

And this is the kind of disparity, we have the highest disparity between the wealthiest people in the country and the poorest people in the country since the 1920s, that is going like this. And the whole idea is to try to lift all the boats up into the middle class.

And we were talking earlier about the economy. This is, again, third-party validator, as we begin to wrap up. The long term, because we get a lot of happy talk, but the long-term outlook is such a deep well of sorrow that I can't get much happiness out of this year. That's a former director of the Congressional Budget Office that used to work for President Bush. It is such a deep well of sorrow.

This country is going in the wrong direction, whether you are talking about oil or Medicare or the war or Katrina or whatever, and my friend has got his toy there. This country is going in the wrong direction and we want to go in another direction.

If you like the neoconservative agenda that has been implemented, look around, gas, oil, retirements, pensions, minimum wage, Social Security, college tuition, keep the Republicans in office.

Mr. MEEK of Florida. Mr. RYAN, just very quickly, the bottom line is, Mr. DELAHUNT, to your point, sir, the reason why the chairman hasn't called ExxonMobil in, the reason why everything that we have described here today is that we are on the total opposite side of their position.

We are not willing to rubber stamp everything that the President and the administration says must happen in this Congress. We are not willing to rubber stamp the special interests just because they are contributors to a particular campaign or something.

We are willing to stand up for the American people. And the reason why we have this rubber stamp down here on the floor, just to illustrate exactly what the Republican Congress has done, and that is the reason why we are in the situation we are in now.

Ms. WASSERMAN SCHULTZ.

Ms. WASSERMAN SCHULTZ. I just think, at the end of the day, we need to stress that in November, when we have the opportunity to take the majority of this institution, we will move the country in a new direction.

We will make sure that we make a commitment to reducing the deficit and reduce it. We will expand access to health care. We will actually invest in alternative energy resources so that we can truly reduce gas prices. And we will make sure that the American people know that their Representatives are here for them and not for the special interests.

Mr. RYAN.

Mr. RYAN of Ohio. And even in the first couple of days, we will raise the minimum wage and cut college loan interest rates in half for parents and students. Just in the first couple of days, once we get this signed into law, we will recognize a huge difference.

Www.housedemocrats.gov/30something. All of the charts that we have here can be accessed on the Web site. Wwww.housedemocrats.gov/30something.

It has been a real pleasure.

Mr. MEEK of Florida. Mr. RYAN, you did such an excellent job with the Web site.

I want to thank Mr. DELAHUNT for coming down and joining us this evening. We know that he could not join us yesterday evening.

Ms. WASSERMAN SCHULTZ, always a pleasure working with you here on the floor and off the floor.

What is good for the American people; and with that, Mr. Speaker, we thank the Democratic leadership.

EMBRYONIC STEM CELL RESEARCH

The SPEAKER pro tempore (Mr. WILSON of South Carolina). Under the Speaker's announced policy of January 4, 2005, the gentleman from Maryland (Mr. BARTLETT) is recognized for 60 minutes.

Mr. BARTLETT of Maryland. Mr. Speaker, we have appeared here on the floor several times to talk about a subject which is very important to a number of Americans, particularly those with some debilitating diseases that they believe might be cured with technology developed from embryonic stem cells.

I have had the privilege of having several Members of the House to work with me in developing the legislation that we are going to talk about tonight. And one of those Members is Congressman TOM OSBORNE from Nebraska, who is here with us this evening. And I would like to yield to him.

Mr. OSBORNE. Thank you very much, Mr. BARTLETT. I really appreciate your leadership on this issue. And you are obviously the expert.

Mr. BARTLETT is a geneticist and understands the topic very well. I would just like to set the stage for some of the debate tonight.

Many of us have been impacted directly or indirectly by diseases like juvenile diabetes, Alzheimer's, Lou Gehrig's disease, Parkinson's and so on. And so I think everyone understands the desire for people to find a cure. And for many people, the silver bullet is embryonic stem cell research. And they feel this holds great promise. It has been going on now for about 7 years. We have not seen great progress, but it is still early in the process. So, as a result, there are many people who are pushing very hard for embryonic stem cell research.

On the other hand, many oppose embryonic stem cell research because they see the embryo as a living, viable human being; and therein lies the moral dilemma. On the one hand, people see the possibilities and on the other hand they see the destruction of life. And so is there a possible solution? Where do we come out on this?

If you believe that life begins at conception and if you believe in the sanctity of life, the destruction of embryos for research purposes would be largely unacceptable. And so, Mr. BARTLETT's legislation holds great interest to me, because we have found that there is a possible alternative.

The President has said that he will veto H.R. 810, which is a stem cell research bill. And if it is passed by the Senate, and people predict that it will be passed, then it will probably be vetoed by the President. And at that point, it appears as though the House will sustain that veto and probably the Senate as well. So we are right back to square one.

So is there an alternative? And that is why I am here tonight.

As many people may be aware by now, there is still the potential for a morally acceptable stem cell research to be conducted with Federal funds through the Bartlett bill. And evidently there is a process at the present time whereby embryonic stem cells can be extracted, and it is still in its elemental stages, without destroying the embryo. So I have great interest in this because it does provide an answer to the dilemma that I have just outlined.

And so, without a lot of further commentary from me, being somewhat of an amateur in the area, I would defer to Mr. BARTLETT, because he truly understands this research, which I think can be the answer that so many of us are looking for.

I personally am a very strong prolife individual, have voted consistently in that direction. And so I welcome this opportunity to look at a prolife solution to embryonic stem cell research.

I appreciate the gentleman's work on this bill, appreciate his knowledge, his expertise, which is certainly unparalleled in the Congress.

