GENE TECHNOLOGY AT STAKE
Abstract
This thesis examines the Swedish political response to the challenges posed by gene technology, seen through the prism of governmental commissions. It discerns and analyses continuities and changes in the Swedish political conception of gene technology, over the course of two decades, 1980–2000. This is done by thematically following ideas of “risks” and “ethics” as they are represented in the inner workings and reception of three governmental commissions. The Gene-Ethics Commission (1981–1984), the Gene Technology Commission (1990–1992) and the Biotechnology Commission (1997–2000) form the empirical focal points of this analysis. The first two provided preparatory policy proposals that preceded the implementation of the Swedish gene technology laws of 1991 and 1994. The last one aimed at presenting a comprehensive Swedish biotechnology policy for the new millennium.

The study takes into account the role of governmental commissions as arenas where science and politics intersect in Swedish political life, and illuminates how this type of “boundary organisation”, placed on the border of science and politics, impinges on the understanding of the gene technology issue. The commissions have looked into the limits, dangers, possibilities and future applications of gene technology. They have been appointed to deal with the problematic task of distinguishing between what is routine and untested practices, realistic prediction and “science fiction”, what are unique problems and what are problems substantially similar to older ones, what constitutes a responsible approach as opposed to misconduct and what it means to let things “get out of hand” in contrast to being “in control”. Throughout a period of twenty years, media reports have continued to frame the challenges posed by gene technology as a task of balancing risks and benefits, walking the fine line between “frankenfoods” and “miracle drugs”.

One salient problem for the commissions to solve was that science and industry seemed to promote a technology the public opposed and resisted, at least in parts. For both politics and science to gain, or regain, public trust it needed to demonstrate that risks – be it environmental, ethical or health related ones – were under control. Under the surface, it was much more complicated than “science helping politics” to make informed and rational decisions on how to formulate a regulatory policy. Could experts be trusted to participate in policy-making in a neutral way and was it not important, in accordance with democratic norms, to involve the public?

Keywords: Gene technology, biotechnology, recombinant DNA technology, bioethics, ethics, risk, GMO, embryo, transgenic organisms, boundary organization, boundary object, governmental commission, regulatory policy, Sweden, public, expertise, democracy
GENE TECHNOLOGY AT STAKE

Swedish Governmental Commissions on the Border of Science and Politics

Jenny Eklöf

Umeå University
2007
# Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preface</td>
<td>7</td>
</tr>
<tr>
<td>1. Introduction</td>
<td>9</td>
</tr>
<tr>
<td>Objective</td>
<td>13</td>
</tr>
<tr>
<td>Understanding Governmental Commissions and Gene Technology</td>
<td>14</td>
</tr>
<tr>
<td>Prior Knowledge and Engagement</td>
<td>21</td>
</tr>
<tr>
<td>Earlier Research in the Field</td>
<td>22</td>
</tr>
<tr>
<td>2. Theoretical Framework</td>
<td>25</td>
</tr>
<tr>
<td>The Science-Politics Boundary: Science for Policy, Policy for Science</td>
<td>25</td>
</tr>
<tr>
<td>Linear Models and the STS Critique</td>
<td>27</td>
</tr>
<tr>
<td>Politicisation and Scientification</td>
<td>30</td>
</tr>
<tr>
<td>Boundary Organisations and Boundary Objects</td>
<td>33</td>
</tr>
<tr>
<td>The Role of the Media</td>
<td>36</td>
</tr>
<tr>
<td>On Method: Themes, Sources and Limitations</td>
<td>39</td>
</tr>
<tr>
<td>The Themes of Risks and Ethics</td>
<td>40</td>
</tr>
<tr>
<td>Source Selection and Limitations</td>
<td>41</td>
</tr>
<tr>
<td>3. Gene Technology Entering the Political Arena</td>
<td>45</td>
</tr>
<tr>
<td>The International Recombinant DNA Technology Controversy</td>
<td>45</td>
</tr>
<tr>
<td>Swedish Media Debate, 1977–1979</td>
<td>47</td>
</tr>
<tr>
<td>The Scientist</td>
<td>49</td>
</tr>
<tr>
<td>The Industrialist</td>
<td>53</td>
</tr>
<tr>
<td>The Politician</td>
<td>55</td>
</tr>
<tr>
<td>On the Footsteps to Political Regulation</td>
<td>59</td>
</tr>
<tr>
<td>The Ugly Face of Misconduct</td>
<td>66</td>
</tr>
<tr>
<td>Factual Ethics for Ethical Fact-Makers</td>
<td>72</td>
</tr>
<tr>
<td>Concluding Remarks</td>
<td>81</td>
</tr>
<tr>
<td>Aftermath</td>
<td>86</td>
</tr>
</tbody>
</table>

GMOs Coming Out of Laboratory Closets 92
Getting to Grips with Uncertainty: The Gene Technology Commission 97
   Framing the Work 98
   Risk Assessment and Risk Communication 102
   How to Arrive at an Ethical Standpoint 111
   Tampering with Nature and Patenting Living Organisms 113
   Concluding Remarks 123
Aftermath 126

5. Gene Technology Coming of Age

Breaking the Divides: The Biotechnology Commission 135
   Manageable Risks 139
   Business at Risk, or Risky Business? 144
   Drilling the Ethical Minefield? 149
   Concluding Remarks 158
Aftermath 160

6. Hybrid Understandings of Hybrid DNA

Core Questions to Solve 169
Politicisation and Scientification 170
   Public Concerns and Concerns about the Public 172
   Ethics as a Boundary Object 174
Best of Both Worlds? 179

Appendix 181
Commission Members and Experts 181
Glossary and Abbreviations 184

Bibliography 188
Preface

First of all, I would like to thank my supervisors, Kjell Jonsson and Christer Nordlund, for their support of my project from beginning to end. Although there must have been reasons to doubt, from time to time, whether I was on the right track, you have always been open-minded and encouraging. If it had not been for Kjell, I would not have applied for the PhD programme, and certainly not enjoyed it so much once I started. As my assistant supervisor, Christer has exceeded all expectations one could possibly have. You have read and commented on my many drafts enthusiastically and without delay, spurring me on particularly during this final year. I am very fortunate to now have the opportunity to continue working with you. Together with Kjell, you two have formed the best team possible.

It has been a joy to be working among so many intelligent and nice friends and colleagues at the department. You have all made my time there particularly pleasant. However, some of you have more directly contributed to this study. Per Wisselgren read and commented on the final draft and before that Anna Larsson and Erland Mårald took their time to read and discuss separate chapters. Joakim Norberg’s comments during the final stages of writing were also of great help. While I was abroad at the Science Studies Unit in Edinburgh, I got to know Donna Messner, who has been a great source of both academic and personal inspiration.

Elinor Adenling and Anna Nilsson have been with me long before I set out on this PhD journey, and hopefully they will stay with me long after it has ended. This summer Elinor shared the same experience of finishing a thesis and without her these last 3 months would not have been as
tolerable as they eventually turned out to be.

Writing a thesis is like having a temporary family member for a number of years. All you do is talk about this new member, and those nearest to you become involved in every step of its development. My mother and father have both been of tremendous help, backing me up both mentally and practically. At a late stage, my brother Martin was called in as a “freelance historian”, digging his way through the volumes at the National Archives. My mother-in-law, Mona Eklöf, has always showed great interest in my work and has provided me with an extra home.

Finally, I would like to thank my dear Jan, whose good influence on this thesis is directly related to his good influence on me. I am blessed to have you with me.

I dedicate this thesis to our beloved son, Alvar Eklöf.

Umeå, October 2007
I. Introduction

Technologies often function as markers for identifying and bounding historical time periods. This has been the case for modern technological artefacts like nuclear power plants and computers as well as for older ones, such as mechanical clocks, steam engines, and so forth. The current ideas that the development of biological knowledge, frequently called the “new biology”, lies at the root of the emergence of a profoundly new society has many historical predecessors. The technical applications of biology have engendered the hopes, fears and expectations of this new society, and has an equally long history\(^1\). In the second half of the 20\(^{th}\) century, these ideas gained special momentum after the advent of recombinant DNA technology in the early 1970s. Gene technology has been interpreted as holding a key to an understanding of our contemporary society. Side by side with information technology, it is supposed to be the defining technology of our time. Recombinant DNA technology has now come of age – it is more than thirty years since the technique was invented. A lot has changed since it was first introduced, changes that involve not only its potential and actual implications for a range of diverse societal sectors, but also how it has been framed and understood. But at the same time, some of these images have been fairly robust and immune to ongoing historical changes. Ideas about the dangers of “playing God”, creating monsters like that of Dr Frankenstein, opening Pandora’s box, etc., reappear as often as hopes of finding cures for the terminally ill, or dreams about science and technology becoming tools for achieving economic and social progress.

During the 1980s and 1990s, we saw the emergence of an industrial biotechnology sector, the implementation of different forms of political regulatory measures, shifts in science policy priorities in order to support biotechnological research and its commercialisation as well as changing industry-academia relations and a transformation of the identity of Swedish universities as knowledge producers in a knowledge based economy. Throughout a period of twenty years, media reports continued to frame the challenges posed by gene technology as a task of balancing risks and benefits, walking the fine line between “frankenfoods” and “miracle drugs”. As new products reached the market and new techniques became part of medical practice, the anonymous “public” turned into a more diversified group of patients, consumers, voters, donors – more direct stakeholders in the expanding realm of gene technology. Battles over the pros and cons of genetically modified crops have infected trade relations between the United States and Europe. What was once an arcane method used in basic molecular biology research turned into Big Science with the launching of the massive international Human Genome Project in 1989. The 21st century has seen the upbringing of its offspring: functional genomics, bioinformatics, metabolomics, and HUPO, the Human Proteome Organisation. Old terms like “life science” and “biotechnology” are re-deployed to demarcate this change as a revolution in scientific, technological, political, economic, cultural and ethical terms, and a striking historical short-sightedness characterises most responses to this perceived change.

What can a historian of science and ideas possibly make of this? History is often used as a rhetorical resource in debates. If you can control the interpretation of the past, you can also make the most credible statements about current events as well as the most reliable predictions of the future. History plays the role of justifying claims about the present state of affairs, and in science-based controversies it is commonplace to selectively pick and choose from the historical record in order to give strength and authority to certain claims about how things are or should be. Finding a proper distance from present rhetoric surrounding this highly contentious field, poses serious problems. One dispute emerges after the other and the stakes have been raised again and again. Both proponents and adversaries of the latest gene technology application set out to be concerned for nothing less than “the future of mankind”. As has been poignantly pointed out by Thomas Gieryn, “In medias res is
hardly a propitious time for summing up.” Fortunately, this thesis has no intention of “summing up”. It might be something that historians do better than others, but that task will be left for others to take on.

However, as a historian of science and ideas, it is important to counteract the idea that historical change, in this case the development of scientific knowledge and technology has a force of its own. There is nothing “natural” or “inevitable” about the development and implementation of gene technology. Rather, it is an outcome of complex interactions between scientific, cultural, industrial, political, legal, economic, cultural and social factors. To investigate the contingent elements that underlie this change is an important task, not to look back retrospectively in order to seek explanations for why a certain technology has succeeded or failed, but to understand its development in terms of its own historical context. For an empirically based discipline, ideas just don’t exist “out there” disconnected from the complexities of everyday life. Every “history of ideas” therefore becomes a history of social and cultural life, and a history of science in society is likewise a history of scientists in society.

In this study “scientist” refers to all sorts of researchers, not only persons from the natural, medical or engineering sciences. The Swedish word “vetenskap” has a broader connotation than the English word “science”, more similar to the German word “Wissenschaft”. Scientific experts, be it geneticists or ethicists, have played a pivotal role in public attempts to assess the impacts of gene technology in society. The role of scientific experts is often multidimensional. Firstly, they are the producers and proprietors of specialised knowledge, bodies of knowledge that often function as prerequisites for divergent technical and social applications with variable consequences and impacts. Secondly, they take part in the mediation and translation of that specialised knowledge to audiences not belonging to the core group of scientific or technological expertise. Thirdly, they are among those who identify or interpret possible dangers or benefits connected to certain applications.

No a priori judgement of whether certain actors, be it scientists, priests, journalists, politicians, environmentalists, etc., are legitimate or

illegitimate interpreters of gene technology’s societal dimensions will be made. Instead, the fact that actors disagree on this, provides an interesting “opening” to the gene technology issue, as it exposes explicit and implicit norms about the proper relation between researchers and other actors, their knowledge claims and their position in society. To put it in concrete terms; my job is not to say that molecular biologists, as opposed to, say, biochemists, should have the final say on a specific matter, or that theologians are not as “scientific” as geneticists and therefore should be excluded from technical decision-making. Nor do I set the task for myself to engage in a discussion about how the expert category should be defined; for example whether it should include “lay” expertise, experience-based expertise or just lay people, regardless of how their credentials are defined.\(^4\)

The answer to situations of uncertainty and controversy has been to call for more expertise and improved techniques for testing, measuring, assessing and managing controversial science and technology. Claims to new areas of expertise are often highly contested, since they challenge established structures of epistemic authority and the social and political privileges that follow from having a secure position in that structure.\(^5\)

What is judged concerns not only the content of knowledge claims, evidence and advice, but also the credibility, legitimacy and authority of the person taking on the role of expert. Experts are trusted as long as their expertise is trusted.\(^6\) What is being understood as an objective, rational, sound or meaningful interpretation of the order of things, is intrinsically dependent on the position and authority of the person or group marshalling that interpretation. To put it another way, what people know is relevant for how people define themselves and others, and how people define themselves and others has a bearing on the legitimacy of what they know. Constructing boundaries around gene technology is a way


of constructing boundaries around who has legitimacy to talk about it.

Even though the exposure of disagreement among scientific experts has been commonplace in public domains, especially since the early 1970s, many Western governments still rely heavily on experts as a resource in policy-making. One such example is the Swedish governmental commissions, where scientific experts have a role to play for how problems are defined, solutions sought after and consensus, however temporarily, is achieved. Inseparable from the question of how to define gene technology, is therefore the question of how science and politics relate to one another, in these contexts.

Objective

The objective of this study is to discern and analyse some continuities and changes in the Swedish political conception of gene technology, over the course of two decades, about 1980–2000. This is done by thematically following the ideas of “risks” and “ethics” as they are represented in the inner workings and reception of three governmental commissions. The Gene-Ethics Commission (1981–1984), the Gene Technology Commission (1990–1992) and the Biotechnology Commission (1997–2000) form the empirical focal points of this analysis. The first two provided preparatory policy proposals that preceded the implementation of the Swedish gene technology laws of 1991 and 1994. The last one aimed at presenting a comprehensive Swedish biotechnology policy for the new millennium. Analysing how ethics and risks have been understood in relation to gene technology in these contexts is about trying to answer a set of related questions: What risks/ethical issues are identified, deemed invalid/relevant, by whom and on what basis? How and why should they be dealt with?

In order to better appreciate the Swedish political history of gene technology, it is important to pay attention to the specific contexts in which it has taken form. Consequently, one subsequent aim is to take into account the role of governmental commissions as arenas where

---


science and politics intersect in Swedish political life, and to illuminate if and how this type of organisation impinges on the understanding of the gene technology issue.

