

ABORTION, ANIMATION, AND BIOLOGICAL HOMINIZATION

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WITH THE DISCOVERY in 1827 of the human ovum, many scholars with an interest in pinpointing the beginning of human life considered the question closed. When the sperm fertilized the ovum, nothing further was to be considered. Later discoveries in genetics seemed to confirm this notion, but not to the point where any official statement by the magisterium indicated that animation occurred at fertilization. The long debate over mediate vs. immediate animation is too well known to be recounted here, except for the remark that not even the welter of biological facts discerned since 1827 has brought rational psychologists any closer to a certain identification of the precise time of ensoulment.

Speculations on a time of animation have, from several viewpoints, little applicability to the recent events which have caused a reopening of the question: when does an individual homo begin? Western law identified abortion as a crime against the person, as contrasted with crimes against the king or the state.¹ The begotten but unborn child was identified as a person, first from "when a woman is large with child," then from "quickenings," and finally laws were written against abortion at any time. Potional, physical, and surgical attempts upon the life of the unborn were variously punished, occasionally allowed to go without prosecution because of evidentiary problems, occasionally minimally punished, and occasionally punished with the severity meted for murder. The wide disparity of penalties, prosecutions, laws, and practices was quite similar to the disparities seen in cases of infanticide of already born children.² It is easy to suggest, but difficult to prove, the reason behind this disparity, and the best explanation may lie in a conjecture that by some sort of distillation or titration man tends to carry out the proportionate valuations cited in Leviticus 27:1-7, i.e., men are worth more than women, adults more than the young, and those in their prime more than the elderly.

This disproportionate valuation of human beings achieved official jurisprudential recognition in the United States in the *Roe v. Wade*

¹ For an excellent history of abortion-law development, see Dennis J. Horan *et al.*, "The Legal Case for the Unborn Child," in Thomas W. Hilgers and Dennis J. Horan, *Abortion and Social Justice* (New York: Sheed and Ward, 1972).

² William L. Langer, "Checks on Population Growth: 1750-1850," *Scientific American*, February 1972, pp. 92-99. This is an unusually candid exposition of the psychodynamics operative side by side in abortion and frank infanticide.

decision of January 22, 1973.³ Unborn children are not accorded full constitutional protection as “persons” until they are born, and may be slain for virtually any reason or no reason at all. An attempt is being made to undo this Supreme Court decision with an amendment protecting human beings from conception to death. While the notion of “brain death” has been developed more or less satisfactorily by biologists and moral theologians pooling their insights, and while this notion has been accorded legal recognition in several states (although not yet in the Supreme Court of the United States), a problem involving principles and precedents has been created. A “brain-dead” homo has been adjudged no longer a constitutional “person,” because he has no discernible capacity for any future rational activity specifically characteristic of an *ens rationale*. On the other hand, an unborn child has an entire lifetime of rational activity before him, his normalcy presumed until proven otherwise. Since the Constitution does not define its own term “person,” moral theologians and legists are seeking the aid of prosaic and value-free biological facts in order to discern with the highest possible accuracy the empirical content of hominization, when “livingness” begins and when “livingness” ends. Any exploration of the start of hominal livingness necessarily involves the moralist profoundly, and this paper is merely an exploration of empirical data, an exploration carried out with the hope of enhancing accuracy of moral insight into areas where some imprecision may exist for want of empirical data.

In justifying its decision that the state has no duty to protect the unborn, the Court referred fleetingly to the notion of animation by observing that theologians and philosophers disagree upon the time when human life begins. Without defining a homo, a person, human life, or a human being, the Court simply refused to address itself to the central threshold question posed to it. It then, for reasons obscure to this day, added the disclaimer that scientists are also unable to discern when human life begins.

Those seeking to protect the unborn by a constitutional amendment seized upon this gaffe by the Court. It was patent in the testimony of medical scientists that their differences lay not in the biological facts of human reproduction but in the value they felt ought to be assigned to nascent humans. Since science by itself provides no matrix of values, scientists enjoy no specific competence as valuers. With propriety—in the jurisprudential sense, at least—the would-be amenders disavowed the integrity of a judicial decision which refuses to rule upon a matter upon which theologians disagree. If such a limitation were to be universally applied, the statutes of the land theoretically ought to read

³ *Roe v. Wade*, 314 F. Supp. 1217, Supreme Court 70-18, and *Doe v. Bolton*, 319 F. Supp. 1048, Supreme Court 70-40.

“Do good and avoid evil,” or perhaps merely “Act lovingly” (a Fletcherian jurisprudence).

By basing their attack upon a tactic citing the biological facts pertinent to human reproduction, however, the would-be amenders walked into a quite unanticipated trap which as of this writing has paralyzed them to the point of undoing their solidarity. The majority of the petitioners for an amendment are Catholic. Into their amendment arguments they carried the time-honored thesis that the life of the individualized homo begins at fertilization, the conviction that the prevention of implantation constitutes a homicide, and the notion (of obscure genesis) that Catholic moral theology definitively holds that the front end of the abortifacient act extends to any or all interventions into the natural reproductive process from fertilization on.

A virtually unprecedented emphasis on this often simplistically visualized microcosm of biology has evoked from experts in several disciplines an intense study of the earliest days of reproduction. Few, if any, studies produce conclusions favorable to the concept of hominization at fertilization. Because biologists with no particular axe to grind in the abortion debate are moving away from fertilization to a slightly later date, moral theologians are re-examining the possibility, or probability, that a later date is more tenable in moral deliberations. As was inevitable, the legislator has now been forced to answer the question “If the force of the amendment is directed against homicide and if it appears that it is improbable that a homo comes into existence at fertilization, ought an antihomicidal law restrict acts which victimize that which is doubtfully a homo?” Ethicists, particularly those who visualize moral man in dimensions uncontained by any single branch of theology to the exclusion of all others, rightly do not limit their explorations of abortion morality to biological micro-dissections. Nevertheless there are enough serious and partly answerable questions flitting about the earliest days of reproduction to warrant the thoughtful attention of the time-tested moralist who, though fully aware of all of theology’s dimensions, still sees the necessity for constant examination of the biological substrate to bioethical matters.

