

Clones and Cloning: the Dutch debate

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Clones and Cloning: the Dutch debate

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Foreword

The announcement of the birth of the cloned sheep Dolly in February 1997 released a storm of emotional reactions and debate all over the world. The Netherlands was no exception. 'The sheep today, the shepherd tomorrow' seemed to be the most common reaction and fear. After the initial outcry, Dutch parliament called for a public debate on cloning and a ban on cloning experiments whilst the debate lasted. In response the minister of Health, Welfare and Sport asked the Rathenau Institute, the Dutch parliamentary technology assessment organization, to organize such a nation-wide public debate on cloning. In the year and a half that followed, the Rathenau Institute, in close co-operation with a number of other organizations, organized a large project on clones and cloning, which received widespread media-attention. In this publication, the main results of this project are presented to an international audience.

This publication starts off with a comprehensive overview of the background, contents and impact of the project, as well as the current legal situation on cloning in the Netherlands. During the project a series of five public meetings was organized on the different aspects and applications of cloning. Two of these meetings, 'religious aspects of cloning' and 'cloning and political traditions' were aimed at clarifying the different religious and political arguments used in the debate on cloning. Three other meetings had as subject-matter different applications of cloning: 'cloning in animal husbandry', 'cloning and medicine' and 'cloning of human material'. An account of these five meetings is presented here.

To get a sense of public perceptions a survey on cloning was organized, in which one thousand members of the general public were questioned on their knowledge and opinions on cloning. A summary of the findings of the survey is included in this volume. To further broaden the scope of the debate, the Rathenau Institute called into life a Citizens' Panel on Cloning. The twenty voluntary lay-members of the Panel were asked to critically follow the debate and take initiatives to develop an independent opinion on cloning. A summary of the conclusions of the panel is included. The complete text of the Final Declaration of the Citizens' Panel is published separately.

At the end of the project, the Rathenau Institute, as a parliamentary technology assessment organization, made its own recommendations on cloning in a Report to Parliament. The main conclusions of this report are included here, but the full text is published separately.

By presenting the results of its project on clones and cloning before an international audience, the Rathenau Institute hopes to have made accessible its relevant experiences on organizing a societal debate on this controversial new technique.



Ms. Prof.Dr. Josée C.M. van Eijndhoven
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Table of Contents

Foreword	5
1 The Rathenau Institute and the Dutch debate on cloning	9
2 Summary of five meetings	17
2.1 Cloning of human embryos	17
2.2 Cloning in the cattle breeding sector	19
2.3 Cloning and medicine	21
2.4 Cloning and religion	23
2.5 Cloning and political traditions	25
3 Standpoints of the Citizens' Panel on cloning	29
4 Knowledge and opinions of the Dutch population on cloning	31
5 Conclusions of the societal debate by the Rathenau Institute	37
6 Contribution of the Rathenau Institute to the societal debate	39

1 The Rathenau Institute and the Dutch debate on cloning

Between March 1998 and June 1999 the Dutch Rathenau Institute organized numerous debate activities on cloning. It started with a hearing in the Dutch parliament building; the debate was concluded in the same building with a presentation of the conclusions of the debate. Researchers, politicians, interested parties and interested citizens took part in the debate. There were five sub-meetings on: cloning and religion, political traditions, human embryos, cattle breeding and the production of medicine. A public survey was held in order to gauge public opinion on cloning. During the debate a citizens' panel was active, which presented its own conclusions. There was extensive media coverage of the beginning and the conclusion of the debate.

Publicity surrounding Dolly was the trigger

These activities on cloning, organized by the Rathenau Institute were triggered by the huge media coverage of the cloned sheep Dolly. The publication in the journal Nature (February 1997) caused a wave of reactions. Especially the fact that Dolly was possibly cloned from an adult udder cell, was widely associated with the novel The Boys from Brazil by Ira Levin. Reporting reflected the sentiment that if it is possible to clone a sheep from an adult cell, than it will not be long before a human being can be cloned. Headlines like 'And now: the new Elvis', 'Russia fears the emergence of the western clones' and 'Human beings playing with Creation'. Letters were sent in expressing the fear that dictators like Saddam Hussein would happily use cloning technology to multiply themselves and their elite troupes. Around the globe the reporting led to firm political statements. The United Nations, the World Health Organization, President Clinton as well as the Vatican unequivocally called for a ban on the cloning of human individuals.

Polarised positions

The Rathenau Institute, the technology assessment organization funded by the Dutch government, has been involved in debates on new biomedical and biotechnical developments for some time. Earlier on, it organized activities on genetic manipulation of animals and predictive medicine. The immense media attention for cloning logically raised the question within the institute whether it would be useful to set up a project on the subject of cloning. During the initial shaping of ideas on such a project, the manner in which the media dealt with the subject was a central theme. On the one hand there was quite a strong emphasis on the aforementioned Boys from Brazil-like stories, in which cloning techniques were used to create the most outrageous fantasies. Politicians reacted uncharacteristically quickly with a call for a ban on the cloning of human individuals. There was no room for subtlety. On the other hand, researchers emphasised that the cloning of the sheep Dolly was not such an innovative thing, and that cloning techniques had already been used for quite a while. According to them interesting applications in the area of health could emerge from this. All in all the reactions of the public were very divers, ranging from fearful visions to stories that it-is-no-big-deal.

Initially, the aim of the project on cloning was to facilitate debate and create room for subtlety and allow better insight into the considerations that play a part in the various arguments. The Institute considered setting up a structured debate in collaboration with one of the national newspapers or organising a roundtable discussion featuring the various actors involved in the subject.

When exploring the possibilities for such a structured debate it soon became clear that the reactions to cloning were so diverse that the initiatives planned by the Rathenau Institute seemed to be impossible to carry out. The various actors used completely different problem definitions and agendas for the discussion. While, for instance, politicians were calling for strict legislation on cloning human individuals, researchers thought this was irrelevant and wanted to discuss medical applications or the advantages of the technique for the production of transgenic animals. Under those circumstances, it seemed virtually impossible to formulate a common denominator to shape the debate. Naturally, the Institute could have chosen to carry out TA-like research into the sources of these diverse perceptions on cloning. This would probably result in an interesting analysis, but it would not directly contribute to launching a structured debate between different actors. The Rathenau Institute sees it as its explicit duty to advance the realisation of such debates.

Politicians want a societal debate

Reactions to the publicity on Dolly had its repercussions in Dutch politics as well. In the Dutch parliament, the Ministers of Agriculture and Public Health were questioned on possible cloning experiments taking place in The Netherlands and there were demands for strict legislation. The need for stimulating societal debate on cloning was also expressed, to enable citizens to express their opinions on cloning technology.

In the autumn of 1997, the political debate resulted in an official request by the Ministry of Public Health, Welfare and Sport to the Rathenau Institute, to organize a societal debate. Later, in the spring of 1998, a great majority of the Dutch parliament accepted a motion that determined that experiments with cell nucleus transplantation using animals would be forbidden as long as the results of the aforementioned societal debate were not known. Thus, the societal debate was given political weight from the outset.

The Minister's request to the Rathenau Institute was part of a new assignment, which the Rathenau Institute had received earlier. The existing Platform for Science and Ethics, set up at the time by five ministries in order to organize discussion on ethical aspects of scientific activity, was housed in the Rathenau Institute in 1998 by government order. The first activity of the new Platform was to chart the ethical discussion on biomedical developments. Activities related to the debate on cloning were a natural extension of this.

Dutch legislation

Below some information will be given on existing legislation on biotechnology in The Netherlands, as an intermezzo. Cloning is not per definition forbidden by law. In order to be able to carry out biotechnological experiments with animals, a license needs to be obtained, according to the decision on biotechnology in animals. A special commission, the Commission on Biotechnology in Animals, has been set up to give advice in these matters. The commission assesses the applications: on the importance of the experiment, whether there are no alternatives to reach the same goal, whether there are no unacceptable consequences for the health and the welfare of the animal and whether there are no unacceptable ethical objections to the experiments. This assessment is summarised by the term 'No, unless' policy.

It is worthwhile to mention that the request submitted by the biotechnological company Pharming for permission to clone cows was turned down by the commission in early 1998. This rejection was not based on principles. The commission felt that the company should first show that the injected gene for the production of a human protein is indeed expressed in the milk produced by the cow, before copies of that cow may be cloned. The company has decided to carry out the cloning in its Finish and Belgian branches.

The Netherlands has signed an additional protocol of the Council of Europe that ensures a ban on the cloning of human beings. An exception is, however, made for experiments with embryos no more than 14 days old. A special law is being prepared in The Netherlands,

which allows experiments with embryos up to 14 days old if this serves an important health interest. Embryos upon which experiments have been carried out are not allowed to grow. The Central Commission on Human-Related Research must approve the experiments. Here our intermezzo ends.

The Hearing

It was mentioned earlier that the Rathenau Institute came across very diverse perceptions on the meaning and implications of cloning when setting up a debate on cloning. With the request from the Minister of Public Health to organize a societal debate, the Rathenau Institute was given an important new element to get the debate off the ground: political weight behind the debate. Now the search began to come up with a form of debate that met a number of criteria:

1. The political weight of the debate must be expressed;
2. The actors involved who have strongly diverse problem definitions must be prepared to participate fully in the debate;
3. The debate must contribute to finding common problem definitions;
4. The debate must have a public character;
5. The debate must contribute to public opinion shaping.