A national gene technology policy is, evidently, clearly manifested in a country’s legislation. As such, laws become realities which different actors and institutions need to relate to. The process leading up to the decisions taken in Parliament is often overlooked, or quickly forgotten. When the preparatory stages are analysed the discussions often halts at the point of publication of finalised commission reports. An additional aim has therefore been to, when possible, open up the “black box” of governmental commissions by studying archived documents of the discussions and considerations taking place within them.

I have chosen to study three governmental commissions that have looked into the limits, dangers, possibilities and future applications of gene technology, taking official and public parliamentary and governmental documents as my main source material. I have intended to explore certain aspects of this process by also relating it to contingent scientific and political changes over the past twenty years. Each commission appointment has also taken place against a backdrop of more or less intense media debates. Finally, on a much more general level, this study aims at providing additional insights into the mutual shaping of expert knowledge, policy-making and public media debate.

Understanding Governmental Commissions and Gene Technology

A typical feature of Swedish central administration is the organisational distinction between large independent agencies and relatively small ministries. Many important steps in the policy-making process are carried out by these agencies, especially in the preparative and executive stages. For policy issues that are highly influential a standard procedure is to appoint a commission of inquiry, the larger ones made up of politicians, experts, public officials, advocacy groups or other stakeholders. These commissions have the same autonomy as other central agencies, which is reflected in the fact that all correspondence between the responsible ministry and the commission is made public. The kind of topics these commissions work with are not by any means peripheral to the political

agenda, sometimes they have rather profound effects on important sectors of Swedish society for longer periods of time. The use of commissions means that an important part of the government’s policy-making process is carried out by organisations that are connected to, but formally lie outside, the government’s direct area of influence.\(^\text{10}\)

The historical role of governmental commissions in Swedish political culture has been the subject of several studies in political science concerned with democratisation processes, the emergence of parliamentarism and the type of political culture referred to as the politics of compromise or consensus.\(^\text{11}\) The use of commissions does not make Sweden unique, but it seems to be broadly accepted that the age and comprehensiveness of this practice presents a very special case.\(^\text{12}\)

The Swedish political system has many fundamental similarities with other Western democracies. But when the uniqueness of the Swedish case is in focus, it is common to refer to the long-standing dominance of the Social Democratic party, the dualistic organisational character of the central administration, the strength of different interest groups and the prevalent use of governmental commissions.\(^\text{13}\) Governmental commissions are often seen as representing, on a practical level, ideas about a “politics of compromise”.\(^\text{14}\) But they also reflect another important feature of Swedish political culture, its reliance on experts. A general belief in and respect for expert knowledge as something that should influence policy-making, underpins the influence of experts in commissions.\(^\text{15}\) In his study of the role of commissions from 1955–1989, political scientist Jan Johansson identifies three key functions pertaining to the use of commissions. Firstly, commissions are appointed in order to produce, collect and analyse knowledge so that policy proposals can be based on the best

---

\(^{10}\) Something equivalent to the Swedish practice can be found in Finland. Jan Johansson and Voitto Helander, *Det statliga kommittéväsendet: En jämförelse mellan Sverige och Finland* (Åbo, 1998).


\(^{12}\) The dualistic and corporate elements of state administration is discussed in Rune Premfors et al., *Demokrati och byråkrati* (Lund, 2003), 49.


knowledge there is at the time. Expertise from a variety of different areas and institutions are gathered together to provide that base. Commissions therefore function as both knowledge producers and knowledge users. Secondly, commissions also function as conflict-solving and consensus-building arenas where experts, politicians and representatives of different interest groups can meet. The openness to non-parliamentary actors and the striving to create broad majorities within commissions, and thereby preparing policy-proposals that can be expected to be accepted by a majority in Parliament, therefore plays a crucial part for generating political legitimacy.16 Last but not least, commissions can also function as a governance tool. By appointing commissions, deciding who is going to take part in it, framing its scope of inquiry and focus, having power to dissolve or merge commissions, the current government can influence with what resources and how the commission will carry out its work.

In Jan Johansson’s study and in an evaluation carried out by the ESO, the Expert Group on Public Finance, in 1998, this rosy picture of a compromise-seeking and expert-friendly institution, is somewhat tainted.17 Jan Johansson concludes his study by stating that the role of the commission system in Sweden has changed character in many different ways from 1955 to 1989. The function of commissions as conflict managing and consensus building arenas has weakened. They have also turned more into knowledge-users than knowledge-producers. Last but not least, the possibilities for government to direct and exercise a higher degree of control over them, has increased.18 In the beginning of the 1980s, the number of commissions was about 400. As a means to make them more efficient, a reform was implemented in the early 1980s in order to decrease the number of commissions appointed and shorten the time they had at their disposal. The reform had its desired effect, and the average time spent decreased to one year, instead of four.19 The number of commissions also decreased radically during the 1980s, so that

---

16 For a discussion on role the of non-parliamentary actors and different interest groups in the Swedish political system, see Bo Rothstein, *Den korporativa staten: Intresseorganisationer och statsförvaltning i svensk politik* (Stockholm, 1992).
it by 1990 only amounted to 200 per year. The 1990s has witnessed an increase again, so that by the year 1997 around 300 commissions were up and running. Other broad tendencies are discernable. For one, the number of single investigator commissions has expanded at the expense of “parliamentary” commissions, that is commissions including different members of Parliament. Also, partly as a result of this, the participation of non-parliamentary actors and experts has declined. This has prompted some analysts to reject the “politics of compromise” as nothing but a myth.

The commissions studied in this thesis, the Gene-Ethics Commission of 1981, the Gene Technology Commission of 1990, and the Biotechnology Commission of 1997, are not good examples of the general trends described above. They were all set up as broad parliamentary commissions, securing the participation of political members with different party belongings. The terms of reference formulated for each commission were comparatively open and non-exclusionary, making it partly up to the commission members and experts to provide a more definitive framing. It took the commissions two to three years to accomplish what had been stated in the terms of reference, and they consulted a large number of experts (working within or outside the commissions). The Gene-Ethics Commission included union representatives, but the other two did not, thereby making them a more exclusive reserve for politicians and experts. The Gene-Ethics Commission sorted under the Ministry of Health and Welfare, the Gene Technology Commission under the Ministry of Justice and the Biotechnology Commission under the Ministry of Education and Science.

A commission is appointed by the government, but enjoys a high degree of autonomy. One can say it has the same status as other agencies and authorities within central state administration, only that it is a temporary one. Initiatives to appoint a commission can come from Parliament, the government, separate members of Parliament, or being joint statements from political parties. Its activity falls under a certain Commission regulation and is guided by the prescriptions in the Commission handbook. Nevertheless, the government can initially

---

21 Ibid., 148-150.
22 Nyman, Kommittépolitik och parlamentarism, 25.
23 Ds 2001:1, Kommitéhandboken (Stockholm, 2000).
Gene technology at stake
direct commissions to some extent by formulating more or less detailed
terms of reference, which the commission has to attend to and follow.
These guidelines determine how a commission examines a particular
issue. Apart from formulating the questions that will be investigated, the
terms of reference also set financial and time limits, make it clear how
the commission is supposed to present its results, what institutions and
actors it must consult, etc. It is also possible for the government to issue
complementary guidelines once the commission has begun to work. This
usually is the case if something unforeseen happens, which the commission
needs to address in order to carry out its mission. There are two major
forms of commissions; parliamentary commissions, with representatives
from political parties in Parliament, and single investigator commissions.
The distinction is not clear-cut, though, since parliamentary commissions
do not necessarily involve all parties, and single investigator commissions
can make use of intensive contacts with experts and other actors. There
are also multiple terms for referring to commissions – committee, inquiry,
council, investigation and delegation.24

The government decides what form the commission is going to
take, but it is the Minister for the responsible governmental ministry
that appoints the chairperson (or single investigator) and the different
commission members. The chairman leads the work and it is he/she
who together with the members takes decisions and is responsible for
the findings and conclusions. A lot of the day-to-day work is carried out
by the secretariat, consisting of secretaries or administrative personnel.
In order to strengthen the commissions’ competence and knowledge
base, people with specialist knowledge are tied to its work. These are
called “sakkunniga” and “experts” and they are predominantly recruited
among civil servants and academic researchers. The experts are consulted
on specific topics, whereas the “sakkunniga” continuously follow the
commission work. Neither “sakkunniga” nor experts are allowed to take
part of the actual decision-making process (they have no voting rights),
but they can add a so-called special statement to the final report where they
declare difference of opinion.25 Regular commission members can add a
“reservation” in the end, declaring on what grounds their views are not
in line with the majority of the commission. The existence and number

24 I will use the term “commissions” so they will not be conflated with parliamentary
committees, that is ”utskotten” of the Riksdag, the Swedish Parliament.
25 The Swedish term is ”särskilt yttrande”.

18
of reservations and special statements is to some degree an indicator of the prevalence of internal conflicts and to what extent consensus could be achieved.

On completion of their work, the commissions publish their findings in a final report, sometimes preceded by an interim report. These reports are published in the Swedish Government Official Report Series, (SOU). A commission proposal is first circulated for comment before it is drafted as a government bill. This gives for example government agencies and different stakeholders an opportunity to express their views on the matter. This process is in Swedish called “remissbehandling” and functions as a type of quality control, as well as a way of checking if the proposals are likely to gain general support. Before a government bill is drafted, the proposal will be submitted to a parliamentary committee, “riksdagsutskott”. The committee will draw up a report containing a proposal as to what decision the Chamber should take on a matter. The report serves as a basis for debate and decision in the Chamber. Parliamentary committees have different areas of responsibility and their members reflect the political composition of the Riksdag as a whole. This is why the Riksdag is most likely to approve the committees’ proposals.

The commissions studied in this thesis have been appointed to address issues related to recombinant DNA technology, gene technology and biotechnology respectively. This study revolves around recombinant DNA technology specifically, and more generally on gene technology and biotechnology. This means that I have focused primarily on the risks and ethics of using gene technology to modify DNA – that is, what for each commission has been the most important issue to address. Gene technology is a term that sometimes is used as synonymous with recombinant DNA technology, but here it will be used as a family of techniques that includes recombinant DNA technology among other techniques.

Recombinant DNA technology (what in Swedish is called “hybrid-DNA-teknik”) is a technique for rearranging genes. It was first used as a technique for modifying genes in bacteria, but could later be used for other organisms. The product is recombinant DNA, or in the case of organisms, recombinant or transgenic organisms. Gene technology, on the other hand, includes a whole range of techniques for sequencing and analysing genes, for copying, multiplying and artificially synthesising DNA or otherwise directly make direct changes in the DNA.26

26 I have chosen the definition suggested in the Swedish National Encyclopedia.
The difficulties of defining “biotechnology” has been thoroughly documented by historians of science and technology. The birth of biotechnology as we know it today is often believed to be marked by the invention of recombinant DNA techniques in the early 1970s, or it has a history that goes back to brewing techniques of ancient Babylonians. Historian Robert Bud comments on this last view: “This […] model not only grants biotechnology a time scale hundreds of times longer […]; it also imputes to it a fundamentally different nature. Biotechnology is seen as a longstanding technology continually being improved through the use of new scientific resources.”

Generally, a distinction between a classic biotechnology and a new biotechnology has been invoked. A common way of demarcation is to put the world “new” in front of an established term. As a consequence, we come across talk about “the new genetics” and “the new biology.”

A brief summary of terms commonly used to capture developments in the last 50 years are: the new biology, life science, molecular science, the new genetics, molecular genetics, bioscience and biomolecular science. In order to demarcate the technological side of this knowledge revolution, terms like applied, experimental or engineering get deployed, for example in words like bio- or genetic engineering, experimental biology, applied microbiology, molecular biotechnology or just applied biology.

The term gene technology shares the same ambiguity as biotechnology. The term itself lies at the intersection of several frequently used and commonly understood conceptual dichotomies. Gene technology is science and technology, biology and engineering, basic science and applied science, publicly accessible knowledge and private property, high-tech and traditional craft. How gene technology is understood and assessed, depends heavily on these attempts of demarcation. In order to write a thesis on this topic, I have felt forced to use a terminology that is continually changing. As a matter of fact, that this is the case is of certain interest for this study. It has been a problem for each of the studied commissions to agree on a clear definition of gene technology or biotechnology. Their usage of technical terminology has not been fully consistent, which inevitably has lead to some inconsistencies on my part.

---

28 The term “new genetics” is used for example in Sociological Perspectives on the New Genetics, eds. Peter Conrad and Jonathan Gabe (Oxford & Malden, Mass., 1999).
as well, when accounting for the commission discussions and findings. As for the Biotechnology Commission, I have used the term biotechnology whenever the commission has chosen to.

**Prior Knowledge and Engagement**

To some extent ignorance can be useful. It allows for openness and a certain naïveté that can function as a resource in areas plagued by controversy. In the beginning I felt vulnerable to questions about my needing to be a molecular biologist or geneticist in order to competently address issues related to the political history of gene technology regulation. As I went along, this turned out to be of minor importance. The level of technical detail in the material I have studied, has never been of insurmountable character. Instead, other questions have cropped up that proved much trickier to handle. For example, can I engage in this subject without being drawn into debates about the pros and cons of gene technology? Several scholars have highlighted the difficulty of analysing scientific controversies without being drawn into the debates themselves. It has been proposed that this cannot be done. In an often cited article Pam Scott, Evelleen Richards and Brian Martin say that:

> This methodological demand for a separation between researcher and researched may appear to work for historical studies and for disputes contained within the scientific community. In such cases the research subjects cannot, or may not want to, deploy the social research in their struggles: historical subjects, being dead, cannot bite back, and social scientists have little perceived status in technical disputes between scientific experts.  

This is not the case, concludes the authors, with policy relevant science or science with strong links to the broader community. Since gene technology was controversial before it even existed, this poses a serious problem. I have had to stop and ask myself again and again whether I favoured certain actors, if and why I sympathised with certain ideas put forward, and whether I was on a private ideological crusade of some kind.

My interest in the political history of gene technology came as I trained

---

as a science reporter in 1997–1998. Gene technology attracted a lot of media attention at the same time as I was grappling with the question of what it meant to be a science journalist, especially if ideas about popular science and critical science reporting could be combined in one profession. Could there be something in between being a “help aid” for natural scientists in their efforts to popularise science and being a science reporter who equated being critical with being critical to science? The same dilemma kept on troubling me as I began my PhD studies, until it became clearer to me that having to ask this question, was the actual problem. A better understanding of science as a social and historical phenomenon is not about being for or against science. My mission has never been to devalue science, nor to overstate its value.