BIOLOGICAL CONSIDERATIONS⁴

All attempts to delineate a staged, serial, or mediate hominization of the biological homo carry with them the aura that attended attempts to

⁴ For basic biological material not specifically footnoted, I had recourse to Jean Brachet, *Encyclopaedia Britannica* (14th ed., 1959) s.v. “Embryology, Chemical”; Claude A. Villee, *Biology* (Philadelphia: Saunders, 1972); Paul B. Weisz, *The Science of Biology* (New York: McGraw-Hill, 1967). For molecular cytochemistry I used Albert L. Lehninger, *Biochemistry: The Molecular Basis of Cell Structure and Function* (New York: Worth, 1970).

delineate a staged or mediate ensoulment of the homo. However, this admission does not militate against that to which this paper is limited; for I seek only to argue that there is a "point" earlier than which neither biological hominization nor animation ought be considered probable enough, or possible enough, to warrant all of the moral and legal constructions proposed as being rightly operative.

Biological data must be read with the admission that our *in vitro* studies are not *in vivo* studies and *in vivo* studies are not *in natura* studies. We cannot help this, and we do the best extrapolating we can. As we near the central secrets of life itself, hollow spots in our knowledge are filled with an expertly weighted guess or theorizing. The confirmation of some of our thesis is possible only by experiments which propose such ethical problems that man has not yet brought himself to do the necessary experiments; in such cases, data from either mammalian or other biological orders are used to fill out our approach.⁵

Nature of Life or Livingness

The livingness of all living things began some three billion years ago and is transmitted from generation to generation in the DNA (desoxyribonucleic acid) of the cell. It is this polymer which is "alive" and can split itself into copies of itself, expending physicochemical energy transfers in its vital activity. The sperm, ovum, zygote, free-skin-graft cell, and the tissue-culture cell all exhibit this activity and are biologically "living."

Sperm

The sperm prior to ejaculation and possible fertilization is not attached to the male body. It is a free entity living within the male. From the fluid surrounding it the sperm derives some oxygen, a homeostatic compatible environment, some water, and perhaps some breakdown products of sugar for energy sources. This is not enough for sustained existence, for other more complex nutritive fuels are needed to maintain metabolism. As long as the sperm is attached to the circulatory-respiratory system of the parent male prior to its breaking free, its nutritive and respiratory needs are met via the parental connection. In the free state a nucleus of a sperm cell survives by utilizing the fuel stores in the extranuclear cytoplasm. A sperm virtually cannibalizes itself, such as does a fasting man who can survive off his body's energy stores for some time before dying of starvation. A reduction in the rate of this self-cannibalism can be achieved by lowering the temperature, and

⁵ Cf. Gustave Weigel and Arthur C. Madden, *Knowledge: Its Values and Limits* (Englewood Cliffs: Prentice-Hall, 1961) p. 66. The Heisenberg indeterminacy problem is especially operative in biological *in vitro* studies, but most scientists live with this problem without undue epistemological torment.

freezing can extend the life of sperm for long periods. When a sperm dies, it does not die all at once. The nuclear chromosomes gradually deteriorate and the DNA molecules fracture, lesser cell structures (organelles) fragmentate and the chemical components necessary for life are exhausted. An accumulation of waste chemicals and dissolved gases is the final toxic event whereby cellular enzyme activity is poisoned into cessation.

Ovum

The remarks made above about the free sperm apply also to the free ovum once it has erupted from the ovary. It is many times larger than the sperm; the nutrient fuel stores in the ovum supply the vast bulk of energy to the nucleus of the zygote (fertilized egg). The ovum and zygote live also by a self-cannibalization, deriving energy by idiotropism.⁶ If a deteriorating sperm fertilizes a healthy ovum, or if a healthy sperm fertilizes a deteriorating ovum (more common), a defective zygote is formed.⁷

Zygote

The sperm fertilizes the ovum in the oviduct, not in the uterus. It is still a free body, unattached to the mother, living within her by the same vital mechanics whereby live free sperm and ova. Some slight transfer of environmental chemicals may occur between the surrounding fluid and the zygote, but these are not the stuff of nutrition. While the sperm starts to enter the ovum within minutes of contact, it takes several hours before full chromosomal conjunction (fertilization) occurs. There is no such thing as a moment of fertilization; it is a process.⁸

Here lies a maximally important observation. Human life does not begin. Human life once began, and it is now transmitted in living DNA. Zygotes begin, and when they begin they are living. However, the

⁶See Brachet, *op. cit.*, Luigi Mastroianni, "Fertilization and the Tubal Environment," *Hospital Practice*, March 1972. The zygote can derive some energy for adenosine transfers from lactate and pyruvate ions in the uterine fluid, but it is not until the early gastrula stage (21 days) that even simple sugars from an extrinsic source are utilizable.

⁷Edith L. Potter, *Pathology of the Fetus and Newborn* (Chicago: Yearbook, 1952). Potter has photographic as well as textual documentation. The majority of sperm-ovum conjugates do not eventuate as babies or even as organisms; see Witschi below; also Villee, *op. cit.*, p. 721: "Such entities cannot be considered organisms for they lack polarity and symmetry."