Ad 1. While politicians called for sharp legislation, they did not wish to speak out too explicitly beforehand during the societal debate. Their reasoning was that first society must be heard and then the politicians. At the same time the political weight was essential in getting the other actors in the debate, like researchers, representatives of corporate life, and animal rights organizations to join the discussion. Thus, a form had to be found in which politicians were present while being able to keep a distance.

Ad 2. The different actors used very diverse problem definitions for the debate on cloning, which meant that every attempt to come to a common debate threatened to collapse, while the participation of the actors was essential to the debate.

Ad 3. The debate would only be useful if it could take place in a structured way and if it could provide room for more precise and subtle considerations.

Ad 4. The Minister had requested the Rathenau Institute to contribute to the societal debate on cloning. Media attention is essential to this. At the same time, media attention could help to increase involvement in debate activities.

Ad 5. The aim of societal debate is the advancement of public opinion on cloning.

Finally, the Rathenau Institute chose to start the debate with a hearing. This way, the aforementioned criteria could be met:

- By placing members of the Dutch senate and former government members in the hearing commission, political weight was sufficiently emphasised, while members of parliament were not obliged to take a position at the outset. By holding the meeting in the parliament building, the political weight of the meeting was further emphasised. In addition, the Minister of Public Health opened the meeting.
- The hearing created an atmosphere in which the different actors were able to participate while maintaining their own problem definitions. The form would be suitable for allowing all the relevant actors to join the discussion.
- It was agreed that the hearing commission would focus their questions on obtaining clarity on the various issues and arguments that play a part in the debate, so that more clarity can be obtained on the agenda of the debate.
- The hearing would definitely draw media attention.

The hearing, organized on the 26th of March 1998, fulfilled its expectations. Researchers in the area of embryo research, cell biology and cattle breeding, representatives of

biotechnology companies, representatives of patient organizations and Animal Welfare, the chairperson of the aforementioned Commission on Biotechnology in Animals, ethicists in health care and with regard to animals, a technical philosopher, were all amply questioned by the hearing commission on the state of the art of technology, the possibilities of application, the arguments for and against certain applications of cloning and the reasoning behind these arguments. Ultimately, the Institute succeeded in getting the different actors involved in the debate, which took place in a structured manner and provided room for a more precise formulation and weighing of arguments. The hearing turned out to be the foundation for other debate activities with related actors; very diverse problem definitions became subjects of debate among them. The media coverage of the hearing was overwhelming. The hearing succeeded in offering more clarity on the agenda for the debate.

In order to contribute to public opinion shaping, a Citizens' Panel was formed at the same time as the hearing was being organized. This Citizens' Panel was given the assignment to come to an opinion on cloning within the period of more than one year. In an advertisement, interested citizens, who were not directly involved in cloning, were invited to enrol. This led to 200 reactions. A panel of twenty was chosen from the 200, based on regional distribution, age, sex and occupation; expertise was not a selection criterion. In the end, seventeen of them formulated the final declaration of the Citizens' Panel.

Agenda for the debate

From the hearing it became clear that there was a consensus on a ban on the cloning of adult individuals. The value of the arguments in favour of the ban was judged differently by the consulted experts. Some found the arguments like: cloning adversely affects the uniqueness of man, it is unnatural and goes against sexual reproduction, to be convincing enough to support a ban. Others felt that these arguments were not convincing because they are weakened by current medical practice (for instance 'artificial' in vitro fertilisation) and because they are directed too much at genetic determinism. Everyone did agree that the medical risks of cloning technology are unacceptable.

Different insights were presented by researchers and the members of the hearing commission on whether or not to clone embryos for scientific research, for clinical applications or for transplantation purposes. One question was for example, on whether embryos could be specially cultured for this purpose. Some felt that this was unacceptable from the point of view of protecting beginning life, others had no objections to using embryos for an important health benefit. There was, however, consensus on a ban on placing embryos used for experimental purposes back. Especially the cloning of animals for the production of medicine was found to be controversial. The corporate sector expressed dissatisfaction about the heavy assessment procedure that has to be followed according to the existing 'no, unless' policy. Patient organizations also felt that companies should be given the freedom to produce the medicines that are so important to them. The objections, most strongly based on principle, to the use of farm animals for this purpose, came from the Animal Welfare. They referred to the health and welfare problems of cloned animals. The hearing did not offer any clarity on for instance the possibilities of producing medicines along alternative lines (other than by using genetically modified and cloned animals) or on the meaning of concepts such as intrinsic value and uniqueness of the animal. The cloning of cattle in the common cattle-breeding sector led to less debate because it was not expected that this application would take flight. There were questions about the possible consequences for the genetic variation among the livestock.

During the hearing a lot of attention was paid to the validation of objections to cloning and certain applications of cloning. Are the arguments presented sufficiently consistent and convincing, are those arguments sufficiently applicable for politicians to base legislation on? What are the fundamental underlying thoughts and values that either do or do not play an explicit part in the reprehension of cloning? Many of those questions remained unanswered during the hearing.

In addition, it became apparent that discussions on clones and cloning quickly moved on to broader visions on the developments in medicine or biotechnology, the combination of cloning with genetic modification and the consequences of application of cloning in the current social context (for instance the growing dependence of the farmer). During subsequent debate this intertwining among related issues would become even stronger.

Continuation

When deciding on follow-up activities, a difference emerged between the approach of the Rathenau Institute and the Ministry of Public Health, Welfare and Sport. The Rathenau Institute is an organization that is mainly focused on making analyses, and getting to the bottom of underlying considerations that play a part in opinion shaping on science and technology. The hearing provided sufficient links for more of these kinds of TA focused activities. In addition, the Rathenau Institute is well experienced in the organising of Citizens' Panels for opinion shaping on scientific and technological subjects.

To the ministry, it was much more of a priority to look at broader educational and informative aspects. The ministry worked with the model that citizens should be given the opportunity to form their own opinion by offering them information that is as objective as possible. In addition, the ministry wanted to gain more insight into what the population thinks about cloning.

This difference of opinion led to a discussion on the possible options for further debate: should the emphasis lie on argumentation, considerations and options for action or on broader public information? An agreement was reached to tone-down the analytical aspect as well as the broad public information aspect, to a lower intensity than either party had originally planned. Two paths were chosen for follow-up activities: one was aimed at a deepening of content and involvement of relevant actors, and the other was aimed at the broader public.

Activities aimed at content

The activities aimed at content were intended to clarify the questions raised during the hearing and to enter into more detail the possible areas in which cloning can be applied. During the hearing it became clear that the arguments on the cloning of human beings and animals were mainly presented in general terms. They also focused insufficiently on their actual meaning to the discussion on cloning. Therefore, two meetings were organized with the special aim of a more in-depth look at these arguments, one was on religion and cloning and the other on political traditions. During these meetings on religion, special room was created for opinions that do not get heard often in Dutch culture that is dominated by Christian values, i.e. the Islamic, the Jewish and Humanist visions.

Three debates were organized on concrete applications: on the cloning of human embryos, on cloning in the cattle-breeding sector and on the cloning of transgenic animals for the production of medicines. These applications were also put forward during the hearing, but at that time there was insufficient opportunity to elaborate on the actual developments and the related arguments.

The report on these five meetings can be found elsewhere in this publication.

Activities aimed at the public

For the activities aimed at the public, the aforementioned Citizens' Panel was set up. Members of this panel attended the said activities. In addition, the panel upon its own initiative worked on opinion shaping by questioning experts and visiting a biotechnology company. Professionals who guided the process supported the panel.

A specialised agency was asked to carry out a public survey. The agency used an existing tele-panel of 1000 households that were regularly presented with questions on various subjects. The survey on cloning got an 87% response. The results of the public survey are discussed in a separate chapter of this publication.

With regard to public information, the book *Allemaal Klonen* ('All Clones') appeared at the end of 1998, explaining various questions and problems on cloning. A brochure was made especially for educational purposes using the results of the public survey mentioned above. Together with civil organizations like the Dutch Organization for Rural Women, debate evenings were organized on the subject of cloning.

Final meeting

To round off the debate activities a final meeting was organized during which the aforementioned Citizens' Panel and the Rathenau Institute presented their conclusions. These conclusions have been integrated into this volume. The conclusions of the Rathenau Institute can be summarised as follows:

The government should guide and regulate the possibilities for research into applications of cloning in humans and farm animals. Considering the widely shared objections within society to cloning, caution is essential. Possible applications of cloning ought to be carefully weighed against the aim, the means used, the possible related effects and the consequences in the longer-term. An isolated opinion on cloning is hardly possible; it needs to be expanded into a wider context in which cloning is applied.

