

# The Cloning of a Man: Debate Begins

A millionaire, with the aid of scientists, creates an infant that is an exact genetic copy of himself. True or false? David M. Rorvik, author of a book soon to be published, says that he helped arrange the first cloning of a human being and has seen the asexually produced boy, now 14 months old. Yale scientist Clement Markert, whose own research involves asexual reproduction in mammals, calls that claim "an absolute fraud." Other scientists, Jonathan Beckwith and Ethan Signer, say whether or not the claim is true, cloning of humans will be possible before long, and society must now consider its implications.

In a statement issued by the publisher, J. B. Lippincott Co., Rorvik says, "A refinement of existing cell-fusion techniques was used in the first cloning of a man—a feat achieved by a team with millions of dollars at its disposal." But Rorvik refuses to identify any of the participants or to offer corroborative evidence. Another publisher, Simon and Schuster, earlier declined to publish the book because Rorvik would not document his claims.

Prompted by public interest in the book, a group in Washington has requested information about federally funded research on asexual reproduction of mammals, including human beings. Peoples Business Commission sent Freedom of Information requests to NIH, NSF, CIA, FBI, and Departments of Defense and Agriculture. They also filed a court suit to expedite the requests' processing. Jeremy Rifkin and Ted Howard of the group say the public needs immediate access to research on cloning, fertilization and gestation in the laboratory, and in embryo implantation "to ascertain the nature and extent of government involvement in the alleged creation of human clone[s]." Beckwith, who finds the claims of the book "incredible," sees it as a mechanism for opening discussion. "What is relevant is that such a clonal man is conceivable given the progress in medical and biological research," Beckwith says. "It is time for the establishment of some kind of national forum for discussion in the implications of this research." According to Signer, the research raises such questions as: Who are to be donors of nuclei for cloning? Who will be responsible for cloned offspring? Should money and time be invested in cloning at the expense of other medical needs? Who is to make the decisions regarding cloning?

Scientists questioned were skeptical of the claims of human cloning. Markert says that no one known to the scientific community has given public evidence of successful cloning with any vertebrate animal. Even in the experiments with frogs, the transplanted nucleus comes from a

tadpole, not an adult animal. Markert estimates that there are only 12 laboratories in the world able to do the requisite microsurgery. "It's not possible to have an unknown so-called scientist succeed working in his basement," he says.

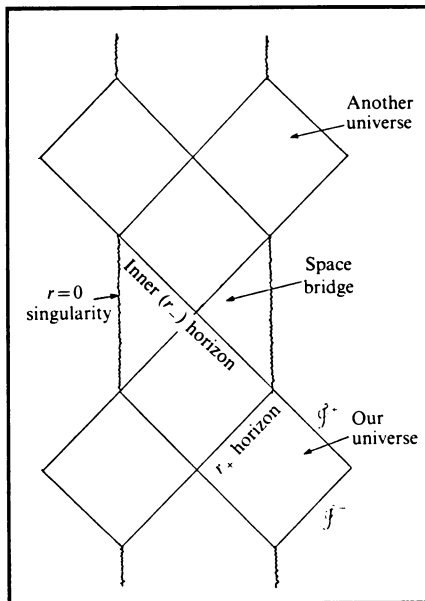
Although he does not believe cloning is possible as described in Rorvik's book, Markert told SCIENCE NEWS that a limited type of cloning is already possible and likely to be applied to domestic animals. Markert and Peter Hoppe of the Jackson Laboratory in Bar Harbor, Maine, described recent experiments in which they changed the genetic material in fertilized mouse eggs. Using microsurgical techniques, they removed one pronucleus (the sac containing one set of chromosomes, either from the male or female parent) from an egg six hours after fertilization. The remaining pronucleus then duplicated, and the two pronuclei merged, giving an egg with two identical sets of chromosomes. The embryos were implanted in female mice and seven offspring of such manipulation have been born; five with all genes derived from the mother, two with all genes derived from the father. Being completely homozygous, all the successful embryos have two X chromosomes and thus are female. That procedure is different from what is generally thought of as cloning. Although all the

genes come from a single adult mouse, they consist of two copies of half the donor mouse's genetic material, rather than a single copy of each donor gene. "This is the highest state of the art now," Markert says. "No one has done any more."

However, it is possible to produce a clone of mice by simply extending that technique. If the procedure is repeated on eggs from any of the completely homozygous mice, offspring with maternal genes will be exact genetic copies of their mothers. Markert expects experiments on such cloning of valuable domestic animals to begin in a few months. His laboratory is currently working on rats, and he expects no barrier to success in rabbits and cows.

Clones of domestic animals, he says, are very much on the contemporary agenda of research. However, neither Markert nor Hoppe foresee human applications of cloning. Hoppe says, "It is a fascinating tool for research purposes, but I would never condone it in humans." Markert says the cloning techniques have "no important potential for human beings." He points out that the success rate in manipulating mouse eggs was exceedingly low. It took hundreds of eggs to produce seven offspring. Such vast amounts of human material are not available. To the claims in Rorvik's book, Markert reacts: "Someone in Lippincott is a publicity genius." □

## We have to stay in our own universe



Going from our universe to another by way of a space bridge provided by black holes. This is a mathematician's conformal diagram, in which time flows vertically and space is represented horizontally.

Black holes are one of the most fascinating features of contemporary physics. At present they are mostly theoretical curiosities, although some astronomers believe there is evidence for actual ones in the sky. Astrophysically a black hole is a star that has finished its nuclear burning and collapsed to a fantastically dense state. Mathematically it is a place where space and time seem to stop.

Black holes are called black because they form, in a sense, horizons to the observable universe. Things that fall into them don't come back. You can't see into them, because any light that might be generated inside them never gets out. A black hole's gravitational field is so strong that the light is infinitely redshifted. In the center of a black hole is a singularity, a place where the laws of physics may no longer apply, and where space and time seem to disappear.

Is a black hole, perhaps, "the drain" down which so many beloved things are said to have gone? Is it a way out of the universe, a doorway or a tunnel into some other universe, of whose existence we are otherwise unaware? The mathematics has