⁸L. Mastroianni and C. Nariega, "Observations in Human Ova and the Fertilization Process," *American Journal of Obstetrics and Gynecology* 107 (1970) 682: "Fertilization is complete with metaphase of the first cleavage mitosis or cleavage to the two-cell stage." It must be remembered that this is an ovicellular phenomenon and not an organismal phenomenon; the entire process can stop at the ovicellular level without the mother organism becoming "fertile" or "pregnant." Cf. Witschi below.

livingness of that which is alive in them antedates the existence of the zygotes.

Cleavage

In the oviduct the zygote undergoes its first active splitting of self into two carbon copies of itself. This cleavage can be induced artificially⁹ and cleavage occurs in unfertilized eggs.¹⁰ Many cells possess the ability to cleave, hence cleavage is not proof of hominality. First cleavage occurs within 40 to 60 hours of fertilization, with successive cleavages occurring more rapidly until an extremely hyperactive phenomenon obtains as the cell mass achieves a numerical cell count in the millions. There is no real growth during cleavage, merely an increase in cell number without increase in weight or volume of the cell mass. At the 4-cell or 8-cell stage (second or third cleavage) the cell mass descends into the uterine cavity. Covered with a sticky substance, the cell mass (morula) adheres to a site on the uterine lining (nidation site). On about the 4th or 5th day a lysis of the uterine cells is effected, permitting the morula to sink into the deeper part of the uterine wall. It is still independent of the mother nutritionally, although it may use some cell-breakdown products from the lysed maternal cells in a primitive form of saprophytism. The numerical cell count is now increasing rapidly, each cell generation being smaller in the sense that individual cells are smaller. There may appear some apparent increase in volume due to osmosis of salt and water, but not even elemental sugars, much less proteins or fats, can be utilized. This will not happen until implantation has been completed.

An odd parallel to later life is seen here, and I cannot resist mentioning it. The vital activity seen in these early days is ordered by what is called messenger ribonucleic acid (RNA) from the mother's ovum. The sperm apparently does not enter into the ordering of this activity. The sperm resembles a man who impregnates a woman and then leaves to her all of the work of raising the child. When we note of such a shiftless male "Isn't that just like a man," we may also say of the sperm "Isn't that just like a sperm."

The important point, of course, is that the directedness of the internal activity of the early cell mass is a maternal donation, while after organization (14 to 22 days) of the blastula the directedness of the internal activity of the conceptus is idiosyncratic and attributable to the influence of specifically *de novo* fetal messenger RNA elaborated by the conceptus itself.¹¹

⁹ Vilee, *op. cit.*, p. 574.

¹⁰ Mastroianni, n. 8 above.

¹¹ Brachet, *art. cit.*; cf. also D. E. Reid, K. J. Ryan, and K. Benirschke, *Principles and Management of Human Reproduction* (Philadelphia: Saunders, 1972): "It can readily be seen in these species, including man, that the few mitochondria contributed by the

Differentiation

The multiplying cell mass, as it becomes engulfed in the uterine wall, acquires a mulberry shape (morula). Each of these cells is totipotential, i.e., capable of differentiating into any type of subsequent cell (bone, blood, brain, etc.). The first differentiation is one whereby the surface cells of the morula differentiate into specialized cells which form the placenta. These cells elaborate a hormone which passes into the maternal bloodstream and which can be detected as early as one week after fertilization by a laboratory test (the radioactive immune receptor assay). This test establishes the presence of the hormone—human chorionic gonadotrophin—but not the presence of pregnancy, because hormone is present in nonpregnancy situations. The test proves the presence of cells which elaborate the hormone, not the presence of a homo.¹²

After this initial differentiation, which occurs slightly less than a week after fertilization, the cell mass grows rapidly in numbers (though not in size or volume) for about another week, when the second differentiation occurs, this time into primordial brain tissue. This is followed in very rapid order by the appearance of heart tissue (the cardiogenic plate), which appears at about the 14th day.

Before going on to later differentiations, we might identify what has been going on to date. Later conclusions will be drawn which demand an understanding of these very early days after fertilization, hence the notions of totipotentiality, differentiation, and the blighted ovum require some explanations.

Totipotentiality (Pluripotentiality)

The zygote and the cells formed from the zygote by successive cleavages are not determined as to their final form until some time after the process of fertilization. Each of the cells of the early cell mass is

spermatozoon soon swell and disintegrate. This raises an important point: since mitochondria are not made *de novo* but arise by division, it appears that all zygotic mitochondria are of maternal origin." Cf. Villee, *op. cit.*, p. 596: "The RNA in the fertilized egg was synthesized in the oocyte before fertilization and hence is a product of the maternal genotype rather than of the genotype of the embryo. . . . It is only later, at about the time of gastrulation, that the genome of the embryo is transcribed to form embryonic messenger RNA. . . ." See also Weisz, *op. cit.*, p. 725, for the same, i.e., that for the first few weeks the fuels and tools are maternal, not embryonic.