Earlier Research in the Field

Studies of gene technology within the humanities or social sciences in Sweden had an upswing in the 1990s. Within my own discipline, the history of science and ideas, most studies have focused on historical periods predating the advent of recombinant DNA technology in the 1970s. One such study is Anna Tünlid’s PhD thesis on the formation of Swedish genetics in the first half of the 20th century.30 Nevertheless, these studies contribute with a more complex view of what it means to talk of a “new” biology and how important it is to take into account the public mediation of biological knowledge for understanding the role of science in society.31 The history of the Swedish eugenic science and politics has been studied by historians such as Gunnar Broberg, Mattias Tydén and Maja Runcis.32

Public understandings of and responses to gene technology have been analysed within different academic framings and traditions, by scholars such as Susanna Öhman, Katarina Westerlund, Nils Uddenberg, Carl Reinhold Bräkenhielm, Susanne Lundin, Lynn Åkesson, Lennart Sjöberg

30 Anna Tünlid, Arförligshetsforskningens gränser: Individer och institutioner i framväxten av svensk genetik (Lund, 2004).
32 Gunnar Broberg and Mattias Tydén, Oönskade i folkhemmet: Rådyggen och sterilisering i Sverige (Stockholm, 2005); Mattias Tydén, Från politik till praktik: De svenska steriliseringslagarna 1935–1975 (Stockholm, 2002); Maija Runcis, Steriliseringsar i folkhemmet (Stockholm, 1998).
and Victoria Wibeck. There are also different ways of studying media coverage on gene technology. Anna Olofsson’s PhD thesis focuses on the reporting of the newspaper *Dagens Nyheter* on gene technology. Malin Ideland has performed a more qualitatively based study of, among other things, the role of metaphors used in media reporting on gene technology and genetics, and Cecilia Åsberg has conducted a study highlighting the role of visual representations. Ann-Sofie Bakshi’s thesis has treated gene technology representations in public domains, with a special focus on prenatal diagnosis.

As for studying contemporary political regulation of gene technology, Thomas Achen’s comparative analysis of gene technology regulation in Sweden, Norway and Denmark is one of the most elaborate ones. Achen has also continued his studies of Swedish biopolitics with his analysis of the formation and establishment of the Swedish Gene Technology Advisory Board. Within the field of moral philosophy, a few studies have touched upon the way that ethics and politics cross paths. One example is ethicist Göran Bexell’s study of Swedish “moral politics”, as it is reflected in policies for abortion, censorship, artificial insemination, etc. Another ethicist, Birgitta Forsman, has contributed with more detailed studies on the role of ethics in politics, one of them (together with Stellan Welin)

---


focusing on the Gene Technology Commission of 1992.\textsuperscript{40} As for the fields of moral philosophy, theology and religious studies more generally, a great number of studies touching on different areas of biomedicine, gene technology and biotechnology are available and deserve to be mentioned, but they cannot be fully accounted for here.\textsuperscript{41} Uppsala university has been hosting the national ELSA programme (Ethical, Legal and Social Aspects) on gene technology and genome research, financed by the Swedish Foundation for Strategic Research. At the Centre for Bioethics, Uppsala university and Karolinska Institutet, interdisciplinary work in bioethics is conducted. There are also a number of completed studies dealing with gene technology and different legal aspects, such as intellectual property law, environmental law and medical law.\textsuperscript{42}

Although this thesis assumes a different theoretical understanding, asks other questions and has a (partly) different empirical grounding than most of the above mentioned studies, it has benefited a lot from taking part of previous work on gene technology in a Swedish context. Most of the international studies that this thesis draws on can be found as references in those sections that deal with theoretical framework and outlooks on the international context. These studies often belong to the hard-to-define field of Science and Technology Studies (STS). Of great importance and help for my understanding of these issues have been the work of Sheila Jasanoff, especially her recent work in such books as \textit{Designs on Nature}.\textsuperscript{43}


\textsuperscript{41} See for example the work of Christian Munthe, Torbjörn Tännsjö, Anders Nordgren, Ulf Görman, Göran Hermerén, Thomas Anderberg, Carl-Gustaf Andréén, Stellan Welin, Anders Persson and Anders Jeffner.


Thinking and talking about science and politics, or even more generally, science and society, as more or less distinguishable and separate entities is commonplace in scholarly literature as well as in everyday speech. Naturally, our understanding of these phenomena is indicative of how we conceptualise their relation. Indeed, much of what has been said in the past about the proper role of science in society revolves around the question if or how science should impinge on, or be influenced by, other areas of thought and practice — politics, religion, art, economy, to name a few.¹ A lot of effort is often spent on attempts to demarcate science as a separate sphere in society, driven by its own specific values and its own specific standards of knowledge validation. However, any definition of science calls for a definition of what science is not, that is, by demarking its borders we simultaneously define what is outside that border — politics, culture, religion etc., According to historian of science Stephen Shapin, the idea that science and society should be clearly separated is part of what he calls the “canonical account” of science’s role in society, and how it has developed.² From being a distributed institution with vague boundaries, reflecting a dependence on wider societal factors and the public, science has earned autonomy and authority through a process of professionalisation and specialisation. According to the canonical account, this transformation can account for the scientific

¹ *Theories of Science in Society*, eds. Thomas F. Gieryn and Susan E. Cozzens (Bloomington, 1990).

ability to generate “progress” of different kinds. A paramount and partly paradoxical feature of science has therefore been clearly spelled-out: being both the site of independent, value-free, objective knowledge production and at the same time having immense influence on societal matters. The utility, value and relevance of science for society, in this model, stems from its independence from that exactly same society. The less “society” there is in “science”, the better the science, and the better the science, the more positively and effectively it can influence society. By virtue of its being neutral, it can guide us when it comes to value issues. Attempts to secure this independence have been manifold and one way of doing it is by reiterating the standard story itself.3

In sociologist Thomas Gieryn’s words, scientists take part in public “credibility contests” in order to gain or defend epistemic authority over a certain issue, and this involvement takes the form of a rhetorical style he calls “boundary-work”.4 This means that scientists, or others, try to depict the whole scientific enterprise, or parts thereof, in a way that is favourable to their own interests. Demarcating science proper from society is often used as a classic example of how boundary-work functions in practice. Boundary-work thus involves explaining and portraying selected aspects of science in a good light by contrasting them to non-scientific activities. Boundary-work is particularly prevalent in situations when something is believed to be under threat (such as shortage of funds, jeopardized positions, undermined credibility). What is important to note is that boundary-work is carried out in public and therefore reflects a dependence on society, demonstrating a willingness to be accepted by specific targeted audiences. Boundary-work in this “downstream” meaning, positions science under the influence of public scrutiny. The strategic manner in which this happens, and the obvious link between professional interests and certain ways of representing science, stands out.5

The canonical account has a general structure which carries with it certain implications for an understanding of the underlying rationale and legitimacy of using expert advice in governmental commissions, that is,

---

4 Gieryn, Cultural Boundaries of Science.
5 I think one needs to be careful not to overplay the strategies so as to mean “manipulation”. Rather, it simply states that what people believe to be right in a peculiar way seems to coincide with what serves their own interests, for scientist as for any other social group. This can be controversial only if we accept that scientists have no professional interests.
for coupling science and politics. Two aspects are particularly important. Firstly, it is a version of a historical development that is (allegedly) descriptive as well as prescriptive. If the success of science (its link to progress) depends on a science/society split, then that division must be policed if we want progress. Science policy debates are therefore often plagued with disputes about the autonomy of science, or the lack thereof. Secondly, it asserts that legitimate political authority can be granted to scientific experts by virtue of their being truth-producers, and that this does not pose a threat to democratic values of citizen rule, if these truths are accepted and trusted. Instead expertise is a resource for realising democratically defined political goals.

It is important to note that this underlying prescriptive model (that society should not influence science but that science should influence society) can explain why many of the interactions between science and society have been conceptualised in a one-way, linear, fashion. All in all, not much is “allowed” to flow from society into science, besides funds and public trust, which is acceptable as long as scientists exert strong influence over the setting of research priorities. Science and Technology Studies, STS, have challenged both the standard story as such and the implications it has for understanding the science/politics distinction.

**Linear Models and the STS Critique**

In political thought, there has been a longstanding tension between what has been coined “decisionist” and “technocratic” models of the appropriate relation between science and politics. The decisionist model presupposes a clear distinction between facts and values where science stands for the former and politics for the latter. It reserves an autonomous and legitimate sphere for political issues, which cannot be reduced to facts. The technocratic model also assumes a clear distinction between

---

7 Linear models can be found not only for science-politics interactions, but for science communication and science innovation understandings as well.
9 This is also called the “demarcation model”, see article by Angela Liberatore and Silvio Funtowicz, “Democratising’ expertise, ‘expertising’ democracy: What does this mean, and why bother?”, *Science and Public Policy*, vol. 30, no. 3 (2003), 148.
facts and values. However, this model expands the sphere of science at the expense of value-based politics. Indeed, for many advocates of a technocratic model, there will be no need for ideology as long as we can rely on scientific descriptions of reality as it is.\textsuperscript{10} Both models presuppose a linear sequencing where politics identifies problems (agenda-setting), science provides fact-based knowledge about these problems, after which politics can engage in policy-making.

These models are still operating as an underlying rationale for coupling science and politics, and for involving experts in policy-making.\textsuperscript{11} Both models have been vulnerable to critique. The democratic model has to account for its knowledge or rationality deficit, and can fall prey to accusations of politicisation or populism. Can “irrational” (meaning value-based) decisions be justified? Do not facts about a situation reduce the range of political options to a singular best one? The technocratic model suffers from a democracy deficit – the public is excluded from political deliberation and representative power is handed over from politicians to experts. This can create pockets of or full-blown technocracy which makes political power a sham and creates accountability and transparency problems.

Insights made within the field of STS have questioned the very basis for separating science and politics in any straight-forward and uncomplicated way. According to Peter Weingart, both the democratic and the technocratic model suffer from three major misconceptions: They were modelled on the idea that politics identifies political problems to be solved, that experts can provide advice based on scientific knowledge alone, and that policy and decision-making follows as a purely political act. They also assume that scientific knowledge is void of value judgements, and they presuppose disinterestedness and political neutrality as a distinguishing feature of scientific expertise.\textsuperscript{12} An alternative view emerges from these studies. Problem formulation and agenda-setting is not seen as a “pure” political operation. Conversely, many problems that politics deals with are products of perception through science. Politics is already permeated by science as is science by politics. One basic insight is

\textsuperscript{10} An idea put forward in the “end of ideology” debate, see eg, Daniel Bell, \textit{The End of Ideology: On the Exhaustion of Political Ideas in the Fifties} (New York, 1965).
that many choices of what scientific knowledge to produce take place on the level of funding. Hence, the overall balance of knowledge is shaped by political expectations about future outcomes.\(^3\)

If experts do not deliver one-dimensional, neutral or value free statements, then a multitude of political interpretations and solutions are possible. It is not given from the very start what certain scientific claims will mean in terms of policy-making, as they are translated into political criteria of relevance. As Donald MacKenzie puts it, citing Barry Barnes, “\textit{No body of knowledge comes with comprehensive ‘instruction books attached’}”.\(^4\) But if the implications, applications or consequences for society of certain scientific knowledge or technologies do not reside in the knowledge or technology per se, it does not grant scientists a special role in politics. Aant Elzinga, while referring to the politics of science (as opposed to science policy), says that:

At this level, the politics of science becomes a rhetorical struggle over the ways that science and technology are interpreted, the worldviews and associated metaphors that give rise to alternative visions for the organization of knowledge. The political domain provides a space for a broader cultural assessment of scientific and technological choices as well as for a more specific process of accounting the costs and benefits to various groups in society.\(^5\)

Hence, the implications of science and technology involve inherent and unavoidable political questions. What sort of society do we want? How do we wish to live? What is environmentally, socially, culturally, economically etc., desirable?

In real life policy-making, especially for regulatory policies of newly developed technologies, political decisions are taken before scientific consensus has been established. Recruiting experts from the research frontier does not solve this problem of uncertain claims and contested values, rather it aggravates it. It is therefore not uncommon that experts


can “disagree along the lines of adversaries” in controversies.\textsuperscript{16} The possibilities of creating a haven of sound, rational handling of politically contested issues, mediated through neutral experts – has not withstood empirical critical scrutiny. According to Susan E. Cozzens:

\begin{quote}

The old understanding assumed that good science produced truth and that truth-producers deserved a special role in politics. The new understanding treats scientific knowledge as a negotiated product of human inquiry, formed not only via interaction among scientists but also by research patrons and regulatory adversaries.\textsuperscript{17}
\end{quote}

All in all, the STS critique suggests that a blurring of the science/politics boundary is in fact common and that, empirically, it is much more fuzzy than the linear models suggests. However, as long as science is kept separate from politics on a rhetorical level, both experts and politicians can take advantage of and maintain the prestige science purportedly has acquired for its objectivity and neutrality. As long as science is understood as neutral and objective, and politics as value-laden and ideological, two distinct processes can potentially threaten or undermine the balance between the two.

\textit{Politicisation and Scientification}

The blurring of the science/politics boundary is potentially threatening, and different kinds of threats derive from processes perceived as politicisation and scientification. Politicisation and scientification are not concepts with shared common meanings, not in public debate, nor in STS literature. Politicisation is mostly used in a pejorative sense, as inappropriate usage of scientific knowledge to support diverse ideological claims, in the process distorting or violating that same knowledge. But it can also refer to the inappropriate direction and influence over the way knowledge is sought after and validated. Two episodes from the history of genetics can serve as examples. The eugenic movement in the early 20\textsuperscript{th} century attracted sympathizers from the whole left-right political spectrum, relying on what was then a new scientific discipline and the belief that it would be able to help solve social problems. The same science could uphold different social policies, thereby pointing

\textsuperscript{16} Weingart, “Scientific Expertise and Political Accountability”, 155.
\textsuperscript{17} Cozzens and Woodhouse, “Science, Government”, 534.
to the shifting ideological usages of science. Another classic example of politicisation is the case of “Lysenkoism”. The aims and goals of the leadership of the Soviet Communist Party were allowed to influence how genetic science was conducted, or more precisely, how it was designed to confirm the self-understanding of Soviet society. What these examples have in common is that they represent politicisation as a process by which knowledge becomes something “ideological”. That is, politicisation is a process of ideologisation. Many science studies scholars find it unhelpful to use the term like this since it often presupposes that science was not in any way ideological to begin with. David H. Guston for example, says that concerns about whether science has been politicised distract us from questions about who benefits and loses from which form of politicisation.

Politicisation can also be taken to mean that areas previously not attracting political interest, or which are completely new, turn up on the political agenda. Thus, politicisation can also be used as another word for democratisation. As such, politicisation is the process by which citizens gain more (direct or indirect) political power over science-related issues. In this sense, politicisation can involve a process by which science is made more accountable and transparent.

Scientification, on the other hand, has been understood as the process by which areas of relevance for policymaking are increasingly being

18 Peter J. Bowler, Biology and Social Thought: 1850–1914 (Berkeley, 1993); Anne Kerr and Tom Shakespeare, Genetic Politics: From Eugenics to Genome (Cheltenham, 2002); Diane B. Paul, Controlling Human Heredity, 1865 to the Present (Atlantic Highlands, 1995).
19 Nils-Roll Hansen, Ønsketenking som vitenskap: Lysenko innmarsj i sovjetisk biologi 1927–37 (Oslo, 1985); Bengt Olle Bengtsson, Genetik och Politik: Berättelser om en vetenskap mitt i samhället (Stockholm, 1999).
20 Of course, many studies have pointed to the fact that eugenic science was already permeated by ideology, making class prejudices masquerading as facts.
23 We can come across yet another way of understanding politicisation. When ideas, originating from radical or activist movements, are taken up by political establishments, they can turn into objects of political consensus. The radical character disappears, and politicisation connotes rather the opposite of ideologisation. However, this is a rather unusual way of using the term.
subjected to, or generated from, scientific studies. This has to do with the increasingly important role of science and technology as motors or forces of societal change. Science is changing society and also our knowledge about that society. In line with this, an ongoing “scientification” of politics can be taken to mean both the increasing prevalence of science and technology related issues for policy-making, as well as raised levels of scientific literacy required to competently carry out political tasks. Thus, scientification often refers to a strengthening of the role of scientific or technical experts in politics, that is, a process of technocratisation. But if experts are believed to deliver neutral, objective, and rational accounts of reality, then scientification also stands for a rationalisation of politics.

