The Female Reproductive System

The Fountain of Life

Thank Heaven for Little Girls
They grow up in the most delightful way
-Gigi/Maurice Chavaller

Whether you lean toward creationism or evolution, it's an important concept that our bodies have developed to accomplish specific tasks. Anatomy is a study of how things are put together. It's like looking at a labeled diagram of a car. Physiology on the other hand is a study of how things work; it shows us how the car is able to use its parts. This analogy only partially works in that while we have invented cars and generally do have some understanding of how they function, we still understand very little of how we work. Even the most developed (and expensive) procedures dealing with reproduction, such as in vitro fertilization, do little more than put a sperm and egg together and hope or pray they “do their thing”. Our lack of real understanding and controls in areas of reproductive science such as cloning and stem cell research intensify and confuse discussions of what these technologies could mean in our lives. It’s a lot easier to work on making faster or more economical cars where the physics and ethics are a lot clearer.

Female reproductive anatomy and physiology is fine tuned to baby making. Baby making however is all too often overwritten by emotions, personality, environment, situations, and life experiences. Rather than getting sidetracked down those alleys, let’s stick with the basics for now.
The external female genital organs—
the vulva, vagina, and cervical opening into
the uterus— are made up of tissues that
resemble skin under the microscope.
Getting pregnant can be a “tough”
experience. The vagina for
instance has to deal with sexual
intercourse, semen, vaginal
discharge, and menstrual bleeding.
Looking at vaginal and vulvar tissues under
a microscope, you notice that they are made up of cells which are
multilayered or thickened for protection. Incorporated into the external
opening of the vulva is the clitoris, a cluster of sensitive nerve endings
designed to be stimulated by sexual intercourse. This stimulation,
interpreted by the brain, is the source of the sexual sensations that can
help make reproduction a pleasurable and “attractive” experience. Wasn’t
the goddess nice not to have turned off these sensations other than during
a woman’s fertile period?

Once inside the cervix, however, things change dramatically. Suddenly
you find a delicate “feminine” single layer of cells whose function is to
facilitate or obstruct the passage of sperm. For most of the monthly
menstrual cycle, these gatekeepers keep the young aggressive sperm from
getting any further than the vagina; only surrounding the time of ovulation,
(the release of the egg from the ovary), do these “endocervical” cells open
the gates.
Microscopic sperm suddenly allowed entry into the uterus find themselves in a vast cavity. The relative journey they undertake and make is incredible, proportionally far greater than a trip across the United States! Racing sperm somehow find their way through the nooks and crannies of the uterus and into one of the two fallopian tubes where they again continue on their long and tortuous journey until they reach the very end of the fallopian tube where they lie in wait for or meet their mate. Here, in the majestic cavity of the distal fallopian tube, the most magic of all God’s or nature’s miracles takes place. Here sperm and egg come together and fertilize. You can philosophize and rationalize and argue all you want, but here truly is where human life begins.

Earlier we briefly discussed how we are all Adams and Eves in search of each other. Here again we encounter nature’s dating service, but in this instance there is an incredible disproportion of Adams. Millions of Adams are ejaculated into the vagina and hundreds of thousands of them survive to surround the “attractive” egg. One of these survivors, with the help of some of his friends, enters into the inner sanctum of the egg. There remains debate as to whether it is the sperm who makes his way in or, similar to so many other interactions Adams have with Eves, it is the egg which attracts the sperm, decides “whom” she allows in, and then lets the egocentric sperm “think” he got himself in. Either way, here within the egg, chromosomal packets of genetic information are forever wed and come together to direct the rest of our individual lives.

The happy couple then honeymoons in the fallopian tube for a week or so. During this time the newly formed couple, which is now a cell, is programmed to reproduce and begins to differentiate. We all start off as a single cell. This cell and the information within it keeps reproducing itself, making exact copies of the genetic instructions it contains. This in turn means that within each of our cells is all the information contained in the original cell. As cells
develop, they are eventually "instructed" to differentiate or specialize. As of this time, we have very little information as to how this process occurs or how to control it. As we unravel the genetic code, however, we have made recent exciting discoveries in these areas. As usual, however, big brother government is stepping in to decide what is in our (or its) best interests to pursue.

A parallel religious teaching is that the fetus knows all of the bible and its teachings, forgets it at the moment of birth, and then spends the rest of its life trying to relearn these teachings. Current research with stem cells is trying to learn how to use the process of "differentiation" to make cells do what we want. Is it playing God or physician to instruct cells to differentiate into a new heart for a terminally ill patient; to make cells secrete insulin in diabetics; to cure Parkinson's disease, Alzheimer's disease, and even cancer? In the not so distant future, the use of surgery to treat disease may be considered as antiquated and barbaric as leeches are today!

The young embryo matures and develops within the fallopian tube and is bathed in special fluids supplied by the tube as it is transported down this tunnel of love. Occasionally abnormalities or obstructions within the tube will interrupt this trip, and the embryo will mistakenly implant within the tube. This situation, known as an ectopic pregnancy, is a very dangerous situation in that, as opposed to the uterus, the tube is not programmed to grow along with the pregnancy. A fallopian tube containing a growing pregnancy will generally rupture and bleed within the abdomen, a life-threatening event for mom and of course baby. Diagnosing this possibility before the tube ruptures is one of the reasons it's a good idea to be seen and have a vaginal ultrasound early in the pregnancy- at about 7 weeks from the last menstrual period or 5 weeks from conception. Managed care plans may limit access to obstetrical providers until after the first trimester and may refuse sonograms. These plans know better but are run by individuals who feel that the loss of a few lives to ruptured ectopic pregnancies are a "reasonable" trade for the money saved. On the other hand, you are the ones who pick your health plan or provider- let the buyer beware. Those few dollars you saved each month on medical payments may come back to haunt you- and not just on Halloween!
Fortunately the embryo usually doesn't have a problem with its trip through the fallopian tube, and the toddler embryo ends its E ticket ride by being deposited into the uterine cavity where it checks out the local real estate until it finds a spot to build its first home. The embryo implants into the uterine lining which has been prepared for it and feeds off the nutrients in the local soil. Like so many computer games on the market today, the embryonic cells organize into groups and take on tasks to insure survival and development. Search parties drill for sources of food and oxygen; a shelter is constructed; chemicals are manufactured; defense systems are organized; communication networks are established; young cells go to school and learn to become productive adults. It's a wonder how we take for granted these daily miracles which are understood only on the most superficial levels. Studies of these miracles on sub cellular levels integrated with the concurrent development of computers and information technology are already yielding practical considerations and applications. We cannot even imagine where these developments will lead any more than our ancestors could predict what the world would be like before telephones, airplanes, or automobiles.

Here we now leave our embryo to grow and develop while we go back and look at some of the other players in this most amazing of stories.