34 *The Beginning of Human Development*

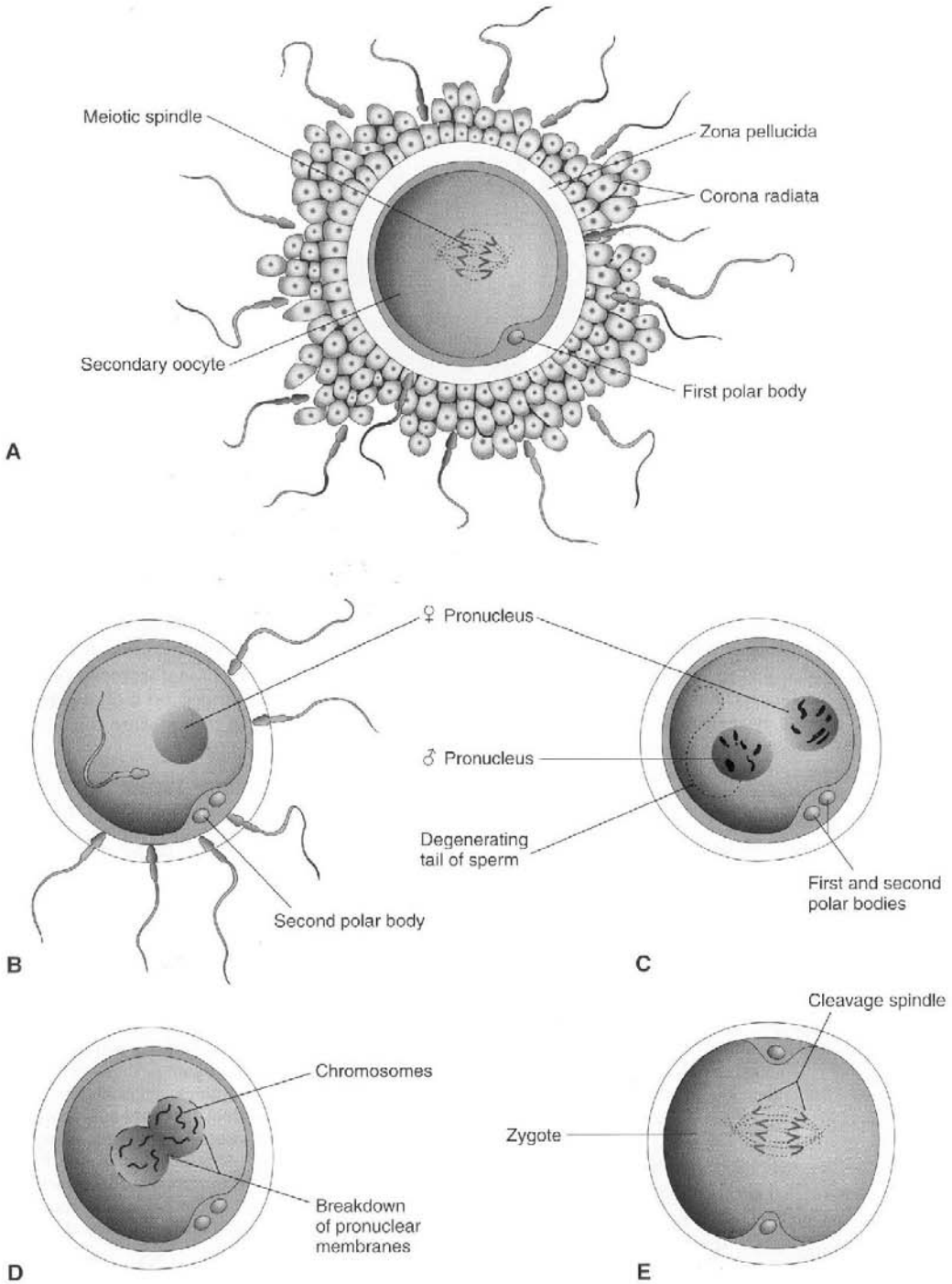

Figure 2 – 16. Diagrams illustrating fertilization, the procession of events beginning when the sperm contacts the secondary oocyte's plasma membrane and ending with the intermingling of maternal and paternal chromosomes at metaphase of the first mitotic division of the zygote. *A*, Secondary oocyte surrounded by several sperms, two of which have penetrated the corona radiata. (Only four of the 23 chromosome pairs are shown.) *B*, The corona radiata has disappeared, a sperm has entered the oocyte, and the second meiotic division has occurred, forming a mature oocyte. The nucleus of the oocyte is now the female pronucleus. *C*, The sperm head has enlarged to form the male pronucleus. This cell, an ootid, contains the male and female pronuclei. *D*, The pronuclei are fusing. *E*, The zygote has formed; it contains 46 chromosomes, the diploid number.

Source: **THE DEVELOPING HUMAN:**
CLINICALLY ORIENTED EMBRYOLOGY, 7TH EDITION
Keith, L. Moore, PhD, FIAC, FRSM and T. V. N. Persaud, MD, PhD, DSc, FRCPath (London), p 34.