In order to underline the political weight of the debate activities, the final meeting, like the hearing, was held in the parliament building. The Minister of Agriculture, the Minister of Health, Welfare and Sport as well as the Speaker of the Second Chamber (The Commons) spoke during the meeting. Especially the Minister of Agriculture commented on the content of the conclusions: he saw this as a clear confirmation of the Dutch 'no, unless' policy and made it clear that he would not consider calls for a relaxation of this policy from the corporate sector and certain scientific circles. Furthermore, he plans to promote the Dutch approach to modern biotechnology in an international context. Both the Speaker of the Second Chamber and the Minister of Health, Welfare and Sport felt that the approach to the debate activities was so successful that they wish to use the same approach to looking at other socially controversial subjects such as xeno-transplantation or medical experiments on embryos. From the audience, the Dutch chairman of the international Human Genome Organization reacted positively to the conclusions, which according to him correspond greatly with those of the ethics commission of HUGO.

Critical Reflection

A science philosopher presented a reflection at the final meeting of the debate. He identified a dominant role in the debate of so-called regulation-ethical arguments. In these arguments, the central question is whether a certain action adversely affects the interest of someone or a certain ethical principle. If this is not the case, then it is not an ethical issue. Because especially supporters of cloning equip themselves with regulation-ethical arguments, he feels that the emphasis on these arguments leads to a predictable outcome of the debate: cloning embryos and producing transgenic animals should be allowed as long as certain conditions are met (certain interests are served).

Opposite to the regulation-ethical arguments he places the arguments of the so-called ethics of life. These do not deal with the regulation of conflicts of interest, but with the question of how to live and what a good life consists of. In the cloning debate this could lead to a negative judgement because cloning is a product of the vanity of the donor or because it is a greedy way of treating animals. He stated that though these kinds of ethics of life arguments kept popping up during the debate, they were not given full recognition. That is because the Western culture dictates that they belong in the personal domain. This is disadvantageous to

the people who are opposed to cloning. The speaker pleaded for more room for arguments based on ethics of life within the debate, because 'the logic of regulation-ethics is too poor to do justice to the questions that technological developments like cloning present society with'.

Media attention

The first meeting of the debate, the hearing in the parliament building, was covered in all national newspapers. In part they emphasised the content of the debate, like the statement of the Minister of Public Health calling for a ban on the cloning of human individuals. Some newspapers felt that the debate did not result in very much, because the audience was left with a lot of questions. Others felt that the debate did provide clarity. In part the reporting emphasised the character of the debate, and the question was raised as to whether the hearing actually marked the beginning of a societal debate. Regional or university newspapers only covered the subsequent debates. The results of the public survey were published in almost all the national newspapers. The final meeting was especially covered by radio and television, but hardly by newspapers. Apparently, the newsworthiness of the conclusions of the debate was weighed differently by different forms of media.

2 Summary of five meetings

2.1 Cloning of human embryos

One of the applications on which further debate took place was the cloning of human embryos. When choosing this subject, two arguments were considered:

1. the subject was put on the agenda by researchers. They fear that possibly useful applications of cloning embryos could be undermined by the generally shared objections to the cloning of human individuals. Therefore, researchers emphatically plead for a special position and regulations to be granted to cloning human embryos.
2. the subject is interesting because it is placed on the cutting edge of the ban on cloning the human individual on one side and the possibility of achieving useful medical applications on the other. The debate on cloning embryos might contribute to focusing these arguments.

The set-up of the debate

When setting up the debate the choice was made to have two introductions from the world of research on the possible applications of cloning embryos: the state of the art of technology, the problems yet to be solved and the future on applications. Subsequently, the legal and the ethical aspects of cloning embryos were explored in two introductions. In these morning introductions, the medical-technical, legal-ethical arguments would be charted. For the afternoon session, 'outsiders' (a scientific journalist, a brain researcher, an ethicist and a lecturer on gender and technology) were requested to formulate a challenging statement and to react to the aforementioned introductions. They were requested to specifically raise those questions that remained under-exposed during the discussion on cloning embryos.

The introductions

The medical-technical possibilities

It emerged from the medical-technical introduction that important medical applications are expected especially from the development of stem cells for transplantation purposes. The stem cells are obtained from an embryo developing in vitro. By using special techniques the multi-potent stem cells can be developed into specific tissue cells which can subsequently be transplanted. It is expected that within a period of five years by using this technique it will be possible to treat diseases in which a certain type of cell is dysfunctional such as in the case of leukaemia, muscular dystrophy, and Parkinson's disease.

In order to prevent rejection during transplantations the use of cloning techniques is essential. According to these techniques the nucleus of a cell of a patient is injected into an egg cell, from which the nucleus has been removed. The stem cells that develop from this embryo are nearly identical to that of the patient. Obviously, an embryo cloned thus, is not intended for reproduction.

In addition to this non-reproductive form of cloning, cloning can also be used to increase the chance of a successful pregnancy. In the case of infertile parents, the cell nucleus of one of the two could be transplanted into an egg cell. In addition, embryo splitting could increase the number of embryos that can be placed back after in vitro fertilisation.

In cell nucleus transplantation the chance of success will be quite low, even lower than during the creation of the sheep Dolly. The chance of success through embryo splitting is considerably higher. It is not yet clear whether the chance of a successful pregnancy following embryo splitting will also be higher.

The legal state of affairs

From the legal introduction, it became clear that there are international declarations against the cloning of human beings, such as the United Nations declaration regarding the human genome and the declaration of the World Health Organization, but neither is legally binding.

The 'Agreement on human rights and biomedicine' of the Council of Europe, however, is legally binding. This agreement includes conditions protecting the embryo during research (a separate protocol on this still need to be determined) as well as a ban on the production of embryos especially for research. In addition, a separate protocol on cloning is formulated in which 'any intervention seeking to create a human being genetically identical to another human being is forbidden'. Terms such as 'human being' and 'seeking to create' clearly leave room for interpretation. The agreement of the Council of Europe is legally binding if a country has ratified it. The Netherlands has not yet done so and has made a proviso towards research using embryos. Dutch law does not have any stipulations on cloning. Recently, a bill was drafted allowing the use of existing embryo material for research. Generally speaking, the law protects the embryo as a beginning living being, but this protection is not absolute and may be sacrificed for another more important health interest. It is, however, prohibited to place back an embryo upon which research has been carried out. According to the legal overview presented, it is expected that the door to cloning and producing embryos for instrumental use will be opened just slightly.

The ethical debate

In the ethical debate the compromising of the essential principles is introduced as a major objection to the cloning of human individuals. Cloning was considered unnatural, leading to the instrumental use of the child and to compromising the child's uniqueness. However, there were counter arguments to these objections. In addition, consequentialist arguments were brought forward related to irresponsible medical risks, possible psychosocial risks faced by the clone or eugenic misuse. There was only a consensus on the medical risks among the ethicists, on all other arguments there was a difference of opinion.

The arguments applied to the cloning of an adult individual do not necessarily apply in the case of embryo splitting. If not more than two embryos are produced and if they are implanted at the same time, then the subsequent process of development is not very different from the natural path which the development of identical twins takes. If the cloned embryo is placed back later, then the difference with cloning adult individuals is much smaller, because then genetically identical children with different ages are produced.

With regard to the use of embryos for transplantation purposes, it is not the cloning as such which leads to an ethical debate, but rather the use of embryos or the intentional production of embryos for instrumental use. According to recommendations made by the Dutch Health Council this should be allowed if an important health interest is involved. In addition, the question whether women can be asked to supply egg cells for transplantation purposes is also an issue, according to the overview of the ethical arguments.

The discussion

During the afternoon session, it became clear that it was not simple to identify the key questions of the debate. The position presented by the science journalist, stating that there should be a focus on the consequences of the use of cloning techniques for the appearance of society, led to discussions on priorities in health care, the ability to repair humans and the acceptance of mortality. But it was not clear what cloning as a fundamentally new element actually contributed to this discussion. Remarkably, the position taken by the ethicist, i.e. that cloning is allowed in the case of an important health interest hardly triggered any reaction. Apparently, much is considered acceptable if it is in the interest of health. Only after some persistence did one of the participants feel moved to object, even though he felt that it did not make much difference because science does exactly what it wants to anyway.

A remark made by the brain researcher on the possibility of using other sources of stem cells (aborted fetuses, stem-like cells of the patient him or herself) to culture transplantation material, and thus prevent the use of embryos, brought an element into the discussion which would lead to a new consensus. Numerous ethical problems are bypassed by not using embryos for transplantation. Even the objections to 'egg cell donation duty' for women, brought forward by gender studies and the realisation that because of improved IVF-technology fewer surplus embryos would be produced in the future, were integrated into the consensus. The new consensus was formulated as follows: With regard to research into the cultivation of stem cell lines, there must be a more inventive and intensive search for alternatives for the use of embryos.

Conclusions

The meeting provided more insight into the possible applications of human embryo cloning. There are high expectations with regard to the development of stem cell lines for transplantation purposes. During the debate, a strong desire to seek alternatives for the use of embryos was expressed, in order to avoid a number of controversial issues. The clinical use of cloning embryos for reproductive purposes is much less clear. The same goes for the ethical objections against it: when health interests can be served, it will probably be allowed.