¹²Emil Witschi, "Congenital Malformations," *Proceedings of Third International Conference (Amsterdam)* (Excerpta Medica, 1970). Witschi estimates that 58% of sperm-ovum conjugates never complete implantation; 16% terminate at conjunction, 15% never begin implantation, 27% are lost before the completion of implantation, and only 30% survive to birth. Many such failures would give a positive HCG test, despite the fact that differentiation and organismicization of somatic cells cannot occur due to defects intrinsic to the zygotes themselves. Hominizability, even *in potentia*, does not exist.

potentially a brain cell, a bone cell, etc. Certain laboratory experiments in lower morulae can show this:¹³

a) If the early cell mass is teased into two halves and if each of these halves is allowed to grow, each half will form a separate subsequent adult form. This is the twinning process, which either happens naturally or can be induced experimentally.

b) If these separated cell masses are allowed to grow for only a brief time and are then conjoined back together, only one adult form will eventuate. The reconnection must occur prior to the point where the cells undergo differentiation.

c) If the original cell mass separates incompletely—remaining attached in one area—and then differentiation occurs, the end product will be Siamese twins.

d) If, prior to differentiation, cells from one area of the morula are grafted to a different area of the morula, the eventual form of the individual is not affected. However, if cells which have already differentiated into one cell-type are grafted into an area which has already differentiated into another cell-type, the eventual product will be a monster of some type (e.g., an arm growing where it should not normally be growing). Fortunately, most such monsters never survive the early weeks or months of gestation, but several born specimens are known in medical history. The scientific discipline investigating these mishaps is known as teratology.

Blighted Ovum

It is now widely recognized that anywhere from one third to one half of all fertilized ova never survive to implant or differentiate to any advanced degree.¹⁴ Failure to implant can be exogenously brought about by hostile conditions in the uterine cavity, but the failure under discussion here is an endogenous failure on the part of the zygote. Due to natural deficiencies in either a sperm, ovum, or zygote, some zygotes will never cleave, or cleave only a few times, or cleave incompletely, never differentiate, differentiate only rudimentally, or differentiate incompletely. It appears that in the very nature of things there is not even *in potentia* the capacity of the zygote to form a subsequent homo. It is clear that no moral theologian is going to hold that an ontic homicidal evil obtains in the exogenously induced anti-implantational act which renders the uterine cavity hostile to the nidation of these utterly impotentiated entities. But what of those zygotes which in the nature of

¹³The classic experiments done in this field are largely the work of Joseph Needham, *Chemical Embryology* (3 vols.; Cambridge, 1931). For a brief review, see Rupert A. Willis, *The Borderland of Embryology and Pathology* (London: Butterworth, 1958) chap. 1.

¹⁴Cf. Witschi, *art. cit.*

things have all the potency or virtuality for going all the way to full cleavage, differentiation, implantation, and even to adulthood, should all the exogenous right things occur? What is the ontic evil contained in acts ordered to prevent the implantation of these? To answer this question, we must return to fertilization and see what is the hominizational content of the sperm-ovum conjunction.

Genotypes and Phenotypes

When a human sperm and human egg fuse at fertilization, a cell is formed which contains 46 chromosomes (or a 47-chromosome trisomal variant, as in Mongolism). It is a cell which is classifiable as belonging to the human order as distinguishable from the order of dogs, for example. Any human cell is so distinguishable under high-power microscopy, including tumor cells, human tissue-culture cells, frozen human-graft cells, and the cells of a human heart while being transplanted from a donor to a recipient (while attached to neither). There is no special homination attributable to a simple fact of possessing 46 chromosomes.¹⁵

The pluripotentiality of the zygote cell distinguishes it from the differentiated state of the tissue-culture cell, the graft cell and the donor-heart cell, but there is far less of a distinction between the pluripotential zygote and the pluripotential cells seen otherwise in human biology. Pluripotential cells are seen in embryonic anlage rests, the testis, the ovary, and in neoplasms both benign and malignant arising from any of the above. Since pluripotentiality of a cell containing 46 chromosomes does not establish the hominality of a cell, we can see that no hominality can be posited, without further distinction, to the zygote or to any 46-chromosome cell. This further distinction lies in the phenotype of the zygote, which is laid down at fertilization.

Both the mother and the father of a child contribute to the phenomenal form of the child by contributions carried within the chromosomes of the sperm and ovum. The phenotype is the sum of the apparitional characteristics of the child's physical make-up, which is hereditarily handed down in either a progressively diluted or intermittently recurrent degree from grandparent to parent to child to that child's children, then grandchildren, etc. Each newly generated link in this chain derives some physical characteristic from earlier links, and the individual's summation of all of these hereditarily transmitted characteristics constitutes his

¹⁵Weisz, *op. cit.*, p. 138. There are over 2 million different species of organisms; chromosomal numerality rarely exceeds 100 chromosomes; thousands of organisms are 46-chromosomal. Neither does a 46-chromosomed zygote specifically derived from human parental cells attain to hominality merely by virtue of that number; for moles, teratomata, chaotic cell masses, choriocarcinomata and nonsomaticized blighted ova can arise quite normatively from 46-chromosomal zygotes. See Potter, n. 7 above.

unity, his induplicability, and his uniqueness in the biological order.¹⁶ The uniqueness of the zygote and of the homo which might subsequently eventuate from that zygote is irrevocably established at fertilization. The entire phenotype is not established, for many physical modifications of a phenomenal nature can be induced later on in the gestational process.

The sexual gender of the zygote is also established by the contribution of the fertilizing sperm. This is a *cellular* sexuality or gender; gendered cells other than in a zygote are seen in a variety of tumors and teratomas in human biology. Cellular gender is not in itself evidence of hominality. Neither is the morphic or psychic gender of the subsequent homo established by fertilization, for all varieties of morphic and psychic sexuality (gender) are seen in both adult males and females.

