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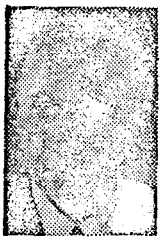

Joshua Lederberg

Science Can't Be Dogmatic About Virgin Birth in Man

BY COMMON knowledge, fertilization of an egg by a sperm is the indispensable route by which life is transmitted each generation. Vestiges of parthenogenesis — "virgin birth" — can, however, be observed in a number of animals. These remind us not to be too dogmatic about asserting that it could never occur as a natural process in man or (more likely still) by the calculated use of some principles learned from experimental biology.

Some technicalities have to be remembered. In many mammals, the implantation of a fertilized egg into the uterus of a virgin female is a commonplace surgical operation. This would certainly work in man: two women, infertile for different reasons, might cooperate to mother a child neither could produce alone. So far as I know, this experiment has not been reported, but it has surely been attempted.

Many fertilized eggs that fail to implant could be recovered and reimplanted. However, this is not parthenogenesis, which is the development of an egg that has not been fertilized.

THE MOST striking example of natural parthenogenesis has been studied in turkeys by Dr. M. W. Olsen of the Agriculture Department. Certain breeds had long been known to lay eggs that, although sterile, would undergo a limited amount of development. For many generations, Dr. Olsen selected hens whose eggs showed progressively greater capacity for this.

He eventually produced a flock among whose unfertilized eggs several per cent hatch out into full-fledged birds. These are males, as is expected with birds. Although themselves fatherless, they have been used to father new generations of birds and help propagate this interesting potential for parthenogenesis.

Just how the genetic makeup of this flock facilitates spontaneous development is not yet understood. The presence of fowlpox virus as well as of a group of genes contribute to it. We face the most interesting questions both in basic biology and for its human application.

Limited parthenogenetic development has been repeatedly observed in mammalian eggs, and probably sometimes in man. The embryos usually die at a very early stage. Some of this poor survival may be attributed to genetic weaknesses of the parent that become exposed in isolated sets of genes. In rabbits, chilling the eggs regularly provokes a limited development.

IN 1939, THE late Gregory Pincus—who later contributed so significantly to the development of oral contraceptives—reported having brought five parthenogenetic rabbits out of a great many to full term, one surviving to an adult breeding stage. These experiments are now regarded rather skeptically, not having been confirmed in other laboratories so far—but no comparable efforts have been made, either.

In fish and reptiles, parthenogenesis occurs naturally in a number of forms, usually as an escape hatch for the species if males are scarce or too widely dispersed. In amphibia, parthenogenesis is easy to produce in the laboratory by injecting minute quantities of cell extracts into unfertilized eggs.

What about man? The odds of eventually contriving parthenogenesis seem very high; we then would need a detailed consideration of the human purposes it might serve or abuse. As to its natural occurrence, a cautious assertion is that it is very rare—probably fewer than one per million births.

In England about ten years ago, Dr. Helen Spurway publicized the question and Dr. S. Balfour-Lynn studied a number of respondents. One mother was indeed remarkably similar to her daughter when blood groups were tested.

The claim of parthenogenesis was put in doubt by the mother's rejection of a test skin-graft from the daughter, but more recent work on graft-compatibility makes this test now seem less decisive than it once did.