And with that, I just wanted to make those opening preparatory remarks and lend my support to this bill and this work that you are doing, and thank you for doing it.

□ 1930

This is all probably going to come to a head here in the next week or so; so this is a critical time. And what I think and others are trying to do is to create awareness and to make sure that people in the Congress understand the nature of the research that he is proposing.

So I commend you for your work. I want to wish you the very best, and hopefully in the next week or 10 days, we will see some positive results. So thank you for your leadership.

Mr. BARTLETT of Maryland. Mr. Speaker, reclaiming my time, I thank the gentleman for his support, for his leadership on this, and for his kind words.

I was fortunate in another life, before I came to the Congress, to have the privilege of working in this general area. I have a doctorate in human physiology, and I had the privilege of

teaching medical school for 5 years and doing biomedical research. And when I came to the Congress and learned of the interest in stem cells, with my background I saw some opportunities for applications here that may not have been apparent to others, and I have been pursuing this now for some 5 years with the White House and with the National Institutes of Health.

We are here tonight, Mr. Speaker, because it is our understanding that within a few days, probably next week and maybe early next week, the Senate is going to be voting on three bills, two of them relevant to this, the third somewhat tangential to it.

One of the bills they will be voting on is the bill that we passed here in the Congress here in the House some time ago. It is known as the Castle bill here generally, Castle-DeGette bill. This is the bill that the President says that if it gets to his desk, as Congressman OSBORNE indicated, he will veto it because this is a bill that would use surplus embryos from the fertility clinics, and they would be destroyed in the process of securing cells from them to produce these stem cell lines, although there is the anticipation, the hope, that a great deal of medical good might come from embryonic stem cell applications.

There is a concern of many in our society, which I share, that it is not morally acceptable to destroy one life in the hopes that you will help another life. So I had hoped that there would be an alternative to this, that we could look forward to enjoying the potential benefits of embryonic stem cell applications without having to kill embryos.

And that is what we are here to talk about this evening, because the second bill that the Senate will be voting on next week is a bill that is essentially identical to the one that we have been working on and developing now for these 5 years. The bill that we will vote on in the House, we hope, shortly after it is voted on in the Senate, will be a companion bill to the Senate bill and essentially the bill that we have been working on for these 5 years.

I would first like to take a look at a chart here which shows, in very gross form, the developmental sequence and the origin of what we call stem cells so that we can get a little appreciation of what a stem cell is so that we can understand the difference between adult stem cells and embryonic stem cells and the potential that these hold.

Here we have a very abbreviated development process. It begins with what is called the zygote. The zygote is produced by the union of two sex cells, which technically are called gametes. And the zygote then goes to a number of cell divisions. And, boy, did they skip a lot here because we have just one cell and here we have several hundred cells; so it is divided again and again before you get to this point. And this is the point of the inner cell mass. And in that inner cell mass which will

become the embryo, we have the first differentiation of these very primordial cells here into three distinct cell types: one is the ectoderm and another is the mesoderm and the third one is the endoderm.

There is a fourth cell type there, limited in number and location, and these are the germ cells. These will be the ova, produced in the female, and the sperm, produced in the male. What we have here depicted is the embryo implanted in the wall of the uterus. This is the uterus and this is the embryo and the so-called dissidua, the tissues that surround and support the embryo. Only this part of it here will become the baby. The rest of this will be the supporting tissues, the amnion and the corion, that support the baby.

In each of these germ layers, and we call these germ layers because they are three layers, three types of cells from which all of the tissues and organs of the body will develop, the ectoderm will produce our skin and our nervous system, and the mesoderm will produce the great bulk of our bodies. It will produce all of the muscle cells, our heart, the blood system, the smooth muscle cells of our gut and so forth. All of these will be produced from the so-called mesoderm. The endoderm, much limited in quantity in the body but not in importance, our lungs, much of our lungs, the lining of our intestines, and so forth are produced from the endoderm.

Every student in even a pretty elementary biology class will be familiar with one type of stem cell, and these are the stem cells that produce our blood cells because you can see those very readily in the adult. They are located in bone marrow, in the shafts of our ribs and so forth, and they produce our red blood cells, the little thrombocytes that produce the clotting of blood, and the polymorphonuclear leukocytes. These are the leukocytes with a funny shaped nucleus. And they are called stem cells because from a single cell type, this will differentiate into several types of blood cells, most of the blood cells. There are a couple of white blood cells that are produced in lymphatic tissue, but most of the blood cells are produced from these single stem cells.

Most of the other tissues here are also produced from stem cells because it is a single cell, the ectodermal cell, the differentiations of these several types of cells.

All of these types of cells are adult stem cells, and they have the limitation of already having differentiated. They already are differentiated so that under ordinary circumstances only certain tissues will ever be produced from them. If you can go into the body and take out an ectodermal stem cell, unless you are clever and make that cell believe that it is something that it is not, it will produce only tissues that relate to the ectoderm, cells of our nervous system and cells of our integument, or our skin.

Similarly for the mesodermal cells, if you can get a stem cell even before it is a stem cell for blood, back here you can get a stem cell from which all of these mesodermal tissues will develop, but you could never get ectodermal tissue from that nor could you get endodermal tissue from that; so you are somewhat limited as to the types of tissues that you might develop from an adult stem cell.

But if you could go back to the embryonic stem cell, and you may have to go back even before this stage of development, when the embryonic stem cells are undifferentiated, which means they haven't started to become a specific type of cell, you then could theoretically produce from those cells any and all of the tissues of the body. So there are a number of different diseases where the medical profession treating them and the loved ones of the families believe that there could be dramatic applications made from embryonic stem cells.