At fertilization, then, are established the 46-chromosome genotype of the cell, the cellular gender of the cell, and the phenotypical characteristics of any subsequent entity, whether or not the zygote becomes a differentiated, hominalized organism later. To this matter of later differentiation we can now turn.¹⁷

Later Differentiation

It is known that at fertilization is established the axial differentiation of the organism, i.e., the right side from the left side of the subsequent formed entity. It is also known that in the morular cell mass and later blastular cell mass there is a primordial but nonfixed differentiation potentiality for ultimate orderly emergence of specific parts of the maturely formed body. This nonfixed or presumptive differentiability of the cells retains its pluripotentiality until the end of the second week, when the hominal organizer appears in the blastocyst.¹⁸

Since the blastocyst stage is a crucial stage in hominization, it is worth some description here. The first differentiation of placental cells was noted above. These placental cells form the outer surface of the cell mass, while a thin layer of fluid forms between the placental layer and the inner cell mass. This fluid-containing cyst is the blastocyst, the inner cell mass being the blastula. An invagination at the lower pole of the blastula

¹⁶The second law of thermodynamics is operative here, an increasing randomness ensuing from gene-energy transactions.

¹⁷All zygotes, morulae, blastulae, embryos, fetuses, infants, and adults are phenotypically distinct, as are all moles, blighted ova, nonsomaticized cell aggregates, teratomata, and cancers derived from zygotes. Each has no exact genetic equal either past, present, or possible in the future. Mere phenotypical uniqueness says nothing to an entity's hominality.

¹⁸The term "primary organizer," coined by Spemann in 1927, is a standard working tool of all classical embryologists from Bland-Sutton, Nicholson, Needham, Brachet, Willis, etc., down to modern embryology scholars. For a semidetached history of discoveries in this area, cf. Willis, *op. cit.*, chap. 1.

occurs (the blastopore) and on the posterior lip of the blastopore appears what is termed the primary organizer. If this organizer does not appear, no subsequent differentiation will occur. If it is removed, no differentiation will occur. If it is grafted to another blastula from which that blastula's organizer has been removed, the blastula will recommence differentiation. No differentiation of specific organ systems can occur unless this organizer orders the pluripotential cells to so differentiate into specific organ systems that a homo will form. For this reason, the scientist has an almost insuperable inclination to identify hominization as being positable *no earlier than the blastocyst stage*; for it is at this stage that the hominizable products of fertilization and the nonhominizable products of fertilization are distinguished. Another crucial point can be made here: when the organizer appears in the cell mass, it is irrevocably determined that the unity of the individual is established; for twinning can no longer occur and reconnection can no longer occur. This accounts for the metaphysician who cannot possibly entertain the notion of ensoulment prior to the point where it is biologically established that either one or several human entities have resulted from fertilization. The metaphysician, while perhaps still unable to affirm when the soul is infused, is content to observe that there is a point earlier than which ensoulment cannot be held to be infused, which point lies at that stage of the gestational biology where the individuality of the entity is irrevocably laid down in the nature of things. As a scientist I appose no option to this metaphysical position, and equally as a scientist I suggest that other matters drawn from pure biology can be adduced to support this position. What, then, can be said of the real content of fertilization? I submit that we can justifiably hold that at fertilization is laid down *only* the characteristic of the subsequently hominizable entity(ies), the hominization and individualization of which cannot be posited until the late-second or early-third week after fertilization. To bolster this holding, one more biological distinction must be made, namely, the nature of the vital activity of the preimplanted entity as compared with the vital activity of the postimplanted entity.

Nature of Vital Activity

We recounted earlier that the free sperm, the free ovum, the free zygote, and the later morular and blastular entities are unattached to either parental body so far as nutrition is concerned. They are all internally generative of intrinsic fuel supplies necessary to continued physicochemical functioning. They live off themselves, which existence has a naturally determined end-point. They are analogous to the free graft, which is entirely dissociated from the donor and has not yet been integrally set into the nutritive system of the recipient. They are analog-

ous to the tissue-culture cell, which has not yet been set into the nutritive processes of the culture medium. If any of these above-mentioned "human" cells do not establish a fully functional source of nutrition which differs radically from their self-consumptive modality of sustenance, they will undergo cellular death each in a calculable period of time. This time-period for the self-sustaining blastula appears to lie somewhere between the 14th day after fertilization and some 7 to 10 days later, depending upon the individual circumstances. From *in vitro* studies of human fertilized ova, the self-contained nutritive and differentiatational capacity of the *in vitro* specimen stops at the late blastocyst stage, and it takes a considerable amount of careful professional expertise to devise adjunctive environmental surroundings which will permit even this extent of innate capacity for vital existence to actualize. However, some radically new form of sustenance must be added once the cardiocirculatory system of the forming entity becomes functional. In the nature of things it is ordained that the self-cannibalism must last until the new extrinsic-dependent nutritive supply can be brought into play for the cardiocirculatory system to employ. The heart starts to beat at the end of the 3rd week, at least by the 23rd day. This date coincides with the date at which self-cannibalism exhausts its intrinsic supplies. It is touch and go here, the latter mechanism having to phase in before the earlier mechanism phases out. It is also at this date (or, rather, point in process) that the experimental blastocyst is no longer supportable *in vitro*, and it is also when the implantational processes of the embryo make a functional entry into the maternal circulatory system. It is also at this point that the embryo can begin to grow. It is also at this point that death mechanisms can be distinguished: prior to this point the death mechanism is merely exhaustion of intrinsics, and after this point death is an inability to utilize extrinsics. I simply cannot find in the biological order any reason not to distinguish radically and categorically between the preimplanted entity's vital capacity and that of the implanted entity. In short, the biologist holds that the numerous biological events converging in the general time area of the 14th to 22nd day weigh extremely heavily in any calculus of the beginning of the life of a homo.

NONBIOLOGICAL CONSIDERATIONS

What has gone before is quite a bit of plain empirical biology for a paper in a theological journal. Much of it has been framed merely in skeletonized form, and even more elaborately documented explanations (though out of place here) could be adduced to substantiate all of the above. The thrust of the foregoing biological data is to provide input to the moralist who recognizes that when the facts of a moral situation

change the moral considerations appropriate to the situation also change. While I believe that empirical facts do tilt toward the proposition that fertilization does not represent the beginning of the definitive life of an individualized homo, there are several parallel observations of a nonempiric nature which ought be discussed.