2.2 Cloning in the cattle breeding sector

A second application that was debated more elaborately was cloning in the cattle-breeding sector. In choosing this subject two arguments played a role:

1. During the hearing it became apparent that there was a great lack of clarity on the meaning and importance of cloning for the future of cattle breeding and on the possible consequences for agrobiodiversity.
2. The subject is well suited for an exploration of the interaction between the social-economic context and the application of cloning techniques. During the hearing and the debate meetings on religion, this context was touched upon, but not explored.

The set-up of the debate

In order to provide more clarity on the meaning of cloning for the cattle-breeding sector, two introductions were given on common cattle breeding and on the life-science industry. The context was addressed in two other introductions; one dealt with the relationship between cloning and organic agriculture and the other with the possibilities of bringing about change in the social context of cattle breeding. In order to allow different views and interests in the agricultural sector to be adequately addressed, a panel with representatives from the traditional agricultural sector, the organic agricultural sector and an action group against genetic manipulation of animals, was asked to respond to the introductions. The morning session was concluded with a debate involving the audience present.

The introductions

The common cattle breeding sector

Cloning is already being used in the common dairy and meat-producing sectors. Embryo splitting is most commonly used (in the US on average more than 150 items per year) to produce multi-plets from one 'good' cow or more copies of a prime bull. This is a case of small-scale applications in specific situations. Large-scale applications are not expected in the basic breeding places, for their genetic variation is much more important than producing genetically clones. The only useful large-scale application would be the quick multiplication of a certain quality obtained by the breeder. But whether it will ever go this far depends

among other things, on whether the method will become affordable. If and when this is the case, it will still not lead to genetically identical herds on the farms for the simple reason that the best cow does not exist. A farmer will always try to improve the characteristics of the off-spring. All in all cloning in the traditional cattle breeding sector will not change much, at the most it may strengthen existing tendencies.

The life-science industry

The situation is very different in the life-science industry that focuses on the production of medicines, transplants, diet food, diagnostics and cosmetics using transgenic animals. This is a growing industry, which uses a combination of information technology, genetics and reproduction technology, which includes cloning. Companies respond to the new opportunities by forming conglomerates. It is expected that the new products will turn into a billion-dollar market. As a consequence of these developments, the nature of the cattle breeding sector will undergo drastic changes and shift more and more towards industrial production. It remains to be seen how the consumer will view the new products, produced by cloning techniques.

The social context from the perspective of organic agriculture

The interaction between cloning and the social context in cattle breeding was initially discussed from the perspective of organic agriculture. A traditional cattle breeding is characterised by expansion, specialisation, mechanisation and technology. The combination of these characteristics leads to problems such as excess production of manure, health and welfare problems for the animals, diseases and scandals.

Applications of cloning will intensify the reigning characteristics in the cattle-breeding sector. For instance, it will contribute to the process of making certain characteristics more uniform and to expanding the scale. According to this view, cloning will intensify the factors, which create problems in the common cattle-breeding sector. In addition, cloning has consequences for the genetic variation among the livestock. For even though a breeding farm needs genetic variation, this variation will always be determined by goals set by the traditional cattle breeding sector: goals aimed at increasing and improving production. Biological agriculture, however, requires varieties, which react to the specific climate and soil conditions of the farm. Within the context of the traditional cattle-breeding sector, the application of cloning is a threat to organic agriculture, according to this introduction.

Changes in the social context

The fourth introduction put forward the following point: The question whether cloning in the cattle breeding sector can be applied in another way cannot be separated from the question whether the context in which cloning is applied can be changed. Instead of repeating the arguments for or against cloning in the cattle-breeding sector, the debate ought to be about the possibilities of changing this context. A crucial point here is the breeding aims of the sector. Is it possible, when determining this, to incorporate other social interests, in order to ensure that the needs of ecological agriculture can be met? Are new forms of interaction between various actors in the cattle-breeding sector possible so that breeding aims can be determined by a more diverse set of interests than simply the interest of increasing production?

Discussion

The panel's reactions to the introductions were predictable: representatives with an ecological orientation saw nothing in the application of cloning, the representatives of the traditional agricultural sector felt that the biggest possibilities lay in the life science industry. This triggered a discussion among the audience on whether an animal may be used for the production of products, which are unrelated to the body. Some people found this to be a more relevant point of discussion than the discussion on whether or not cloning should be allowed. The theme of breeding aims led to contact in the discussion. The representative of the biological agricultural sector was interested in discussion with the breeders. The

breeding scientists asked the biological agricultural sector to clarify its idea of desirable breeding aims.

Conclusions

The meeting resulted in more clarity on possible applications of cloning in the cattle-breeding sector. In the common cattle-breeding sector it is of little importance, the life science industry will be the most important advocate of the use of cloning techniques in the cattle-breeding sector. The discussion on the context within which cattle breeding takes place put forward breeding aims as an important new element of discussion. Through the new coalitions being formed in the agricultural sector, these aims should become more detached from the interests of agribusiness and thus become more accessible to biological agriculture.

2.3 Cloning and medicine

The third application upon which there was an additional debate was about cloning and medicine, such as the production of medicine or organs in transgenic animals and producing experimental animal models. The following arguments led to the choice of this subject:

1. From public surveys it is clear that this application of cloning faces the least resistance. It is interesting to find out which arguments determine this.
2. The application is subject to sharp controversy between the biotechnology industry and animal rights organizations. This became also apparent during the hearing on cloning and clones. Further debate could provide more insight into the value of the arguments and the possible common ground between two extremes.
3. The biotechnology industry and biotechnological researchers are directing a powerful lobby at government to change the existing cautious 'No, unless' policy, which in principle bans all experiments unless they meet a number of conditions. They are pleading for a much more flexible 'yes, provided that' policy, which in principle allows experiments provided that they meet certain conditions. What is the meaning of these discussions for the application of cloning?

The set-up of the debate

The discussion on whether or not to use animals for health purposes has been going on for quite a while. This also became clear during the hearing on cloning and clones, where the most common arguments of the discussion were repeated. Consequently, the question was raised to what extent the application of cloning added a new element to the discussion, and whether the arguments would change in the case of cloning. Therefore, the first part of the morning session centred on the question whether cloning was indeed a different case altogether. The question was addressed during three different introductions, one from a technological point of view, one from the point of view of biotechnology industry and the final one from the ethical point of view.

During the discussion on creation of transgenic animals for the production of human proteins, the opposition emphasised that there are indeed alternatives, for instance fungi. Even the Dutch 'no, unless' policy refers to the issue of alternatives. If there are alternatives available for making a certain product, it is forbidden to make use of transgenic animals. In the societal debate this subject often leads to a polarisation of the discussion between the position that 'there are no alternatives' and the position that 'industry is not prepared to look for an alternative'. In order to deepen the discussion on this issue, an introduction addressed the point of how alternatives are dealt with.

In order to shed more light on the pro- and counter arguments to the creation of transgenic animals, two concrete cases were presented, which were subsequently commented upon by those who presented the introductions and the audience at the end of the morning session.

Is cloning a different case altogether?

Seen from a biotechnological perspective, cloning by cell nucleus transplantation is not essentially different and at the most, supplementary, to existing techniques of genetic manipulation of embryo stem cells, like for instance micro-injection of DNA. The expectation is that with cell nucleus transplantation a more precise operation is possible and that more genes can be placed into the cell nucleus. The biotechnological industry even feels that cell nucleus transplantation is superior to micro injection; this application would require less experimental animals, it is cheaper, it is more efficient and it offers more possibilities. According to the representative of the biotechnological industry, there is therefore no reason to subject cell nucleus transplantation to a strict 'no, unless' assessment.

Seen from an ethical perspective, a distinction was made between cloning and other biotechnological techniques. Cloning is seen as the ultimate form of instrumental use of an animal and is also viewed as one more step towards a development which is as such considered to be problematic. The course which the development of man's interaction with agricultural animals has taken, started with locking them up behind a fence, and then through breeding programmes, artificial insemination, surrogate mothers and genetic manipulation, ended up with cloning. People draw the line at a point where they feel that the animal is being made into an object. A clear final opinion on the question whether cloning is a different case altogether did not emerge from the discussion.

Weighing the alternatives

The Dutch legislation stipulates that biotechnological experiments must be assessed by the Commission on Biotechnology in Animals, according to the aforementioned 'no, unless' policy. The Commission must assess the importance of the aim of the research and availability of alternatives to achieve the same aim. It emerged from an analysis of the work of the commission, that there is usually a lack of clarity regarding the aim of the research. There is often quite a gap between the actual research, for instance gaining more insight into processes at cell level, and the cited aim, for instance improvement in the treatment of cancer. The factors that determine the importance of the aim are also unclear.

The manner in which alternatives are sought is sometimes strongly determined by the cited aim. If the aim is the production of a certain protein, then the number of alternatives is smaller than if the aim is treatment of a disease. The alternative can also be considered closer to the aim, for instance another way of producing that protein, or in a broader sense, for instance alternative methods of treatment. From the activities of the Commission on Biotechnology in Animals one can surmise that the aim is often formulated far away from the actual research and that the alternative is very close to the actual research. According to the person giving the introduction, the question is whether this is justified.