Every year I look forward to the juvenile diabetic people coming through my office. These are such heroic little kids that I see. Some of them so brittle that they have an insulin pump and they have to puncture their fingers or their earlobe a dozen times a day or more to keep track of their insulin because they are so fragile, so brittle, they can go from very low glucose to very high glucose with life-threatening changes.

Then the people come through the office who have friends and relatives who have Parkinson's disease, who have Alzheimer's disease, and any of the autoimmune diseases where the body's defenses have been confused so that the body is attacking its own tissues. And it is believed that in all of these different kinds of diseases that embryonic stem cell applications might produce dramatic effects.

I just returned from a family reunion. And my cousin's husband, who was a pathologist here in the Washington area, Washington Adventist Hospital in Shady Grove, for years, retired and went to Florida and very shortly came down with Parkinson's disease. I recognized him from his smile. Other than that, it would have been hard to recognize him because of the wasting of his body that has occurred with Parkinson's disease. And the mind, of course, is still very alert. It is just the mechanical part of the body that is deteriorating.

And Dr. Teske, Johnny Teske, we were talking about stem cells, embryonic stem cells, and he says, "Time is of the essence." And I kind of choked up a little when he said that because here is a person who really understands this. He is a pathologist. He knows what he has got, and he knows what his future is going to be, and what he was telling me is that if I am going to benefit from this, you have got to do it quickly.

So I hope, Mr. Speaker, that we are able to move quickly on this in the

House. It is our understanding that the Senate will be moving quickly on it. I mentioned that several of our colleagues here have been working with us and helping on it. And one that I am very pleased has been helping us is someone who is really familiar with this subject because he is a physician who has delivered a lot of babies. He gets involved down the line from here after all of these tissues have been developed and we have that little baby at 9 months in the womb. And this is Dr. GINGREY from Georgia.

I am very pleased that he has joined us and would like to yield to him.

Mr. GINGREY. Mr. Speaker, I deeply appreciate the gentleman from Maryland for yielding. And I just want to say, as my good friend and our colleague Coach OSBORNE said at the outset, ROSCOE BARTLETT deserves a lot of credit for this bill, H.R. 5526. And it has not been easy. You heard him say, Mr. Speaker, that he has been working on this issue for over 5 years, has met with the Bioethics Commission, the President's Bioethics Commission, to discuss this issue, discuss this issue with the White House, understanding, as he said just a few moments ago, that while we want to search for that miraculous medical breakthrough, that cure, that hopefully we can obtain either from adult or umbilical cord blood stem cells or the even greater potential for utilizing embryonic stem cells to save human life, to save the people that he was just talking about, Mr. Speaker.

And, indeed, I am sure you know this as well as the other Members that these folks do come by and talk to us on an annual basis, whether they are juvenile diabetics or Parkinson's, as he described, Alzheimer's. I think often of children born with something called spina bifida, where there is an open defect in the spine. One of these germ cell layers that ROSCOE was just talking about, the ectoderm, something goes awry in the developmental process, in the fetal stage of development, and these children are born perfectly normal in every way except for this defect, which in almost every instance leaves them with a permanent, noncurable paralysis usually from the waist down.

□ 1945

That not only affects their lower extremities, but of course, it affects the function of bowel and bladder in these otherwise perfect, perfect children, and yet their lifespan is drastically shortened because of the complication of this birth defect.

I have lain awake more than one night thinking about what might be done, whether it is a surgical technique or a medication. Obviously, it would be great if these birth defects never occurred, if we knew exactly what caused that birth defect, but we do not. We just do not, and so to be able to develop something, some way of helping these children and people with other diseases that the gentleman from Maryland has

just described is a passion of mine as a physician.

To come to this Congress, as I did 3½ years ago in the 108th, and to meet other Members of this body on both sides of the aisle, but in particular Representative BARTLETT, and understand that he has a knowledge of this subject far beyond probably any physician Member, ROSCOE BARTLETT of course is a doctor. He is a Ph.D. He has taught embryology in medical school. Physiology, he is a physiologist, and the subject matter of which he is describing and talking about this evening, he has done so over the last several years, and it is amazing how he can put that, Mr. Speaker, in a simplistic terminology, with charts but with a very lucid explanation so that we, other Members on both sides of the aisle in both chambers, can understand and the general public who hopefully are watching can understand because the sound byte becomes reality.

This issue revolves around the use of embryonic stem cells, embryonic stem cells to hopefully result in these medical cures, these miracles that we hope will be there in our lifetime.

Mr. Speaker, we have a President that feels very strongly about that, that has great passion and compassion. But what he has said, and I heard him loud and clear shortly before I became a Member of this august body, when he made a decision not to destroy human life for the sake of hopefully some miraculous medical cure.

You could almost compare it to what our military commanders do and the decisions that they make. I know that the Speaker tonight particularly understands that with his military service and that of his sons serving in the military, but you try as hard as you can to avoid collateral damage in the military. The last thing you want to do in going after the enemy and taking him out is to inadvertently destroy or injure the life of a civilian.

Well, this is getting right down to the core of this matter of what Representative BARTLETT is so concerned about. We want to be able to improve human life and relieve the suffering of our fellow brothers and sisters, but at the same time, we do not want to destroy a life in the process.

That destruction of life, whether it is a little embryo from one of these infertility clinics or, indeed, whether at some point somebody extends that destruction of human life to a senior citizen at the other extreme who may have lost most of their, not all of their, but most of their mental capacity, I would hope, Mr. Speaker, that if we knew that we could obtain a cell from the brain of a senior citizen who is suffering from senility and use that as a stem cell to cure somebody else's disease but in the process kill that individual, no one would accept that, I would hope, I would think, I would pray, and I think not.