Formal Cause

First the notion of a formal cause of the homo. In metaphysics it is customary to hold that until an entity has form it is improbable that a formal cause of the entity exists. It has been pointed out by some observers that the embryo-fetus does not acquire recognizable human form until about 10 to 12 weeks after fertilization. This holding hinges upon one's definition of what constitutes human form. I believe that a more appropriate way of questioning the presence of human form is to ask "Does this conceptus at this or any age possess the form of all human conceptuses at the same age?" By putting the question this way we can avoid comparing the form of a very young human to that of a very old human. Since the specifically human form of an organically differentiated conceptus during the very early days does not in any way resemble the form of a person in his prime as visualized grossly, resorting to the microscopic form seems valid. Here there is a possessed human form on the level of the magnifying glass or microscope. Prior to differentiation one would have considerable difficulty in predicating that human form does exist. One could ask "Does this zygote or does this 16-cell morula have the form of all zygotes or morulae at this age?" and not be able to answer with certitude at the given state of man's knowledge and ability to measure. At any rate, I do not see much future for pursuits of the time of animation which are based on explorations of a formal cause before 14-22 days.¹⁹

Biological Signal of Motherhood

My second observation has no metaphysical or moral weight, but I mention it for what it is worth. The biological signal sent to a woman that she is a "mother" is the failure to menstruate after fertilization has occurred. A woman normally expects her period about 14 days after ovulation and fertilization, although slight variations are seen. A woman is physically unable to consider herself as a "mother" at fertilization, during cleavage, during the earliest differentiation period. At almost the same time as she notices that she is pregnant, the brain and heart have just differentiated, the possibility of twinning has just been removed, the

¹⁹ Joseph Donceel, S.J., has investigated formal causality in two papers: *THEOLOGICAL STUDIES* 31 (1970) 83 ff., and *Continuum* 5 (1967) 167-71.

primary organizer has appeared, and, according to my analysis, hominization has just occurred. I do not know just what this means, if anything. It is just that "nature" does nothing if she does not dovetail her processes, and if the biological naturalisms and the "signal" of nature to the behavioral woman coincide we might be slightly tilted to assigning weights to the notion that biological hominization is best dated several weeks after fertilization. As I noted above, this proposition has no intrinsic weight of itself, but it is interesting.

Culture and Ethics

The influences our culture exerts on our moral calculations are hard to pin down, but there are certain observations to be made regarding our current ethos. The act of abortion has been understood for countless centuries; a woman misses a period, discerns that she is pregnant, and attempts to dislodge the pregnancy from her womb. This act has now been translated into surgical attacks upon the lodged conceptus and chemical agents which induce a uterine contractility which will dislodge the attached conceptus. No one has ever understood abortion to be the prevention of implantation, not even after the use of anti-implantational agents became widespread. States which wrote firm laws against abortion never wrote laws against the prevention of implantation. Countless women, their spouses, and their doctors who would never consent to the immoral act of ending an already begun life simply do not attach a similar wrongness to the prevention of implantation. Of course, the parallel observation can be made that people who would never consent to homicide will consent to abortion. I am not sure that the same distinctions apply in both cases: in the latter the abortifacient act is done with a disvaluation of the nascent life, while in the former the prevention of implantation is not commonly understood to be a disvaluation of a nascent life but the prevention of the nascence of life. There are gross weaknesses to this argument, but there is also something in our culture speaking to the nonhomicidal content of those acts which prevent implantation.

Thomistic Definition of Soul

In keeping with the above serialized biological data, it can be seen that no automatically discernible applicability of the Thomistic definition can be posited prior to differentiation, organization, and implantation of the entity. What did Thomas mean when he insisted that the being be "physically organized"? What sort of vital functioning did he have in mind when he insisted that the physically organized being have the potency for "life"? I pointed out earlier that there is a radical, fundamental difference between the vital activities of the preconceptus

and the postconceptus, and that the vital activity of the postconceptus is identical until death in old age. Did Thomas mean current potency or prospective potency?

No soul need be posited in a sperm, ovum, zygote, or unattached blastocyst, any more than the presence of a soul need be posited in any other human cell or cell cluster after it has been totally separated from an ensouled parent organism and left to survive on its residual quanta of fuels and physicochemical energies. I do not know, nor does anyone know, just when specific animation occurs, but I can think of no reason in the purely biological order to sustain the argument that animation is possible to consider at fertilization. As a matter of fact, after one has reviewed all the biological data in an attempt to assist in the chore of locating ensoulment, one inevitably gets the impression that one is chasing an undiscoverable chimera and that the best one can do is to adduce evidence showing why animation ought not be considered prior to the point where twinning is no longer possible in the biological order and let it go at that. The problem, of course, is that biology in and of itself does not provide the norms by which the proper weighting ought to be assigned to the serially appearing phenomena of human reproduction. In all scientific candor, I suggest that the overwhelming weight of biological data tilts the objective scientist toward that inexactly definable time period of 2 to 3 weeks after fertilization as the time or point in process when biological hominization occurs. If metaphysical and behavioral observations also point toward the same general point, so be it.