In sum, politicisation inhabits a tension between ideologisation and democratisation, and scientification inhabits a tension between rationalisation and technocratisation. These distinctions are often overlooked, or remain unacknowledged. In this study, I believe that paying attention to these differences are crucial for a better understanding of the internal negotiations, as well as public reception of, governmental commissions.

One must be aware of the fact that, throughout its history, science has had a very troubled relationship with politics in its ideological meaning, but has an equally celebrated relationship with politics, when connoting democracy. If politics is to be influenced by science, it is by making it more rational, not technocratic. If politics is to influence science it is by making it compatible with democratic ideals, not ideology. But can politics be science-directed at the same time as it is democratic? Can science be politics-directed at the same time as it is not ideological? The role of governmental commissions in Sweden are, in themselves, expressions of the belief that the answer to these questions is “yes”. The legitimacy of the whole preparatory stage of the policymaking process manifested in governmental commissions, depends on whether these questions

25 This theme has been discussed in, for example, Lars Ingelstam, “Expertberoende beslutsfattande och demokratisk delaktighet”, in Lekmännistyre i experternas tid: Dokumentation från ett seminarium, SOU 1998:102 (Stockholm, 1998).
have been answered satisfactorily or not. As will be suggested below, if governmental commissions are understood as “boundary organisations”, their success will be a measure of the stability of the science/politics boundary.

**Boundary Organisations and Boundary Objects**

One way of reflecting on how the meaning of gene technology emerges within governmental commissions, is to see them as boundary organisations. Both boundary organisations and boundary objects are concepts based on, but expanding, sociologist Thomas Gieryn’s often cited analysis on boundary-work. Instead of focusing on how boundaries are upheld, these concepts also help us to understand how cooperation over boundaries is possible.

According to political scientist David H. Guston, boundary organisations are placed on the border of the different spaces of politics and science and they involve the participation of actors from both sides of the boundary. Boundary organisations are accountable to (in this case) both science and politics, and the success it can have will depend on how well it satisfies the interests of both parties.

The success of the organization in performing these tasks can then be taken as the stability of the boundary, while in practice the boundary continues to be negotiated at the lowest level and the greatest nuance within the confines of the organization.

They also provide the opportunity and sometimes the incentives for the creation and deployment of boundary objects. Boundary organisations “provide both an object of social action and stable but flexible sets of rules for how to go about engaging with that object”. Several studies have been conducted within the STS field that try to make sense of science-politics

27 See beginning of this chapter.
29 David Guston, *Between Politics and Science: Assuring the Integrity and Productivity of Research* (New York, 2000), 146.
organisations as boundary organisations. If governmental commissions are seen as boundary organisations, they are accountable to both science and politics and need to negotiate how to draw the line between political and scientific aspects of gene technology.

The concept of boundary object was initially introduced in an article about the building of the Museum of Vertebrate Zoology at the University of California, by Susan Star and James Griesemer. They argued that boundary objects facilitate the cooperation and coordination between actors of different social worlds, helping to “get the work done” in a situation of divergent interests and commitments. Although the goals, viewpoints and concerns of all participants are reflected in the multiple meanings ascribed to these boundary objects, this flexibility occurs within a common frame that provides a shared understanding of what is at stake. Boundary objects both narrow the range of possible interpretations, hereby making it possible to accomplish agreements and compromises, but also allow for a certain interpretative ambiguity. In the words of Star and Griesemer, “Boundary objects are both plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use, and become strongly structured in individual-site use.”

The strength of boundary objects is, according to Joan H. Fujimura, that “they keep in the foreground the heterogeneous concerns of the different worlds involved.” In this study, I will suggest that boundary object is a fruitful term for understanding the role of “ethics” in the political discussions on the societal role of gene technology.

To sum things up: If studying governmental commissions, we need
to be aware that ongoing negotiations take place within an institutional setting which already relies on experts, and whose legitimacy rests on the idea of neutral experts providing objective knowledge. But this is not the only important feature; commissions are also appointed to accommodate diverging interests, political or otherwise, and to give a broad, all-round view on things. The role of experts can therefore be problematic. As Jan Johansson has pointed out, if experts are involved to provide a solid knowledge base and to make judgements as to what actions are most efficient, reliable, secure etc., what role can the other non-experts really have? What room is there for political negotiations, for a “politics of compromise”, if commission members are more or less faced with a “best solution”?35 There seems to be a contradiction here that strikes at the very core of what commissions are about; political negotiations and expert involvement. For achieving legitimacy it is important that experts are believed to have a special standing, otherwise they can be accused of being political puppets – the threat of ideologisation of expert advice. But the other side of the problem is technocracy – if everything is left to experts to decide, what remains is a politics that has been reduced to executing pre-made decisions. The dependence on experts can therefore be seen as a problem of technocratisation. These implicit tensions between politics and science are built into the very arrangements that have been set in place to overcome them. The commissions also deliver reports that propose how science and politics should relate in the future, and these proposals can also be seen as balancing on the border of science and politics.

The Swedish commissions constitute an essential part of the political effort to prepare policy proposals and is therefore an important instrument for creating political legitimacy and overcoming conflicts. If a “politics by commissions” is considered typical of Swedish political culture, then studying governmental commissions might hold the key to a better understanding of the formational steps of the Swedish political history of gene technology. The commissions constitute in themselves curiously hybrid forums, where scientific and administrative experts meet and discuss with politicians and other actors on a face-to-face basis. It is an arena where negotiations of the boundary between politics and science is brought to the fore. We can expect to find an in-built tension between what I earlier referred to as a process of politicisation and scientification.

Each commission appointment has been motivated by the rapid

development of gene technology, strengthening the sense of urgency and the need for societal control. Each commission appointment has also been motivated against a backdrop of intense media debate. There has been an awareness of the controversial character of gene technology and the different worldviews, values and interests underlying opposing standpoints. The commission work can therefore also be seen as an effort to gain public credibility by accommodating concerns and addressing value issues.

Finally, it can be interesting to take a step back and view the whole practice of appointing commissions as either a sign of politicisation or scientification. Political scientist Rune Premfors points to the possibility for governments to “disarm” politically charged questions by appointing commissions. Instead they will be treated as matters of (technical) facts, best handled by experts in commissions. We can interpret this as an act of scientification. However, it can be argued that this is a political act. It must be considered a forceful political strategy to handle an issue by “storing it away”, at least temporarily, thereby simultaneously postponing direct confrontation and “dealing with” it. Read this way, making something “apolitical” is a political act.

The Role of the Media

Governmental commissions do not work in a social or cultural vacuum. For example, controversies played out in the general media have been important for the political regulatory initiatives taken, such as appointing commissions. Studies of the relationship between science and the media have shifted in accordance with disciplinary priorities and analytical traditions; ranging from highlighting the efforts and motives behind scientists’ or scientific institutions’ desire to “go public”37, focusing on the mediating and shaping role of different media technologies and rationales38, to understanding the heterogeneous and complex role of various audiences39. As a result of these studies, the notions of science, the

36 Premfors et al., Demokrati och byråkrati, 155–156.
38 Bruce V. Lewenstein, “Science and the Media”, in Handbook of Science and Technology Studies, eds. Sheila Jasanoff et al.
39 Allan Irwin and Brian Wynne, Misunderstanding Science? The Public Reconstruction of
media and the public, have all undergone crucial developments and what was once believed to be a straightforward process of “popularisation” and “diffusion” of scientific findings to a passive public, has been replaced by a much more complex picture of science communication. For some time now, social scientists and humanists interested in the mutual shaping of science and the media have objected to the older linear model of science communication. For a long time, this model has served as a dominant view of popularisation, by some deemed to be prescriptive rather than presenting an accurate description of the practice of science communication.

Especially controversy studies have pointed to the fact that the media constitutes a major resource for advancing certain knowledge claims and for defending professional and political interests. Nevertheless, the linear diffusion model has undoubtedly informed and is still influencing, many official agencies and bodies working to improve or change science-society relations.

Since its inception, gene technology has been seen as an area in great need of public debate. But people have not agreed on who should participate in that discussion. Questions about the right way to interpret or understand gene technology, are therefore intermingled with questions about who has the necessary skills, knowledge, training or experience to legitimately engage in a discussion about it. If that discussion is carried out in the media, it involves questions about access to and influence over media representations of gene technology. This might explain why so much energy has been spent on policing the boundary between “correct” and “incorrect” media representations. Overall assumptions about the proper role of science in society, and politics, impinge on how science communication is conceptualised; why it is needed (or not), how one should go about it, what effects it is supposed to have, and what type of qualifications a science communicator needs to have. The insufficient capacity of the media to act as trustworthy educators has been announced.

---

GENE TECHNOLOGY AT STAKE

as often as it has been acknowledged as the primary channel for reaching out to a knowledge-deprived public. The political history of gene technology is therefore intermingled with the political history of science communication.

Controversy studies of scientific and technological disputes have highlighted a move from technical issues to moral ones from the 1980s and onwards, especially in the field of the life sciences. Accordingly, the emergence of bioethical advisory bodies throughout the science policy landscape has been seen as mirroring this tendency. In the wake of this moralisation, ambivalence toward the authority and legitimacy of the expert accounts of natural scientists has flourished. In Stephen Shapin’s words:

There is as much modern uneasiness about putting scientists in a position to make ethical decisions as there is about releasing them totally from such responsibilities. [...] Authority to speak on what is true is disengaged from authority to speak on what is good.

This has only strengthened the science and society paradox described earlier; how to claim value freedom and neutrality on behalf of scientific knowledge and political relevance at the same time? This question is at the core of our modern understanding of the political role of expertise. If science and technology have inherent moral aspects, how can we claim that they are value-free? But if it is not value-free, how can we trust it? Should we leave the direction and use of modern science and technology in the hands of scientists, or should other groups in society have a say about its direction, content and implementation? Is not scientific and technological innovation, after all, a political matter?

During the 1990s, there has been a general tendency towards a more involved political position vis-à-vis science. New models have arisen, calling for more inclusive practices of democratic participation in science related


issues, but also expressing demands for a higher degree of accountability, raising claims about the “social responsibility” of scientists. Concepts like civic science, civic epistemology, extended peer review, socially robust science, informal technology assessment, postacademic or post-normal science etc., are linked to these concerns (not all of them coined in the 1990s, though). Some of these ideas have, to some extent and in various forms, entered deliberations on science communication, partly redefined the role of Swedish universities and propelled the introduction of new institutional arrangements for coping with these tasks. The participatory turn in STS has entailed an approach to the subject from two different angels. One is to “democratise” expertise, by stressing the contingent, mutable and always contestable nature of expert knowledge. The other is to reclaim the value of “lay” knowledge. Brian Wynne’s work, for example, has done a lot to reconceptualise lay knowledge, not as imperfect science, but as valuable in its own right.

On Method: Themes, Sources and Limitations

I did not start out with a specific theoretical lens, rather it evolved as I became more acquainted with my empirical sources and the STS field in general. It was an early ambition to stay intellectually flexible to avoid the pitfall of overlooking aspects that did not fit into a certain theoretical reading. As time went by, the theoretical understanding helped me to select and define a more narrow focus of my study.

46 In 1997, a new formulation in the Higher Education Act directed the Swedish universities to cooperate or work together with external actors and institutions, instead of only disseminating information.
As I am conducting this study in a discipline with a strong hermeneutical tradition, I am not looking for the objective meaning of risk or ethics, or of gene technology generally, but the meaning ascribed to these categories by the people and institutions involved in the study. I conceive of gene technology as something that is not fixed and stable, but changes meaning depending on who is defining it. This does not mean that everything about gene technology is always up for redefinition or renegotiation, but it does mean that even when something is perceived of as self-evident or uncomplicated, it is a result of people subscribing to one way of seeing the world. As an outside analyst, I can have the ambition to display ideas that are expressed explicitly as well as implicitly or taken for granted. I have intended not to take the ideas of risks and ethics, or science and politics, at face value. Upon closer inspection, these categories are full of ambiguities and interpretative richness. Even though the focus is on different understandings of gene technology and how these understandings have changed, my own research will go beyond what these actors explicitly express.

The method used can be described as close textual readings of archived commission material, official governmental and parliamentary documentation, and to a certain extent newspaper reportings. My interpretations are by necessity coloured by the theoretical framing chosen. I have also had the ambition to place each case study in a broader context.

The Themes of Risks and Ethics

Gene technology has since its inception been framed as a risky technology. It has also, from early on been considered to bring to the fore, or in itself generate, ethical problems. In this thesis, analytically, these concepts are treated as fairly “empty”. It is what risks and ethics are taken to mean in the context of governmental commissions that is of interest. I have therefore not taken into account the abundance of literature on risks and the so-called risk society, or the existing literature on bioethics.

As stated earlier, analysing how ethics and risks have been understood in relation to gene technology involves trying to answer several questions: What risks/ethical issues are identified, deemed invalid/relevant, by whom and on what basis? How and why should they be dealt with?

Ideas of benefits and control are embedded in these discussions, or act
as prerequisites for them. Risks are always contrasted to opportunities and benefits. Separating risks from opportunities, means deciding what are “negative” and “positive” consequences, respectively. Identifying risks are also always done with the explicit aim of deciding if or how they should be controlled. By the same token, deciding what counts as an ethical issue also involves an understanding of what ethics is not. It is not completely self-evident what ethics is taken to mean in this science-politics context, and part of what is of interest for this study is to see what questions are framed as and named ethical ones. Generally speaking, ethics is peculiarly double-natured. Ethics is both what is under threat, or rather, certain values are believed to be undermined if certain applications of gene technology are accepted, and functions as a tool for safeguarding that these values are protected.

Even though risks and ethics are treated as separate issues, they overlap in many discussions. Firstly, it can be considered “unethical” to overlook, neglect or accept considerable risks. Secondly, risks can be separated into different categories, such as health and environmental risks, but also “ethical risks”. How the areas of ethics and risks overlap, or are kept apart, is therefore of interest. Finally, conceptions of risks and ethics are intermingled with the overall issue of defining gene technology in political and/or scientific terms, and in setting the science-politics boundary.

Source Selection and Limitations

At the outset, this study consisted of a broad investigation of the public debate on gene technology in Sweden, but gradually it was narrowed down to a study of three governmental commissions. I chose these three commissions on the basis that they were fairly similar in scope – they were all, at least initially, covering broad aspects of the gene technology field as opposed to more narrow investigations – and that they were evenly distributed in time. The fact that they were fairly similar in terms of the areas they covered made comparisons interesting and relevant. They have also had direct impact on political decision making.

The bulk of my empirical sources can be divided into three categories. The most important material has been taken from the National Archives in Stockholm, where governmental commission material is archived in certain collections. The other category is public official documentation of activities in Parliament and the government. The third category is
newspaper reporting on gene technology issues in connection to the commissions’ work.

