

27. The confusion (the substitution) between *may* (*might*) and *can* – i.e. between *natural* (as a *passive extrinsic potential*) and *natural* (as an *active-actual intrinsic potency*) – is made by Finkel in his book quoted above (see on: p. 8:<<can also still split>>; p. 26:<<capable of splitting>>; p. 34: <<can split>>; p. 36: <<able to twin>>).

28. The same confusion (mistake) is made by Ford (emphasis added): <<[...] the zygote has a *natural actual potency* for cell multiplication and differentiation to *form one or more* human individuals.>> (M. N. Ford, *The Prenatal Person...*, op. cit., p. 66; see M. N. Ford, P. Herbert, *Stem Cells...*, op. cit., p. 74). Also for the Italian CNB (cursive and square brackets added): human embryo is <<[...] una struttura biologica umana specificatamente orginizzata, nonché specificatamente e autonomamente – "spontanea"[-mente]" – tesa a dar luogo alla produzione di [più] individui umani chiaramente discernibili [...]>> (COMITATO NAZIONALE PER LA BIOETICA, *Identità e statuto dell'embrione umano*, Presidenza del Consiglio dei Misnistri, Roma, 1996, 14, 15 e 17).

29. Called also: "primitive embryo"; "human material" (Yeo J.); "potential individual", "test-tube embryo", "excess embryo", "fertilized egg" (Finkel E.); "proembryo" (Ford N.); "[cellular!] human life" (Muelenberg B.); "human cells" (Savulescu); "laboratory material" (Agazzi E.); "ball of cells", "surplus embryo" (www.biotechnology.gov.au); "collection of undifferentiated blank cells", "isolated

human cell tissue”, “random process of cell division” and “chaotic microcosm” (sic!) (Walker J.).

30. *Tuziorism* is also well expressed in *Evangelium Vitae* n° 60.

31. More precisely, the Catholic experts of the Bioethical Centre of Catholic University “Sacred Heart” in Rome.

32. A. Serra, R. Colombo, “Identità e statuto dell’embrione umano: il contributo della biologia,” in *PONTIFICIA ACADMEIA PRO VITA (a cura di), Identità e statuto dell’embrione umano*, Città del Vaticano 1998, p.132): <<la capsula di fertilizzazione [i.e. the *pellucida membrane* (author’s note)] (...) essa è centrale per uno sviluppo normale e costituisce una elegante soluzione nella morfogenesi>>. Serra e Colombo (*Ivi*, pp. 151 e 154) referring to experiments performed by Hall-Stillman – and cited by Kolberg – on human embryos with abnormal chromosomes, textually reports that: <<Singoli blastomeri separati [...] furono rivestiti di una zona pellucida artificiale e posti in un terreno nutritivo dove potessero cominciare a dividersi di nuovo [...] >>; <<Nell’altro modello sperimentale, due o più *sets* di cellule embrionali di stadi pre-blastocistici sono aggregati insieme entro la stessa zona pellucida [...] il processo epigenetico procede così [...]>> (compare also A. Serra, *L’uomo-embrione: il grande misconosciuto*, Siena 2003, 118). Ford, as well (cursive and square bracket added): <<Blastomeri provenienti da diversi embrioni possono [*devono!*] essere aggregati e sigillati con agar in un cilindro fino a determinarne la blastulazione [...]>> (N. M. Ford, *Quando comincio io?...*, p. 209; ID, *When did I...*, p. 139). And more recently: <<When a single cell from four-cell white, black and brown sheep embryos is aggregated in an empty pellucid zone [...] a [...] sheep can be formed>> (ID, *The Prenatal Person. Ethics from Conception to Birth*, Vic-Australia 2002: 66. See M. L. Di Pietro, E. Sgreccia, *Procreazione assistita e fecondazione artificiale, tra scienza bioetica e diritto*, Brescia 1999, 110-111: <<Kolberg riporta che i due ricercatori americani hanno deciso di intraprendere questo progetto – che è stato premiato come migliore lavoro presentato al *meeting* annuale dall’ American Fertility Society – dopo che nel 1991 erano riusciti a realizzare una membrana pellucida sintetica con la quale rivestire le due cellule embrionali separate. Prima di arrivare a questo artificio, infatti, i tentativi di duplicare l’embrione umano non erano mai riusciti>>.