I thank the Chair.

Mr. BOND addressed the Chair.

The PRESIDING OFFICER. The Senator from Missouri.

Mr. BYRD. Will the Senator from Missouri yield?

Mr. BOND. For a brief comment?

Mr. BYRD. For a brief comment.

Mr. BOND. I am happy to yield.

Mr. BYRD. I want to thank the distinguished Senator from Missouri for his patience in listening to this discussion that has been going on. He is going to manage a bill, but he has been very patient, and I think we imposed on him. I just wanted to apologize and thank him.

Mr. CHAFEE. I also thank the distinguished Senator from Missouri because he let us proceed. He was to go at 11:30. We thank him very much for his time.

The PRESIDING OFFICER. The Senator from Missouri.

Mr. BOND. Mr. President, I have to say that it is very enlightening to listen to my two distinguished colleagues debate this very important matter. Were it not for the schedule of the Senate, I far prefer to be enlightened and edified by these two great leaders of our time. Unfortunately, I believe the time has come for us to move on with other business.

HUMAN CLONING PROHIBITION ACT—MOTION TO PROCEED

Mr. BOND. Mr. President, I ask unanimous consent that the Senate now turn to the consideration of Calendar No. 304, S. 1601, regarding human cloning.

The PRESIDING OFFICER. Is there objection?

Mrs. FEINSTEIN. I object.

The PRESIDING OFFICER. Objection is heard.

Mr. BOND. In light of the objection from the other side of the aisle, I now move to proceed to S. 1601.

The PRESIDING OFFICER. Is there debate on the motion?

Mrs. FEINSTEIN. Mr. President, I wish to debate the motion.

The PRESIDING OFFICER. The Senator from California may proceed.

Mrs. FEINSTEIN. Mr. President, this is a rush to judgment on one of the most fundamental issues of the 20th century. Mr. President, this is not renaming National Airport Ronald Reagan Airport.

Mr. President, I submit respectfully to the distinguished Senators on the other side of the aisle that this is a major debate that has scientific implications, moral implications and ethical implications. It is a debate, also, that involves one of the most difficult areas of science involving human genetics, with a vocabulary and a lexicon that is not understood by the great bulk of the American people and certainly not by many of us in the U.S. Senate.

Both the Bond-Frist bill and the Feinstein-Kennedy bill dealing with the subject of human cloning were introduced less than 48 hours ago—48 hours. No hearings have been held on either bill, no floor debate has been held on either bill. The medical community, the research community, patients with currently incurable diseases whose cure we might affect by both of these bills have barely read the bills, much less analyzed them.

As a matter of fact, the letters are now beginning to pour in. I ask unanimous consent to have printed in the RECORD a 9-page statement of the Biotechnology Industry Organization regarding legislation introduced to ban human cloning and a letter to Senator MACK from the American Association for Cancer Research.

There being no objection, the material was ordered to be printed in the RECORD, as follows:

STATEMENT OF THE BIOTECHNOLOGY INDUSTRY ORGANIZATION REGARDING LEGISLATION INTRODUCED TO BAN HUMAN CLONING

The Biotechnology Industry Organization (BIO) believes that it is both unsafe and unethical to even attempt to clone a human being. BIO strongly supported the review of this issue by the National Bioethics Advisory Commission (NBAC) and the moratorium on cloning imposed by President Clinton. We believe that the FDA has clear authority and jurisdiction and will, as they have stated, prohibit any attempt to clone a human being.

BIO is concerned about the scope and impact of legislation introduced to make it a crime with a ten year prison sentence to conduct biomedical research which may or may not have any relevance to the cloning of a human being. We are very concerned about the rushed process to pass legislation on this complex subject and the possibilities for unintended consequences. The scientific and legal issues with respect to any legislation regarding biomedical research are exceedingly technical, and a hastily drafted bill could advertently and inadvertently damage biomedical research on deadly and disabling diseases.

The Senate needs to adhere to the standard for doctors, ''first, do no harm.'' Biomedical research into deadly and disabling diseases is far too important to rush to enact legislation which would unequivocally undermine promising research and therapies. The Senate should be extremely cautious before it starts sending scientists to jail when the purpose of their research meets the highest moral and ethical standards and holds such promise for relieving human suffering.

ANALYSIS OF PENDING BILLS AND THE SCIENCE AT RISK

Several bills have been introduced in the Senate regarding human cloning. They vary widely in focus and precision. The three principal bills are S. 368, S. 1599, and S. 1602 and we have analyzed each of them here.

The first bill introduced by Senator Bond last year, S. 368, is one of the better drafted bills introduced in either body. It uses reasonably accurate terms to describe the applicable science and limits Federal funding for the cloning of a human being.

The new bill introduced by Senator Bond, S. 1599, would impose a ten year prison sentence for any individual for the act of ''producing an embryo (including a preimplantation embryo)'' through the use of a specified technology, ''somatic cell nuclear transfer,'' even if the production of such an embryo is for purposes unrelated to the cloning of a human being and even if the embryo does not contain nuclear DNA which is identical to that of an existing or previously existing human being (cloning). The bill goes beyond the issue of cloning to make it a crime to use somatic cell nuclear transfer of a nucleus derived from normal sexual union of an egg and sperm, which is obviously not cloning. It would also make it a crime to conduct some research seeking to generate stem cells to treat a wide range of deadly and disabling diseases, treatments which have nothing whatever to do with human cloning.[1]

The third bill, introduced by Senator Feinstein, S. 1602, would impose heavy civil fines for any entity that would ''implant or attempt to implant the product of somatic cell nuclear transfer into a woman's uterus . . .'' This sharply focuses the bill on an attempt to clone a human being and would not imperil biomedical research.

IMPACT OF BILLS ON STEM CELL RESEARCH

The current bill introduced by Senator Bond would, because it goes well beyond the issue of human cloning, imperil promising biomedical research, including research to generate stem cells. Instead of focusing on cloning, it makes it a crime to zygote or embryo through the use of a new technology, somatic cell nuclear transfer, even if the use of this technology is essential for the generation of stem cells to treat disease and where there is no intention or attempts through use of this technology to clone a human being. Basically the current bill would make it a crime to conduct research if it could possibly be related to the cloning of a human being even if it is not, in fact, conducted for that purpose.

This approach in S. 1599 goes beyond the issue of human cloning and would outlaw some research to create stem cells, including stem cells for the following types of treatments: cardiac muscle cells to treat heart attack victims and degenerative heart disease; skin cells to treat burn victims; spinal cord neuron cells for treatment of spinal cord trauma and paralysis; neural cells for treating those suffering from neurodegenerative diseases; pancreas cells to treat diabetes; blood cells to treat cancer anemia, and immunodeficiencies; neural cells to treat Parkinson's, Huntington's and Amyotrophic Lateral Sclerosis (ALS); cells for use in genetic therapy to treat 5,000 genetic diseases, including Cystic Fibrosis, Tay-Sachs Disease, schizophrenia, depression, and other diseases; blood vessel endothelial cells for treating atherosclerosis; liver cells for liver diseases including hepatitis and cirrhosis; cartilage cells for treating of osteoarthritis; bone cells for treatment of osteoporosis; myoblast cells for the treatment of Muscular Dystrophy; respiratory epithelial cells for the treatment of Cystic Fibrosis and lung cancer; adrenal cortex cells for the treatment of Addison's disease; retinal pigment epithelial cells for age-related macular degeneration; modified cells for treatment of various genetic diseases; and other cells for use in the diagnosis, treatment and prevention of other deadly or disabling diseases or other medical conditions.

To be precise, the current bill introduced by Senator Bond, S. 1599, would make it a crime to generate stem cells, for the above uses, where somatic cell nuclear transfer technology is used. It would not ban stem cell research where the stem cell is generated without the use of somatic cell nuclear transfer. It is not possible to say how much of this promising research will or might involve the use of somatic cell nuclear transfer. As described below, the bill would clearly ban the generation of any stem cells

[1] An identical bill has been introduced by Senator Lott as S. 1601 and this may be the bill which is called up for the Senate debate.

''customized'' to an individual where somatic cell nuclear transfer must be used.