The commission material consists of notes taken at commission meetings, memos, incoming and outgoing documents, preliminary drafts, documentation of conferences and hearings, and to a various extent other complementary documentation. For the Gene-Ethics Commission, 3 volumes have been archived, 7 for the Gene Technology Commission and 13 for the Biotechnology Commission. The number of referral bodies consulted to review the final reports have been in each case around, 100, 60, and 100. Notes taken vary in detail, due to how or if they have been edited and how close after the meeting they have been written. It is not always the same person who has taken notes. The same can be said about the level of detail exposed in notes and minutes. For the Gene-Ethics Commission, notes taken have not been saved, if they ever existed. In some cases, registered documents are missing.

Each commission has a political pre-history as well as a post-history when certain issues have been discussed in Parliament or have prompted separate members or political parties of Parliament to write and submit motions in order to alert the government about new gene technology issues. Most of these official documents are available in university libraries or, nowadays to a great extent, on the Internet. These official documents include motions (private members’ motions or party motions), bills, interpellations, written communications, records of debates in the Chamber, parliamentary committees’ reports, publications in the Ministry Publications Series or the Swedish Government Official Reports, SOU. In the bibliography they are listed under “Official Public Records”. When a commission report is completed, it is sent out for a broad societal review so that different agencies, institutions, and organisations are given an opportunity to express their views on the matter. Documents related to this process are filed in the Government Offices Records Centre, or for review rounds older than 10 years, in the National Archives (in Arninge).

The notion of contextualism places importance on the contextual setting in which gene technology is being interpreted and evaluated and has been a cornerstone in the work of historians of science and ideas. What counts as contextual factors varies from one case to another and the legitimacy of the approach depends on the researcher’s ability to

49 In Swedish “offentligt tryck”.
convincingly demonstrate how certain factors help to make sense of a specific case. I have chosen to take into account media reporting linked to the chosen commissions. The reasons for doing so are manifold. Firstly, every commission has been appointed with direct reference to ongoing media debates. Secondly, the commissions have, as part of their work, kept track of media discussions as their work proceeded. Copies of articles were sent out to commission members on a regular basis and are saved in the archives, in two cases out of three. Thirdly, the commissions have been directed to work “publicly”, that is to support and promote public debate. This means that the commissions, or in some cases different commission members, have taken a (more or less) public position. Fourthly, media reporting also says something about how the commissions’ work and final reports have been received. For my part, media reporting has been of interest as a backdrop for understanding the larger context in which these commissions can be placed. I have gathered articles primarily in connection to the period under which the commissions worked. As two of the commissions monitored media reporting themselves, copies of articles can be found in the archives. As a convenient shortcut, I have taken these articles as a point of departure. For the Gene Technology Commission, no such material exists, and in that case I have tried to reconstruct ongoing debates by searching article databases. I have had no ambition to give a full account of these media activities, or to claim that my selection of articles are representative of general trends.

Media representations cannot be taken as direct “evidence” of what people have said or done or how events have been unfolding. They are, however, evidence of how people and events have been represented. This is an important distinction to keep in mind when analysing this material. Thus, in most cases when I have cited what someone has expressed in a newspaper article, it has been articles written by actors themselves, not journalists.

No interviews have been conducted, even though it was my first intention to do so. There are several reasons for that. Firstly, a lot can be said from studying existing commission documentation. Secondly, I do not believe that interviews would have profoundly improved a study like this one, as it does not focus on the role of or perspective of specific individual actors. Thirdly, a properly designed interview study would have taken time away from analysing archive and media sources, and hence it was simply a question of priority. On the other hand, interviews
could have provided a lot more informal information about the day-to-
day work and negotiations within these governmental commissions, and
would be a very interesting way of continuing and complementing a
study like this one.

In addition to media reporting, I will take into account some general
changes in Swedish science policy, international regulation, and life
science commercialisation, drawing on existing literature and earlier work
in the field. The three commissions have more or less come to represent
three different cases, presented in three different chapters. Although
not constituting proper case studies, they are similar in that they are
illuminated with the help of a wide range of different kinds of sources.0

I have chosen to present my findings in chronological order. This has
the advantage of highlighting how each commission worked in a climate
conditioned by previous investigations and regulations, but it also makes
thematic issues easier to follow up from case to case. However, you can
easily fall into the trap of overemphasising the explanatory force of
your chosen cases, simply because these are the cases you have at hand.
Discovered continuities or changes might become an artefact of the
research design, not accurately reflecting actual historical tendencies.

The thesis is written in English, but the bulk of the empirical sources
is in Swedish. As far as possible, I have tried to translate citations as
accurately as I can, always providing the Swedish original text in the
footnotes. However, in some cases the original documents, especially
notes taken during commission meetings, have been written so quickly
that translating them accurately has been far from easy. In those cases
I have tried to make quotations more readable and understandable by
adding explanatory information. When established English names have
existed for certain governmental agencies or interest organisations for
example, I have used those, in other cases the Swedish name has been
used. Translations of important titles and names have been listed in the
appendices. As for referring to dates using numbers only, the American
style of putting the month before the day, as in 11-30-07, has been used
throughout the book.

---

0 See discussion on cases studies in Bill Gillham, Case Study Research Methods (London & New York, 2000).
The International Recombinant DNA Technology Controversy

Recombinant DNA technology was developed in 1973 in the U.S. The technique involved working with so-called plasmids, circles of DNA independent of the nucleus found in bacteria. Through the use of restriction enzymes, it became possible to cut DNA at specific nucleotide sequences, and to move segments (genes) from one DNA string to another. Originally this was done using bacteria, a strain of the intestinal bacterium *Escherichia coli*, *E. coli*. The result of this “cut and paste” procedure was the creation of hybrid or “recombinant” organisms. Hybrid plasmids could easily be cloned, producing thousands of copies of the inserted genes. The significance of the invention soon became clear; it made it possible to put together genes in ways never conceived of before, crossing barriers between unrelated organisms. Also, from the very inception of recombinant DNA technology, its commercial potential was considered promising. Most notably, genetically engineered bacteria were hoped to be able to produce human insulin, different hormones and other valuable proteins, turning bacteria into “drug factories”. The technology did not only entail improved molecular research or potential industrial applications, but it also raised fears about possible dangers of using and producing recombinant organisms in laboratories. During the Gordon Conference on Nucleic Acids in June 1973, concerns were expressed by scientists about the risks of genetically engineered molecules being hazardous for laboratory workers, generating new forms of disease,

---

gene technology at stake

disseminating into the environment and running rampant through populations. A decision was taken at the conference to alert the U.S. National Academy of Science and the Institute of Medicine, and to form a committee investigating potential risks connected to this new method and the need for research guidelines. In July 1974 the committee published a letter in Science and Nature calling for a voluntary moratorium on certain kinds of recombinant DNA experiments. The following year, during the now-famous Asilomar Conference on Recombinant DNA Molecules, regulatory guidelines were developed that in the years to come served as a precedent for policy making in many other countries, including Sweden. The guidelines included directives about physical containment (laboratory safety principles) and so-called biological containment, which meant that experiments could only be performed using a type of weakened bacteria. In the years 1976–1978, regulatory control was softened as a result of continuing scientific risk assessments and international policy discussions. It was concluded that E.coli could not easily turn pathogenic and that epidemic risks were minimal.²

The international disputes of the 1970s have been subjected to a number of different interpretations.³ Apparently the past still functions as a resource for advancing certain interpretations of what gene technology is, what characterises scientists and the scientific community, and how society and policy-makers should respond to or behave in the face of scientific or technological hazards. For example, the publication of biochemist Paul Berg’s and his colleagues’ whistle-blowing letter in Science in 1974, by which he alerted not only the scientific community as such, but the general public as well, has been described as an unprecedented event of a voluntary, self-imposed, altruistic call for research restrictions initiated by members of the scientific community themselves. Others have emphasised that the voluntary moratorium, that lasted for about a year, only brought to bear on small parts of all the experimental possibilities at hand. Some see it as a manifestation of an honest attempt to take social responsibility for possible hazardous outcomes of scientific practices.

even to put a halt to further experimentation, without having any actual evidence of real risks.\textsuperscript{4}

The early recombinant DNA technology dispute has sparked scholarly interest because it involved trying out new models for public participation in regulatory policy. In the city of Cambridge, U.S., a panel of citizens was constituted to evaluate current developments in recombinant DNA research. Was this yet another sign of scientific openness, of willingness to be exposed to public scrutiny? The lay panel soon gave the research community a green light to proceed with experimentation, and it has been suggested that this reflected the panel’s strong dependence on scientific experts and the information they provided. Last but not least, how scientists could go from being whistle-blowers in a situation of great uncertainty, to only a couple of years later publicly presenting a united front proposing substantially weakened guidelines, is a matter of interpretation. In the self-written history of many prominent scientists, like James Watson for example, consensus was achieved as a result of testing and evaluating risks.\textsuperscript{5} To the contrary, Charles Weiner emphasises the press scientists were under to avoid political and legal regulation at the time. There were strong incentives among scientists to come up with a solution that would protect the scientific community from external regulation.\textsuperscript{6} In this way, the “closure” of the recombinant DNA controversy has been interpreted as a victory for scientists’ professional interests. What can be said with certainty, however, is that the international recombinant DNA controversy also came to be interpreted in very different ways by participants in the Swedish recombinant DNA debate in the late 1970s.

**Swedish Media Debate, 1977–1979**

In the course of this controversy, recombinant DNA technology began to be interpreted as a technology of the future. Potential risks with gene technology were outweighed by expected future benefits, and until the beginning of the 1980s the debate about leaking laboratories and pathogenic bacteria lost momentum. In Sweden, media debate on


recombinant DNA technology erupted in 1977–1979. It was triggered by the fact that two so-called high-risk laboratories were about to be built in the cities of Stockholm and Uppsala. In the late 1970s there was also a widespread recognition that recombinant DNA technology stood outside existing law, and that some form of state regulation was required. As a response, a one-man commission was appointed by the Swedish government in 1978. In the next sections, I will briefly discuss the workings of this inquiry and some general features of the Swedish recombinant DNA debate that ignited the inquiry in the first place. For the sake of simplicity, a condensed version of three dominant positions taken in the Swedish recombinant DNA debate will be presented in the following. These positions were not exclusive, but in order to better highlight the differences between them, the voices of three different actors will be heard.

In Sweden, this period was characterised by political turbulence. After staying in power for 44 years, the Social Democrats lost the general election in 1976 and were replaced by a non-Socialist government. Conflicting positions on nuclear power caused internal tensions within the government, and a Liberal minority government took over in 1978–1979, another non-Socialist coalition government in 1979–1981, and a Centre/Liberal minority government in 1981–1982. After this, a long period of Social Democratic minority governments followed from 1982 to 1991. According to Susan Gerard Marton, Swedish science policy culture from 1968 to 1978 was fixed on a “social goals” model, a view that predicated that science and technology should be supported for what it could do to improve the well-being of people. It was also a period of the so-called “sektorsforskning”, that is research initiated to meet the demands of different societal sectors, often contrasted to the role of basic research.

Throughout the 1970s, debates over the pros and cons of nuclear power split the traditional left-right political blocs in Swedish politics. The Centre Party (right wing) and VPK, the Communist Left Party, objected to the energy policy supported by Social democrats, Liberals

---

9 Leif Lewin, Ideologi och strategi (Lund, 2002), see chapter 8.
and Moderates. In the first half of the 1970s, the Centre Party strongly positioned itself against the use of nuclear power as a main energy source and employed an argumentation that bore similarities to the public framing of recombinant DNA technology a few years later. These arguments were about the lack of knowledge about risks, the untested nature of the technology, the magnitude of potential accidents, and concerns about negatively affecting future generations. Above all, it was about the environmental threat posed by a recently developed technology. The question came to a political climax with the power plant accident in Harrisburg in 1979 and a general referendum held in spring 1980.

The Scientist

Lennart Philipson worked at the time as professor of molecular biology at Biomedicinskt Centrum in Uppsala. His unit planned to arrange for a so-called high-risk laboratory where they would use recombinant DNA techniques. These plans were criticised in the newspaper Dagens Nyheter in November 1977 by Nordal Åkerman, an expert on international security issues who figured in many public contexts at the time. For him, the dangers of performing experiments with hybrid DNA amounted to a question of the future survival of mankind. This was not about calculating risks and choosing the safest way to go, it was about the obligation of not engaging in these sorts of activities at all. The most “elementary sense of responsibility” demanded it, and competitive specialists should not be allowed to set the research agenda in this case. The same month, Kerstin Anér, a politician for the Liberal Party, alerted the public in an article in the newspaper Expressen about the growing importance of DNA research generally, and specifically about the plans to build a laboratory in Uppsala.

Lennart Philipson responded in a way that in many ways was typical of how natural scientists viewed the situation. Like others, he aimed at presenting a “factual” picture by introducing readers to the basic science of molecular biology. As he expressed concerns over the lack of, or distortion

10 Laboratories were classified in different categories depending on the different levels of security required.
of facts, a great deal of effort was spent on educating readers about the latest developments in DNA research. In doing so, he could infer that recombinant DNA technology was not riskier than any other molecular or microbiological technique already in practice. So, installed means of control of for example pathogenic molecules or organisms, would suffice to regulate the use of recombinant DNA technology as well. Philipson conceded that recombinant DNA technology could be misused or otherwise (unintentionally) be the cause of health or environmental risks, but that measures had already been taken to avoid these. It was however, according to Philipson, unreasonable to expect a zero-risk situation when handling any newly developed technology. The “real” risks remaining (which were contrasted to “thinkable” ones) could best be handled by the research community. It was important for people to trust scientists, not least because they had such a crucial role to play for the sake of improving health care, coping with environmental pollution and finding alternative energy sources. If the public and politicians granted science appropriate trust, there would be no need to approach the subject with legal means. Commenting on the inevitability of risks, in this case for misuse, he said:

This problem remains even if we legislate against recombinant DNA research and is even more salient if we take into account the possibilities of creating dangerous bacteria with other techniques, so called biological weapons that are only controlled by a UN resolution. Therefore we must trust the scientists’ judgements and social responsibility, and accept that the research community, industry or society at large never can achieve a zero risk level.13

For Philipson, the international course of events where scientists had acted as whistle-blowers, constituted a main argument for putting trust in science and scientists.

I will soon find it pointless to discuss these important questions when our politicians put on an aura of sanctity and try to discredit scientists. It was the scientists themselves who initially blew the whistle to call attention to what was then considered to be potential risks, who took security measures

to protect laboratory staff and society, and who have spent the last three years discussing and penetrating safety issues. With this background, more objectivity is required on behalf of the recently awoken politicians. We scientists are in favour of an insight into our research.  

Philipson, like many others at the time, was occupied with the contested boundary between “possible future developments”, and “wild speculations”. Not surprisingly, he was not content with his critics’ views on the matter. Popular culture and more specifically science fiction productions were to blame, as well as journalists. “Many are the misconceptions that have been circulating in the recombinant DNA debate. Partly these are due to journalists and the public relying on novels like Aldous Huxley’s ‘Brave New World’ and George Orwell’s ‘1984’ for gaining knowledge.” Many of the applications for which Nordal Åkerman and Kerstin Anér had raised a warning flag, were described as fictional or solely theoretical, and therefore not worthy of further attention. One such application was Nordal Åkerman’s concern about human cloning.