So this is really what this is all about. ROSCOE BARTLETT knows and

has finally convinced his colleagues, I think certainly in this body, but also in the other body, that there is a better way, that there is indeed a better way and that we can obtain these pluripotent stem cells, not totipotent because I know some would say if it is a totipotent, that it is an embryo in and of itself.

But this bill has the precept of saying we can fund research that will allow the harvesting of stem cells without destroying human life, and anybody that suggests that the embryos that are so-called left over from the fertility clinics are throwaway embryos, are going to be flushed down the drain anyway and it is okay to churn them up and centrifuge out some stem cells and destroy that human life, that it does not matter, needs to talk to the parents of the snowflake babies, some of them 3 and 4 years old now, I think close to 100, who have been adopted from those parents that own those embryos, those so-called excess throwaway embryos.

So there is a better way, and we do not need to get into this debate about who is pro-life and who is pro-choice and all of that. If we can do this in the Bartlett way, H.R. 5526 is the way to do it, and it is a companion bill to what Senator SANTORUM has introduced in the Senate. I am just thrilled to learn that Dr. FRIST will allow that bill, as well as the Castle-DeGette bill and the Brownback bill to be brought to the floor of the Senate, it is my understanding next week, voted on. Possibly all three of those bills, Mr. Speaker, will pass, and then the President will have an opportunity, after we pass the companion bill to H.R. 5526, to do the right thing.

Then I think the Members of this body will sustain if the President vetoes the Castle-DeGette bill, which, again, I am not criticizing the authors, but there is no question that it goes back and allows taxpayer dollars, mine, my constituents in the 11th of Georgia, ROSCOE BARTLETT's constituents, with their hard-earned money to pay for research that results in the destruction of human life, and we reject that.

So I am thrilled that the 4 years of hard work that Representative BARTLETT has put into this issue is finally going to come to fruition and we are going to get good results from utilizing these stem cells that are obtained.

I know that he will begin in just a moment, as I conclude, to talk about the different techniques of how that can be done, and I think our colleagues can understand it because he explains it well. It is not rocket science. It is not something that is star wars, but it is real and it is the way to do it.

So I am real happy to be here tonight to once again join my colleague who I have such great affection for, not just him personally but the issue that he has taken on and the hurdles that he has had to go through, and I commend him for that.

Mr. BARTLETT of Maryland. Mr. Speaker, I thank the gentleman very much. Not only do these snowflake babies speak to us, the snowflake babies are the babies that were produced by the parents of the excess embryos, giving these embryos to a mother who could not have a baby. They were implanted in her womb, and we now have more than 100 of those. They were here, by the way, a year or so ago. A number of snowflake babies were here in the Congress and in the White House.

But I think there is something else that speaks to us, too, and that is that before you would harvest the cells from one of these embryos by destroying the embryo, you would want to know that it was a healthy embryo, and you would have it under the microscope and you are looking at it. You want to make sure it is a healthy embryo because you want to have stem cell lines that will be really healthy.

When you are looking at that embryo under there, it ought to occur to you that that could be the next Albert Einstein or the next Beethoven, and you are not now looking at 400,000 surplus embryos in the fertility clinics. You are looking at that one embryo under your microscope. That embryo ought to speak to you. It could be the next Albert Einstein. It could be the next Beethoven, and how could you kill the next Albert Einstein or the next Beethoven? Fortunately, as Dr. Gingrey said, there is a way of getting embryonic stem cells without destroying embryos.

The President was not unmindful of the potential for embryonic stem cell research, and he really wanted the medical community to benefit from embryonic stem cell research. So, quite immediately after he issued his executive order saying that they could use Federal money only for research on those stem cell lines that had already been established, those stem cell lines now are running out, as we knew they would, and a few weeks, months ago, there were 21, 22 or so left, maybe fewer than that left now. We started out with maybe 60.

Very shortly after the President issued his executive order, he set up a council on bioethics, and they issued a report. I have here a copy of that report, and they detailed and discussed at quite some length, it is very interesting reading, and I think even the layman could appreciate most of it. They discussed four different potential ways of getting embryonic stem cells as the equivalent of an embryonic stem cell without destroying or hurting an embryo.

The second one of those that they talked about, you will see a little asterisk there, and you go to the bottom of the page, and you will see the notation that Congressman BARTLETT suggested this technique before the bioethics committee met. A little later, I will indicate to you how I came to have my first discussion with the President on this and how we now made that 5-year journey from then to now.

What I have here in this slide is a depiction of the reproductive tract of the female, and what we will be talking about is what goes on in a dish in the laboratory that I think is a whole lot easier to understand what is going on if we look at this process in this depiction of the mother's reproductive tract.

Here in the corner here we see the total reproductive tract which has the vagina and the cervix and the uterus and the two fallopian tubes, and each fallopian tube ending in a funnel-like structure called infundibulum, and there is the ovary and the blow-up here is only one-half of this reproductive tract. So there is a mirror image on the other half of it. This shows what happens in the fertilization and the early development of the embryo.

Once a month ordinarily, an ovum ripens and is released from the ovary, and if sperm had been deposited in the reproductive tract, they then travel up the reproductive tract. The egg is fertilized very quickly, very soon after it is released from the ovary.

