

# 20 years since the first sheep was cloned — are we ready for humans?

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Dolly the Sheep at the National Museums of Scotland, in Edinburgh, Scotland. Wikimedia Commons

It was a glorious day in the hills above Edinburgh, Scotland, when old friends and co-workers Ian Wilmut and Alan Trounson set off on a hike. It was 20 years ago. High over the city, Wilmut confided that he had a secret to share. Wilmut and several co-workers had birthed a lamb in the lab — not from a mother and father sheep, but from DNA taken from an adult sheep. They had successfully cloned a mammal.

“Crikey! I was stunned,” says Trounson, a stem cell biologist. He remembers sitting down hard on a nearby stone on a warm day, having a chill come over him as he realized the implications. “It changed everything,” he says.

The success led to dark and fantastic predictions: whether humans could be cloned, whether diseases could be stopped or whether children could be born again.

Today, more than 20 years after Dolly’s birth on July 5, 1996, the impact of cloning on basic science has gone beyond anyone’s expectations. However, the form of cloning used with Dolly has largely faded from public consciousness.

## **Human Clones Are Only In Movie Scripts**

In 2016, cloning a person remains something scientists cannot do. There is no scientific benefit to it and it carries an unacceptable level of risk to the person, several scientists say. Most know of no one even considering the feat. The cloning of animals remains limited. Although there will likely be more of it.

Some agricultural cloning is used in the U.S. and China but the European Parliament voted last year to ban cloning animals for food. One scientist in South Korea is charging \$100,000 to clone pets, but the desire for such a service remains unclear.

Cloning's biggest impact may be in the stem cell advances it has sparked, say scientists.

## **Stem Cells Are The Future**

Cloning has advanced the study of stem cells. Scientists can clone adult cells to make stem cells that can form a wide range of other cells. This has reduced the need for taking stem cells from embryos. Embryos are fertilized eggs or fetuses. The cells they take are from embryos in a laboratory, not from a womb. Still, embryonic stem cells have long caused moral concerns for some.

Dolly's birth was transformative. It proved that the nucleus, or central core of the adult cell, had all the DNA necessary to give rise to another animal.

"Dolly was the first example of taking an adult cell and getting an adult," says stem cell biologist Robin Lovell-Badge. "That meant you could reprogram an adult cell nucleus back to an embryonic stage."

Dolly died on Feb. 14, 2003, at age 6 from a lung infection, which is common among animals who are not given access to the outdoors. It probably had nothing to do with her being a cloned animal, said Ian Wilmut.

## **Preoccupied With If You Could, You Didn't Stop To Think If You Should**

Wilmut says he thinks it would be possible to clone a human, though that doesn't mean he thinks it is a good idea. The cloning technique used to create Dolly has been shown to not work in primates. While he believes it could be possible to clone a person, he is vehemently against the idea.

"Just because it may now work in the sense of producing offspring doesn't mean to say we should do it," he says.

There is a potentially large market for cloned livestock. In 2008, the U.S. government decided there were no evident differences between cloned and non-cloned cows, goats and pigs, so they allowed the process to continue, although mainly for breeding rather than meat. In China, a company has plans to produce at least 100,000 cloned beef cattle.

Theoretically, cloning could bring back endangered species. There has been talk of using it to restore woolly mammoths, giant pandas and even an extinct species of Ice Age humans called Neanderthals. Lovell-Badge dismisses these ideas as “fairly silly.”

The idea of cloning a loved one—human or pet—who has passed away has fallen out of favor. This is in part because we have come to understand the part that environment plays in determining behavior. The genetics might be the same, but would a clone still be the same lovable individual? Personally, Lovell-Badge thinks the idea of cloning a pet is “stupid.”

Lovell-Badge is even more dismissive of the idea of cloning a person. “We’d have to know an awful lot more about reprogramming and how to make it 100 percent efficient,” he says. “I have never thought of a good enough reason [to clone] a human being.”