

**J**EFF NISKER HAS THIS NIGHTMARE. He's no longer a renowned doctor, researcher and ethicist but instead an eight-year-old boy on his first trip to Disney World. He's entering Peter Pan's Neverland when suddenly he sees himself in the mirror. But wait, he says. Is that me? No, it's an exact replica. An hour later, he's climbing aboard a boat to cruise past the mechanical dolls that twirl and bow to that little jingle "It's a Small, Small World." And there he is again! Up there, two boats ahead. Someone else, just like Jeff, but this time he's wearing a different baseball cap. Is that another me. Jeff wonders? How many of me are there?

That eerie image comes to Nisker's mind as he imagines a world in which it would be possible to create baby duplicates — lots of them. He shudders at the thought of all those identical human beings manufactured in a lab somewhere: "It has a yuck factor of more than nine," says Nisker, a 49-year-old expert in reproductive endocrinology at the University of Western Ontario in London. Yet that world, as Nisker well knows, is no longer the stuff of science fiction. A human clone may be born sooner than we think.

Since 1996, when Dolly the sheep became the first mammal to be copied from an adult, scientists have made exact copies of adult mice and cows. In 1997, two rhesus monkeys were cloned from embryos. Now some fertility doctors are talking about copying human embryos in the lab to improve a woman's chances of having a baby.

The race to create the first human clone is on. Just last December, a South Korean researcher claimed to have created an embryo by copying the genetic material of an infertile adult woman. Had the embryo grown into a human, he or she would have been the world's first manufactured clone, an exact genetic copy of an adult human.

Nisker has been watching these developments with growing alarm. He once ventured to the cutting edge of the world of assisted reproduction — to that place

where scientists discovered they had the power to create baby duplicates in the lab — and he turned back in horror.

Cloning wasn't his goal. Nisker was motivated by the dismay of watching women terminate 20-week-old fetuses that had a genetic defect. As a medical resident in London, Ont., he had



Cloning could lead to genetically engineered humans who would have full heads of hair, Nobel Prize winners' IQs and Barbie-doll legs

watched one woman go through labour and deliver a doomed fetus that cried for a few moments before dying. "It was the worst thing I'd ever seen," he says. As a doctor who still sang Sixties peace songs and believed he could help make a better world, Nisker sprang into action. There must be a way to diagnose these awful conditions earlier, he thought.

And so there was — much earlier, two or three days after fertilization in a Petri dish, in fact. As head of pre-implantation diagnosis research at London Health Sciences Centre, one of the two largest such centres in the world at the time, Nisker helped pioneer the technique of analyzing a single cell from a minute eight-cell embryo to identify specific genes before the embryo is transferred into a woman's womb.

That research was coming along nicely in 1993 when Nisker went to Montreal

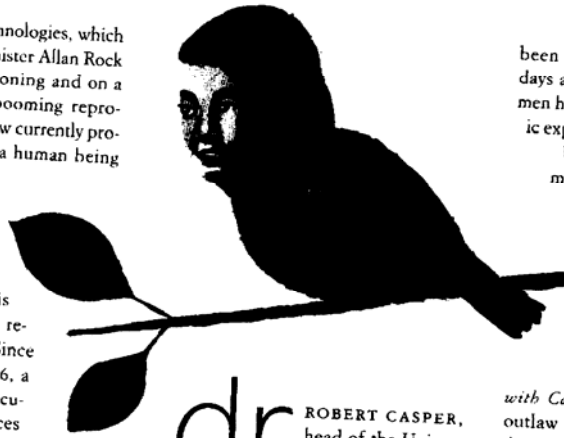
for an American Fertility Society meeting. There Jerry Hall dropped the cloning bombshell. Hall, director of the in vitro lab at George Washington University Medical Center in Washington, D.C., announced that he and his supervisor, Robert Stillman, had created 48 clones from human eggs in the laboratory at the university. The researchers won the conference's first prize, but the implications made Nisker squirm in his seat — especially since Hall had borrowed some of the ideas and techniques developed in Nisker's lab. "I was probably the only one in the audience who was bothered by this," says Nisker. "The first thing that hit me was that Abby Lippman was right." Lippman, a feminist and professor of epidemiology and biostatistics at McGill University in Montreal, has written about the dangers of altering the genetic blueprint of human beings. "She had been warning me. She said, 'Jeff, you're an altruist, but the stuff you're developing is going to be awful. You should stop right now.' And I didn't believe her that people would use it. She was right."