Now, sometimes the egg is not picked up by the infundibulum, and it floats out into the body. Many of these sperm will make it clear through the reproductive tract and go out into the body where they will simply be absorbed later, but they may find the ovum out there and fertilize the ovum. Then the ovum will do what it does in the reproductive tract. It will divide again and again, and we will look at that in a moment.

At the appropriate time, it will find someplace to implant, and since it is out here in the body cavity, it will implant on one of the body tissues, and we call this an ectopic pregnancy, and that pregnancy will threaten the life of the mother. The baby cannot develop fully there, and the baby will die and the mother, too, if this is not interrupted.

□ 2000

At other times, as the egg, fertilized egg goes down the reproductive track here, it may implant along the tube here. And we call that a tubal pregnancy. And that tube is nowhere near big enough to accommodate a baby growing. So the baby will die, and the mother possibly too if we do not interrupt that pregnancy.

But most of the time, and nature is really quite a marvel, most of the time the egg is fertilized here high up in the fallopian tube and then it begins a several day journey. And here we have the days marked. Day 4, day 5 and day 6 and 7 and day 8 and 9. It is a bit more than a week after it is released from the ovum and fertilized, and day zero here begins the fertilization. It makes its way down the reproductive track.

No motility of its own, it is moved along by little cilia, little hair-like projections on the wall of the oviduct, which move in wavelike fashion and move the ovum down. As it moves down, it divides. First into two cells, then four cells, and then into 8 cells,

and we will come back to that 8-cell stage, because that is an important one.

Then it goes on to divide further to a number of cells, and finally to the inner cell mass that we found on that first slide. And then it implants in the uterus.

And the mother's uterus produces some tissue and the little embryo produces some tissues, we call these the decidua. And they develop the placenta and the amnion. They are filled with fluids and support the baby and protect it during its development.

When eggs are taken from the laboratory, and all of this by the way can happen in the laboratory in a Petri dish, they simply take the egg from the mother, generally produced by hormone treatment that causes multiple ovulations, so that there are a number of eggs. There may be 6, 8, 10 eggs are produced by the mother. They will fertilize those in a dish in the laboratory, a Petri dish, in vitro, that means in glass.

This is in vivo, that means in life. The in vitro fertilization, they then will divide and the doctors watch them divide. And if they are going to harvest these for stem cells they generally wait to the inner cell mass stage down here and take them out. And the reason for that is that these cells do not like to be alone. And you have to be clever to get one of them to divide.

So they take them when they have lots of company after there is a number of cells in the inner cell mass. They take these cells and destroy the embryo in the process.

There is a technique used, first in laboratories in England, and then in this country, and I spent more than a half hour on the phone with two of the physicians in the one here in Virginia, where they go to the 8-cell stage, and this is all in a Petri dish in a laboratory now.

And they take a cell, and sometimes they get 2 cells from the 8-cell stage, and they do a preimplantation genetic diagnosis on that to make sure that the baby is not going to have some genetic deficiencies like Trisomy 21. You generally know it as Mongolism. And that is when just one of the chromosomes, there are three of them there. And if there are three of those chromosomes there, there are various degrees of Trisomy 21, but the baby then will be affected by that.

And you would like to have, most parents would like to have a normal baby. So they can do a preimplantation genetic diagnosis, and then they implant the remaining seven and sometimes six cells. And more than 2,000 times now, what appears to be a perfectly normal baby has been produced from that. I will have a slide a little later to show this.

But I would just like to note for now that that is no big surprise. In fact, the big surprise to me would be that the baby was not normal, because nature, for as long as we have had people here,

and happens in animals too, but nature has been doing exactly this, but they take not just one or two cells away, nature takes half the cells away. And from each half, nature grows a perfectly normal baby, and we call them identical twins.

So if nature can take half of the cells away and each half develops into a perfectly normal baby, it ought to be that you can take a cell or two away and the embryo would not even know it. If it does not know that half of the cells are gone, if it goes on and develops into a perfectly normal baby, each half does, why should it be affected at all if you take only one or two cells?

So the big surprise to me would have been if there was any effect of this on the baby. And it is that technique which had occurred to me earlier. But to kind of put this in perspective, I would like to look at the next slide. And this next slide, this next chart up depicts some of things that we have been talking about and some additional ones.

This is the fertilization process. We saw that in that former slide. But we did not see there the early development of the gametes or the sex cells. And they develop in the seminiferous tubules in the male, and in the ova of the female, those cells divide and divide again.

And most of these divisions are what we call mitotic divisions, that the chromosomes split so that the same number of chromosomes remain in the daughter cells. But in one of these processes there is a meiotic division called meiosis where the chromosomes do not divide, so that when the cells split, each daughter cell has only half as many chromosomes.

You see, that is necessary because the chromosomes are going to be joined from the female and from the male, and you now need to end up with the right number of chromosomes, not twice as many chromosomes. Because if that happened, the embryo would certainly die.

By the way, it is really interesting that in plants, when you have what is called polyploidy, that is what this is called when you have polyploidy, which is more than the diploid, which is the double, and there is a haploid number here, and there is a diploid number when the two haploids come together.

In plants it just makes them bigger and prettier, and the flowers brighter colored and so forth. That works well for plants, but for humans and all other animals, by the way it is fatal.

So this depicts the fertilization process and they combine to form the embryo, and then the embryo divides again and again. And we see there the same types of depictions that we saw previously.

The second little sequence here shows cloning. And Dolly the sheep was the first clone that the public knew about anyway that was produced. In cloning what happens is, that you take an egg cell, and you take the nucleus

from the egg cell. You remove the nucleus, so now you have an egg cell with no nucleus there. And then you take a nucleus from a donor cell. This is a general somatic. By soma, that means body, somatic cell. You take the nucleus from that cell, and you put it inside the egg cell.