Two cases

One case, about the creation of a rat through cell nucleus transplantation that will develop cystic fibrosis for medical research purposes, triggered a discussion on assessment criteria especially among the ethicists. One felt, that as long as an experienced group was carrying out the research, there was no problem. However, the other one felt that the use of a combination of two problematic techniques, i.e. genetic manipulation and cloning, should require extra caution. According to this ethicist, in the case of cell nucleus transplantation, there is a link between the problematic nature of a technique and the source of the host egg cell and donor nucleus. If the host egg cell is from the same animal as the donor nucleus,

then there is no real problem. If the host egg cell is from another species and the donor nucleus is genetically manipulated, then the application is clearly problematic.

The second case, dealing with the production of biopharmaceutical products from milk, was used by the representative from the biotechnology company, to make a powerful plea for a more relaxed policy on allowing cell nucleus transplantation. The representative from the Animal Welfare organization found the use of animals for the production of biopharmaceutical products unacceptable on principle: genetic manipulation and cloning compromises the integrity and intrinsic value of the animal. The two started a debate on the extent to which the health of the animal is affected. Animal Welfare referred to scientific publications that identified serious problems in animals produced by cell nucleus transplantation. The representative of the biotechnology company, on the other hand, claimed that such health problems did not occur in his company. Animal Welfare also accused the corporate sector of not investing enough into finding alternatives for producing biopharmaceutical products. A representative of an association of patients felt that the life of an animal was less important than obtaining a good and safe medicine, although the animal ought to be treated with integrity.

Conclusions

The debate did not come up with any conclusions on whether cloning is a different subject altogether or not. However, retrospectively there was a clear correlation between finding the subject problematic or not and considering it a different subject altogether or not. Everyone agreed on the aim, i.e. the production of biopharmaceutical products, but there were differences of opinion on the use of animals for this purpose. The extremes of the debate, the Animal Welfare and the corporate sector, provided few additional arguments to those that they presented during the hearing on cloning and clones. It was clearly different with the input from the two ethicists, who introduced new elements through their arguments on what is problematic, what requires careful assessment and what course the discussion on alternatives is taking.

2.4 Cloning and religion

In order to get a reflection of the arguments surrounding cloning, a discussion was organized on cloning and religion. This was founded on the following arguments:

1. During the discussions, religious arguments often implicitly play an important role, although they are not made explicit. The debate was able to provide the room to make these considerations explicit.
2. Since Dutch culture is strongly influenced by the Christian religion, the impression can easily arise that there is only one religion that plays a part in the debate on cloning. However, in fact one can distinguish between various Christian religious traditions. Also Humanism and other religions, like Judaism and Islam, may play a role. The debate served as an occasion for the different religions to be presented and discussed.

The set-up of the debate

In order to shed some more light on the multiple beliefs, representatives of the Roman-Catholic religion, the Orthodox Protestant religion, the Liberal Protestant religion, Judaism, Islam and Humanism, were invited to take part. They were asked to present arguments from their religion that bore relevance to the subject of cloning, in short introductions. During the second half of the afternoon, there was a debate with the audience.

The introductions

From the introductions it became clear that there is a great difference of opinion between the religions on the subject of cloning. For the Orthodox Protestants and the Roman Catholics, for instance, respect for the creation is their starting point. Man may only intervene with the greatest of caution. According to this belief, cloning of human individuals should be forbidden; sexual reproduction should be respected.

From the Roman Catholic point of view, cloning is the reprehensible symptom of a civilisation that strives towards creating the perfect human being and a science that assumes that it possesses the halo of the Almighty. The Orthodox Protestants find cloning problematic because of the undesirable instrumental use of animals. An exception is made for the production of life-saving medicines.

The Jewish religion chooses a very different approach. It holds the belief that it is the duty of man to perfect creation. Cloning is seen as a natural process, which is helped along by technology. Even the cloning of human individuals is permitted in certain medical situations. The same goes for the cloning of animals for the welfare of man.

Between these extremes we find the Liberal Protestant belief, that also considers it the duty of man to perfect the creation and not to idolise it. This reasoning does permit cloning. A cloned individual is not considered a lesser copy of the original, because both are equal in the eyes of God. According to this vision, the reasoning regarding the fallibility and fall of man counters the first reasoning. This leads to the conclusion that caution is advisable in the application of cloning.

The Islamic religion also assumes a middle of the road position on cloning. Research using cloned embryo cells for medical purposes is permitted, the cloning of adult individuals is not allowed because of the meaning of the relationship between men and women and the uniqueness of each individual. The representative of the humanist belief system felt that the discussion on cloning ought not to be narrowed down to a mere discussion on intervention into the genetic material of a cell. Cloning means an intervention in social and societal interrelations linked to specific social pressure and the role of certain institutions and interests. She felt that the cloning of animals was undesirable because, in her opinion, it is a perverse technique that does not solve any pressing social problem.

The discussion

The discussion focused mainly on the meaning of fundamental religious notions for the debate on cloning. The humanistic vision rejected any claim on a final judgement or the notion that any institution could make a final judgement. Instead of choosing a specific place of man and animal within the hierarchy of Creation, she pleaded for an aesthetic approach: is biotechnology stylish, elegant, and pleasant or an example of a good way of life? The other speakers did not agree with her. One cannot rely simply on personal views on biotechnology; the old ideological traditions are simply necessary in order to come to a meaningful judgement.

In addition to this discussion about whether or not the fundamental notions of religion are meaningful, there was also a discussion on the manner in which those fundamental notions are used in order to form an opinion on cloning. One of the speakers warned that it was not prudent to automatically or systematically apply fundamental notions to cloning. He cited the official reaction of the Catholic Church to cloning as being a bad example of this. Instead one should take a closer look at the social reality in which cloning is applied, and at the way that it is applied, so that one can come to a more focused opinion on cloning.

Conclusions

The debate on ideologies resulted in very useful additions to the arguments, which play a role in the debate on cloning. Certain criticism often presented in the shape of a metaphor, such as 'Playing God' or 'Intervening in Creation' was placed within the context of specific religious beliefs. The different approaches were very clearly brought to light. The debate on the meaning of religious fundamental notions in order to form an opinion on cloning was enlightening. All in all, the discussion helped to name, value and put the arguments that implicitly play an important part in the debate on cloning, into perspective.

2.5 Cloning and political traditions

This meeting aimed at reflecting on the arguments surrounding cloning and clones dealt with cloning and political traditions. The choice of this subject was based on the following arguments:

1. The subject allowed political parties to get explicitly involved in the debate activities and allowed them to play a different part than being the listeners or recipients of conclusions presented to them.
2. Obviously, political traditions play a role in the political debate on cloning. During the debate, the related considerations would be made explicit.
3. It is interesting to see to what other considerations or starting points are important from the perspective of political traditions, than those cited during the general debate.
4. During the debates it was mentioned several times that the discussion should be about the what is desirable for society and to what extent applications of cloning are linked to that. It is interesting to hear to what extent politics is actually dealing with this prospective question when forming an opinion on cloning.

The set-up of the debate

In order to avoid the caution already shown by politicians and to emphasise the role of political traditions, the decision was taken to invite scientific bureaus of political parties. These bureaus have a tendency to publish in-depth studies on issues, which are of interest to the party involved. Almost all the parties represented in the Dutch parliament sent a representative; six parties sent representatives from their scientific bureau's, two other parties sent members of parliament. In the first round of the evening session party representatives were interviewed about the meaning of their political traditions for their position on cloning.

In order to find out to what extent positions changed due to future projections of developments in the area of cloning, three scenarios presented through multi-media clips, were used. The first scenario was about the production of medicines from the milk of sheep and cows. It showed an aggressive corporate sector that carried out large-scale experiments promising great things. However, things go wrong: animals die and the research hardly has anything to show for itself. Politics reacts by formulating sharp legislation that force biotechnology companies to turn their back on The Netherlands. In the second scenario, the company Meatsubishi has an absolute monopoly on the production of cloned meat with additives that improve health.

The third scenario is about eugenics: it is possible to enrich one's children by making them super intelligent and resistant to disease through a combination of genetic manipulation and cloning. The representatives of the political parties were asked to respond during the presentation of the scenarios. In order to assess to what extent politicians allow their

positions to be influenced by public opinion, the audience present was presented with five positions and the politicians were asked to respond to the outcome.

Positions of the parties

During the first round, it was striking that the party representatives initially put forward standpoints, and only went into the relationship between those standpoints and their political tradition after being probed. For the social-democratic PvdA party, the largest party in The Netherlands, the starting point is to maintain cautious procedures and to maintain public openness in assessing cloning experiments. Another standpoint of this party is that the application of cloning should not lead to an increase in power differences. This party therefore supports the Dutch 'No, unless' policy: cloning is forbidden unless it complies with a number of different conditions. The starting point of the right-wing liberal party VVD, the second party in The Netherlands, are the integrity of body and spirit and the complete self-determination of the individual. Therefore, the cloning of a human individual must be banned. This argument does not apply to animals, because they find themselves in another hierarchical position.

For the Christian-democratic party the CDA, respect for creation and suspicion of arrogance of man dominate its position. In the practice of everyday politics there is a difference of opinion within the party. The strict members for instance, feel that no experiments using an embryo should be permitted, while the more lenient party members are not so fast to put on the brake.