The Embryonal Diapause

While this is a botanical-biological matter, I am placing it in this section because it has no counterpart in human biology. The embryonic diapause is a mysterious phenomenon seen in certain animals and plants where the unimplanted blastocyst lies dormant (in animals, in the uterus) for long periods of time without implanting. This period lasts up to 15 months in the European badger. Roe deer have a gestation period of 6 months, yet they mate in July and deliver in May. Seals, mink, otters, fishers, weasels, armadillos, and many other mammals disclose the same phenomenon, i.e., the blastocyst is biologically intervalital rather than vital.²⁰ The same phenomenon is seen in plants which reproduce sexually. Locust trees demonstrate this "intervalital" stage for 15 years, hedge bindweed for 20 years, lotus seeds for 800 years, and the arctic lupine for 10,000 years (frozen). In all these cases, dormancy is biologically impossible once implantation (into the uterus or into the soil) has been accomplished.

Now badgers are badgers and humans are humans, but blastocysts are

²⁰See J. T. Lanham, *American Journal of Obstetrics and Gynecology* 106 (1970) 463.

still blastocysts, and there is nothing in the above-cited parallels to weaken the argument that the blastocyst stage of the human gestational process is where an *intervital* form of existence must take implantation into a receptive donor of vital capacity before it “springs” into life.

MORAL CONSIDERATIONS PRIOR TO HOMINIZATION

The term “contraception” is a misnomer. It does not appear in many prestigious dictionaries. While the current popular usage of the word promises to see dictionary inclusion, I suggest that a greater precision is possible in terminology. I suppose that “contraception” was coined by someone who was trying to express “contraconception” and found a shorter term palatable. However, on the basis of biological data, I submit that we can identify the old “contraceptive” technics as being more precisely “antifertilizational” and identify anti-implantational acts as being “contraconceptive.” This distinction has for its basis the identification of “conception” with “implantation.”

It is only in English translations of the Creed that the word “conception” is not considered a maternal act. Given the early ages at which the Apostles’, Nicene, and Athanasian Creeds were written, and given the fact that the implantational processes of human reproduction were not discovered until one and a half millennia later, it can certainly be declared that no use of the notion (*concipere* = “to catch, to take to one’s self”) had a biological prescience intrinsic to it. Biblical “conceptions” are not specified as occurring in the oviduct but in the womb, yet conception as implantation does occur in the womb. There is no biological annotation to “conceived by the Holy Spirit” as used in recent English credal forms said during Mass. In short, we simply do not know what “conception” was meant to mean by the unbiological Fathers. Again, if hominization occurs factually at conception (implantation), no flawing of the content of the Immaculate Conception ensues.²¹

There is no consistent relationship between exegetical understandings of “conception” and subsequent moral postures of the Church. (a) The Church has never defined the front end of the abortifacient act. The back end is “the expulsion of the fetus from the womb prior to viability.” (b) The Church excommunicates those culpable in an abortion but does not excommunicate those participating in the prevention of implantation of a fertilized ovum.²² (c) The Church has never defined abortion as homicidal because of “ensoulment” problems; she does lay down instructions for the baptism of expelled fetuses which were once im-

²¹ For example, see *The Compact Edition of the Oxford English Dictionary* (Oxford: Clarendon, 1971) s.v. “conceive.” Here the sense of “to generate” is alluded to, while the etymological derivational sense is “to catch.” Did credal use cause lay usage?

²² *Code of Canon Law*, can. 2350.

planted. The Church has never defined the prevention of implantation as homicidal. (d) The moral injunction against abortion is constantly stated as "innocent human life is to be protected at every moment of its existence." Yet no note is made of the criteria by which it is to be established that human life has begun its existence. (e) Is "expulsion from the womb" the same as the prevention of "impulsion into the womb"? Or is the prevention of implantation closer morally to being an illicit intervention into a natural process, the norm by which the artificial contraceptive act is flawed in natural-law moral theology?

From what has gone before, the reader can see that advances in modern biology have thrown considerable doubt upon any thesis that the prevention of implantation ought to be held, ontically, the equivalent of abortion done against the differentiated, organismicized, and implanted conceptus. The patient of a homicidal act must be a homo.

By a (biological) homo I mean a living hominal organism. By "hominal" I express the human genetic derivation and identity of the entity. By "living organism" I mean a phylogenetically distinct being which is currently capable of controlledly carrying out the minimal vital acts adequate for sustaining, either mediately or immediately, the continued existence of itself at the highest biological level natural to the species.

The qualifiers "currently" and "controlledly" are fixed inasmuch as they spring from already bordered data in biology. The qualifier "minimal" is probably fixed biologically, perhaps some openness being left to medical advances of the future. Man can live without many organs and functions and yet function adequately as an organism. The qualifier "mediately" is used to include the young who require placentation suckling, premastication, and predigestion, as well as adults who require adjuvants which mimic the natural adjuvants of the young, e.g., heart-lung machines, intravenous feedings, pacemakers, dialysis, etc.

The term "livingness" is not univocal. Organismic life is pyramidal. Molecular life underlies cellular life, which underlies colonial life, which underlies organal life, which underlies organismal life. The organism emerges and disappears in this pyramidal fashion.

I am not certain that the general evolution of living creatures is with full propriety equated with the emergence of the individual, but the parallels are illuminative, i.e., the Haeckel theory. The organismal pyramid is not static. Organismicity is achieved in steps and lost in steps at death. In all forms of organisms it is the highest level of "livingness" possible in the biological order, all subsequent accruals being merely developing form and function. Abortion induces organismal death, and it is the biological equivalent of any later homicide. Prior to organismalization, the deprivation of "livingness" is not homicidal, since it removes a

preorganismic "life" from a preorganismalized entity. This activity may be immoral but it is not homicidal in the amoral biological order.