**N**ISKER FEARED THAT CLONING could lead to genetically engineered human beings who would have full heads of hair, Nobel Prize winners' IQs and Barbie-doll legs. So Nisker did something highly unusual for a modern scientist: He halted his experiments and became an ethicist. That was six years ago. These days, Nisker wears his clothes casual and his curly hair long, though it now has a touch of grey. While scientific colleagues are venturing into uncharted territory, Nisker spins out stories because they're a good way to talk about good and evil and about the hazy line that separates the two in today's world of medicine. He's even written the lyrics for a musical, *Orebirds*, that deals with the issues around cloning.

Offstage, he is co-chair of the National Advisory Committee on Reproduc-

tive and Genetic Technologies, which is advising Health Minister Allan Rock on the question of cloning and on a bill to regulate the booming reproductive business. No law currently prohibits the cloning of a human being in Canada, but if Nisker has his way that will change: He thinks cloning should be outlawed in virtually all cases. His task is complicated by recent developments. Since Dolly was born in 1996, a growing chorus of articulate and powerful voices in science and philosophy has emerged to say that maybe cloning isn't so bad after all.

These pro-cloners, most of them outside Canada, say that our intuitive revulsion about cloning is nothing more than prejudice, based on ancient mythology and religion and ignorance of genetics. Facing those fears squarely, they say, will erase them as quickly as a nightmare fades in the clear light of morning.



**dr.** ROBERT CASPER, head of the University of Toronto's division of reproductive sciences and past president of the Fertility and Andrology Society of Canada, is one Canadian scientist who has changed his mind about cloning. He's a thoughtful and prominent researcher, a straitlaced individual who fills his office with diplomas, pictures of his wife and two boys, and Matisse-style paintings by his mother. Casper has

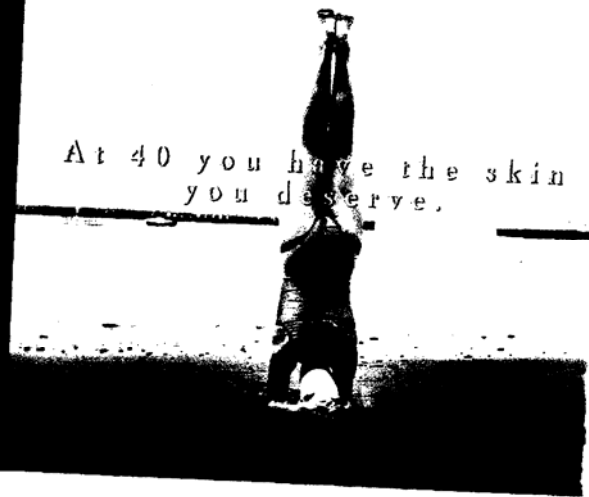
been friends with Nisker since their days as medical residents, and the two men have collaborated on some scientific experiments.

Unlike Nisker, Casper coolly dismisses the arguments against cloning. "People are going out of their way to imagine a sci-fi syndrome," he says. He thinks in particular of Dr. Patricia Baird, a university distinguished professor at UBC and the author of a major national report, *Proceed with Care*, that called on Canada to outlaw reproductive cloning. To this day, Baird fears that human clones could be raised merely to supply spare parts for other humans. "That's just nonsense," says Casper. "I can't believe someone of her stature would put forward such an argument."

Casper says that doctors are already messing with Mother Nature in the creation of new humans. They're literally sticking sperms into eggs to create new life. They're withdrawing cells from embryos to test for genetic de-



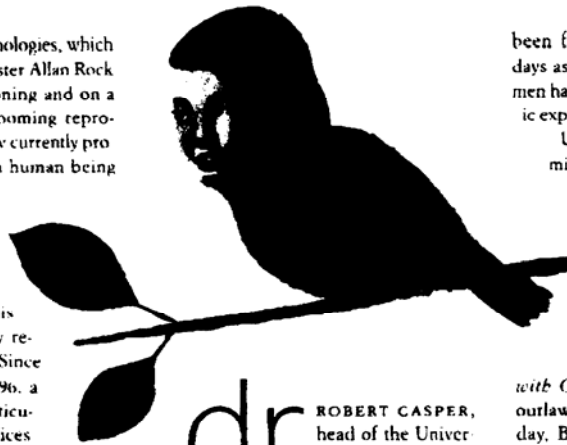
At 20 you have the skin you were given.