The progressive-liberals D66, the fourth party in parliament, in principle feels that technological developments in the area of health care are positive. At the same time, it is difficult for politicians to follow these developments because of the closed nature of the scientific and technological complex. In order to solve this dilemma D66 pleads for the creation of room for communication between science and politics. With regard to political control, the most important values to protect are the integrity of the individual and self-determination.

The green party GroenLinks, the fifth party in The Netherlands, feels that there must be respect for everything that takes place in life and in nature and therefore pleads for the utmost caution. The small Christian right-wing parties, RPF, GPV and SGP, have the same starting point as the Christian-democrats CDA, namely, respect for creation. However, they are more stringent in their adherence to this standpoint. Therefore, they plead for a ban on cloning.

Finally, the left-wing party SP feels that the interest served by cloning should determine the ultimate opinion.

The future scenarios

Only the representative of the right-wing liberal party VVD is enthusiastic about the first scenario on extracting medicines from milk. She calls it a fundamental step in the direction of producing new medicines. Other parties mainly mention objections to making instrumental use of animals. The VVD representative calls this argument hypocritical.

The scenario continues with a clip showing the total failure of the experiment and the departure of the medicine production from The Netherlands. This means a loss of employment opportunities, is the response of the liberal VVD representative. The progressive-liberal D66 representative accuses her of pushing aside other social norms through her one-sided emphasis on economic and instrumental aspects. Ninety-nine percent of all medicines currently being used come from abroad, the social-democratic representative adds at this point. The representative of the small right-wing Christian party feels that the scenario confirms his position that the piling of technology upon technology

leads to vulnerability because it becomes uncontrollable and because there is too much focus on partial aspects.

The scenario of Meatsubishi is unacceptable according to the right-wing liberal VVD representative because of the monopoly of the company and because of the health enhancing additives. The left-wing SP feels that the scenario is a good illustration of the link between the application of cloning and developments, which lead, to monopoly.

The third scenario, on the genetically enriched baby, triggers unanimous reprehension. The arguments presented are of particular interest. As a genetically enriched person, one is dependent upon others for one's own functioning, according to the progressive-liberal D66 representative. By genetically enriching people, one makes a value judgement on other people. Who can claim to be able to judge what a good human being looks like?, the right-wing liberal VVD representative stated. Making one better than the other has unacceptable consequences for the status of society, for the distribution of chances and social justice, according to the representative of GroenLinks.

The right-wing Christian representative quoted Kant who said that a human may never merely be a means to an end. The genetically enriched child is a means to the end of fulfilling the desires of its parents and that of the dominant culture. A unanimous reprehension was triggered by the question: does politics have the power to come to a rejection in principle in a pluralistic society? After all, there is always someone who can successfully show the health benefit of such an application.

The public opinion on the position presented

Gauging of public opinion on the positions presented brought forward a rather negative opinion on cloning applications. Two positions triggered the most interesting discussion. The one on production of medicine from milk from animals led to a new debate on the question of whether animals may or may not be used for this purpose. What is the difference between manipulating fungi and manipulating cows, someone in the audience wanted to know from the politicians. Apparently, it is only an emotional matter. The representative of GroenLinks admitted that for her it was also ultimately a question of weighing the use of animals against achieving a health benefit.

The other position was about whether or not only parents should be involved in making reproductive choices. The audience largely felt that that decision should remain with the parents. The representative of the Christian-Democratic CDA wondered whether one could actually speak of self-determination if the parents are left with the choice of creating a clone or a genetically superior child. Unfortunately, the time was too short to go into that.

Conclusions

The meeting resulted in more insight into the meaning of political traditions to positioning by the parties with regard to cloning. It was interesting to see that the future scenarios were used by some to confirm their rejection of the use of cloning, while supporters of cloning considered the disadvantages described as incidental. Another striking point is that the positions presented by the parties showed a lot of similarities with the results of the public survey.

3 Standpoints of the Citizens' Panel on Cloning

One of the activities during the project on clones and cloning was a Citizens' Panel made up of twenty lay volunteers. Their task for one and a half year was to critically follow the debate and take all kinds of initiatives to develop an independent opinion on cloning. Below is published a summary of the conclusions of the panel. The complete text of the Final Declaration of the Citizens' Panel is published separately.

Cloning in animals

- Every development which involves the use of animals for the benefit of human beings must include an assessment of the benefit itself as well as an assessment of whether this benefit is proportionate with the suffering to which the animal is subjected. It is our view that the interest of human beings outweighs the interest of the animal. Nevertheless, we struggle with this antropocentric stance. As human beings, we formulate what the interest of the animal entails. The animal can not agree or disagree with it. We, human beings, give the animal a voice. But that way we can always put forward arguments in our own favour. And it is almost impossible not to be antropocentric.
- The integrity of animals ought to be respected as far as possible. But violation of this integrity must not be completely unacceptable.
- The argument that technological developments such as cloning and genetic modification of animals should be allowed because of their benefits to medicine is used too readily. Before the cloning of animals is allowed for medical purposes, it must be clear that it is indeed beneficial to medicine. To this end, the potential medical benefits should be placed in a much more global setting by the researchers.
- In the societal debate on cloning of animals alternatives are given too little attention.
- The burden of proof in support of the admissibility of cloning animals in principle rests with the researchers. This is why we are pleading for the current "No, unless" policy.
- Emotional arguments are not merely gut feelings to us. Such arguments are important counsellors for people and that is why they should be taken seriously. Furthermore, putting intuitions into words can provide one with a guide to finding and examining other, perhaps more rational, arguments. It is our opinion that emotional arguments must play a part in rational considerations about the admissibility of cloning.
- Examination of intuitive disgust of cloning in animals has taught us that violating the boundaries of nature through genetic modification and the apparent uncontrollability of scientific developments, are important concerns.
- By cloning animals and the genetic modification of animals natural boundaries are violated. These violations carry risks that are difficult to estimate. On the basis of the insight that we now have into the risks of cloning and the suffering brought to the animals used, we find that cloning of animals must be discouraged.

Cloning in humans

- With the exception of one person, we are all against the reproductive cloning of human beings, meaning the use of cloning techniques to create a cloned human and to allow it to be born. This attitude against the cloning of human beings is mainly based on our conviction that a cloned human will have severe problems with his or her identity and that the technical risks are too high to carry out such experiments with human beings.
- With regard to cloning, our panel focused more on the meaning of sharing one's genetic identity with another person, than any of the other discussions held in The Netherlands did. The research done on the development of the identity of multiples can provide important information that can be used in the discussion on cloning.
- Involuntarily childless couples might gain more by learning to deal with their childlessness than by distant future expectations of a cloned child.
- Creating embryos for scientific research is justifiably forbidden in The Netherlands. We consider a ban on the creation of clone embryos for, for instance transplantation purposes, a logical consequence of this legislation.
- We consider none-reproductive cloning, for instance the use of cloning techniques for making transplants, less objectionable than reproductive cloning.
- It is our opinion that cloning techniques may be used for making transplants on condition that:
 - the current practice in transplantation does not offer any further possibilities,
 - stem cells of born individuals are used and not those of embryos or fetuses.
- By using cloning techniques in human beings in combination with genetic modification, eugenic practices can emerge. Eugenics without medical grounds, such as for instance preventing fatal hereditary diseases is considered non-negotiable to us.
- The way, in which cloning techniques are discussed in The Netherlands, contributes to a very one-sided view within society, focused on preventing and curing disease, while there is little room for learning to deal with infirmity.
- Our image of man, meaning our ideas about the physical and social functioning of human beings assumes equality among human beings. The application of cloning techniques to human beings can seriously disturb this image.
- The effects of cloning on human beings need to be researched not only from the natural scientific perspective but also from psychological and socio-cultural perspectives.
- Based on the realistic and expectable risks involved (which are most probably the same problems and risks involved in animal cloning) the cloning of human beings must be strongly discouraged.

Advice to politics

- Cloning of animals and human beings ought to be made unattractive. The existing legislation can only partly be used to achieve this. It is necessary to develop new legislation. We advice politicians to introduce mandatory health impact assessments, which are comparable to the environmental impact assessment system. This system can be used to assess requests for cloning experiments as well as to assess other (bio)technological activities.

4 Knowledge and opinions of the Dutch population on cloning

In order to get a picture of what the Dutch population thinks about cloning the Rathenau Institute initiated a survey. The survey did not merely focus on gaining information on attitudes towards cloning. It also examined the interest and involvement of the Dutch public in this subject and measured to what extent people feel informed about the issue of cloning. Besides, the survey tried to clarify what kind of actors, according to the Dutch public, should play a (guiding) role in the debate on cloning. Below the main results of the survey.

The Rathenau Institute assigned the bureau Veldkamp to carry out this research. In light of the nature of the problem and the manner in which the problem can be presented to respondents, a written procedure was chosen. This way the respondents are not overwhelmed by the problem and are given the opportunity to quietly think about their answers. A Tele Panel was used, a research instrument through which approximately 1000 households can answer questions by themselves using a laptop. The fieldwork took place at the end of March 1999. In total 847 persons aged 16 and older took part in the research. Following a slight correction, the sample survey was representative of the Dutch population with regard to sex, age, level of education and number of people per household.

