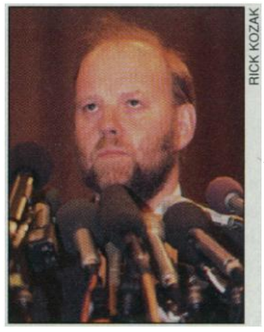
BIOMEDICAL POLICY

Mammalian Cloning Debate Heats Up

The hubbub over the cloning of Dolly, a Scottish mountain sheep, continued without letup last week. Experts of every type—and nonexperts—offered opinions on how the technique developed at the Roslin Institute in Edinburgh, Scotland, might change the way humans reproduce and, some said, destroy human dignity. Members of Congress rushed forward with bills to outlaw human cloning, state legislators from Alabama to California also proposed new laws, and the National Bioethics Advisory Commission (NBAC) began taking testimony on whether the government should outlaw the cloning of people.



RICK KOZAK

Cloner. Wilmut sees "no good reason" to clone human beings.

President Clinton has asked the NBAC to write an opinion by the end of May to guide the Administration. Until then, he has banned all federally funded human-cloning research. If the NBAC's initial sessions on 13 and 14 March are any guide, NBAC members may have a hard time reaching a consensus. The witnesses, chiefly lawyers and ethicists, offered widely differing views. For example, Leon Kass, an ethicist at the University of Chicago, urged the NBAC to recommend a sweeping ban on human cloning, warning that it "represents something radically new." The NBAC should act, he said "as if the future of humanity may lie in the balance." But another ethicist, Ruth Macklin of Albert Einstein College of Medicine in New York City, suggested that it's not clear that cloning of a person would violate anyone's human rights and so should not be banned reflexively.

While the debate at the NBAC probed such extremes, the Senate subcommittee on public health and safety—chaired by the only physician in the U.S. Senate, heart-transplant surgeon William Frist (R–TN)—took a more moderate and pragmatic approach at a hearing it held on 12 March. The purpose of the hearing, Frist made clear, was to examine the benefits cloning might offer to agriculture, research, and medicine—and to cool down an overheated public discourse.

The star witness at the session was Dolly's "father," Ian Wilmut, the embryologist who headed the cloning team in Edinburgh. At a crowded press conference and later, during his testimony, Wilmut dodged questions about how the new technology ought to be regulated. When pressed by one senator, however, Wilmut said that he could imagine "no good reason" to clone a person. At Frist's invitation, Wilmut and Harold Varmus, director of the National Institutes of Health, concentrated instead on cloning's promise as a technology.

Armed with props—a chart showing the development of an embryo and giant photos of a nucleus being inserted into a mouse egg—Varmus gave the senators what he called a "Bio 101" lesson. He suggested that Wilmut's technique might help reveal how the environment within the cells of the early embryo regulates gene function. Such information, Varmus said, might eventually help in combating genetic diseases by allowing researchers to turn good genes on or bad genes off.

In the near-term, though, Wilmut said, cloning's most likely applications will be in allowing researchers "for the first time to make precise modifications" of the DNA of farm and laboratory animals. The technique used on Dolly might make it possible to create large numbers of custom-designed transgenic animals that secrete medically useful human proteins in their milk, he suggested. Some candidates for this kind of mass production, Wilmut said, are human clotting factor and fibrinogen, which aids in healing wounds. He also suggested that cloning might be used to create model animals for research, such as a sheep designed to replicate the effects of human cystic fibrosis. And he predicted that in 5 to 10 years, cloning techniques may be used to generate tissues for organ replacement.

Both Varmus and Wilmut argued that it is important to make a distinction between the cloning of humans and the cloning of human tissue. In addition, they asked that Congress wait for the results of the NBAC review before rushing to enact new laws.

They have reason to be concerned about that. Already, Representative Vernon Ehlers (R–MI) has introduced two bills—one (HR 922) that would prohibit spending federal funds on "any project of research that involves the use of a human somatic cell for the process of producing a human clone," and another (HR 923) that outlaws the use of such a cell "for the process of producing a human clone." Senator Christopher Bond (R–MO) likewise introduced a bill (S 368) that bans the use of federal funds "for research with respect to the cloning of a human individual."

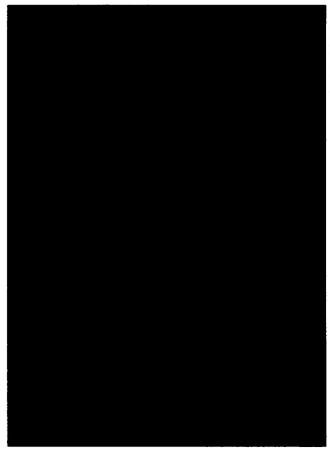
As a practical matter, every witness at the Senate hearing said, no one is going to clone a human being in the next 90 days, so Congress will take no risks if it waits for the NBAC's advice before acting on these proposals.

–Eliot Marshall

PLANT PATHOLOGY

ATCC Plant-Virus Collection Threatened

In the past few weeks, plant scientists have been trading e-mails and faxes warning that the most diverse collection of plant viruses in the world could be in jeopardy. Their fears were sparked when they learned that in order to cut costs, the American Type Culture Collection (ATCC)—a vast library of microbial cultures that is a vital resource for researchers around the world—has decided, for now, not to include a greenhouse in its new facility, which is being built outside Washington, D.C., near Manassas, Virginia. Moreover, as a further money-saving step, the ATCC, a private, nonprofit organization now headquartered in Rockville, Maryland, recently dismissed the curator of its extensive plant-virus collection. "There is the real possibility that the plant-virus collection will deteriorate and possibly be abandoned," worries Michigan State University plant pathologist Gus de Zoeten.



G. DE ZOETEN

Homeless? Plant viruses, such as this ring spot virus, may lose their home at ATCC.

ATCC officials say that they want to protect and even enlarge the collection but concede that it may be difficult. At risk are isolates of more than 1000 plant viruses and viroids—smaller plant pathogens consisting of small, naked, circular RNAs. While not in as high demand as the ATCC's other products, samples of viral pathogens from these standardized cultures are crucial to understanding—and thwarting—plant diseases, says plant pathologist Anne Vidaver of the University of Nebraska. Without them, she says, "it is not likely that many microbial studies can be replicated by other scientists." The ATCC also produces various diagnostics, such as probes used to screen seeds for viruses before they are planted.

The problem, says ATCC President Raymond Cypess, is that the plant-virus collection runs an annual deficit of about $150,000. Currently, the