**The Miracle of Life (1983), by NOVA** [1]

By: Maayan, Inbar Keywords: Human development [2]

The most-watched NOVA documentary ever made and a revolution in the understanding of human development, The Miracle of Life (abbreviated Life) employs the most current developments in endoscopic and microscopic technology to capture the intricacies of human development. Narrated by Anita Sangiolo and vividly illustrating the most minute and hard-to-reach parts and processes of living systems, this film truly flexes the muscles of the newest photographic technology of its time, with esteemed photographer Lennart Nilsson [3] behind the camera. Aired in 1983, Life was the first documentary of its kind, clearly explaining, in under an hour, biological systems that many people had never seen before. The film was written and produced by Bebe Nixon and directed by Bo G. Erikson. What follows is a description of the film, along with a brief analysis of its impact.

Life opens with a description of the origins of life in the ancient sea. Unicellular organisms swim around and mingle. These are explained as the first life forms on earth, the organisms that are at the base of the tree of life. More specifically, the cell is described as the fundamental unit of life, a unit that has persisted from the origins of life to this day. The division of a human body cell is shown, magnified to expose detail; each daughter cell carries the same information, and has the same structure as the parent. The DNA inside the cell, shown in the form of chromosomes, is what directs cell division and all other processes that begin and sustain life. High-resolution photography reveals the detailed, intricate structure of the chromosome.

Life then embarks on a journey never before depicted in such stunning detail: the process of human conception [4], development, and birth. The ovary [5] containing the eggs is filmed as it is gently brushed by the blood-engorged lumbiae at the mouth of the fallopian tube, which collect a mature egg [6] and help conduct it down the tube after ovulation [7]. Clarification is provided by way of a diagram of the female reproductive system that shows the processes of ovulation [7] and fertilization [8]. As the egg [6] enters the fleshy fallopian tube, muscular contractions and tiny swaying cilia conduct its motion toward the uterus [9]. An endoscopic view of the fallopian tube reveals the intricate folds of an organ whose diameter is only twice the thickness of a single human hair and five inches in length. The entire process of ovulation [7] is made possible by the sex hormones [10], which form colorful, complex patterns when crystallized and stained. Sex hormones [11] play a key role in regulating a woman’s reproductive cycle.

Attention now turns to the male reproductive system, which is also controlled by sex hormones [10]. A diagram showing the male reproductive system is used to explain the process by which sperm [12] and seminal fluid combine and exit the man’s body through the urethra during ejaculation. The film shows and explains each major component of the male reproductive system. At this point, a journey similar to the one taken through the fallopian tubes [13] is taken inside the penis, entering through the urethra. The flesh inside the penis is rich with blood vessels and lined by a mucous substance. The prostate, through which the urethra passes, is a spongy pink tissue that secretes fluid through orifices in its walls; this fluid is a component of the semen [14]. Next, the testicles are shown as they would appear were the scrotum removed. They are composed of millions of tiny, tightly meandering seminiferous tubes and are riddled with minute blood vessels. These tubes are the site of immense sperm [12] generation, and protect and nourish the sperm [12] as they mature in preparation for ejaculation. Since sperm [12] perform best when they develop at a temperature a few degrees below that of the body, the testicles are held outside the body in the scrotum. A thermal view shows that the lower part of the scrotum, where the testicles are nested, is considerably cooler than the part closer to the body. An extreme close-up taken inside the testis reveals millions of tangled sperm [12] in the process of formation. They are aided by nurse cells, which both nourish them and protect them from being attacked by the man’s immune system; having only 23 chromosomes, the sperm [12] are considered foreign bodies and thus potentially harmful.

After maturing, the sperm [12] are stored in the epididymis, where they become fully motile and ready for fertilization [8], should they be expelled. Exploring an individual sperm’s structure, Life explains that the sperm’s head contains the genetic material from the father, and is coated with enzymes and enzyme inhibitors. The enzyme inhibitors are only removed when the sperm [12] is preparing to attempt penetration of the egg [6] during fertilization [8]. The middle part of the sperm [12] contains fuel packets (mitochondria), which energize the motion of the sperm’s tail. While many of the sperm [12] form correctly, there is also a high percentage (up to 20%) that do not, exhibiting deformities such as multiple tails or being nearly headless. Many sperm [12] deformities are simply the result of elevated temperature of the testicles or other external conditions, including pollution, stress, poor nutrition, and smoking.

The drive to reproduce is emphasized as the force propelling the continuation of life on Earth. The courtship of human beings is depicted as a dance between male and female, where factors like arousal and attraction play a key role. The human eyes and skin are especially receptive to these factors; the skin is extremely sensitive and contains millions of nerve endings that encourage arousal. These nerve endings are most concentrated in the erogenous zones of the male and female bodies. Sexual arousal in the human male is triggered by signals from the brain that respond to external factors. These signals provoke a swelling of the erectile tissue in the penis, causing the penis to harden and elongate and its temperature to rise (as seen using thermal imaging). Once climax is reached, the various parts of the male reproductive system function in concert to propel the...
The most-watched NOVA documentary ever made and a revolution in the understanding of human development, The Miracle of Life's Greatest Miracle, was produced by NOVA in 2001, explaining some processes in greater detail and showcasing advancements in understanding and imaging technology.

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