This stem cell technology is exciting and potentially revolutionary. Scientists are developing a new approach for treating human diseases that doesn't depend on drugs like antibiotics, but on living cells that can differentiate into blood, skin, heart, or brain cells and can potentially treat various cancers, spinal cord injuries, and heart disease. For example, this stem cell research has the potential to develop and improve cancer treatments by gaining a more complete understanding of cell division and growth and the process of metastasis. This could also lead to a variety of cancer treatment advances.

The type of cells that make up most of the human body are differentiated, meaning that they have already achieved some sort of specialized function such as blood, skin, heart or brain cells. The precursor cells that led to differentiated cells come from an embryo. The cells are called stem cells because functions stem from them like the growth of a plant. Stem cells have the capacity for self-renewal, meaning that they can reproduce more of themselves, and differentiation, meaning that they can specialize into a variety of cell types with different functions. In the last decade, scientists studying mice and other laboratory animals have discovered new powerful approaches involving cultured stem cells. Studies of these cells obtained from a mouse's stem cells show they are capable of differentiating, in vitro or in vivo into a wide variety of specialized cell types. Stem cells have been derived by culturing cells of non-human primates. Promising efforts to obtain human stem cells have also recently been reported.

Stem cell research has been hailed as the ''[most] tantalizing of all'' research in this field, because adults do not have many stem cells. Most adult cells are fully differentiated into their proper functions. When differentiated cells are damaged, such as damage to cardiac muscle from a heart attack, the adult cells do not have the ability to regenerate. If stem cells could be derived from human sources and induced to differentiate in vitro, they could potentially be used for transplantation and tissue repair.

Using heart attacks as an example, we might be able to replace damaged cardiac cells, with healthy stem cells, that could differentiate into cardiac muscle. Research using these stem cells could lead to the development of ''universal donor cells,'' and could be an invaluable benefit to patients. Stem cell therapy could also make it possible to store tissue reserves that would give health care providers a new and virtually endless supply of the cells listed above. The use of stem cells to create these therapies would lead to great medical advances. We have to be sure that this legislation concerning human cloning would not in any way obstruct this vital research.

BOND BILL APPLICATION TO NON-IDENTICAL NUCLEUS

The purpose of a bill to ban human cloning is supposedly to ban the cloning of an individual and the essence of this is the duplication of the DNA of one individual in another. The term ''somatic cell,'' however, is not limited in the current Bond bill to somatic cells with DNA which is the same as that of an existing or previously existing human being. If it is not limited to cases where the DNA is identical, human cloning is—by definition—not involved.

The current Bond bill goes beyond cloning because it does not define the term ''somatic cell'' or limit to cases where the DNA is identical. It only defines the term ''somatic cell nuclear transfer,'' but it does not define the term ''somatic cell.'' We need a brief glossary of terms to define what constitutes a ''somatic cell.''

''Zygote'' means a single celled egg with two sets (a diploid set) of chromosomes as normally derived by fertilization;

''Egg'' and ''oocyte'' mean the female gamete;

''Gamete'' means a mature male or female reproductive cell with one set (a haploid) set of chromosomes;

''Sperm'' means the male gamete;

''Somatic cell'' means a cell of the body, other than a cell that is a gamete, having two sets (a diploid set) of chromosomes.

So a ''somatic cell'' is any cell of the body other than a gamete, and it includes a fertilized egg. This means that the current Bond bill would make it a crime to use somatic cell nuclear transfer even in cases where the somatic cell contains a nucleus derived from sexual reproduction, which is obviously not cloning. This means that even though the nucleus is not a clone, the current Bond bill makes it a Federal crime to create it. This means that the current Bond bill goes beyond the issue of cloning.

Because of this coverage of all ''somatic cells'' the current Bond bill would make it a crime for doctors to use a currently effective treatment for mitochondrial disease. In this treatment women who have the disease have an extreme and tragic form of infertility. The disease is a disease of the mitochondria, which is an essential element of any egg. The treatment for this disease involves the use of a fertilized nucleus which is transferred through the use of somatic cell nuclear transfer to an egg from which the nucleus has been removed. The new egg is a fresh, undiseased egg. The current Bond bill would make a crime to provide this treatment even though the nucleus which is transferred is the product of fertilization, no cloning.

CUSTOMIZED STEM CELLS

If the current Bond bill was limited to sometic cells with nuclear DNA identical to that of an existing or previously existing human being, i.e., to a cloned nucleus, it would make it a Federal crime to conduct one especially promising type of stem cell research, into generating ''customized'' stem cells.

A researcher or doctor might want to create a human zygote with DNA identical to that of an existing or previously existing person through the use of somatic cell nuclear transfer, the act prohibited in the bill, in order to create a customized stem cell line to treat the individual from whom the DNA was extracted. By using the same DNA, the stem cell therapy would more likely to compatible with, and not be rejected by, the person for whom the therapy is created. By starting with the patient's own nuclear DNA, the therapy is, in effect, custom made for that person. It is like taking the patients blood prior to surgery so that it can be infused into the patient during surgery (avoiding the possibility of contamination by the use of blood of another person).

Because the current Bond bill makes it a crime to use the technology—somatic cell nuclear transfer—it would make it a crime to develop a therapy with the equivalent of the patient's personal monogram on it a customized treatment based on their own nuclear DNA.

Because the bill introduced by Senator Feinstein requires the implantation of an embryo, it does not curtail stem cell research, and the bill provides that the transfer nucleus must be that of an ''existing or previously existing human child or adult,'' precisely the limitation not present in the current Bond bill. None of the issues we have raised regarding the current Bond bill apply to the Feinstein bill, which is narrowly focuses on the act of cloning, or attempting to clone an individual.

PROTECTING BIOMEDICAL RESEARCH

The current Bond bill and the Feinstein bill both contain clauses for the protection of biomedical research. There is a critical difference between them.

At the press conference announcing introduction of his bill Senator Bond distributed a document entitled ''Current Research Untouched by the Bond/Frist/Gregg Legislation.'' The title of this document was followed by a list of such research, including ''In Vitro Fertilization,'' ''Stem Cell Research,'' ''Gene Therapy,'' ''Cloning of Cells, Tissues, Animals and Plants,'' ''Cancer,'' ''Diabetes,'' ''Birth Defects,'' ''Arthritis,'' ''Organ Failure,'' ''Genetic Disease,'' ''Severe Skin Burns,'' ''Multiple Sclerosis,'' ''Muscular Dystrophy,'' ''Spinal Cord Injuries,'' ''Alzheimer's Disease,'' ''Parkinson's Disease, and ''Lou Gehrig's Disease''. Unfortunately, the title is followed by a critical qualification, an asterisk. The asterisk qualification states, ''The current Bond bill would not prohibit any of this research, even embryo research, as long as it did not involve the use of a very specific technique (somatic cell nuclear transfer) to create a live cloned human embryo.''

In the ways described above this asterisk qualification acknowledges that the bill would, in fact, make it a crime to conduct some types of stem cell research and other research. Given the importance of the asterisk, the document's title the list of supposedly protected research could be considered misleading. The document should more accurately have been entitled ''Only Some Research Regarding the Following Diseases is Outlawed.''

The current Bond bill contains a Section 5 entitled ''Unrestricted Scientific Research.'' This section provides that ''Nothing in this Act (or an amendment made by this Act shall be construed to restrict areas of scientific research that are not specifically prohibited by this Act (or amendments).'' This provision is circular. It states that the bill does what it does and does not do what it does not do. The provision does nothing to modify the prohibitions on research and does nothing to protect ''scientific research.''

In contrast the Feinstein bill includes a provision regarding ''Protected Research and Practices'' which provides that ''Nothing in this section shall be construed to restrict areas of biomedical and agriculture research or practices not expressly prohibited in this section, including research or practices that involve the use of—(1) somatic cell nuclear transfer or other cloning technologies to clone molecules, DNA, cells, and tissues; (2) mitochondrial, cytoplasmic or gene therapy; or (3) somatic cell nuclear transfer techniques to create nonhuman animals.'' This is a ''savings'' clause with meaning and content. Its reference to the cloning of ''cells'' and to ''mitrochondrial'' therapy are laudatory and meaningful.