Knowledge

People were asked whether they think they are well- or ill-informed on the subject of cloning. Only a relatively small group (13%) thinks that it is well or reasonably well-informed. Seventeen percent of the sample survey had never heard of cloning. This subjective level of knowledge appears to be strongly related to the level of education of those questioned: the more highly-educated consider their level of knowledge to be higher than those with a lower education do. There are more differences: younger people consider their knowledge on cloning to be higher than older people do, men estimate their knowledge to be higher than women and people who never go to church think they know more about cloning than the other respondents do.

The question why one would want to clone animals was widely answered as follows: to improve the yield of meat and milk. Other frequently mentioned reasons were; to produce more animals with equal, desirable properties and to develop and produce medicines. People who claim to be reasonably to well-informed, mention the reason of higher yields of meat and milk relatively more frequently than those who feel that they are less-informed. According to the respondents the cloning of human cells is mainly for tissue-culture of one's own cells and organs for transplantation purposes. Giving birth to healthy children in cases of genetic disorders is also mentioned as a reason for cloning.

Applications in the cattle-breeding sector (65%) are usually associated with cloning. In addition, applications in the medical sector (38%) are often considered, as well as other applications of cloning (horticulture, but also the cloning of human beings). A widely held opinion is that the technology on the cloning of animals is more advanced than of human cells.

	<i>cloning of animals</i>	<i>cloning of human cells</i>
<i>technique is advanced</i>	36 %	12 %
<i>technique is reasonably advanced</i>	30 %	27 %

The higher the knowledge the respondents claim to have on the subject of cloning, the more frequently they voice the opinion that the technical knowledge with regard to the cloning of animals and that of human cells is more advanced. One fifth of the respondents feel that they know more about the subject of cloning now than they did one year ago. Young and highly educated people, as opposed to older and less educated people, more frequently express the feeling that they know more now than they did last year.

Information on cloning

During the past twelve months, 80% of the respondents has seen, heard or read something on the subject of cloning, usually through television or newspapers. The more highly-educated have more frequently acquired information through a variety of sources than the less-educated. They were relatively more frequently informed through newspapers, radio and periodicals. Highly and less-educated people were equally intensively informed through television.

Almost half of the respondents have spoken with others about cloning during the past year, usually with family, friends, acquaintances or colleagues. Only 3% has attended meetings during the past year at which cloning was spoken about or discussed. An even lower percentage (1%) has actively sought information on the subject of cloning during the past year. One fifth has at some point read a book or seen a movie in which cloning is involved. Fantasising about the possibilities of cloning does occur: the perfect human, a clone of oneself, abuse by criminals, a clone of Johan Crujff.

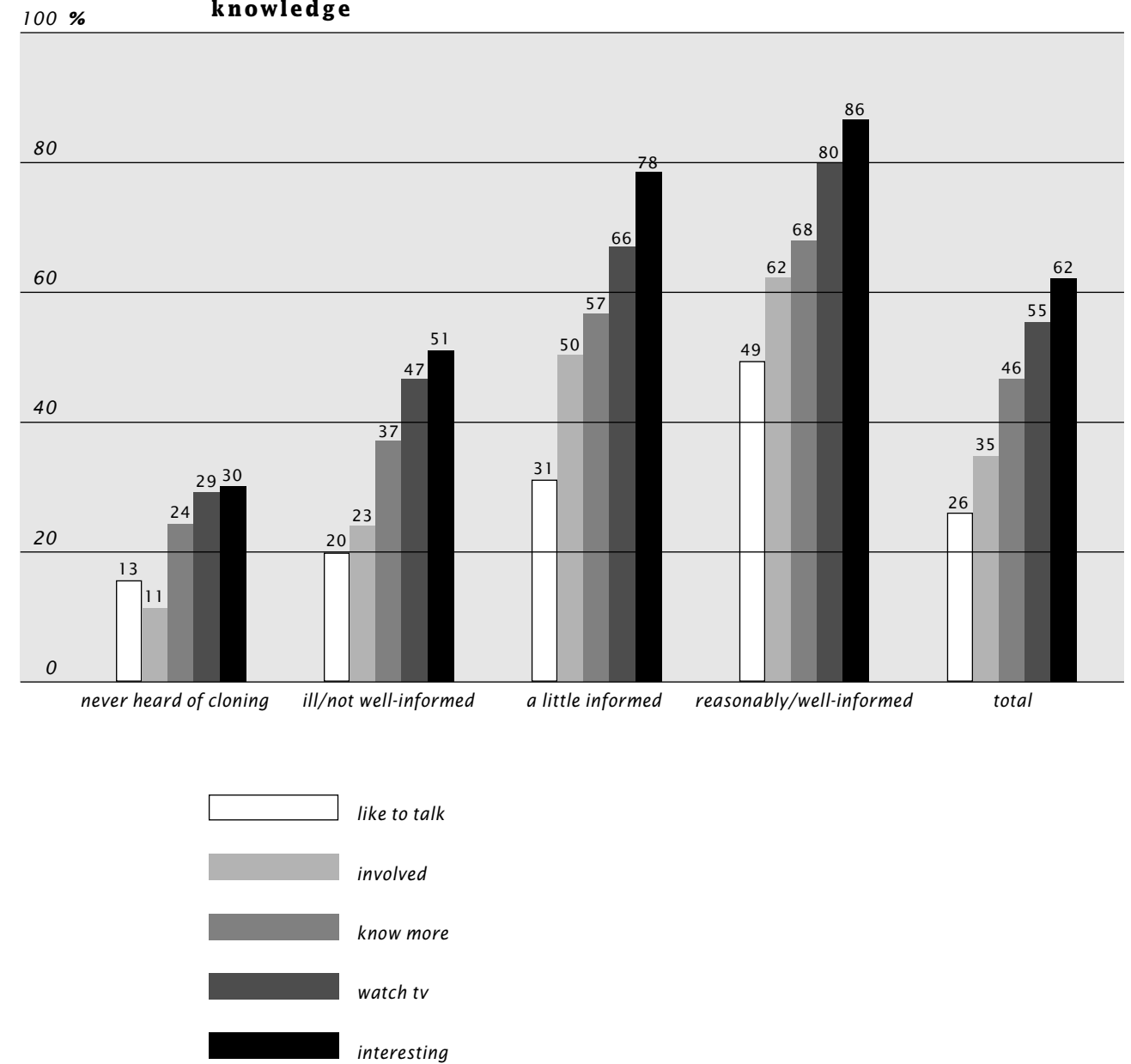
The need for information

There does appear to be an interest in the subject of cloning: 46% of all the respondents would like to know more, 26% would like to discuss it with others and 15% finds discussions about the applications of cloning very interesting (and 47% finds it a little interesting); 5% feels very involved with the discussions on applications (and 30% feels a little involved).

Of all those questioned, 55% would certainly or probably watch a television programme on cloning. The interest and involvement is considerable among those who claim to be reasonably to well-informed on the subject, but also among those who claim to be 'a little' informed. The remainder generally shows little interest or involvement.

The youngest group among those questioned (aged 16-24) shows the least interest and involvement, the group aged 25-45 shows more than average interest and involvement. People with liberal or left-wing political preferences show a higher than average level of interest and involvement.

