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L. G. German

M. Phil

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The Beginning of Individual Human Life

by

L. G. German M.D., M. Phil., F.R.C.O.G.

The author is an OB/GYN Consultant and a Graduate in Philosophy.

While there seems to be general agreement among embryologists on the scientific facts concerning fertilization, the interpretation of these facts in relation to the beginning of individual human life remains controversial. A recently-published commentary¹ on this topic also featured the views of a number of human embryologists.

While hardly would find fault with statement that "*the result of fertilization is the beginning of a new life*"², the same cannot be said for Professor C. Ward Kischer's claim that '*first contact*' between the male and female gametes marks "*the initiation of the new individual*"³. I shall argue that this claim lacks the necessary scientific and philosophical support, and that the establishment of the new genotype provides a more appropriate landmark for the beginning of individual human life.

Definitions

In any debate on the ontological status of the early human conceptus it is important that key terms be properly defined to avoid misinterpretation. One such term is 'fertilization' which is no longer regarded as a momentary event but is now recognised as a complex dynamic process⁴. The process starts with the first contact of the sperm with the plasma membrane of the secondary oocyte (ovum) and ends with the mingling of maternal and paternal chromosomes (syngamy) to constitute the unicellular zygote. The term 'syngamy' refers to that phase in the fertilization process which starts with the first crossing over of the chromosomes of the male and female pronuclei and ends with the formation of new genotype⁵.

Scientific Data

During fertilization the male and female gametes, each carrying 23 chromosomes, undergo a radical change to become a unicellular zygote with its normal complement of 46 chromosomes. At *first contact* the random mix of the

parental chromosomes has yet to take place. Even after the sperm has traversed the *zona pellucida* and penetrated the plasma membrane of the ovum, "the genetic material in the [sperm] head remains intact within the ovum and subsequently forms the male pro-nucleus" which is identifiable as a separate entity within the ovum⁶. What establishes the new genotype is the fusion of the male and female pronuclei and this is what gives the unicellular zygote its unique genetic identity and ontological individuality.

Philosophical Considerations

The process of fertilization has clearly identifiable beginning- and end-points. 'First contact' represents the *initiation* of a process which comes to an end with the formation of the unique genotype that marks the beginning of the new individual. There is organic and genetic continuity between the zygote and the adult human being which develops from it. Such continuity is an essential requirement for ontological individuality. The possibility that the zygote may later form more than one individual (as in the case of monozygotic twinning) in no way negates the individuality of the original zygote whose capacities are determined by the sequence of the bases in its DNA molecule.⁷

Although 'first contact' by the fertilization sperm would determine which chromosomes will eventually combine with those of the ovum to form the new genotype, the two sets of parental chromosomes are still segregated. What there is at this stage, therefore, is not an actually existing individual but a future *possible* individual human life. Ontologically, one cannot validly postulate the existence of an 'individual' until such an individual has come to be. It is the new genotype that gives the human zygote its individual status.

A correct interpretation of the known scientific facts will confirm that although the new genotype is potentially determined at the stage of 'first contact' between the parental gametes, it is not fully formed until the end-stage of syngamy. Since it is the genotype that confers individuality on the zygote, the formation of the genotype provides a more accurate marker-event for the beginning of individual human life.

References

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2. *Ibid.*, p. 74.
3. *Ibid.*, p. 75.
4. Ford, N.M. *When did I begin? Conception of the human individual in history, philosophy and science.* (Melbourne: Cambridge University Press, 1989), p. 102.
5. The term '*karyogamy*' is sometimes used to describe the process of unification of the male and female pronuclei leading to the formation of the new genotype.
6. Buckle, S. Dawson, K., and Singer, P. The syngamy debate: when precisely does a human life begin? in Peter Singer et al. (eds.), *Embryo Experimentation.* (New York: Cambridge University Press, 1990), p. 218.
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