Now all of the genetic material is not in the nucleus. Most of the genetic material that determines who you are, whether you are male or female, tall or short, blond or brunette, going to be tall and thin or short and stout, most of that is in the nucleus. But in the cytoplasm here are a lot of control factors. Ribonucleic Acid, so called RNA and then messages are sent back and forth between the cytoplasm and the nucleus.

And so there are a lot of control factors here in the cytoplasm that when this nucleus from a skin cell or whatever is put inside this egg cell, it is controlled by these control factors in the cytoplasm under appropriate circumstances, so that it now behaves as if it were an embryonic cell. And that is because of the control factors here.

Of course, what the offspring is going to look like now is what the individual looked like from which the donor cell was taken. I was privileged to go to a little dairy in my district that is probably unique in all of the world. He happened to have the best Holstein cow in America, which probably means the best Holstein cow in the world, because we have some of the best cattle in the world.

Her name was Zena. And a cloning company wanted to work with him. And so he cloned two daughters of Zena. And then Zena broke her back and she had to be put down. But he had Zena's daughters. It was very interesting. The daughters did not look exactly like Zena. Why shouldn't they? And that is because of the black and white pigment, the general distribution, whether they are mostly white or mostly black is controlled by the genes.

But the actual pattern is kind of an accident of development. And so the two daughters had exactly the same genetic composition as their mother, looked somewhat different. They both had roughly the same amount of black and white, but it was distributed a little differently. And so you could see there the effects of the factors at work during the development of the embryo.

The third little sequence down here shows us parthenogenesis. Parthenogenesis is when an offspring develops just from the ova. That can only happen if this meiotic division does not occur, because the ovum has to, and it says that here, induce the egg to keep all of its chromosomes. This is kind of easy to do with salamanders and frogs and so forth. There is a lot of parthenogenic embryonic studies that are done with these, with these animals.

But now of course it is going to have exactly the same genetic makeup as the mother. I do not know if we ever

have a documented case of this happening in humans. But you can certainly induce it in some of the lower animals.

The next chart now shows us the four processes, the potential sources of stem cells that were described here in the white paper produced by the President's Council on Bioethics, called alternative sources of human pluripotent stem cells. Dr. GINGREY used the term pluripotent. I would like to note just for a moment what that means.

The embryo itself, when it is first fertilized, is totipotent, it can produce any and all cells, including the decidua. These are the cells that will produce the amnion and corion to support the embryo. By the time it gets to several divisions, even the eight-cell stage, it has now become only pluripotent. A single cell will not be able to produce all of the tissues of the body.

If it could produce everything, maybe produce all of the tissues of the body, but not the decidua, if it could produce all of those, it would simply, as Dr. GINGREY mentioned, be another embryo and the ethical argument would start all over.

But it is my understanding, and I was pleased to learn this, because I did not know before I got involved in this, I do not think that we knew until very recently with research, when the embryo went from totipotent to pluripotent, but you do not want totipotent cells, you want only pluripotent cells; that is why the name of this article.

There are several different techniques, four of them, and three of them are shown here. The last one will be on the next slide. Altered nuclear transfer. This is an interesting one. You will see that it looks very much like the cloning.

But what they do before they put the donor cell is they turn out, turn off some of the genes in the donor cell. Generally they are the genes that would produce the decidua. So you do not end up with an embryo, you end up with a mass of dividing cells that have all of the cell types the embryo would have, but they are not organized as an embryo.

So the argument is made that since it is not an embryo, you can take the cells from it. And then you turn the gene back on, because in your stem cell line, you want to have a normal cell, so you turn the gene back on.

There is another variant of this, which is interesting and might have less ethical arguments. Because the ethical argument here might be that you are simply producing a deformed fetus. If a fetus is born deformed, you do not take it and kill it, so why should you kill this? You have intentionally deformed it.

Now the proponents of this will argue that it is really not a fetus because it has no chance of ever developing into a baby. But that argument kind of goes away if you use this technique.

Because what they do here is to enhance the cells that produce the embryonic stem cell growth so that it cannot produce the whole baby.

□ 2015

You haven't disrupted, changed the embryonic makeup; you simply enhanced the activity of some of the cells. So this altered nuclear transfer oocyte-assisted reprogramming is what it is called. And obviously we need a lot of animal experimentation, which is what the bill provides for.

This is the technique that I had suggested to the President. I met him at an event shortly after I went to NIH, and I talked to some of the doctors there. They had an open laboratory there and invited the staff out and Members out. I think I was probably the only Member that was there.

But they were talking about the potential of embryonic stem cell research. They didn't know what position the President was going to take; and of course you can't get inside their head, but my feeling was that they believed that the President was going to permit the use of surplus embryos and use Federal money for that. He, of course, did not do that.

But I asked them during this discussion, if in the development of identical twins you can take half the cells away and each half produces a perfectly normal baby, why shouldn't you be able to take one or two cells away to produce a stem cell line from, and then the rest of the embryo would produce a perfectly normal baby? And they said, yes, that ought to be possible.

And this is just depicted here. You have taken a cell away and you developed it into an embryonic stem cell line. That is easier said than done, because these cells don't like to be alone. And now two doctors say they have done it; Verlinksy and Lanza both say that they have successfully developed a stem cell line from a single cell. But both of them did it creatively by giving this cell some company, and after developing a sufficient number of like cells, they then could take the company cells away, and they had a pure embryonic stem cell line.