NBAC RECOMMENDATION AND CLINTON ADMINISTRATION BILL

The National Bioethics Advisory Commission (NBAC) cautioned that poorly crafted legislation to ban human cloning may put at risk biomedical research on the following types of diseases and conditions: ''Regeneration and repair of diseased or damaged human tissues and organs'' (NBAC report at 29); ''assisted reproduction'' (NBAC report at 29); ''leukemia, liver failure, heart and kidney disease'' (NBAC report at 30); and ''bone marrow stem cells, liver cells, or pancreatic beta-cells (which product insulin) for transplantation'' (NBAC report at 30). The Clinton Administration proposed law, like the Feinstein bill, avoids the peril identified by

NBAC and focuses only on the issue of human cloning and does not imperil biomedical research.

SUNSET AND PREEMPTION

NBAC proposed that any law include both sunset review and preemption provisions.

Regarding a sunset review provision, NBAC stated in its report: ''It is notoriously difficult to draft legislation at any particular moment that can serve to both exploit and govern the rapid and unpredictable advances of science. Some mechanism, therefore, such as a sunset provision, is absolutely needed to ensure an opportunity to re-examine any judgment made today about the implications of somatic cell nuclear transfer cloning of human beings. As scientific information accumulates and public discussion continues, a new judgment may develop and we, as a society, need to retain the flexibility to adjust our course in this manner. A sunset provision . . . ensures that the question of cloning will be revisited by the legislature in the future, when scientific and medical questions have been clarified, possible uses have been identified, and public discussion of the deeper moral concerns about this practice have matured.'' NBAC report at 101.

President Clinton has proposed a five year sunset in his bill. The Feinstein bill includes a ten year sunset and the current Bond bill includes no sunset review.

BIO supports inclusion of a sunset review provision, but the most important issue is whether the terms of the prohibition in any law focuses only on the issue of human cloning. A sunset review provision will not undo the damaged which a poorly crafted, over broad law would do to biomedical research prior to the sunset date.

The Feinstein bill, but not the current Bond bill, includes a clause which preempts inconsistent state laws. NBAC strongly supported a preemption of state laws: ''The advantage to federal legislation—as opposed to state-by-state laws—lies primarily in its comprehensive coverage and clarity. . . . Besides ensuring interstate uniformity, a federal law would relieve the need to rely on the cooperation of diverse medical and scientific societies, or the actions of diverse IRBs, to achieve the policy objective. As an additional benefit, federal legislation could displace the varied state legislative efforts now ongoing, some of which suffer from ambiguous drafting that could inadvertently prohibit the important cellular and molecular cloning research described . . . in this report.'' NBAC report at 100.

Numerous bills introduced in state legislatures, some of which are very poorly crafted and over broad.

BIO supports inclusion of a preemption clause. Again, the key issue is whether the prohibition in any law focuses only on the issue of human cloning and does not imperil biomedical research. A poorly drafted, over broad Federal law which preempts state laws might do even more damage.

NBAC ROLE AND COMMISSION

NBAC performed a public service with its quick and thoughtful analysis of the human cloning issue. The current Bond bill would set up an entirely new body to review the human cloning issue rather than rerefer the issue back to NBAC for further review. NBAC is well qualified and positioned to perform this function and it may be wasteful and expensive to establish another body to perform this ongoing review. The Feinstein bill calls on NBAC to conduct the reviews.

AMERICAN ASSOCIATION FOR CANCER RESEARCH, INC.,
Philadelphia, PA, February 4, 1998.

Hon. CONNIE MACK,
U.S. Senate, Washington, DC.

DEAR SENATOR MACK: Medical research, conducted in the United States over the last 20 years, has opened up tremendous opportunities to make progress against many devastating diseases. The scientific community does not desire to make human beings, or modify or genetically mark any portion of our population. However, to deny the application of molecular biology, made possible through the use of cloning technologies, to patients who could be benefited would be a great injustice.

A litany of beneficial applications of cloning technology was enumerated in this weeks TIME Magazine. Several of these applications are at the core of cutting-edge cancer research, and there are many more potential benefits that are unknown at this time. These applications, as well as any future progress, would be eliminated by broad legislation setting back progress and potential in our conquest to develop effective approaches to the prevention, detection, and treatment of cancer.

The American Association for Cancer Research (AACR), with over 14,000 members, is the largest professional organization of basic and clinical cancer researchers in the world. Founded in 1907, its mission is to prevent, treat, and cure cancer through research, scientific programs, and education. To accomplish these important goals it is essential that scientists vigorously pursue all promising lines of investigations against cancer.

The AACR feels strongly that an ethical and just compromise can be reached that will protect the public and the scientific community from the irresponsible application of cloning technology while permitting meaningful and ethical research to move forward. The medical and cancer research community feels that the present rush to enact legislation without proper consideration or deliberation is a serious mistake, and the unfortunate result would be irresponsible legislation.

As scientists we clearly see the tremendous advantages of cloning technology as well as its potential problems, which we, also, have reason to fear if it is applied in an unreasonable manner.

The AACR, therefore, appeals to all Members of Congress to establish and honor a moratorium of at least 45 days on enacting any legislation until definitions and implications of legislation can be determined in a more reasonable and thoughtful manner, and in an open and public process. This would be a service to humanity, science, and millions of individuals who are now suffering, or will suffer in the future, from catastrophic and crippling diseases such as cancer. We appeal to all members of Congress to give this important moral and scientific issue very careful consideration and deliberation. Clearly a rush to judgment on this complex issue could be a major setback for cancer and medical research.

Sincerely,

DONALD S. COFFEY,
President.

Mrs. FEINSTEIN. Mr. President, the Biotechnology Industry Association analyzes both the Bond-Frist bill and the Feinstein-Kennedy bill, which is a second bill that addresses cloning. This interesting analysis, representing the entire biotechnology industry of the United States, makes a very important point, that whatever we do here impacts on human research in a multitude of different areas, and most particularly it affects cancer research. Mr. President, I will comment on this paper and also comment on a number of other items.

The American Association for Cancer Research's letter to Senator CONNIE MACK urges that there be a 45-day delay in enacting any legislation until definitions and implications of legislation can be determined in a more reasonable and thoughtful manner and in an open and public process. They are calling for reason, they are calling for thoughtful deliberation, they are calling for a public process. Who can deny that on a very complicated subject?

The Whitehead Institute—and specifically Gerald R. Fink, a Director of the American Cancer Society, Professor of Genetics—in his letter talks about the limited ability to develop cell-based strategies, which will take place if the Bond-Frist bill is ramrodded through this body.

The American Society for Reproductive Medicine has written a letter urging this body to vote no on the Bond-Frist legislation.

The American Psychological Association has written to us urging that we delay, that there be discussion and debate, and they point out that we need to protect research efforts in this area.

The American Association for the Advancement of Science has said that they are deeply concerned about the ethical and scientific issues. They warn us: ''Use great caution in moving with this legislation.''

Even the College of Veterinary Medicine from the University of Missouri, Colombia, has written to this body urging caution.

The University of California at San Francisco, Roger A. Pederson, Professor and Research Director of the Reproductive Unit of the Department of OB/GYN and Reproductive Science, has written to this body urging caution and restraint as well.

I ask unanimous consent that these letters be printed in the RECORD.

There being no objection, the letters were ordered to be printed in the RECORD, as follows:

AMERICAN SOCIETY FOR REPRODUCTIVE MEDICINE,
Birmingham, AL, February 5, 1998.

DEAR SENATOR KENNEDY: The American Society for Reproductive Medicine (ASRM) urges you not to allow the Bond Human Cloning Prohibition Act (S. 1601) to be brought to the floor for a vote today, and if it is, to vote against it.

ASRM is very concerned that in the rush to make human cloning illegal, Congress will inadvertently outlaw very serious and promising medical research that may uncover cures to some of the most deadly diseases. Cloning is a highly technical area that cannot easily be understood and should not be hastily legislated.

Scientists engaged in legitimate medical research are not interested in cloning a human being. Since October, professional organizations representing more than 64,000 scientists have announced their participation in a voluntary five year moratorium on human cloning. Efforts led by the scientific community, rather than legislative prohibitions, have worked before, and will work this time.