For the reasons cited earlier, we simply cannot say that all zygotes are homines either *in potentia* or *in esse*. Since some zygotes will in time become hominal organisms, a temptation exists to hold that some zygotes are homines *in potentia*. We cannot hold that some zygotes are homines *in esse* unless we allude to human zygotes within a biology other than that within which we define other multicellular organisms. I submit that this is invalid. But are some zygotes homines *in potentia*? I suggest that there is a multiple, staged potency in effect here. Some zygotes, once fertilization occurs, are intrinsically capable of being organismalized by a series of right extrinsic things happening to them, if all wrong extrinsic things are prevented from happening. Yet an ovum has the potency for becoming a homo if the right thing (fertilization) happens to it. I am not comfortable with divisions of a continuum into subcontinua, and the biodynamic continuum leading to you and me is 3 billion years old and contains a virtual infinity of subcontinua and potentiations for acquiring subsequent potencies. I prefer to avoid the potency notion in the biological order, settling for the notion that a homo begins when it is organismalized and acquires the capacity for carrying out vital activity in a biological manner identical to that which all homines controlledly employ, i.e., organismal livingness.²³

In a heavily biological article written in a theological journal for a mixed readership such as this, prudence indicates that many of the much more highly sophisticated and complicated arguments drawable from teratology, chemical and experimental embryology, cytochemistry, and molecular biology be left to other pages, though substantiative of the skeletonized material presented here. I submit that the prevention of implantation of the human zygote and all other acts done to the preimplanted entity are not antihominal acts and are not homicidal in the biological order, no matter how immoral such acts might be in natural-law moral theology. The unnidated, nonorganismal entity is not

²³See Weisz, *op. cit.*, p. 24: "We recognize that neither life nor death is a singular state but is organized and structured into levels." Again, p. 28: "Living units are organized structural aggregates at or above the cellular level of complexity, carrying out the function of metabolism and self-perpetuation at every one of these levels. A whole organism is more than the sum of its parts. An organism is a collection of parts plus organization, for an organism exhibits properties above those of the totality of its components." Again, p. 733: "Group integration is a necessary condition for the formation and maintenance of a properly organized living whole." H. Nicholson (*Guy's Hospital Review*, 1935) makes the following observation regarding cases where zygotes develop into entities other than hominal organisms: "What I miss in the established teratoma is the co-ordinating action of a whole upon its parts; in more scientific language, evidence for the action at any stage of development of a dominant organizer for a body."

vital in the same sense that the organismalized conceptus manifests vital activity. The existence of the early fertilizatum is most accurately defined as intervital (like that of the sperm and ovum) and either preorganismal or interorganismal. The moral theologian can perhaps frame a more accurate definition of the ontic evil intrinsic to preorganismal (preimplantational) interventions. I have in mind a schema which divides acts into (a) antifertilizational, (b) anticonceptive, and (c) abortional (the induction of organismal death in a living human organism, thus a homicide). Animational considerations may be brought into the definition only when the killing of an animated and biologically hominized entity is discussed.

CHURCH LAW AND CIVIL LAW

Many Catholics and their leaders have embarked upon a movement to amend the Constitution so as to prohibit abortion. This exercise, difficult enough to accomplish, is complicated by the fact that no distinction is being made between preimplantational interventions and acts which kill an implanted, differentiated, organismalized, and hominized conceptus. The amendment does not seek to force all to keep themselves open to God's will, to be "open to life," or to be "open to the possibility of generating new life." It cannot seek to outlaw theologically illicit interventions into God-ordained natural processes. Today our civil law must use factual biology as its substrate. Moral theology must use these same facts, because, although moral precepts may be constant in their essence, new facts or newly conceptualized old facts can modify the applicability of the precepts. In short, the writer holds that the time has come for an examination of all empirically known data with an eye toward an enhanced precision on the part of ethicists regarding the ontic content of acts designed to prevent implantation. The patient of such acts, at the time of the acts, must be identified so that needed work can go on in several areas:

a) The theologian can be of real assistance to the Congress in a search for right and just laws of an antihomicidal nature. Homicide means the slaying of a homo.

b) The pastoral area is obvious. What is the precise moral status of IUD usage? What medical recourse is open to rape victims? What may Catholic women and doctors do in such matters? What ought the policy of Catholic hospitals be in such matters? Our answers to these questions, no matter what they prove to be, will be right answers only if they are based upon a right understanding of biological facts.

c) The recently emerged area of bioethics is vital. Before wrestling with the question of "personal" hominality, one must come to grips with biological hominality (hominal organismality). Other matters exist:

What is the status of laboratory experiments employing entities produced by *in vitro* fertilization for which implantation is not contemplated?

Fear of tomorrow's biological discovery is hardly the posture that characterizes a man of faith in God. Any bioethical schema worth elaborating should have enough enduring biological substance to it that it will not be washed away with the next laboratory discovery. There is a reasonable constancy in the notion of homicide as being the deprivation of organismal life from a hominized organism. There is a naturalistic permanency in the biological identifiable intrinsic to organismality. Less promise of unchangeability lies in two other ethical quanta. There is, first, the matter of societal ethics, which can establish human disvaluations. This is a dangerous age of disvalues, particularly when ever smaller power groups can influence and frame the valuational psychodynamics of ever larger social groups as a societal ethic is groped for. Secondly, in a day when ova are being fertilized by nonspermatoc material, when unfertilized ova are brought to term-births of organisms, when human sperm can be made to fertilize nonovarian cells and indeed fertilize mature cells from species other than man with the production of embryonic gene material, the bioethician is well advised to adopt a cautious posture toward the notion of fertilization as hominization, particularly when there has never been a time in science when so many unanswered questions rotated about the nature, mechanics, specificity, necessity, and even eventual desirability of sperm-ovum conjugates in human reproduction. Above all, this is a time for intense study, not for simplistic echoings of unsubstantiable claims.