The last one here is a really interesting one, and that is the idea that you could take cells from an embryo which was clinically dead, like a person could be clinically dead but their organs are still good; that is how we do organ transplants. So maybe there is a time when an embryo is clinically dead, but the cells are still alive. It does not have the organizational capacity to produce an embryo, but yet the cells are still alive. There has been a lot of research on this, and, yes, that is a possibility.

The argument might be, gee, what kind of confidence could you have? You have got a good stem cell line from an embryo that was dead? But the counterargument would be, and one of our colleagues has a lung transplant here in the House and one of my very

good friends here had a double lung transplant and lived with it for a long number of years, and both of those came from people who were clinically dead.

The next chart shows a really interesting one. And if this could be made to work, it is better than any of the others because you now would end up with embryonic stem cells that were a genetic match for the person that you were going to treat. And we won't take the time to go through these, but these are all techniques of trying to convince the donor cell, this is the donor, this is the guy with Parkinson's disease or the child with diabetes. You take the donor cell now and you use embryonic stem cell, the cytoplasm of the embryonic stem cell to confuse the donor cell nucleus so that it thinks it is an embryonic stem cell. And if you can do that, it is called de-differentiation, you have now taken the de-differentiated state, if you could do that, this would be the best of all worlds, because not only do you have a stem cell, you have a stem cell that is generically identical to the person you are going to treat so you don't have any rejection.

Now, we don't know if this is going to work or not, and what this bill does is to authorize the NIH to expend Federal funds to explore all of these techniques.

The next slide shows a phenomenon, and I would like to ask Dr. GINGREY to make a brief comment. We will be closing here in about 7 minutes, but this is what led me to believe that you could take cells from an early embryo without hurting it, because nature does this all the time. It is called identical twinning. Sometimes they divide at the two-cell stage and sometimes as late as the inner-cell mass stage. And my understanding is that you can tell when the division occurred by how they present. If they present at birth in a common amnion, the division probably occurred at the two-cell stage. If they present in the uterus with two different amnions, the division probably occurred at the inner-cell mass stage. And I would like to ask Dr. GINGREY, in his many deliveries, if he has had a chance to verify if this was true.

Mr. GINGREY. I thank the gentleman.

Indeed, it is true, Mr. Speaker, what he is describing. In fact, I can relate some personal experience to that. I think a lot of my colleagues know my wife and I had our fifth grandchild, but our oldest grandchildren are identical twin girls; they are 8 years old, and they were actually born at 26 weeks. They only weighed one pound, 12 ounces. And, Mr. Speaker, normally that situation is fraught with a lot of problems, and we were, of course, very blessed that they did well.

But what Representative BARTLETT is talking about is exactly right. And, as he said, in human nature, you get this division, and you may be dividing at the eight-cell stage, you may be dividing at the four-cell stage or the 16-

cell stage, and no harm is done. You are basically taking away 50 percent; it is almost like the wisdom of Solomon in dividing a child without harming either. And it is amazing what human nature can do.

And the gentleman said earlier that preimplantation diagnoses biopsy of the embryos so that you can avoid reimplanting an embryo that has a genetic defect that is incompatible with life. And these processes are being done, the gentleman referred to maybe a couple hundred cases that he was familiar with, with absolutely no harm. So this is exactly the right track, and so I do agree with your statement.

Mr. BARTLETT of Maryland. I thank the gentleman very much. I had forgotten that he had identical twins and is very familiar with this, not just as a physician but as a father.

I want to close with a note that a very fortuitous thing has happened, and let me put the next chart up that simply is a page from this White Paper that refers to this technique and that credits me with this proposal early in this process.

After I suggested this to the President, a very interesting thing had happened after that with a dialogue between Karl Rove and the White House, and they were, in effect, carrying out simultaneous monologues and thought they were dialoguing. And that very frequently happens, one of our big problems in this world, which is why, I guess, we have a State Department, because sometimes people think they are dialoguing and they really are carrying on simultaneous monologues.

But during this 5 years this technology has developed to the point that the British now are doing this preimplantation genetic diagnosis. And I am sure he won't mind if I mention his name. Richard Doerflinger made one of the greatest contributions to this dialogue of anybody when he suggested, "Roscoe, the first thing that you need to do with that cell that you take from this eight-cell stage is to establish a repair kit for the baby."

Now, we are kind of trying to do that with freezing cord blood. That is the reason you freeze cord blood, because later you may need it. That, by the way, is not embryonic stem cell; those are the adult stem cells. The baby's is an adult when it is born. As a matter of fact, the day you are born, you start to die. You are an adult when you are born. The embryonic is when you are first starting to develop; it is not an embryo, it is a fetus at that time. And the tissues are really in terms of the genetic development; they are adult tissues.

But if now the first thing that a parent does with that cell that is taken is to establish a repair kit and take a second cell, because the six cells that were implanted do just as well as the seven that were implanted, with the second cell, do a preimplantation genetic diagnosis, if they wish. But the critical thing is that we would get the stem

cell lines now from the surplus cells, from the repair kit.

So now I think that all ethical arguments disappear, because the parents are making two decisions that we are not a part of; we don't even get involved. They make a decision to have in vitro fertilization; then they make the decision to establish a repair kit. And only after the repair kit is established do we ask for some surplus cells from the repair kit.

I am very pleased that there is this possibility, because I understand, and I have a number of prolife friends who have decided that since these surplus embryos are going to be thrown away anyhow that you may as well try to get some medical benefit from them. That may be, for some, a compelling argument. And if I didn't believe that there was an alternative to that, it might be a more compelling argument.

But since there is an alternative to that and we don't have to offend the sensibilities of a large number of people in the country, and I am one of them; I am a little different, I guess, because I am a scientist and understand these things a little from that perspective, too. But I am devoutly prolife.