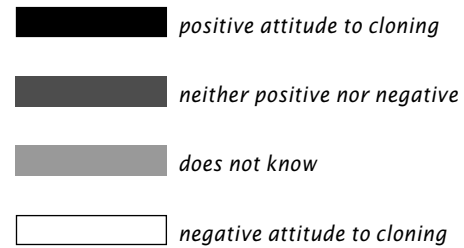
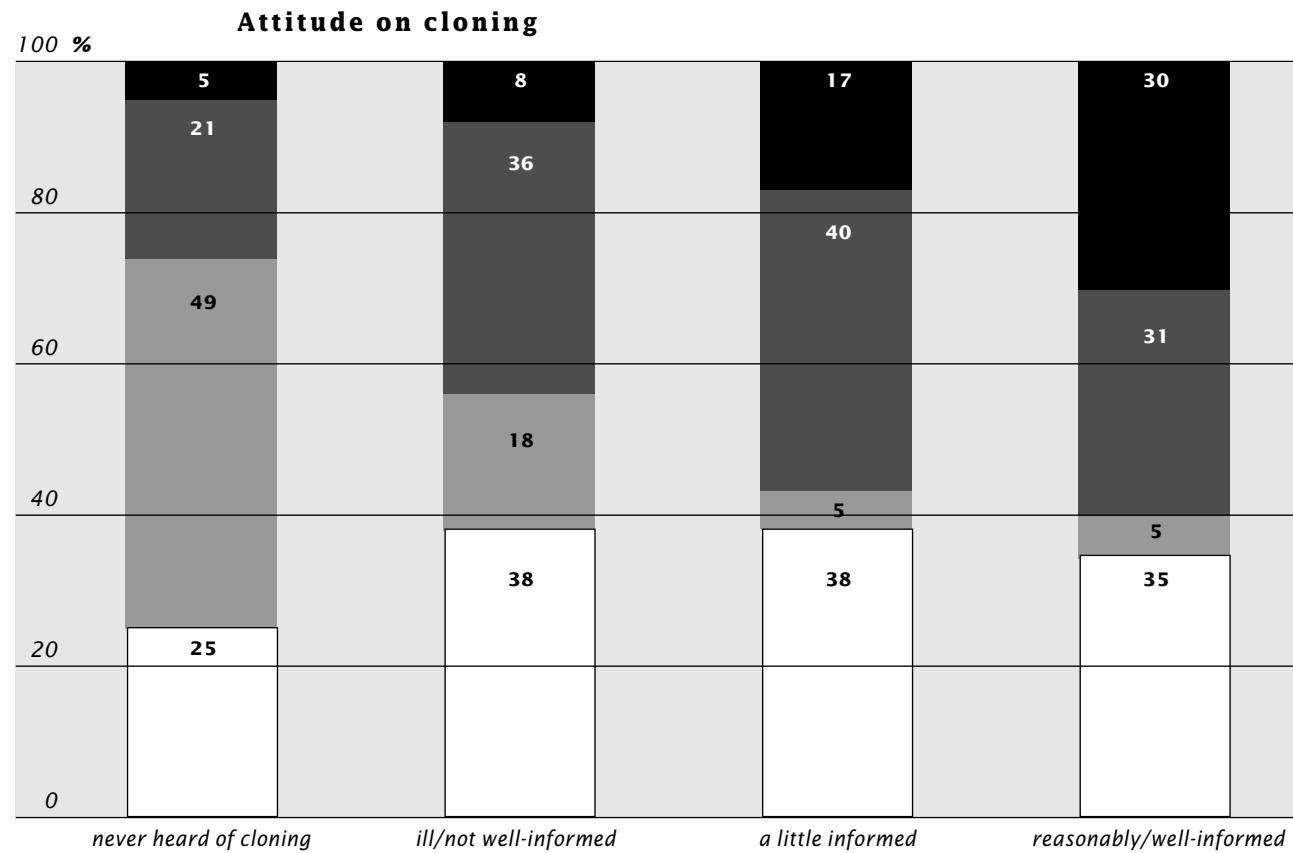
Interest and involvement in relation to subjective level of knowledge



Attitude with regard to cloning

People were asked to what extent they consider the developments in the field of cloning to be positive or negative. Of all those questioned, 36% considers the developments to be negative, 14% considers them to be positive, 34% considers them to be neither positive nor negative and 17% expresses no opinion. Men are more positive than women, younger people are more positive than older people and the highly-educated are more positive than the less-educated. On average, those with a liberal political preference are more positive and people with a confessional preference are more negative.

On average, the higher the level of knowledge the more positive the opinion. Those respondents with more knowledge often also express a clearer positive or negative opinion than those who are not or ill-informed.



People with a positive attitude do often realise that there are negative aspects to cloning. People with a negative attitude are less inclined to distinguish positive aspects. From the explanations attached to the answers it is clear that certain themes reoccur very often: frightening associations related to cloning (Hitler, Übermensch), human beings should not

play God, one should let nature take its course, and the ultimate consequences are unknown. There is often fear of abuse by the wrong people. However, positive aspects are most certainly also distinguished: better medicines, organs for transplantation, a lot of information on, for instance, the development of an organism and the related processes.

There is clearly a more positive attitude towards applications of cloning related to the development and production of medicines (57% acceptable always or sometimes) and to the development of medical applications such as organ transplantation (53% acceptable always or sometimes), than to applications aimed at having children (34% acceptable always or under certain circumstances) and improving the level of production and quality in the cattle breeding sector (36% acceptable always or under certain circumstances).

People were asked whether they think that this development in the field of cloning should be stimulated at the expense of issues outside the health care sector (the environment, education) or issues within the health care sector (prevention and nursing homes).

To stimulate developments

	Yes	No	Do not know
at the expense of issues outside the health care sector	14 %	54 %	32 %
at the expense of issues within the health care sector	6 %	72 %	22 %

Only 6% of all respondents thinks that the development of cloning should be stimulated, even if this would be at the expense of the health care sector; 14% apparently thinks the development of clones is so important that it may be stimulated at the expense of issues outside the health care sector. People with a reasonable to high level of knowledge, are more frequently inclined to find the development important than people with little or no knowledge on the subject.

The societal debate

The majority of the respondents is of the opinion that the government and politicians must be able to influence what takes place in science. With regard to cloning, two-thirds is of the opinion that the government and politicians should play a guiding role in the application of cloning.

Many of the respondents feel that the medical world, the scientific world, national government and citizens should certainly be involved in discussions on cloning. When it comes to final decision-making, the choice is largely that this should lie with the national government (57%). This answer is mainly chosen by the more highly- educated (69%) and men (64%). The less-educated, women and the youngest age group relatively frequently express no opinion on this question. A societal debate should produce good information in particular (56%), but also create awareness on the subject (51%), approve or disapprove developments (48%) and allow people to form an opinion on the subject (46%). Especially the government, the medical and scientific world and the media are expected to provide information. The most reliable information is expected to come from the scientific information centres, the national government, the medical world and independent institutions.

The more highly educated frequently feel that the most reliable information can be provided by independent institutions. Preferred sources of information on this subject are the television (65%), while the newspapers (31%) and leaflets and brochures (29%) are mentioned as well. Information provided through meetings is hardly mentioned (7%). When asked how personal involvement could be increased, almost half of the respondents answered that the best way would be through national media attention. Ideological organizations, political parties or pressure groups are hardly mentioned. One fifth remarks that personal involvement could not increase because the subject does not interest them enough.

5 Conclusions of the societal debate by the Rathenau Institute

At the end of the project the Rathenau Institute, as a parliamentary technology assessment organization, made its own recommendations on cloning in a Report to Parliament. The main conclusions of this report are found below, the full text is published separately in its original lay-out.

1. There are deep-rooted and widely felt objections to cloning in general. These objections should clearly and recognisably be included in decision-making on cloning.
2. When forming opinion about cloning, it is important to consider international aspects as well as shifts in consideration, which can occur with the new possibilities.
3. An isolated opinion on cloning as such is almost impossible. Opinion forming should take place in the wider context in which cloning is applied.
4. Considering the concern that the development of cloning has brought about, there is a widely felt need for governmental regulation of these scientific developments. International matching of policy is emphatically required.
5. When assessing concrete applications of cloning, it is imperative to assess its 'usefulness' in a broad social context. This includes the conditions and circumstances under which they are applied and the long-term effects of these applications.
6. A ban on the cloning of individuals is not controversial. The application of cloning technology to human material for transplantation purposes is viewed positively by many people. However, the debate put forward the opinion that it is of great importance to explore other means of obtaining stem cells than extraction from embryos.
7. The use of cloning in animals to produce medicine appears to raise the least resistance. Experiments in this area are justifiably assessed according to the 'no, unless' principle laid down by law. This principle could also be applied at European level.
8. Possible applications of cloning in cattle breeding, together with other biotechnology, will almost inevitably lead to an increase in scale. It is of importance to make sure that biotechnological developments in the cattle-breeding sector do not reinforce the ongoing loss of biodiversity.

6 Contribution of the Rathenau Institute to the societal debate

Public meetings

Agenda-setting Hearing in the Oude Zaal of the Dutch House of Commons

The Hague on the 26th of March 1998

Debate on Ideologies and Cloning

Utrecht on the 2nd of July 1998

In collaboration with the Multidisciplinary Centre for Church and Society and the Catholic Union of Care Institutes

Presentation of the compilation titled Allemaal Klonen ('All Clones') and the Interim Report to Parliament

The Hague on the 10th of December 1998

Debate on human cloning

Maastricht on the 26th of April 1999

In collaboration with the Institute for Health Ethics, University of Maastricht

Debate on cloning in the cattle-breeding sector

Wageningen on the 20th of May 1999

In collaboration with the Department of Technology and Agricultural Development, Agricultural University of Wageningen

Debate on political traditions and cloning

Amsterdam on the 26th of May 1999

In collaboration with the Institute for Public and Politics

Debate on the cloning of animals for medicine

Utrecht on the 8th of June 1999

Final meeting in the Oude Zaal of the Dutch House of Commons

The Hague on the 23rd of June 1999

Four regional debates

In Baexem, The Hague, Groningen and Utrecht

June 1999

In collaboration with Swoka

Publications and research

Rathenau Special including a report on the hearing

May 1998

Compilation: Allemaal Klonen ('All Clones') – facts, opinions and questions about cloning

December 1998

Report to Parliament including an interim report of the societal debate

December 1998

Results of the survey on cloning by Bureau Veldkamp Market Research
May 1999

Final declaration of the Citizens Panel on Cloning
June 1999

Rathenau Special in which different aspects of clones and cloning are treated in a widely
accessible manner using the survey
June 1999

Report to Parliament
In which the Rathenau Institute draws conclusion from the societal debate
June 1999

Still to be published:

Reports on the various debates held

Analysis of the content of the societal debate (by Dr. T.E. Swierstra, University of Twente).