When we first discovered how to duplicate DNA at any level, there were cries to outlaw it. Luckily your predecessors did not take that step, instead allowing the scientific community's voluntary moratorium to slow

research while we explored its implications. Today millions of Americans are alive thanks to drugs made using recombinant DNA.

This bill prohibits not just the creation of a human clone, but any attempt to understand how somatic cell nuclear transfer could be used to improve our understanding and treatment of disease.

We urge you and your colleagues to carefully consider any human cloning legislation and to proceed through the proper legislative channels so that a hastily drafted bill does not get passed, sentencing millions of Americans to needless suffering.

Sincerely,

J. BENJAMIN YOUNGER, M.D.,
Executive Director.

AMERICAN PSYCHOLOGICAL ASSOCIATION,
February 2, 1998.

Senator DIANNE FEINSTEIN and
Senator EDWARD KENNEDY,
Committee on Labor and Human Resources, U.S. Senate, Washington, DC.

DEAR SENATORS FEINSTEIN AND KENNEDY, I write to support the proposed ''Prohibition on Cloning of Human Beings Act of 1998'' introduced by both of you. There appears to be considerable confusion on this topic which apparently has resulted in an effort by some to restrict various areas of biomedical and agricultural research dealing with reproduction and embryo research. It is important to differentiate between human cloning and other types of research. My understanding also is that the FDA has indicated that they are the federal agency responsible for monitoring any possible attempts at cloning research.

I do want to emphasize again that we need to protect researchers efforts at research which does not include ''the production of a precise genetic copy of a molecule (including DNA), cell, tissue, organ, plant, animal or human''.

Let me also add that the American Psychological Association took the stand that it is human behavior, in all its aspects which should ultimately serve as the focus of scientific and bioethical inquiry, not simply the techniques which initiate the process. After all, just think if nature had not beaten us to the development of twins. Wouldn't there be a huge cry about how we ought not to have identical twins because it would be unnatural to have two people so similar to each other?

Thank you for permitting me to express my viewpoints. I am sure they are shared by many scientists in this country.

Sincerely,

NORMAN ABELES, Ph.D,
Professor and Immediate Past President.

AMERICAN ASSOCIATION FOR THE
ADVANCEMENT OF SCIENCE,
February 2, 1998.

Hon. CHRISTOPHER S. BOND,
U.S. Senate, Senate Russell Office Building, Washington, DC.

DEAR SENATOR BOND: The American Association for the Advancement of Science (AAAS) has followed with interest the developments of the past year related to cloning, including current and proposed legislation regarding the possible use of somatic cell nuclear transfer to clone a human being.

Throughout its 150-year history, AAAS has been a pioneer among American scientific organizations in addressing the moral and ethical issues related to scientific developments. We are deeply concerned about the scientific and ethical issues raised by the possibility of cloning human beings and believe that a much more complete understanding of these issues is essential before such experiments are even considered. At the same time, however, we are also concerned that well-intentioned legislation in the area of human cloning may inadvertently impede vital research in agriculture, biotechnology, pharmaceuticals, and genetics.

We urge that congressional leaders use great caution in drafting legislation to ban human cloning. Congress should consult with leading researchers in genetics and other areas of the life sciences in crafting language so that definitions of scientific and technical terms are well understood and the resulting laws do not impede important research that may use similar techniques but do not raise the same kinds of moral and ethical concerns. Such related research can yield great benefits, for example, in increasing agricultural production, generating new products through biotechnology, finding cures for genetic disorders, and reducing the costs of pharmaceuticals. It is essential that these legitimate and socially-important areas of research not be adversely affected by legislation aimed at restricting human cloning.

AAAS, founded in 1848, is the world's largest multidisciplinary scientific association, with 145,000 individual members and nearly 300 affiliated scientific and engineering societies. Our Committee on Scientific Freedom and Responsibility has been a powerful voice for ethics in science and, in collaboration with our Program of Dialogue Between Science and Religion, held a major public forum in Washington last June that explored scientific, moral, ethical, and religious implications of human cloning. We are eager to assist in promoting a responsible and constructive dialogue between scientists, policymakers, and the public in this area, and stand ready to assist you in any manner that would be useful.

Sincerely,

RICHARD S. NICHOLSON.

COLLEGE OF VETERINARY MEDICINE,
UNIVERSITY OF MISSOURI-COLUMBIA,
Columbia, MO, February 4, 1998.

To: Ms. Adira Simon, Senator Kennedy's Office.
From: R. Michael Roberts, Curators' Professor and Chair, Veterinary Pathobiology.
Subject: Feinstein/Kennedy (S1602) *versus* Bond (S1599).

I am sending you a copy of my letter to Senator Bond, which addresses some of the same scientific issues raised in your comparison.

I have read S1602 and believe that it would be well accepted by scientists, including members of the Society for the Study of Reproduction, and the Developmental Biologists. What is important is criminalization of any intent to produce a baby and not to ban a possibly desirable outcome of the technology, which is the generation of replacement cells and tissues for an individual. The Feinstein/Kennedy Bill also creates a moratorium rather than a difficult-to-reverse ban on cloning of human beings. Again, most scientists would find this comforting.

I should point out that the term ''somatic cell nuclear transfer technology'' has much broader meaning than the way it is defined in either bill. Nuclear transfer between somatic cells is a common technique and has been used for decades. I would be happier if the wording of both bills made it clear that it is the transfer of a somatic cell nucleus to an oocyte to create a human baby that is the issue.

What I found contradictory about S1601 is that it creates an elaborate commission to report on cloning (and other issues), yet the very technique that could allow future discourse will have been criminalized.

In summary, I judge the Feinstein/Kennedy Bill likely to accomplish what most scientists and the lay public support, a ban on cloning human beings. It will not prohibit the legitimate use of somatic nuclear transfer to oocytes to create replacement tissues, and it places a time limit on the ban, which can be extended as public and scientific sentiment dictates.

UNIVERSITY OF CALIFORNIA,
SAN FRANCISCO,
January 30, 1998.

Hon. Senator KENNEDY,
U.S. Senate, Washington, DC.

DEAR SENATOR KENNEDY, I am writing to express my profound appreciation and support for your efforts to preserve the opportunities for continuing research in the United States on the earliest stages of human development. I can provide you with the names and histories of several patients in our experience who have benefited directly from prior research and diagnostic procedures leading to healthy pregnancies and births. In addition, I can provide you with one or more names of families whose health misfortunes could have been or could be avoided through research on early products of human conception.

Please tell me if this additional information will be of value to you. I applaud your efforts to achieve a responsible bill on the subject of human cloning prohibition that does not impede the benefits of basic and clinical research for the American people.

Sincerely yours,

ROGER A. PEDERSEN, PH.D.,
Professor and Research Director, Reproductive Genetics Unit, Department of Obstetrics, Gynecology and Reproductive Sciences.

Mr. BOND. Mr. President, may I inquire of the distinguished Senator from California how long she will be? We have not had an opportunity for an opening statement. I would like to know how long she proposes to proceed in opposition.

Mrs. FEINSTEIN. I would like to respond to the distinguished Senator from Missouri. I think the Senator is right. I do have a very lengthy presentation to make, and it is going to be quite involved. I would be very happy to yield to him to make his opening statement if he would see that I have the floor regained directly following his statement.

Mr. BOND. Mr. President, I would be happy to ask unanimous consent that when my remarks are finished, the Senator from California be recognized.

The PRESIDING OFFICER. Without objection, it is so ordered.

The Senator from Missouri is recognized.

Mr. BOND. Mr. President, I thought before we got into a full-fledged debate saying this is bad, perhaps my colleagues would like to know what it is that we propose to do, speaking for the sponsors of this measure. It is obviously one that is going to take some discussion and debate, and it's very helpful to know some of the objections that are raised to it. Again, for the sake of the RECORD, let me say what this is.

This measure is a very carefully and narrowly targeted provision that places an outright ban on the use of somatic cell nuclear transfer for human cloning purposes. It defines one technique, the technique that was used to

create, by cloning, the sheep Dolly and says that you shall not do that for human beings —quite simply.