And I am just so pleased, Mr. Speaker, that we will have the opportunity shortly in the House as they are doing in the Senate to vote on a bill that can go to the President's desk, where he can sign the bill and say, I am really happy that we have here a bill that gives all of the promise of embryonic stem cell research without destroying or even hurting embryos.

VACATING 5-MINUTE SPECIAL ORDER

The SPEAKER pro tempore. Without objection, the 5-minute special order of the gentleman from Texas (Mr. BURGESS) is vacated.

There was no objection.

AVIAN INFLUENZA

The SPEAKER pro tempore. Under the Speaker's announced policy of January 4, 2005, the gentleman from Texas (Mr. BURGESS) is recognized for 20 minutes.

Mr. BURGESS. I thank the Speaker for that consideration.

Mr. Speaker, I wanted to come to the floor tonight to speak just a little bit about a situation that we have had to address here in Congress, and we likely will have to think about it some more over the coming year or years, and that is the issue of avian influenza.

The important thing to remember when we talk about bird flu, or avian influenza, is, there are different types of flu. We are all familiar with the common type of influenza, the one that we all get a flu shot for or should get a flu shot for every year. And the reason we have to be vaccinated every year is because there are modest changes that occur in the genetic

makeup of this virus year in and year out, a so-called genetic drift.

Avian flu refers to a virus that is currently present only in birds, but has on occasion made the transition to a human host with rather significant effects. This reflects a bigger genetic change than can occur in the flu virus from time to time, a so-called genetic shift. This could become a major health threat to humans.

As of June 20, 2006, the World Health Organization has confirmed 228 human cases with 130 deaths. It doesn't take much to do the math to see that that is a mortality rate in excess of 50 percent for this virus.

Now, the trouble signs that are already present. We do have the virus present in birds; there is a wide geographic setting with involvement of other animals, including cats and tigers. Bird-to-human transmission has occurred, but it has occurred only with inefficiency; and there has been on occasion, through close household contact, inefficient human-to-human transmission.

Steps one through four have occurred since 1997, and I must stress, they have occurred in the Eastern Hemisphere of the world. There have been no reported cases in birds or humans in the Western Hemisphere.

The last step in this process, the efficient human-to-human transmission of this virus, has not occurred. If that step does occur, and it is certainly not certain that it will, but if that step does occur, that would trigger the onset of the possibility of pandemic flu.

One of the big problems that we have with this virus, as humans, is that we have no underlying immunity to this virus, so that if the virus is introduced to the community where it can spread easily from person to person, it could progress very rapidly through the population.

Now, pandemics are not new phenomena; they occur and have occurred over the centuries. They happen about every 35 years, approximately three per century. And, indeed, in the 20th century there were three such epidemics. In 1918, the so-called Spanish flu killed 50 million people worldwide. In 1957, the Asiatic flu killed 170,000 people in the United States. And, in 1968, the Hong Kong flu killed 35,000 people in the United States.

What would happen if a pandemic flu were to reemerge? The Department of Health and Human Services estimates that for a moderate outbreak like the Asian flu pandemic in 1957, we could see over 200,000 deaths in this country. In a worst-case scenario, such as the Spanish flu pandemic in 1918, almost 2 million deaths would be estimated to occur in the United States.

□ 2030

Mr. Speaker, I have a couple of maps that show some of the progression of this illness across the globe. Looking here at this first map, the eastern part

of the world, avian flu cases are depicted in blue, human cases in black. On this map you will see almost 50 countries that have been involved with avian flu in bird populations and a smaller number, 10 countries, have reported human cases which have moved with some difficulty from birds to humans.

Looking at a map that shows the progression of this illness in birds, we see that in Hong Kong in 1997 when the disease was first reported, there has been a gradual progression westward since that time. June of 2004, the disease had progressed to Vietnam. June of 2005, the disease was reported in Iraq. In 2006, Turkey. In March of 2006, it had made an appearance in Egypt, and the progression is westward.

This inset map on the bottom, the orange lines, and it is difficult to see, but that outlines the places where bird populations, domestic bird populations, poultry populations and human populations tend to overlap. You can see in the areas in China and Vietnam and Southeast Asia where that appears to have been a significant issue, and you can see some areas of the United States that would be at risk if bird flu actually spread to this country.

To date, the disease has been endemic in birds and over 200 million birds have been culled in the last 3 years. This is significant in that there are many parts of the world that rely on poultry as literally a means of currency, and this has been a very difficult thing for some countries to accomplish. But a critical aspect of the prevention of the disease is if we can stop it in birds and never have to worry about it in humans, it is going to be much, much better for us as a people.

Let me take these out of the way for a moment and demonstrate one of the issues that is so striking about this illness because it does occur in wild birds. This is a map that shows the migratory flyways across the world. It is thought that this virus is spread by migratory birds to poultry populations. The countries with outbreaks in general have a high concentration of poultry. There is some concern because there are two of these flyways, as you can see, the East Atlanta Flyway which goes from the African continent up into the polar regions of Canada, and then the East Asia Flyway which comes up through Australia and comes into Canada and Alaska.

Now, it is unknown whether the virus will make a transition to the Western Hemisphere by these routes, but the routes suggest there could be some risk. And for that reason, there has been increased testing across the United States starting in Alaska with nearly 100,000 samples taken from live and dead wild birds, and 50,000 samples from water from high-risk waterfowl habitats to be tested in 2006 alone.

The World Health Organization has identified six levels of pandemic alert, and we are currently at level 3 with limited human-to-human transmission.