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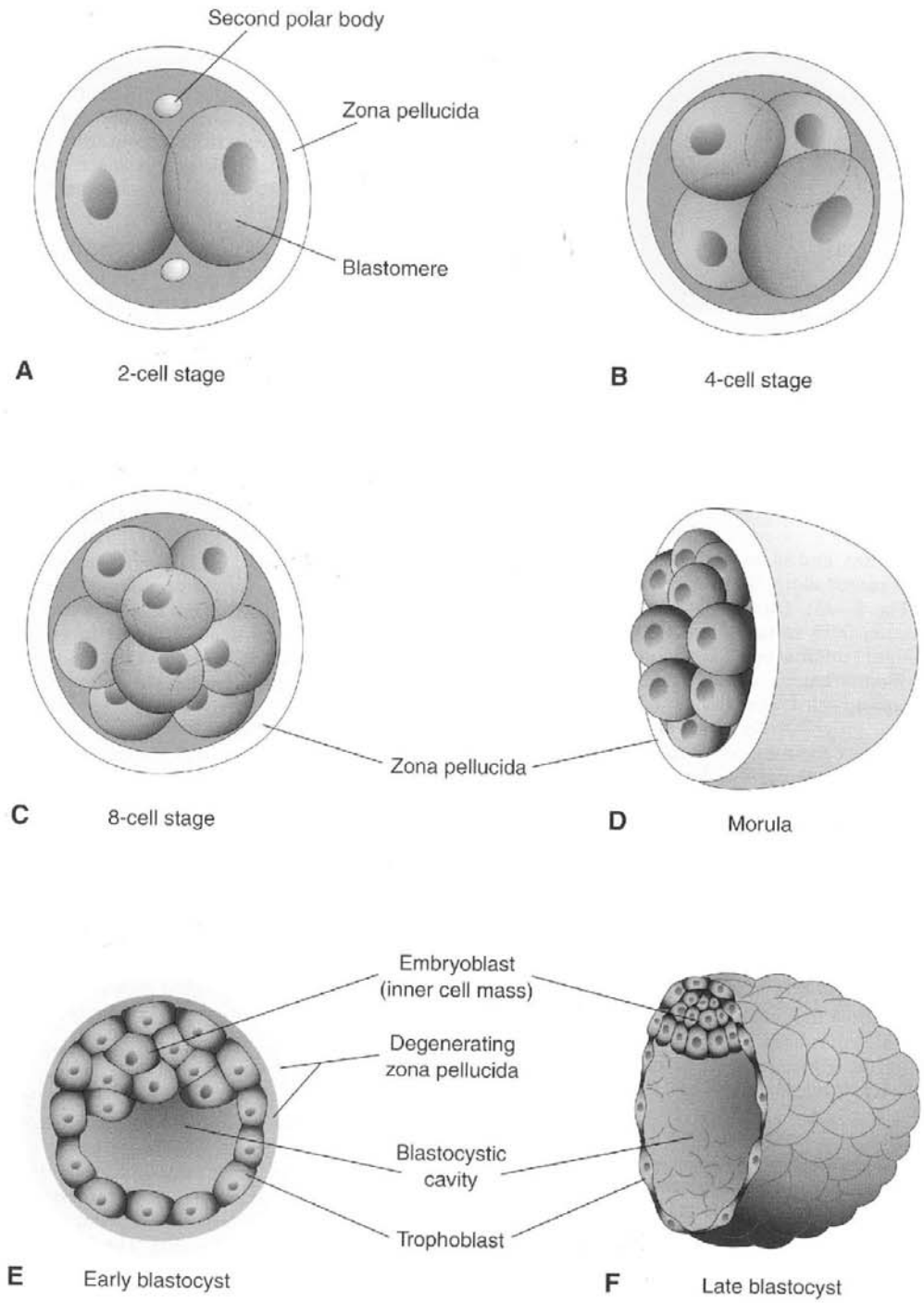

Figure 2–19. Drawings illustrating cleavage of the zygote and formation of the blastocyst. *A* to *D* show various stages of cleavage. The period of the morula begins at the 12- to 16-cell stage and ends when the blastocyst forms. *E* and *F* are sections of blastocysts. The zona pellucida has disappeared by the late blastocyst stage (5 days). The second polar bodies shown in *A* are small, nonfunctional cells that soon degenerate. Cleavage of the zygote and formation of the morula occur as the dividing zygote passes along the uterine tube. Blastocyst formation normally occurs in the uterus. Although cleavage increases the number of blastomeres, note that each of the daughter cells is smaller than the parent cells. As a result there is no increase in the size of the developing embryo until the zona pellucida degenerates. The blastocyst then enlarges considerably.

Source: **THE DEVELOPING HUMAN:**
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Keith, L. Moore, PhD, FIAC, FRSM and T. V. N. Persaud, MD, PhD, DSc, FRCPath (London), p 38.