At 40 you have the skin you deserve.

tive and Genetic Technologies, which is advising Health Minister Allan Rock on the question of cloning and on a bill to regulate the booming reproductive business. No law currently prohibits the cloning of a human being in Canada, but if Nisker has his way that will change: He thinks cloning should be outlawed in virtually all cases. His task is complicated by recent developments. Since Dolly was born in 1996, a growing chorus of articulate and powerful voices in science and philosophy has emerged to say that maybe cloning isn't so bad after all.

These pro-cloners, most of them outside Canada, say that our intuitive revulsion about cloning is nothing more than prejudice, based on ancient mythology and religion and ignorance of genetics. Facing those fears squarely, they say, will erase them as quickly as a nightmare fades in the clear light of morning.



dr.

ROBERT CASPER, head of the University of Toronto's division of reproductive sciences and past president of the Fertility and Andrology Society of Canada, is one Canadian scientist who has changed his mind about cloning. He's a thoughtful and prominent researcher, a straitlaced individual who fills his office with diplomas, pictures of his wife and two boys, and Matisse-style paintings by his mother. Casper has

been friends with Nisker since their days as medical residents, and the two men have collaborated on some scientific experiments.

Unlike Nisker, Casper coolly dismisses the arguments against cloning. "People are going out of their way to imagine a sci-fi syndrome," he says. He thinks in particular of Dr. Patricia Baird, a university distinguished professor at UBC and the author of a major national report, *Proceed with Care*, that called on Canada to outlaw reproductive cloning. To this day, Baird fears that human clones could be raised merely to supply spare parts for other humans. "That's just nonsense," says Casper. "I can't believe someone of her stature would put forward such an argument."

Casper says that doctors are already messing with Mother Nature in the creation of new humans. They're literally sticking sperms into eggs to create new life. They're withdrawing cells from embryos to test for genetic de-



At 20 you have the skin you were given.



At 40 you have the skin you deserve.

**J**EFF NISKER HAS THIS NIGHTMARE: He's no longer a renowned doctor, researcher and ethicist but instead an eight-year-old boy on his first trip to Disney World. He's entering Peter Pan's Neverland when suddenly he sees himself in the mirror. But wait, he says. Is that me? No, it's an exact replica. An hour later, he's climbing aboard a boat to cruise past the mechanical dolls that twirl and bow to that little jingle "It's a Small, Small World." And there he is again! Up there, two boats ahead. Someone else, just like Jeff, but this time he's wearing a different baseball cap. Is that another me, Jeff wonders? How many of me are there?

That eerie image comes to Nisker's mind as he imagines a world in which it would be possible to create baby duplicates — lots of them. He shudders at the thought of all those identical human beings manufactured in a lab somewhere: "It has a yuck factor of more than nine," says Nisker, a 49-year-old expert in reproductive endocrinology at the University of Western Ontario in London. Yet that world, as Nisker well knows, is no longer the stuff of science fiction. A human clone may be born sooner than we think.

Since 1996, when Dolly the sheep became the first mammal to be copied from an adult, scientists have made exact copies of adult mice and cows. In 1997, two rhesus monkeys were cloned from embryos. Now some fertility doctors are talking about copying human embryos in the lab to improve a woman's chances of having a baby.

The race to create the first human clone is on. Just last December, a South Korean researcher claimed to have created an embryo by copying the genetic material of an infertile adult woman. Had the embryo grown into a human, he or she would have been the world's first manufactured clone, an exact genetic copy of an adult human.

Nisker has been watching these developments with growing alarm. He once ventured to the cutting edge of the world of assisted reproduction — to that place

where scientists discovered they had the power to create baby duplicates in the lab — and he turned back in horror.

Cloning wasn't his goal. Nisker was motivated by the dismay of watching women terminate 20-week-old fetuses that had a genetic defect. As a medical resident in London, Ont., he had



Cloning could lead to genetically engineered humans who would have full heads of hair, Nobel Prize winners' IQs and Barbie-doll legs

watched one woman go through labour and deliver a doomed fetus that cried for a few moments before dying. "It was the worst thing I'd ever seen," he says. As a doctor who still sang Sixties peace songs and believed he could help make a better world, Nisker sprang into action. There must be a way to diagnose these awful conditions earlier, he thought.