Why is this necessary? Why is it necessary that we move forward on this? Well, frankly, recent reports show that a Chicago-based scientist is prepared to move forward with human cloning experimentation. I think this forces an immediate debate on how far out on a moral cliff we are willing to let science proceed before we as a nation insist on some meaningful constraints. We no longer have the luxury of waiting around for this morally reprehensible act to occur.

That scientist is proposing to raise huge sums of money and promise infertile couples that he can clone human beings for them. The time for the debate and action is now. If creating test tube babies by cloning a human embryo is morally, ethically, and practically wrong, as I strongly believe it is, we need to stop it now. To delay it, to filibuster it, to postpone it means that not only this scientist and others who, perhaps, are not holding news conferences, can go forward with a process that I believe the overwhelming majority of American people believe is wrong, as I believe it is. To those who say we have not studied this or debated this, I only say that since we had this story about the cloning of Dolly the sheep, and stories of organizations and individuals pursuing human cloning, they have kept the debate alive. The American public is asking if similar techniques can be used to clone human beings, and they are concerned very deeply whether something which was thought only to be science fiction is now closer to reality.

Now, there are some distinguished books that oppose a prohibition on human cloning. They suggest that we cannot put the genie back in the bottle and we cannot stop progress. I suggest that we have come to the point where our technological capability may be outrunning our moral sense. We have, in this body, carried a prohibition against Federal funding of cloning human embryos. We have prohibited the research and experimentation with Federal funding because we thought it was way down the line. We didn't want to see money used. Last year, after the cloning of Dolly the sheep, we held hearings; tremendous amounts of testimony were presented. I personally testified before Senator FRIST's subcommittee. This is not a new debate. The reason this debate is important, and the reason that action is important is that now we are faced with scientists of, I believe, questionable judgment, who would go forward with something that is morally reprehensible.

This measure is targeted narrowly to one specific process that was used to clone the sheep Dolly. It is the somatic cell nuclear transfer to create a human embryo. In addition to prohibiting that, we have, at the urging of my distinguished cosponsor, Senator FRIST, provided for a commission to study the ethical implications of related technologies. And I believe we have made it clear that ongoing legitimate activity, short of this one specific process, cleaning out a human embryo and putting in a nuclear cell transfer, and starting the process of differentiation of the cell toward creating a test tube baby is unacceptable.

The ethical implications of human cloning are staggering. I believe that we would have the overwhelming understanding and support of the American people that we should never create human life for spare parts, as a replacement for a child who has died, or for unnatural or selfish purposes. How many embryos or babies would we tolerate being created with abnormalities before we perfect human cloning? It took Dr. Wilmut, the Scottish scientist, 276 tries before creating Dolly, and we still do not even know if Dolly is the perfect sheep. For humans, those results are unacceptable—creating tremendously deformed human embryos or human beings. Dr. Ian Wilmut, the lead Scottish scientist who created Dolly, himself stated that he can see no scenario under which it would be ethical to clone human life. And he is right.

In September of 1994, a Federal human embryo research panel noted that, ''Allowing society to create genetically identical persons would devalue human life by undermining the individuality of human beings.'' Further, the panel concluded that there are moral concerns about the deliberate duplication of an individual genome, and that making carbon copies of a human being is repugnant to members of the public. ''Many members of the panel share this view and see no justification for Federal funding of such research.''

I emphatically argue that those statements apply to private sector research as well. That is what we are trying to reach. It is important to note that the legislation is narrowly drafted, and its sole objective is to ban the use of somatic cell nuclear transfer for human cloning purposes. We worked overtime to ensure that this language was specific so that it would ban only the technique used to create Dolly.

This technique has also been criticized by a representative of the pharmaceutical industry, who in a prepared statement for Members of Congress, dated January 13, 1998, stated:

> While conventional cloning technology has been used extensively worldwide to meet global medical needs, nuclear transfer technology is fraught with untold failures for each partial success and has major scientific and significant ethical issues associated with it. Furthermore, it has no strong therapeutic or economic-based need driving it at this time. The concept that it is a viable alternative to infertile parents is cruel and completely unjustified. I would challenge you not to confuse the two as the Congress considers its options here.

Well, Mr. President, myself, Senator FRIST, Senator GREGG, and others, have met with and consulted with representatives of the pharmaceutical industry, researchers, representatives of patient groups, and we have told them what we are proposing to do, and we have listened to them discuss all of the implications. We know that in vitro fertilization, plant and animal cloning, cloning of DNA cells and tissues, stem cell research, gene therapy research, and other activities taking place at the Human Genome Center offer great hope in addressing how to prevent, diagnose, and treat many devastating diseases. These types of research will continue to thrive, that is clear, because we have targeted our ban so narrowly, and we intend only to prohibit, by cloning, the creation of the human embryo.

This is a technique characterized by industry, researchers, theologians, ethicists, and others, as fraught with failures and lacking therapeutic value. This bill, however, does allow the important and promising research to continue. I have long been a supporter of biotechnology. I have supported biotechnology efforts. I continue to support everything from human genome mapping to all of the other human research efforts. We have no problems with and support cloning of animals. But there is a bright line between those activities and human cloning, and we must draw that line. There is a line, Mr. President, and that line is clear.

You can do all the research you want. You can create organs, you can do all kinds of experimentation. But you should not be able to create a human embryo by cloning, starting a test tube baby. Now, there are some who say that it is all right so long as you don't implant that cloned human embryo, so long as you destroy it. Once you start the process of creating this test tube baby, it is OK to destroy it. As a matter of fact, they would have us believe that we would start all these human embryos, start the cell differentiation, and then wipe them out. Well, I think that raises serious questions with many people, and I am included in that. But it also raise also the prospect that once you start cloning these human embryos—they are very small —they can be transported very easily, picked up and taken from this country to someplace else in the world in large numbers, where there may be no ban on implementation. The difficult science is creating the human embryo. Once you do that, you have opened a whole area. And to say we are just going to prevent them from being implanted so a baby is brought to term, that won't get it because that is too late. I have heard the arguments of those who oppose this bill. And, quite frankly, let me tell you what those arguments are.

They are that some scientists would like to be able to create human embryos, play with them, and experiment with them, experiment with a human embryo that is differentiating and starting to grow, and say, ''OK. Time is

up. We will toss this one away and we will start playing with another one.'' Once you get into that process, Mr. President, you have stepped over the moral and ethical line. There is a clear line. There is a very clear line.

We are ready to have the argument because I believe a significant majority of the Members of this body reflect a significant, overwhelming view of the American people that that is unacceptable. There may be well-intentioned scientists who say we need to play with human embryos and start these embryos growing and let us play with them. They may get something. They may develop some scientific knowledge. But the statements I have already presented show that there is no really legitimate, scientific need, and, in fact, there are grave moral and ethical reasons not to. I strongly hold the belief that all human beings are unique and created by God. And I think billions of people around the world share it. Human cloning, a man's attempt to play God, will change the very meaning of life, of human dignity, and what it is to be human. Are we ready for that? I don't think so.

Mr. President, the Washington Post in October of 1994 in an editorial said:

The creation of human embryos specifically for research that will destroy them is unconscionable. Viewed from one angle this issue can be made to yield endless complexities. What about the suffering of individuals and infertile couples who might be helped by embryo research? What about the status of a brand new embryo? But before you get to these questions, there is a simpler one. ''Is there a line that should not be crossed even for scientific, or other gain, and, if so, why is it?''

That is the quotation from the Washington Post. In case you missed it, let me give you the first sentence again. ''The creation of human embryos specifically for research that will destroy them is unconscionable.''

That is a simple, straightforward statement with which I agree, and I believe when the Members before the body have an opportunity to reflect on it and consider it, they will agree that is right.

Let me quote President Bill Clinton, 1994.

The subject raises profound ethical and moral questions as well as issues concerning the appropriate allocation of Federal funds. I appreciate the work of the committees that have considered this complex issue, and I understand that advances in in vitro fertilization research and other areas could be derived from such work. However, I do not believe that Federal funds should be used to support the creation of human embryos for research purposes.

That is the President. He said don't create human embryos by cloning for research.