Finally, I am sure that You as a social scientist knows that if You had not grown up under exactly the same circumstances, You would perhaps, with an identical genetic make-up, have become a modest debater who would inform your audience in a fact-based way. No, human cloning, which has nothing to do with recombinant DNA, is only a theoretical but not a practical reality.

He was not the only one to be discontent with journalistic standards; both


the biochemist Peter Reichtard and the microbiologist Hans G. Boman joined in.\textsuperscript{17} Their response to this perceived lack of intellectual rigor and decline in moral judgement, was to call for improved qualifications among those involved in discussing or reporting on science. Hans G. Boman, suggested a somewhat drastic solution, namely to employ scientists as journalists. According to him, no other journalistic sector treated its subject matter as poorly as science reporters did theirs. Commenting on a recently broadcasted television programme about recombinant DNA technology, he wrote: “In television, it wouldn’t be possible to talk about Stenmark and show a picture of Björn Borg, but in the recombinant-DNA programme, without correcting it one could speak about Crick and show a picture of Watson.”\textsuperscript{18} If only scientists learned elementary journalistic principles, there would be no need for science journalism. Lennart Philipson also questioned the motives driving people to paint dystopic pictures of the future. “The potential risks for world wide epidemics, which Kerstin Anér and Expressen have chosen as examples to spice up her presentation are intended to strengthen public fears and are not realistic.”\textsuperscript{19}

To sum up, Philipson presented a strong case for the autonomy and authority of science, for securing interpretative rights to (natural) scientists and leaving problems of regulation and control in the hands of the scientific community. He did so by clearly demarcating recombinant DNA technology (safe) from other technologies (such as cloning), by emphasising the familiarity of the technique in the context of regulation and the uniqueness of the technique in the context of evaluating possible economic, health and environmental benefits. Furthermore, he clearly separated science as a fact-based endeavour from politics and journalism, as actors from these professions were prone to emotional exaggerations and irrational speculations.

\begin{flushright}
\begin{tabular}{l}
\textsuperscript{17} Hans G. Boman, “Lärdomar av hybrid-DNA-debatten: (1) Anställ forskare som journalister!” \textit{Dagens Nyheter}, 02-06-79; Peter Reichtard, “Massmedia måste ta ansvar”, \textit{Svenska Dagbladet}, 09-27-78. \\
\textsuperscript{18} Boman, “Lärdomar av hybrid-DNA-debatten”. Translation of: “I TV skulle det aldrig gå att tala om Stenmark och visa en bild av Björn Borg, men i hybrid-DNA-programmet gick det att utan rättelse tala om Crick och visa bilder på Watson.”
\\
\textsuperscript{19} Philipson, “Ta av dig helgonglorian”. Translation of: “De potentiella riskerna för världsomspännande epidemier som Kerstin Anér och Expressen valt som exempel för att krydda framställningen och öka rädslan hos allmänheten är inte realistiska.”
\end{tabular}
\end{flushright}
As soon as recombinant DNA technology became a practical reality, its commercial potential was believed to be promising. In April 1976, the U.S. company Genentech was founded, which was the first company to commercially exploit the recombinant method by producing the human hormone somatostatin. The Swedish state-owned company KabiGen, a spin-off from the pharmaceutical company Kabi, was founded in 1978 as the first Scandinavian biotechnology company using recombinant DNA technology. It signed an agreement with Genentech about licensing its technology and genetically modified bacteria to produce human growth hormone, something that had earlier been extracted from pituitary glands. KabiGen came to attract much media attention as well as political interest. Its director, Bertil Åberg, became a front figure in the promotion of the commercial use of recombinant DNA technology.

The government appointed a one-man commission in 1978 to investigate how or if recombinant DNA technology was covered by existing safety laws. KabiGen had to await the commission's result before it could start up big scale industrial production of human growth hormone. In several articles Åberg expressed a high degree of impatience with Swedish politics and Swedish bureaucracy. According to him, Sweden ran the risk of lagging behind in international technological competition. In 1979 he stated, together with engineer Kerstin Sirvell (also KabiGen) that he had chosen to trust the Swedish government not to let that happen. “We have assumed that the government does not wish for Sweden to helplessly fall behind when it comes to industrial uses of recombinant DNA technology.” It was, however, their duty not to let Sweden down as a nation in this situation. “We in KabiGen see it as our duty, despite ungainly political conditions in this area, to save what we can for the future of Swedish industry.”

---

23 Ibid. Translation of: “Vi i KabiGen anser det vara vår skyldighet att följa med och trots otympliga politiska förhållanden i denna fråga här i Sverige rädda vad räddas kan till
of overcoming political hurdles in KabiGen’s history was retold as an amusing episode as Åberg confessed to have smuggled the genetically engineered bacteria from Genentech into Sweden, after which he had kept it in his refrigerator for six months. Nothing about this, of course, was mentioned by Åberg in 1979.

A year before that, in 1978, Åberg was triggered to respond to Nordal Åkerman’s critique of what he (Åkerman) had called “the Devil’s Doctrine”. By this he meant the scientific-industrial complex he saw growing up around recombinant DNA technology. Åberg responded:

How is this “devil’s doctrine” going to be judged and evaluated objectively, nationally, if we forbid our universities and colleges to work with and learn the technology? Are Swedish scientists supposed to inform decision-makers, political or industrial, on the sole basis of foreign papers? Is the health department of Uppsala City Council the right authority to make decisions for Uppsala University?

In order to provide the best scientific advice possible on these matters, recombinant DNA technology should be dealt with in scientific environments and not political, that is, at Uppsala University. Furthermore, it was of utmost importance to allow for Swedish scientists to acquire the necessary skills to do this. Therefore, Åberg equated control not with regulation or prohibitions, but with going ahead with research. But as his critics pointed out, KabiGen wasn’t all about research, it was about commercialisation and profit as well. In the SACO/SR-paper, John Lilja, head of the department of social pharmacy at Uppsala University, requested a better transparency of what the pharmaceutical businesses were up to. Bertil Åberg, offended by the accusation that pharmaceutical companies were “just” profit-seeking enterprises that neglected social needs, rejected vehemently any demand of more openness.

---

Insight, this constant nagging about having insight. KabiVitrum has been state-owned for ten years. I have presented research programmes and results before the board around four times. On the board there are representatives of “society”. How much more transparency does senior lecturer Lilja want? Should the whole Swedish population have permission to run around and dig among our papers or witness all our experiments?27

Together with other company directors from Pharmacia, Leo, Astra and Ferrosan, he declared that companies would only and always produce medicines for which there was a market. The alternative would not make economic sense. But luckily, society’s needs could be met, exactly because pharmaceutical production was run by profit-seeking corporations. In a retrospective analysis, Bertil Åberg concluded in his book of 1982 Safe Enough that the next time a new technology was introduced in Sweden, the debate would have to be directed by provision of expert advice to political decision-makers, so that emotional and irrational beliefs would not dominate in the same way they had been allowed to in the recombinant DNA technology debate.28

The Politician

Guy Ehrling worked as an information officer for the Centre Party and showed a particular interest in environmental issues. He joined the choir of critical voices raised in 1979, when the company KabiGen AB was on its way to establish a high-risk laboratory in Stockholm. Also working for the City Council, he considered these plans to be “highly political” and tried to alert the public – especially those living in the vicinity of the lab – through the media. If Lennart Philipson saw good reasons for trusting scientists, Guy Ehrling saw no particular reason for trusting them more than others. In fact, he made it clear that experts indeed could be wrong, and had been wrong, which provided grounds for a cautious attitude. Instead of discussing only recombinant DNA technology, he wanted


28 Bertil Åberg, Tillräckligt säkert hybrid-DNA: Kring införandet av en ny teknik i Sverige (Stockholm, 1982), 89.
an assessment of recombinant DNA technology in the context of other techniques. Especially important were comparisons to nuclear power. “According to all risk analysis experts a nuclear power plant breakdown of a Harrisburg type would only occur once in a large number of reactor years. Nevertheless the impossible, or close to impossible happened in the reactor on Three Mile Island.” Despite the fact that a few natural scientists had already publicly stated that every risk assessment analysis up to that point had showed the same result – that actual health or environmental risks were highly limited – Ehrling still did not trust recombinant DNA technology to be safe. Instead of questioning the motives of scientists, he thought the tests might have been methodologically flawed. The fact of the matter is that humanity, through recombinant DNA technology, has gained access to bacteria material with numerous new gene combinations and traits. The statement that so far no one has found any dangerous gene combinations can mean that no one so far has been able to discover them due to insufficient risk analysis.

For Ehrling the debate had just started. He called for a moratorium on experiments in order for the public debate to grow stronger in the meantime. For Philipson and his fellow scientists, the controversy was, or should have been, over. Clearly, Ehrling was not satisfied with the general scientific consensus at this time that appropriate safety measures had already been taken and that there was no evidence supporting higher levels of risks for recombinant DNA technology. He saw the effort to “close” the debate as a mistake.

Without an open debate on gene manipulation or recombinant DNA research this will become the nuclear power debate of the 1980s. Many

crucial decisions on the nuclear power issue were taken already in the 1950s, whereas the debate did not gain serious momentum until the 1970s. This mistake must not be repeated.\textsuperscript{33}

The very fact that experts had been shown to be wrong in the past, made it so much more important to include other segments of the population (political parties, adult educational associations, unions etc.) in a broader technology assessment of these issues. Ehrling wished for a free and open debate where these groups faced up to their responsibilities of participating in the recombinant DNA policy discussions.\textsuperscript{34} He also repeatedly emphasised what he saw as ethical implications of recombinant DNA technology, a theme his adversaries tended to “overlook”, and claimed that politics had a stake in the future development of gene technology.

Guy Ehrling tried to make the recombinant DNA issue into a political one, thereby carving out a space for political involvement. But, as had been the case with other participant in this debate, he also wanted to provide facts. He discarded risk assessments performed up to that point as unreliable, by referring to past political mistakes of believing in the safety of nuclear power plants and experts’ assurances about safety. Together with Inger Ekengard, another Centre Party politician, he wrote a book that was published in 1980, as a way of fuelling public debate. In this book they made it clear that choosing technological trajectories were inherently political choices, since it involved deciding what was a desirable path for society to embark upon. A political position for them meant protecting democratic values, as opposed to technocratic ones.

Knowledge, curiosity, research and technological development are important for society’s development. To hinder knowledge production and research is, of course, as undemocratic as to forestall a free flow of opinions. However, with a complicated technology that integrates all aspects of life and detaches us from nature, mankind and our sense of social belonging, the risk of technocracy is imminent.\textsuperscript{35}


\textsuperscript{34} Guy Ehrling, ”Lägg papperen på bordet”, Dagens Nyheter, 08-23-79.

\textsuperscript{35} Guy Ehrling and Inger Ekengard, Genetisk ingenjörskonst: Tjuvkoppling eller genuig? (Stockholm, 1980), 38. Translation of: ”Kunskap, nyfikenhet, forskning och teknisk utveckling är viktig för samhällelig utveckling. Att hejda kunskapsinhämtande och forskning är givetvis lika odemokratiskt som att hejda en fri opinionsbildning. Med en på livets alla områden komplicerad teknik, som fjärmar sig från naturen, människan och
Of course, as a politician Guy Ehrling represented his own party, and his view on the subject did not automatically go down well with other politicians. In 1981, Social Democrat Lennart Pettersson commented in parliamentary discussions on Ehrling’s approach: “The Minister of Agriculture has one of the more militant spokespersons for an extreme position just around the corner in the Government Offices, that is the Minister Olof Johansson’s own information officer Guy Ehrling.” This purportedly “militant” approach of the Centre Party within the non-Socialist government also reflected the dividing lines on the nuclear power issue.

If we stop for a while and look at the arguments put forward by Philipson, Åberg and Ehrling, apart from their apparent differences, they all agreed on some issues, at least superficially. All claimed to be supporters of science and scientific knowledge, and they also claimed to want societal control over science. All of them based their views on “facts”, and discredited their opponents as ideology- or interest driven. In addition, they expressed the need for an extended public debate on these issues, a debate in which all of them saw themselves as legitimate spokespersons for the public. That is, they both addressed the public, and acted as spokespersons for the public. Hence, the role of public was, at this historical time and in this media debate, marked by its apparent absence. It was a debate orchestrated by a few prominent scientists and a handful of very engaged politicians. The fact that this debate took place in public, can explain why so much energy was spent on policing the boundary between appropriate mediation of knowledge and experience, and outright distortions of facts. That is, it can explain why many commented on the role of journalists and about what was or wasn’t a correct framing of these issues. At the bottom of this lurked the implicit question: Whose views should influence the public? Needless to say, what counted as distortion for one person, could very well count as a factual account for another.

Now, as with any controversy, at least part of a valid explanation for how different actors understand the world must be related to the goals, views...
and needs of the actors. It is not by chance, that Bertil Åberg emphasised the societal benefits (and moral duty) of companies producing medicines. It is not accidentally so, that Guy Ehrling wanted to see the freedom of scientists limited and the role of the politician empowered. It is not taken out of the blue, that Lennart Philipson defended basic research by appealing to public trust, instead of suggesting tightened political regulation. We were led to believe that science could produce societal benefits if and only if, it was left to its own devices. Just because science was about producing truths, it would be useful, for what was built on ‘how it is’ would work, and what was built on false assumptions would fail to deliver what we expect of it. This was the position taken by Philipson. Bertil Åberg pursued a similar line of argument, but from a completely different vantage point. He put his faith in the smooth workings of the market, trusting that what society needed in terms of medicines, the market would provide. But this could only be the case if the hands of the pharmaceutical companies weren’t tied up by restrictions and regulations. Guy Ehrling believed that society had a long way to go before it would be in control, that facts about risks were still missing and that public debate had just begun.

On the Footsteps to Political Regulation

In the Swedish political context of 1978, politicians faced what seemed to be a potential threat; the budding but rapidly growing use of recombinant DNA experiments in research laboratories as well as for industrial production. The main issue was framed as a question about how to control or regulate this kind of activity.

The Swedish Natural Science Council, NFR, had in 1976 adopted a set of guidelines which relied on elements of the NIH and UK guidelines from 1975–1976. But there was a widespread recognition in the late 1970s that recombinant DNA technology stood outside existing law, and that some form of state regulation was required. As a response, a one-man commission was appointed by the Swedish government in 1978. The inquiry was chaired by Bertil Wennergren, an expert on administrative law. Wennergren started working with the inquiry in February 1978 and delivered his final report in December 1978. He consulted many experts

during this time, as a way of collecting information about ongoing research projects and practices. The scope of the inquiry was limited to safety issues – defined as excluding broader environmental and ethical questions.