And so there was — much earlier, two or three days after fertilization in a Petri dish, in fact. As head of pre-implantation diagnosis research at London Health Sciences Centre, one of the two largest such centres in the world at the time, Nisker helped pioneer the technique of analyzing a single cell from a minute eight-cell embryo to identify specific genes before the embryo is transferred into a woman's womb.

That research was coming along nicely in 1993 when Nisker went to Montreal

for an American Fertility Society meeting. There Jerry Hall dropped the cloning bombshell. Hall, director of the in vitro lab at George Washington University Medical Center in Washington, D.C., announced that he and his supervisor, Robert Stillman, had created 48 clones from human eggs in the laboratory at the university. The researchers won the conference's first prize, but the implications made Nisker squirm in his seat — especially since Hall had borrowed some of the ideas and techniques developed in Nisker's lab. "I was probably the only one in the audience who was bothered by this," says Nisker. "The first thing that hit me was that Abby Lippman was right." Lippman, a feminist and professor of epidemiology and biostatistics at McGill University in Montreal, has written about the dangers of altering the genetic blueprint of human beings. "She had been warning me. She said, 'Jeff, you're an altruist, but the stuff you're developing is going to be awful. You should stop right now.' And I didn't believe her that people would use it. She was right."

**N**ISKER FEARED THAT CLONING could lead to genetically engineered human beings who would have full heads of hair, Nobel Prize winners' IQs and Barbie-doll legs. So Nisker did something highly unusual for a modern scientist: He halted his experiments and became an ethicist. That was six years ago. These days, Nisker wears his clothes casual and his curly hair long, though it now has a touch of grey. While scientific colleagues are venturing into uncharted territory, Nisker spins out stories because they're a good way to talk about good and evil and about the hazy line that separates the two in today's world of medicine. He's even written the lyrics for a musical, *Orebid*, that deals with the issues around cloning.

Offstage, he is co-chair of the National Advisory Committee on Reproduc-

fects. They're drilling holes in the sides of embryos to help them stick to the walls of the uterus. Even when he thinks about Dolly-style cloning - in which a baby is a genetic copy of an adult - he sees nothing morally wrong with it. It's neither good nor evil. It's just an extension of existing assisted reproduction techniques.

Most important, Casper points out, is the fact that opponents of cloning usually base their arguments on a gross misconception: "People are fooling themselves if they think scientists are making an identical person." Clones created in the lab are no different from identical twins that occur naturally in one in 300 births. Naturally born identical twins have identical genetic imprints, and yet they hardly fit the popular image of soulless zombies. But identical twins are conceived naturally, say opponents of cloning, whereas clones are manufactured. It is the manufacture of humans that disturbs so many opponents of cloning. It plays on an ancient fear, the terror of breaking the deepest laws of nature.

**N**O ONE HAS BROKEN THE deepest laws of nature where human reproduction is concerned in more innovative ways than the Danish-born developmental biologist Steen Willadsen. He is a visionary scientist, a clone cowboy who once owned part of a cattle cloning company in Calgary. He has done a lot of groundbreaking, even bizarre things with animal embryos. A pioneer in sheep cloning, he's also created strange creatures that are part goat, part cow. He still has the skin of one calf-lamb, although a mouse in his Calgary garage ate part of it. These days, as a consultant to a New Jersey hospital, he's putting the nuclei of human embryonic cells into cow eggs. It's not that he wants to make a cow-man; the purpose is to examine the human genetic material for possible defects.

So Willadsen, who has a doctorate in reproductive physiology, is not impressed by those who are scared of breaking the laws of nature. "The laws of nature are nothing but the laws of man," he says. "Who knows the laws of nature?" On a

rainy spring day, Willadsen, dressed in green operating room scrubs and tennis shoes, is peering into a microscope in an in vitro fertilization lab, where he works with his wife, Carole, an embryologist. The task at hand is pretty conventional by today's standards. His right hand holds a joystick that's connected to a needle dipped into a Petri dish. With a jerk of his hand, he sticks a sperm in to a minuscule human egg. He feels no awe about creating potential new lives; he's too busy chatting and bickering with Carole.

Why, Willadsen wonders, are the opponents of cloning so disturbed by the manufacture of new humans? What difference does the method of conception make? "I don't know anyone who has to answer under what circumstances their children were conceived. Who cares? It's between you and..." His voice trails off. Government, Willadsen says, should not interfere with the human desire to reproduce - whether it takes place in the bedroom or the laboratory. "We're not talking about changing the world, just about having kids."