That is the question. Those who would delay and filibuster want to avoid that question and delay it. I know they are well-intentioned. I know they may have great reservations. They may not agree with that simple moral standard. But there are people out there who want to start that process, who may as we speak be engaged in that process.

We have debated whether cloning of human embryos is a good idea. I think there is a clear consensus. We have drafted a narrow bill, a targeted one that I hope we can move forward to enact. There is a lot of smoke and mirrors, and there are a lot of discussions about a whole range of other options. These are very technical. That is why we set up a commission to review all of these things. What we are targeting right now is the one procedure that has been used with sheep, and could be used, if it is not stopped, to start creating human embryos. For those people who want to create human embryos for research purposes and destroy them or implant them, I say you are going across the line. I don't care what your motives are. I don't care whether it is profitable. I don't care what you think might come out of it. At this point we are saying, ''No, you cannot cross the line.''

Mr. President, that is what this debate is all about. I believe that we may have an opportunity, if discussion continues, to bring this debate to a close. At such time I will be back on this floor to say, if you want to allow the scientific community and some people with different sets of standards and different sets of judgments to go ahead and attempt to create human embryos by cloning by a somatic cell nuclear transfer, go ahead and support the extended discussion. Vote no against cloture. But, by doing so, you are providing a green light. You are saying, go ahead and use this technique that I believe is unacceptable and should be made illegal in this country as it is in the United Kingdom, Germany, Canada, and many of the other developed and leading countries in the world.

Mr. President, I appreciate very much the Senator from California allowing me to explain what the bill is and what it is not. I yield the floor.

Mrs. FEINSTEIN addressed the Chair.

The PRESIDING OFFICER. The Senator from California.

Mrs. FEINSTEIN. Mr. President, I thank the distinguished Senator from Missouri. I appreciate his comments. And I must tell him that in the main I agree with him.

We have submitted an alternative bill to Bond-Frist. It is Feinstein-Kennedy.

I am opposed to human cloning. I believe human cloning is scientifically dangerous, it is morally unacceptable, it is ethically flawed, and we should outlaw it. That is not the issue.

The issue is we are dealing with a complex subject. The bill at hand is a bill that uses words and does not define those words. There is the rub.

So the issue here today is whether we go ahead and ramrod through legislation with virtually no consideration by this body, legislation that would impose a permanent ban forever with prison terms of up to 10 years, and we will not understand fully what that bill will do. That is why the medical and the scientific research community have asked us to proceed with caution.

Let's say that you don't believe me. Would you believe the Biotechnology Industry Association representing the entire biotechnology community? Let me quote from page 4 of their 9-page statement to us.

The current Bond bill goes beyond cloning because it does not define the term ''somatic cell'' or limit to cases where the DNA is identical. It only defines the term ''somatic cell nuclear transfer,'' but it does not define the term ''somatic cell.'' We need a brief glossary of terms to define what constitutes a ''somatic cell.''

''Zygote'' means a single celled egg with two sets (a diploid set) of chromosomes as normally derived by fertilization;

''Egg'' and ''oocyte'' mean the female gaméte;

''Gamete'' means a mature male or female reproductive cell with one set (a haploid) set of chromosomes;

''Sperm'' means the male gaméte;

''Somatic cell'' means a cell of the body, other than a cell that is a gaméte, having two sets (a diploid set) of chromosomes;

Here is the point.

So a ''somatic cell'' is any cell of the body other than a gaméte, and it includes a fertilized egg. This means that the current Bond bill would make it a crime to use somatic cell nuclear transfer even in cases where the somatic cell contains a nucleus derived from sexual reproduction, which is obviously not cloning. This means that even though the nucleus is not a clone, the current Bond bill makes it a Federal crime to create it. This means that the current Bond bill goes beyond the issue of cloning.

Because of this coverage of all ''somatic cells'' the current Bond bill would make it a crime for doctors to use a currently effective treatment for mitochondrial disease. In this treatment women who have the disease have an extreme and tragic form of infertility. The disease is a disease of the mitochondria, which is an essential element of any egg. The treatment for this disease involves the use of a fertilized nucleus which is transferred through the use of somatic cell nuclear transfer to an egg from which the nucleus has been removed. The new egg is a fresh, undiseased egg. The current Bond bill would make it a crime to provide this treatment even though the nucleus which is transferred is the product of fertilization, not cloning.

This is the Biotechnology Industry Association's statement.

It goes on into other areas that would be prohibited. But let me say what I think the major problem here is.

The key terms in this bill are undefined, and the full scope of the bill is unknown by anyone in this body. It is just 48 hours old. We don't understand the impact of it. The bill is not ready for rushing to the full Senate for immediate consideration.

The Bond-Frist bill fails to define the following terms: somatic cell, oocyte, embryo, and preimplantation embryo.

These are all technical, scientific, state-of-the-art terms that need definition. The bill actually drops the definitions that were in earlier versions of it.

Undefined key terms will chill vital medical research and treatment. The medical and scientific community has

overwhelmingly stated that this bill would chill important scientific and health research. The bill criminalizes that research. Scientists will refuse to do that research. Venture capitalists will refuse to fund it when faced with possible prison terms.

The Bond bill bans somatic cell nuclear transfer technology, and, as a result, the Bond bill may ban production of genetically identical tissues for treatment of disease and transplantation, including blood cell therapies for diseases, such as leukemia and sickle cell anemia; nerve cell therapy for neurodegenerative diseases such as Alzheimer's, Parkinson's and Lou Gehrig's; multiple sclerosis; nerve cell therapy for spinal cord injury; insulin transplants for diabetes; skin cell transplants for severe burns; liver cell transplants for liver damage; muscle cell therapy for muscular dystrophy and heart disease; and cartilage-forming cells for reconstruction of joints damaged by arthritis or injury.

Let me say what I think the problem is.

Senator KENNEDY and I have another bill. We approach this differently. Rather than banning all somatic cell nuclear transfer, period, the end, we say you can't use this technology if you are going to implanting it in a human uterus. You cannot grow a baby by implanting it in a human uterus.

Let me restate that.

You cannot grow a baby using this technology unless it is implanted in a human uterus. I have confirmed that, to my knowledge, scientifically at this stage, there is no way of doing it. However, you can use this somatic nuclear cell transfer for the tissue research, the other areas of research that I am talking about. Once you ban the technology, you cannot use it for these other areas of research.

That is why we feel that the place to ban it is with implantation in the female uterus or womb. That stops the production of a baby. It is dangerous. It took 277 implants in Dolly before they got it to work. And there is a lot we do not know about the procedure. It is terribly dangerous because you are taking a cell at a certain degree of maturity, not an infant cell. You are taking a mature cell, and you don't know what the impact of that cell is going to be on developmental disabilities and the rest of human development.

So scientifically it is dangerous to clone a human. Morally, we say it is unacceptable, and there are a lot of reasons for this: Who would clone? What rules do you set up in cloning? Do you permit the cloning of Adolf Hitlers and the other less favorable characters of history, history past and history future.

So there are many, many questions to discuss. I think everyone in this body believes that human cloning should be made illegal, but we should not attack the technology from which so much good can come. For example, using this technology scientists believe that it will be possible to treat third-degree burns, to provide skin grafts because the DNA would be the same. We may that be able to clone their skin, grow that skin and transfer that skin without rejection. The same thing may be true of diabetes, and particularly in juvenile diabetes which is so recalcitrant and so difficult to handle.

This technology may offer a cure. And with respect to cancer, this technology is what is used in the mass production of anticancer drugs. It would stop all of this particular technology.

So the key is not to stop the technology. The key is to stop the implantation of the embryo produced by this technology in a human uterus. That is what we do in our bill. And that is why I can say virtually all of the scientific community supports Feinstein-Kennedy and opposes Bond-Frist.

Now, I am aware of the fact our staffs met earlier this morning. We all want the same thing. Let me beg this body, do not do something in a rush that is going to mean one day someone is not going to have a cure for cancer or diabetes or somebody lying in a burn unit at St. Francis Hospital in San Francisco or anywhere else is not going to make use of this technology to produce tissue that the body will not reject.