The appointment of this commission was a direct response to the media debate. Both critics and promoters of recombinant DNA technology had asserted their belief in societal control over this kind of research. How this control was supposed to be carried out in practice and what it actually meant for society to “be in control”, was another question. Should it be a matter of passing legislation, perhaps banning certain kinds of research, or should politicians as well as the public leave these matters to the scientific community, based on a well-deserved trust? As is evident from Wennergren’s report title, Recombinant DNA Technology under Control, it was asserted that research should be carried out under a system of centralized control. Wennergren proposed the creation of a new agency, the Biotechnology Agency, that would approve project applications and exercise a certain degree of regulatory oversight. He also concluded that the control requirements of recombinant DNA technology could be met with certain revisions of the existing legislation for environmental and occupational protection.

The government bill of September 1979 parted from Wennergren’s conclusions in several respects, especially concerning the role of the Biotechnology Agency. It did end up suggesting similar complementary legislative changes as Wennergren had proposed, though, changes that would allow for recombinant DNA technology to be included in already existing health and safety laws. As had been the case with many other countries, no profound legislative changes were carried out at this time. Actually, a period of over ten years would pass before major changes took place in 1991. Instead of a Biotechnology Agency, a new advisory agency for recombinant DNA activities, the National Recombinant DNA Advisory Committee, was created. This agency would, among other things, act as a scientific resource for regulatory authorities. But it also took over

---

38 Letter, Utsändningslista för tackskrivelser från hybrid-DNA-utredningen, 11-18-78, vol. 1, Recombinant DNA Technology Commission Archive, NA.
41 The Committee was constituted in January 1980. In Swedish, Delegationen för hybrid-DNA-frågor.
the role as public educator that the Natural Science Council had been responsible for since 1975. Disseminating information from biologically trained people, was considered to be highly needed due to what was seen as the growing ethical implications of recombinant DNA technology.\(^\text{42}\)

The bill established a link between ethical problems and the public, thereby implicitly turning ethics into a matter for the public, and at the same time responding to this by underlining the need for openness and active governmental involvement in spreading information. The current Minister for Employment, Rolf Wirtén (the Liberal party), highlighted the need for interested parties to be able to influence the content of these educational tasks:

> When one discusses the ethical and humanitarian conditions of future uses of recombinant DNA and the concern and uneasiness that the public might feel, one is faced with the importance of informing broadly on these topics. [---] In my view, the broad spectrum of members of the Advisory Board, that I will account for later, will secure that interest groups can, rightfully, oversee and influence the design of those efforts of spreading information.\(^\text{43}\)

That ethical questions were best served by including representatives for the public in the agency, which also reinforced the idea that ethics opened up a legitimate room for public participation. Through public representatives, in this case four Members of Parliament and union representatives, the voice of the public was considered to be taken into account. The parliamentary Committee on Health and Social Affairs picked up on the idea of public participation (as did many politicians) and expressed it like this: “Since issues of control in the future might come to include ethical problems, a strong position of public influence should be safeguarded through the participation of a number Members of Parliament.”\(^\text{44}\) However, the expert group in the National Recombinant

\(^{42}\) Governmental bill 1979/80:10, om kontroll av hybrid-DNA-teknikens användning.

\(^{43}\) Ibid. Translation of: “När man diskuterar de etiska och humanitära villkor som bör gälla vid den framtida användningen av hybrid-DNA och den oro och osäkerhet som allmänheten kan känna kommer man osökt in på vikten av en bred information kring dessa frågor. [---] Enligt min uppfattning bör den breda sammansättning av delegationen som jag i det följande kommer att redovisa leda till att olika intressegrupper får en skälig insyn i och möjlighet att påverka utformningen av sådana informationsinsatser.”

DNA Advisory Committee, was to exclusively consist of natural scientists, and a few of them were among those who actively had taken part in the media debate a couple of years before.\textsuperscript{45} The idea that politicians and union representatives could stand in for members of the public, coupled with the idea that ethical questions made this enrolment of the public both necessary and credible, would be a recurrent theme in public debate in the years to come. As we will see in the next section, the introduction of ethical expertise in gene technology policy-making was on its way, thereby somewhat changing the parameters of these discussions. The new agency also inherited from NFR the somewhat ambiguous task to both alert the government in cases of qualitatively new applications of gene technology and keep up with developments in the field – a controlling and monitoring responsibility – at the same time as it would be promoting new Swedish research in the field.\textsuperscript{46}

In 1980 the recombinant DNA controversy in Sweden was believed, by some, to have petered out.\textsuperscript{47} The safety issue was said to have been resolved and no accidents or misuses of the technique had been reported. This position was also taken by the Swedish government in the bill of 1979 as well as by members of the parliamentary Committee on Health and Social Affairs:

Gradually, as recombinant DNA technology has been used and developed, previous concerns about risks have been reassessed. […] Nowadays, the topic of conversations is whether the technique entails unpredictable risks and what ethical and humanitarian consequences it can have.\textsuperscript{48}

With this re-shaping of the problem of recombinant DNA technology, health risks gave way to ethical risks, and several politicians called for a new and more comprehensive investigation that would address ethical

\textsuperscript{45} Hybrid-DNA teknik, Information från Delegationen för hybrid-DNA-frågor (Stockholm, 1982), 12–13. Among the experts were Bo Malmström, Alf Lindberg, Marianne Rasmuson and Peter Reichard.

\textsuperscript{46} Hybrid-DNA teknik, Information från NFR:s kommitté för frågor rörande forskning med hybrid-DNA (Stockholm, 1979).

\textsuperscript{47} See for example Peter Reichard, “Hybrid-DNA-teknikens risker omvärderas”, Forskning och Framsteg, no. 6 (1980).

\textsuperscript{48} Committee report SoU1979/80:18. Translation of: “Efter hand som hybrid-DNA-tekniken använts och utvecklats har man omvärderat de risker som från början befarades. […] Vad som numera är föremål för diskussion är om tekniken är förknippad med risker som i dag inte är förutsebara och vilka konsekvenser inte minst ur etisk och humanitär synpunkt som tekniken kan medföra.”
and humanitarian aspects of the technology. Politicians from the Centre Party even suggested that further research should be halted before a broadened public debate on ethical questions had been achieved, calling for a new moratorium in the meantime.

A Moralisation of Gene Technology: The Gene-Ethics Commission

But we know, that the day will come – for this technology as for every other technology – when it is possible that some of the results will be used in contravention of some of the fundamental ethical values of our culture. Then we need to be prepared.

Around 1980, after the Swedish government had formed a new advisory agency for gene technology uses, the National Recombinant DNA Advisory Committee, the controversy on recombinant DNA technology, petered out. However, different members of Parliament had expressed dissatisfaction with the lack of ethical considerations in political regulation and political debate. Besides health and environmental risks, “ethical” risks, had silently been growing in the shadows of the recombinant DNA technology controversy, to finally take on a shape of their own. By this time, the direct use of gene technology for biomedical research and clinical practice had become established. As a result, a governmental commission was appointed in 1981, consisting of 6 regular political members, 13 experts, predominantly natural scientists, civil servants and science administrators, but also a few union representatives. The commission comprised one ethical expert, professor Holsten Fagerberg, a theologian from Kyrkans Pastoralinstitut. The commission took the name the Gene-Ethics Commission. As with the previous commission, it

49 Motion 1978/79:1908, Bengt Kindbom et al. (Cen), om genforskningen.
50 Motion 1979/80:83, Rune Gustavsson et al. (Cen), med anledning av propositionen 1979/80:10 om kontroll av hybrid-DNA teknikens användning.
52 “Sakkunniga” will be referred to as “experts”, even though they have a slightly different role, see Introduction.
53 Holsten Fagerberg also served on the Insemination Commission as well as chaired a group working with gene technology assessments under the National Swedish Board for Technical Development, STU. See Minutes, 02-25-82, vol.1, the Gene-Ethics Commission Archive, NA, and SOU 1983:42, Barn genom insemination (Stockholm, 1983).
GENE TECHNOLOGY AT STAKE

was chaired by law expert Bertil Wennegren.

The text quoted above was formulated by Gerhald Miksche in 1982, one of the participants of a public conference where members of the Gene-Ethics Commission also participated.54 The quotation evokes the presentiment that gene technology might challenge deeply entrenched cultural values, and that these values might get lost if “we” are not prepared. According to politician Kerstin Anér (the Liberal Party), who would be appointed to work for the Gene-Ethics Commission, it was a great shame and a scandal that political preparations for dealing with the ethical implications had not already been made.55 Indeed, it was by generating ethical problems that gene technology came to be seen as belonging to the political sphere more directly.56 Hence the Gene-Ethics Commission started its work in 1982 in the atmosphere of moral emergency.

It was by mobilising ethical expertise and thus submitting gene technology to professional ethical analysis, that the Gene-Ethics Commission prepared to manage and overcome the risk of societal ethical breakdown. The commission had been appointed to:

- analyse the ethical, humanitarian and social implications of recombinant DNA technology as well as to consider the need for ethical and social legislation in order to define the limits of how far the artificial modification of the genes of living organisms could be taken.57

Ethics was mobilised as something that would clarify limits, draw lines, restrict or hinder certain practices. But at the same time, the deeply rooted ethical principles of Swedish society was exactly what was believed

54 The conference was arranged by The National Recombinant DNA Advisory Committee and STU, the National Swedish Board for Technical Development in 1982.
55 Kerstin Anér, “Felfria kromosomer diskutabelt”, Svenska Dagbladet, 07-06-81. Anér had called political attention to biomedical science throughout the 1970s, for example Kerstin Anér, Den tillverkningsbara människan (Stockholm, 1972); Kerstin Anér, “Kan människan skapa sig själv?”, Västerbottens-Kuriren, 10-16-74
56 This view had previously been articulated in for example George Strachal and Claes Palmkvist, “Det riskfyllda steget in i arvsanlagen”, Folket i bild-Kulturfront, vol. 7, no. 11 (1978); George Strachal and Claes Palmkvist, Manipulation: Genetisk ingenjörskonst (Stockholm, 1977). As have been described in a previous section, Guy Erhling marshalled a similar view.
57 Commission terms of reference, Dir 1981:03, Etiska, humanitära och sociala frågor m.m. kring hybrid-DNA-tekniken. Translation of: ”utreda etiska, humanitärta och sociala frågor kring hybrid-DNA-tekniken samt överväga behovet av en etisk och social lagstiftning i syfte att sätta gränser för hur långt försök med att på konstlad väg förändra anlag hos levande organismer skall tillåtas.”
to be under threat, and an underlying task was to bring those principles to light. The legal framework was meant to reflect ethical standpoints and set bounds to the practice of artificial gene modification.

The commission abandoned the narrow definition of gene technology as referring only to recombinant DNA technology, even though this technique remained at the centre of the analysis, and dealt primarily with gene technology applied to humans. This included, apart from artificial combination of genes or cells, a discussion about genetic screening and genetic diagnosis, gene therapy, cloning, plant and animal breeding and industrial applications of genetically engineered microorganisms. Nonetheless, it was gene technology for medical research and treatment that stood out as the main focus. Interestingly, what had been such an important distinction to maintain for many participants in the recombinant DNA technology debate a few years earlier, namely that between recombinant DNA technology and other gene technologies, was considered to be inappropriate for assessing ethical implications of recombinant DNA technology.\(^5\) For the commission, recombinant DNA technology had to be looked at in the context of other existing technologies and other existing medical practices, for example prenatal diagnosis, abortion, and reproductive technologies.

The practice of treating infertility by using in vitro fertilisation, IVF, within the realm of assisted human reproduction, had started in Sweden in 1982.\(^5\) In vitro refers to a technique where eggs are fertilised by sperm outside a woman’s womb. The fertilised egg is then put back into the uterus with the intent of achieving pregnancy. The technique was pioneered by embryologist Robert Edwards and gynecologist Patrick Steptoe and resulted in the birth of the first “test-tube” baby, Louise Brown, in 1978.\(^6\) By the time the Gene-Ethics Commission had started its work, 6 IVF babies had been born in Sweden.\(^6\) In the course of using IVF, there was a production of excess embryos, and many countries lacked legislation or guidelines as to what should be done with these. The Gene-Ethics Commission faced a number of problems that were directly

---


59 The first IVF baby was born in 1978.


61 This information was provided by Per Olof Jansson at kvinnokliniken, Sahlgrenska sjukhuset, Göteborg. Incoming letter, 06-19-84, vol. 3, the Gene-Ethics Commission Archive, NA.
related to IVF embryos. The main issue was to determine if research, involving human embryos, was morally acceptable. Another had to do with the possibility of using preimplantation genetic diagnosis, PGD, to establish inherited characteristics. This question was tangled up with prenatal diagnosis, but it meant diagnosing the embryo even before it was implanted in the uterus. PGD meant expanding the repertoire of techniques for controlling reproduction and for making reproductive choices, as did prenatal diagnosis generally. The IVF embryos also raised the issue of using gene therapy on germ cells as well as on early embryos and this opened up for a discussion about “manipulation” of not only specific individuals, but of future generations as well. It was feared that gene therapy could be used to “design” humans to satisfy specific desires and needs, as well as altering the genetic make-up of future generations. Internationally, these issues were dealt with for example in the 1982 U.S. report *Splicing Life* and the British Warnock Report, *A Question of Life*, presented for the British Parliament in 1984.62

The Gene-Ethics Commission made a distinction between using gene technology for research and using it for “practical purposes”, that is clinical medical practice and industrial production.63 This was a distinction that repeatedly collapsed, since most uses of gene technology – at this time – were limited to research. The ethical problem therefore presented itself as a question of what scientists should be allowed to do in order to seek and produce knowledge, that is, should there be any limits for the pursuit of science? The most controversial issue the commission had to deal with was how to regulate experimental research on human embryos, which did not necessarily involve artificially modifying DNA, and decide on the acceptability of human gene therapy, which did.

*The Ugly Face of Misconduct*

How was the commission to grapple with the ethical risks posed by gene technology? What was it that justified such alarm? What was it that society needed to be “prepared for”, in Gerhard Miksche’s words?


One important decision to make was whether the man-made recombination of genes was a “natural” or an “unnatural” practice? This was not an irrelevant question, since the commission’s terms of reference had stated that it was the “artificial” changes of hereditary characteristics of living organisms that was the main focus. One argument put forward in the late 1970s had been that the production of “hybrid organisms” in the laboratory was unharmful since it had its equivalent in nature, that genes naturally could move across normal genetic barriers between species. This argument was used in order to downplay the alleged uniqueness of recombinant DNA technology, as well as its unnatural dimension. This was done in the context of regulatory choices; was recombinant DNA technology so unique as to warrant profound legislative restrictions, or could it be safely incorporated into already existing health and safety laws? Another argument put forward for not treating recombinant DNA technology differently from other technologies, was to stress its role as just another refined version of old breeding techniques, thereby highlighting its traditional (“culturally natural”) dimension.64

These arguments could not be used when discussing modifications of human DNA. Quite the opposite, historical undertakings made in the name of human breeding could not be taken as a guarantee for the “naturalness” of for example gene therapy. In a similar vein, eugenics was ruled out on the basis that the quest for the improvement of human populations had been proved to be morally corrupt. A clear distinction between the eugenics of “old times”, and the individualised and democratic medical genetics of “our time”, was made.65 No doubt about it, the techniques had been dramatically improved in terms of realising eugenics goals, compared to the bluntness and ineffectiveness of sterilisation operations. This only strengthened the importance of putting eugenic anxieties to rest. The ethical risk of misconduct made in the name of science needed to be mastered. The press had been telling stories about both positive eugenics – the power to select (already at the embryonic stage) and breed wanted individuals, and negative eugenics – the advanced tools to get rid of, or re-design (genetically manipulate) unwanted people. So the question about how “natural” gene technology was, when applied

64 In 1982, science journalist Peter Sylwan formulated it as “The first human being ever to have fallen asleep after eating fermented fruit, was intoxicated by biotechnology.” Peter Sylwan, Bioteknik – vår sköna nya värld? (Stockholm, 1982), 70.
to humans, could not easily find support in the historical records. Instead it was by emphasising the importance of ethically committed and enlightened medical researchers and doctors that the threat of eugenics could be overcome.