That is really the issue. Why does this have to be done in 48 hours? The FDA says it will prevent human cloning. Why are we rushing to do something and use terms like somatic cell and we do not define in the legislation what a somatic cell is. How many people do we condemn to death because we shut off research because anybody that does any research will have a 10-year Federal prison sentence, a 10-year Federal prison sentence if you do research on somatic nuclear cell transfer to try to develop a skin graft for a third-degree burn that will not be rejected?

That is essentially what we are talking about here today, Members of the Senate. The Bond bill additionally could ban noncloning treatments for diseases carried in the cytoplasm. The cytoplasm is the nonnuclear material in a cell. So parents whose children inherit cytoplasmic diseases can have healthy children by using a variation on somatic cell nuclear transfer. This isn't cloning. It is curing a disease. And I am as sure as I am standing here the Bond-Frist bill bans this kind of therapy.

So let's have hearings. These bills should go to committee and be considered thoroughly. Let's have the biotechnology community testify. Let's have the scientific community testify. Let's have a glossary of terms that we all agree upon. And let's put those definitions into a bill. Yes, let's ban human cloning. Let's say you cannot implant a uterus with somatic cell nuclear transfer. Then there are no babies. Then there is no human cloning. But the rest of the research, research to cure diseases, can move ahead.

I am aware of the fact that the distinguished Senator from Florida is in the Chamber and may wish to make a statement. If I could regain the floor, I would be happy to yield to him for the purpose of that statement.

Mr. BOND. Mr. President, I think there are others in the Chamber as well. I do not believe that we have any agreement at this time to go back and forth with proponents and opponents. The Senator from California has the floor, and if she wishes to yield I suggest the Senator from New Hampshire has been here for some time.

Several Senators addressed the Chair.

The PRESIDING OFFICER (Mr. HAGEL). The Senator from California has the floor.

The Senator from California.

Mrs. FEINSTEIN. Yes, I would like to continue if I can then, and if there is any message that I might be able to deliver on behalf of the distinguished Senator from Florida, who probably knows more about research into areas involving cancer than many of us in this body, I would be happy to deliver it for him.

I say to the distinguished Senator, I do not want to yield the floor and lose the floor because it is my intention to slow down Senate consideration today in this rushed manner in hopes that we will be able to send it to committee, have a hearing and follow the normal deliberative process, including sending it back to the Senate soon for thoughtful consideration.

Mr. MACK. I wonder if I might——

Mrs. FEINSTEIN. I am afraid to yield the floor because I may well lose the floor and not get it back again. So I will continue, if I may.

Mr. President, just yesterday, Dr. J. Benjamin Younger, the Executive Director of the American Society For Reproductive Medicine, wrote:

> ''I urge you and your colleagues to carefully consider any human cloning legislation and to proceed through the proper legislative channels so that a sloppily drafted bill does not get passed and sentence millions of Americans to needless suffering.

Mr. President, once again, I say we should not charge ahead at full throttle on a bill that legislates issues as profound as those surrounding human cloning. There is simply too much at stake.

I would like to give you just a quick side-by-side comparison of the two bills under consideration that ban cloning, Bond-Frist and Feinstein-Kennedy.

Feinstein-Kennedy, as I have said, bans the implantation of the product of somatic cell nuclear transfer into a woman's uterus. It makes unlawful the shipping of the product of somatic cell nuclear transfer in interstate or foreign commerce for the purpose of implanting into a woman's uterus. And it prohibits the use of Federal funds for implanting the product of somatic cell nuclear transfer into a woman's uterus. I recognize that is current in the fiscal year 1998 appropriations law, but we reinforce it in our bill.

The Bond bill, as I understand it, bans human somatic cell nuclear transfer period. It is defined as taking the

nuclear material of a human somatic cell and incorporating it into an oocyte from which the nucleus has been removed or rendered inert and producing an embryo, including a preimplantation embryo. Again, it defines none of these terms. And it makes unlawful the importation of an embryo produced through human somatic cell nuclear transfer technology. It is silent on the use of Federal funds, probably because the authors know that a prohibition on human embryo research is already in place.

The length of the ban in our bill is 10 years. It is a permanent ban in the Bond bill.

The reason it is a temporary ban or a moratorium of 10 years is largely because a voluntary moratorium has been put in place by the entire American scientific community, and to the best of my knowledge, what they were requesting a 5-year moratorium which the President's bill contained. We felt the 5-year moratorium was too short. We prefer the longer period so that it can be reviewed at the end of 10 years.

The Feinstein-Kennedy bill protects and allows biomedical and agricultural research on practices which are not expressly prohibited. That would include research or practices involving somatic cell nuclear transfer or cloning technologies, mitochondrial, cytoplasmic or gene therapy or somatic cell nuclear transfer to create animals. We do not interfere with that. The Bond bill protects or allows areas of scientific research not specifically prohibited. It is silent on mitochondrial, cytoplasmic or gene therapy. And that is part of our problem here, and that is one of the reasons why we think it needs to go to committee and we need to know at the end of the hearing exactly what it is we are doing.

On the issue of a national commission, Feinstein-Kennedy authorizes the current National Bioethics Advisory Commission for 10 years, from the date of enactment. The current commission terminates in 1999. Our would continue it and we require reports and recommendations from the commission in 4½ years and in 9½ years. The Bond bill would establish a new national commission to promote a national dialogue on bioethics of 25 members appointed by the Senate and House majority and minority leadership by December 1, 1998, to conduct a discourse on bioethical issues, including cloning, and to report to Congress by December 31, 1999 and annually thereafter.

On the issue of penalties, the Feinstein-Kennedy bill has a civil penalty of $1 million or three times the gross pecuniary gain or loss resulting from the violation, in other words, a very stringent civil penalty. If an individual uses somatic cell nuclear transfer and implants the product into a woman's uterus, we subject that individual to forfeiture of any property derived from or used to commit a violation or attempted violation. This would get at the lab or hospital where an implantation into a human uterus would take place. Obviously, it has to be done somewhere, and I think this is in a sense a fail-safe major penalty because that entire lab could be forfeited.

The Bond bill has 10 years in prison or a civil penalty if pecuniary gain is derived of not more than twice the gross gain or both. We think 10 years in prison, when definitions are not included to clearly show what we are talking about, 10 years in prison for someone who might use somatic cell nuclear transfer to create the DNA in a cell that could produce a skin graft or another tissue culture, a skin graft that would heal a burn patient, that that individual should not be subject to 10 years in prison.

On the issue of preemption, there is a difference between the two bills as well. Feinstein-Kennedy preempts any State or local law that prohibits or restricts research or practices constituting somatic cell nuclear transfer, mitochondrial or cytoplasmic therapy or the cloning of molecules, DNA cells, tissues, organs, plants, animals or humans. So, we would set a national standard so that the States could not pass legislation and say it's OK to insert a somatic cell in a woman's uterus. We preempt the area.

Internationally, there are some differences in the two bills, too. Feinstein-Kennedy has a sense of the Congress that the President should cooperate with foreign countries to enforce mutually supported restrictions. The Bond bill has a sense of the Congress that the Federal Government should advocate for and join an international effort to prohibit the use of human somatic cell nuclear transfer technology to produce a human embryo.

I think we could easily come to agreement on many of these, particularly this last one. I think we want the same thing.

The major difference is that the Feinstein-Kennedy bill would allow the technology to proceed in medical research as long as it does not involve human cloning.

Mr. President, the successful cloning of a sheep—

Mr. GREGG. Will the Senator from California yield for a question?

Mrs. FEINSTEIN. I will be happy to yield.

Mr. GREGG. Will the Senator entertain a unanimous consent request that I be allowed to speak without taking the floor from the Senator, so the Senator can regain the floor after I finish speaking? I will not offer any amendments.

Mrs. FEINSTEIN. I will be happy to, again, if I can regain the floor.

Mr. GREGG. I ask unanimous consent I be allowed to speak for 5 minutes and at the end of the statement the floor return to the Senator from California.

The PRESIDING OFFICER. Without objection, it is so ordered.

The Senator from New Hampshire.

Mr. GREGG. Mr. President, I thank the Senator from California because I wish to address this issue, also. I, unfortunately, have a meeting that starts at 1 o'clock.

Mr. President, I think we are all actually concerned about the issue of human cloning, and certainly the representations by the doctor from Chicago who stated he intends to pursue a course of commercializing human cloning has caused us to need to accelerate addressing this as a public policy matter. It is appropriately an issue that should be addressed at the level of the Congress of the United States. It should be spoken to by the people's representatives and not left to a regulatory environment such as the FDA for a determination, because it is a matter of dramatic import to our culture and to our scientific community.

There is no question but that the concept of cloning a human is unethical, inappropriate and wrong. We don't have to delve very far into the history of this century to see the horror that can result from a society which allows itself to pursue a course of creating humans or designing a human race not based on God's will but based on the determination of a political decision or a scientific community. Obviously, the Nazi government, in its seeking of a master race, represents one of the true horrors of the history of mankind.

So, the need to debate the issue of whether or not humans should be cloned I think is not necessary. There should be and I believe there is almost unanimity on the need not to allow human cloning to go forward in our society or any other civilized society. I think it is interesting to note that the European Community has also banned human cloning. The question becomes how should we proceed and whether we should proceed with a bill that has been designed by Senator BOND, Senator FRIST and to some part myself, or whether we should proceed in some other manner. I for one strongly support the initiative that is put forward by the bill which we are presently considering because it addresses the core issue of human cloning, which is the creation of an embryo through the process of somatic cell nuclear transfer. That is really the question here.

In order to clone a human, you produce an embryo and as a result you get a human if you follow the next scientific steps. What we have done is limited dramatically and really focused the question specifically on the necessary scientific acts to produce a cloned human and then said, ''No, you cannot proceed in that direction.'' That is the way it should be addressed.

This bill was structured in order to respond to the very legitimate concerns of the scientific community for further research in all the areas the Senator from California has outlined. This bill does not, in my opinion, in any way limit the research into those areas because this bill is purely directed at the embryo issue and the creation of a cloned human being as a result of taking that step. The scientific

issues are further protected by the commission which is in this bill, which says essentially that we have in place, or will have in place, a bioethical commission which will be able to evaluate science as it evolves and make a determination as to when science needs to have more leverage or needs to have more flexibility and then can come to the Congress and say what changes should occur in order to allow for that flexibility. So there is in place a commission which is not only scientifically based but is theologically based and which is politically based, in the sense that it represents, not politicians, but the community at large and which will have the capacity to review what is happening in the area of cloning technology so that we can stay ahead of the curve and be sure we are not limiting the scientific experience and expansion in this very critical area.

So this bill allows for cloning in the area of agriculture and it allows for cloning in the area of animal husbandry. It also allows for cloning for the production of organs. It allows for cloning in stem cell research technology. It allows for cloning in a whole variety of places. Where it does not allow cloning is in the production of a human being, and that is what we should be saying. As a matter of ethics, as a matter of policy, as a matter of a nation which must stand up and define its purposes and ideas, we should be saying humans shall not be cloned.

I yield my time.

The PRESIDING OFFICER. Under the previous order, the Senator from California is recognized.

Mrs. FEINSTEIN. Mr. President, I know there are others on the floor. The distinguished Senator from Texas and my friend and colleague from Massachusetts wished to speak on this issue. I would just like to wrap up very rapidly.

This whole issue was really galvanized with the cloning of the sheep Dolly. Let me reinforce the fact that it took 277 attempts before this cloning was successful. The impact of the cloning is not yet known.

The second point is that the science is such that huge disabilities, real problems can result from human cloning. It is unsafe.

And my third point is, the circumstances to not require us to rush. Chicago physicist Dr. Richard Seed propelled the debate into full force last month when he told the media that he intended to clone human beings. And he said that there were 10 clinics in the United States interested in offering cloning services and that he believed the demand would be for 200,000 cases per year. That's according to the American Medical News.

Since that time, as you know, the scientific community itself has exercised a self-imposed moratorium on human cloning. I know of no legitimate lab, hospital, or facility that will permit human cloning today. I also would like to add that the FDA has said that they are asserting jurisdiction in this area and will not permit human cloning. So I respectfully submit to those who feel there is time pressure that forces us to proceed to the Senate today, that is not correct. There is time for us to take time to consider this issue, to hear the testimony, to go over the scientific terms, to really debate whether the Feinstein-Kennedy approach or the Bond-Frist approach or perhaps a third or fourth approach is the right way to go.

So I would like to end my comments today, Mr. President, by thanking you for your discretion and by appealing to the majority side of this body. You have an opportunity to do some good. But you also have an opportunity to do enormous harm that could cost tens of thousands of lives needlessly if we do not legislate carefully. So let's do it right.

I thank the Chair and I yield the floor.

The PRESIDING OFFICER. The Senator from Texas.

Mr. GRAMM. Mr. President, I ask unanimous consent that I might speak for 10 minutes as in morning business.

The PRESIDING OFFICER (Mr. KYL). Without objection, it is so ordered.

THE HIGHWAY TRUST FUND

Mr. GRAMM. Mr. President, I wanted to talk today on the same subject Senator BYRD spoke on earlier and that Senator CHAFEE also spoke on earlier. Without getting into a debate with Senator CHAFEE, I want to respond to a couple of things he said.

I want to remind my colleagues that in the American system of Government, we have a series of dedicated revenues where we collect specific taxes and fees and we tell the American people that those taxes or those fees are dedicated to a specific purpose. When you go to a filling station, if you live in a State that has banned the little clip that holds the nozzle in the ''on'' position so you have to stand there while it's pumping gas into your car or your truck, I am sure that you have read the sign on the gasoline pump. It basically says, if you wanted to reduce it down to good news and bad news, that the bad news is that a third of the price that Americans are paying for gasoline is taxes. But the good news is every American is assured on every gasoline pump in America that those taxes are going to build highways. Virtually every American in this era of self-service has read that sign on the gasoline pump, the bad news and the good news.

The problem is, the good news is not true. The bad news is sure enough honest to God true. But the good news is not true. Today, on average, somewhere between 25 cents and 30 cents out of every dollar of gasoline taxes is not spent on roads. So that when we tell the American people that the gasoline tax is a user fee for roads, as is often the case in Government, we are not totally leveling with the American people.

Senator BYRD and I would like to partially change that. I want to explain exactly what we are doing. As my colleagues will remember, in 1993, for the first time in American history, the President pushed through Congress a permanent gasoline tax, 4.3 cents per gallon, that was not dedicated to the highway trust fund, and every penny of it was spent by Government on a broad array of projects and programs, none of which had anything to do with highways. You will remember that I offered an amendment in the Finance Committee that was adopted by the Senate, ultimately adopted by the conference, voted on in the House and Senate, signed into law by the President, that took that 4.3-cent-a-gallon tax on gasoline away from the general revenue and put it in the highway trust fund, where it belongs.

We now are looking at a situation where, if we don't take action to allow a competition where those of us who believe that, relatively speaking, we are spending too much on many programs and not spending enough on highways, we are going to have a situation where the trust fund could rise to almost $80 billion, where we have collected $80 billion between now and the end of the highway bill that should be before the Senate today. We will have collected $80 billion, telling people the money was going to highways, and, yet, every penny of it will have been spent on something else.

Senator BYRD and I have said that that is not honest. Senator BYRD and I have said that our amendment, basically, has to do in part with honesty in Government.

Our dear colleague from Rhode Island has said that this has something to do with the budget surplus, or at least has talked about surpluses in the trust fund and the budget in such a way that people might get confused between the two. So I want to make it very clear what the Byrd-Gramm amendment does and what it does not do. In fact, anybody who wants to read the amendment can understand exactly what it does, because it is a very simple amendment.

Basically, what the amendment says is this: We have put the 4.3 cent a gallon tax on gasoline into the trust fund. We had a surplus of $23 billion that had already been collected to build roads but has been spent on something else. What Senator BYRD and I are saying, in essence, is, all right, we ought to get that money back. Fairness would dictate it goes to roads. It was collected for that purpose.

An analogy I have used is that it is like a rustler has come out and has been stealing your cattle and you catch him. Senator BYRD and I called the sheriff and the sheriff has come out and arrested this rustler. Being benevolent, we have said two remarkable things. No. 1, we are not going to hang you,