As the focus had come to rest on the use of gene technology, and especially recombinant DNA technology within medical research, ethical risks were seen as generated from within that practice. This framed the problem of ethical risks in two ways. Firstly, it focused on research methods. Secondly, the risk of societal moral breakdown was boiled down to a problem of the social responsibility of scientists. This was done by driving in a wedge between and older, morally corrupt eugenics and a younger ethically oriented medical genetics. However, what in the final report seemed to be a clear-cut case between “then” and “now”, was not so obvious for members of the commission. For example, the chairman Bertil Wennergren said in a media interview that it was “not against nature” to improve human beings by modifying their genes, provided that, in the future, this would be the only option for survival. He declared he wanted these questions to be treated with great openness and “without taboos”. Some people responded and described this as an “irresponsible” attitude, including one of the commission members, Kerstin Anér. In the same paper, Wennergren clarified that he had meant that nature did not provide ethical grounds for rejecting germ line modifications. However, the commission came to the conclusion that gene therapy on germ cells or embryos could possibly be accepted (in a distant future) only for medically motivated treatments.

If the ethical risks of gene technology were about scientific misconduct, then the question of control had to be solved by finding ways to regulate scientific practice. Ulf Pettersson, one of the commission’s medical experts, declared in a number of the weekly technical magazine Ny Teknik in 1984, that there was a regrettable tendency in Sweden to forbid everything that

---

66 Dag Bjerke, “Gen-experiment ej naturstridigt”, Dagens Nyheter, 04-29-82.
68 Birgit Andersson, “Bertil Wennergren: Avsteg i nødsituationer”, Ny Teknik, 06-29-83.
69 Kerstin Anér believed that this standpoint proved that Bertil Wennergren’s views on the matter had not been influencing the commission conclusions. Letter from Kerstin Anér to Kerstin Persson, 11-15-83, vol. 2, the Gene-Ethics Commission Archive, NA.
could potentially lead to misuse.\textsuperscript{70} In the same magazine the journalist Jan C. Aschan embraced a more open attitude towards the use of gene technology. For Aschan, every kind of regulation seemed to be posing a threat to scientific development.

Is it not time to regulate gene technology research in order to prevent the gene technology workshop from getting out of control? Should one not in the name of humanity forbid parts of it? Certainly, one should not. For it is only through the acquisition of knowledge that we have an opportunity to learn about risks and manage them. Not through ignorance. That insight is prevalent among the gen-ethics commission’s members. That is good.\textsuperscript{71}

This still begged the question: Could there actually be any real safeguards against blatant misuse of science? Several scientists had pointed out how unreasonable it was to demand a situation of absolutely no uncertainties in the case of gene technology, a the position taken by chairman Bertil Wennergren as well:

The technical possibility of manipulating hereditary entities – the genes – so that the characteristics of future generations will be altered, the intelligence improved or the propensity toward aggression diminished, is extremely remote, but it does not prevent ‘unscrupulous’ researchers to try to solve that problem. All the proposals and recommendations of ethical commissions throughout the world would not change them.\textsuperscript{72}

The commission settled for a set of ethical norms (presented in the next section). In concrete terms, how were these ethical norms to be institutionalised? What was the best way of controlling or avoiding misconduct? Should the principles be formulated as laws decided on by

\textsuperscript{70} Maria Hammarén, “Har vi rätt att manipulera med människans arvsanlag, Ulf Pettersson?”, \textit{Ny Teknik}, 01-19-84.


Parliament, as governmental provisions to regulatory authorities or as more loosely institutionalised norms to be guiding medical ethical committees around the country? One member, the politician Göte Ekström (Cen), said in a newspaper interview:

Personally, I think we will get some kind of legal regulation. There is a political motion proposing a constitutional amendment for the protection of the integrity of human life. But it can also be a question about formulating a law that will regulate who is going to monitor the use of this technology. It is important that legislators are ahead of the technical development.

On the front page of the paper *Dagen*, in August 1984, just before the commission’s deadline, it read: “Differences of opinion prolongs proposal about gene technology: Researchers prepared to fight against regulations.” This was exactly what was at stake. Could these norms be translated into laws, thereby risking putting a halt to further research and medical progress?

The main problem was to decide if gene technology was different enough to call for new legislative action. In many respects, the novelty of recombinant DNA technology was emphasized in the report. But when it came to discussing safety, the dominant idea was that these issues had already been dealt with during the 1970s. The idea was upheld that recombinant-DNA technology in that sense was an “old” technology. But the question was no longer about risks related to health and the workplace environment, it was about ethical risks. Recombinant DNA technology applied to humans, could not be said to be either “old”, or “natural”. There was a belief that the commission had had to break new ground in order for it to assess the ethical dimensions of gene technology. Now, did the novelty of recombinant DNA technology in ethical terms give the commission an incentive to propose regulatory legislation? The answer

---


74 Magnus Ramstrand, ”Oenighet i genetikkommittén: Vilka lagar ska dra gränser för gentekniken?”, *Dagen*, 08-29-84. Translation of: ”Oenighet fördörjer förslag om genteknik: Forskare beredda att slåss mot regleringar.”

75 Letter drafted by Holsten Fagerberg, undated, vol. 3, the Gene-Ethics Commission Archive, NA.
was yes. The technology was new enough, only too new. Rapid changes in the development of gene technology were taken as an argument for speaking against legislations in the field. Was it even possible to predict what sort of activities these norms were meant to restrict or forbid? Some scientists, like biochemist Peter Reichard, preferred to wait and see. “When we know if and when it (gene therapy) becomes possible, we can evaluate what it entails. Concerning both benefits and risks. Until then it must be correct to avoid all inhibitions, as the commission does.”

The commission didn’t want to risk putting politicians in a situation where they had to change the law every other year. Instead, it was believed that a set of ethical norms could be implemented more flexibly. The commission stated that: “The advantages of ethical norms compared to legal norms are primarily that the ethical norms can more smoothly be adapted to new developments and unpredictable situations.” In a media interview Bertil Wennergren said that a separate regulatory law for gene technology would be too rigid and might hinder medical progress. Instead, it was up to the ethical committees tied to the medical university faculties to provide for the implementation of these ethical norms. In 1985, Kerstin Anér (Lib) said, on the other hand, that the only reason for not suggesting laws was that ethical norms would be much more effective. “We concluded that there was a better chance of our proposed rule to function in practice, if it was included in the ethical rule system, than by turning it into formal law. No other reasons than that made us refrain from proposing a law.” It is evident from records of commission meetings, however, that it was a serious concern not to impede medical research by introducing legislation.

The choice between ethical norms and laws, also meant a choice
between a more direct political control and scientific self-regulation. It was not until the very end that the commission members could agree on these issues. In one memo, the medical ethical committees were described as based on trust, not control. The power to decide ethical questions came to reside in the hands of the medical ethical committees throughout the university landscape. Up till 1983, no cases of embryo experimentation had been handled by these committees. It was also these committees that were expected to put the new ethical norms into operation. Trust was placed on the self-regulatory arrangements already institutionalised for medical research and the instruments for political control was hereby limited. The commission, however, did propose a law that would give the National Board of Health and Welfare the authority to issue guidelines and approve of permissions for DNA and RNA analysis.

Factual Ethics for Ethical Fact-Makers

The commission tried to establish what it called an “ethical platform”. This was done by drawing on already existing ethical norms as they had been codified in different official statements and international agreements, e.g. the United Nations’ Human Rights Declaration from 1948, the World Medical Association Declaration of Helsinki from 1964 and the International Ethical Guidelines for Biomedical Research Involving Human Subjects from 1982, formulated by WHO and CIOMS.

The commission also discussed ethical norm theories (deontological versus teleological), differences between inherent value and instrumental value, and how to understand the relation between facts and values. Ethics was defined as follows:

Ethics is about making decisions informed by knowledge and good reasons. However, the ethical reflection is about something more than

---

81 Memo, Systematisering av diskussionsunderlag betr etisk kontroll, 03-04-83, vol. 1, the Gene-Ethics Commission Archive, NA.
82 According to professor Ove Broberger from the Medical Research Council. He informed the commission about the regional ethical committees. Minutes, 04-06-83, vol. 1, the Gene-Ethics Commission Archive, NA.
83 SOU 1984:88, Genetisk integritet, 222.
84 CIOMS, Council for International Organizations of Medical Sciences and WHO, the World Health Organization.
The link between facts and values was said to be a necessary condition for making ethical judgements. The question was not if ethics should be influenced by facts, but how facts influenced ethics. It was thus concluded that facts should underpin ethical judgements. According to the final report, the imperative of getting the facts right, was especially important for an ethics applied to the fundamental processes of life itself.\textsuperscript{87} A model for how to arrive at valid ethical judgements was presented as following a progression of steps; from facts to values, to norms, legislation and ultimately control.\textsuperscript{88} An ethical analysis was rational (based on facts) and could provide arguments for its value judgements. It occupied therefore, according to the commission, a legitimate and sovereign sphere, separated from politics and religion. “Both in relation to religion and politics, ethics occupies an area in its own right. Ethical solutions must be based on well-grounded facts and values.”\textsuperscript{89} Ethics was also understood as something that went beyond “subjective thinking” and “individual values”.

What then, were the “facts” of gene technology and what sort of values would the commission base its decisions on? After going through all the official documents referred to earlier, one single common view presented itself to the commission. It was the idea about an intrinsic human value. This idea was said to lie at the root of a humanistic perspective, which also involved a definition of humans as free, responsible, creative and social individuals. The idea about an intrinsic human value that could not be tampered with, was described as an axiom which could not be proven or motivated. This axiom was distilled from documents that articulated arguments from specific historical and cultural time periods, but nevertheless went “beyond” this. In 1983, Bertil Wennergren was reported to have said that the commission had chosen to settle for a way to view

\textsuperscript{86} Ibid., 107. Translation of: “Etiken handlar om att fatta upplysta och av goda skäl styrda beslut. Den etiska reflektionen innebär dock något mera än intellektuell hantering av fakta. Den rör sig i kraftfältet mellan gott och ont och det innebär att i den etiska reflektionen ingår även värderingar.”

\textsuperscript{87} Ibid., 108.

\textsuperscript{88} Ibid., 13.

\textsuperscript{89} Ibid., 105. Translation of: "Både i förhållande till religionen och politiken har etiken ett eget frihetsområde. De svar den kommer fram till skall kunna motiveras av skäl som bygger på välgrundade fakta och värderingar.”
humans that he believed most people would be able to subscribe to. However, the idea that human beings were essentially free, responsible, creative and social collided with views represented in scientific fields such as sociobiology and behaviourism. According to the commission, these disciplines could not provide any guidance on ethical problems, particularly when it came to considering the status of human beings. The sociobiology debate of the 1970s brought into focus the explicatory value of biological knowledge for understanding human nature and human behaviour. But in order to discard certain (biologically informed) perspectives as irrelevant, the commission also discarded the sciences on which these views were based. What might have been a potential conflict was effectively avoided by a simple exclusion manoeuvre. This was not about choosing among contradictory evidence or “facts”, it was about seeing only certain knowledge claims as evidence. For the ethical statement about intrinsic human value to be valid, certain biological or behavioural theories had to be rejected, among those one stemming from the very discipline the commission was meant to set ethical boundaries for, that is, genetics. In an article published after the release of the commission report, Kerstin Anér (Lib) wrote:

> With an audacity bordering on foolhardiness we made clear that we did not believe in any of that [sociobiology and behaviourism]. I willingly admit that every philosopher, not to say theologian hearing this, will shake their heads in despair. You cannot argue like that! No not in a thesis. But what is a poor commission to do? 

Instead the commission saw the idea of inherent human value as a historical and cultural fact. “What is ethically acceptable is only what can be supported by good causes and arguments, which in their turn evidently have to be based on those facts and values that are not called in question

---

92 For a comprehensive overview, see Ullica Segerstråle, Defenders of the Truth: The Battle for Science in the Sociobiology Debate and Beyond (Oxford, New York, 2000).
in our cultural sphere.” However, as had been stated previously, ethics was meant to be something else than politics and religion. The “cultural sphere” the commission drew upon, where certain facts and values remained unquestioned, was apparently expressed in the aforementioned formal documents. What bearing did this ethical platform have on the assessments of the ethical risks of human embryo experimentation, when taking as a point of departure the idea of an inherent human value?

In order to decide if researchers would be allowed to carry out experiments using recombinant DNA technology or other gene technologies on human embryos, the commission had to decide whether this constituted a violation of the idea of an intrinsic human value. The tricky question was when exactly – at what stage of development – a fertilised egg assumed the moral status of a human being. Several alternatives were presented. Its moral status could be fixed to the point of conception, that is after the egg and sperm have fused to form a zygote and the whole unique genetic makeup has been fixed. Another alternative was to attribute human value to the pre-embryo as it was implanted into the uterus (up to seven days after conception). The stage of implantation could be thought of as providing conditions for an actual, real life, development of the foetus. Another suggestion was to set the limit some time after that, for example after approximately 14 days, when the embryo developed the first elements of a neural system and hence the prerequisites for consciousness. Or should the moral status of the embryo be linked to and harmonised with abortion legislation, where free termination of pregnancies was allowed up till 12 weeks after conception? Was there any ethical difference between a three-months-old foetus and a three-days-old embryo? The commission decided to draw a line at 14 days after conception, but experimented with different ways of motivating such a limit for a long time.

The idea of human inherent value did not in itself stipulate exactly in what cases it applied, or if there were any exceptions from the rule. Looking at how the status of the foetus was treated in the context of abortion

---

95 SOU 1984:88, Genetisk integritet, 105. Translation of: “Endast det är etiskt acceptabelt som kan understödjas av goda skäl och argument, vilka givetvis måste utgå från de fakta och värderingar som inte är ifrågasatta i kulturkretsen.”
96 Fertilised eggs that were left-overs from IVF (In Vitro Fertilisation) treatments.
97 The Swedish abortion legislation, SFS 1974:595.
98 Working material on ethical norms, version 1–3, vol. 1, the Gene-Ethics Commission Archive, NA.
made it even more complicated, since abortion legislation was based on ideas about women’s rights to their own bodies, and bodies included foetuses. The commission grappled with the problem of reconciling these contrasting views, resolving this “ethical paradox”, by stating that the situations were incomparable. In the case of abortion, an embryo or fetus was removed in a situation of emotional and physical distress. In the case of embryo experimentation, these embryos had been created to bring children into the world. But trying to support the so-called humanistic view with biological knowledge was definitely no easy undertaking either. Again, the axiom that needed no evidence or motivation – the idea of an intrinsic human value, was here linked to a biological argument; even though biology did little to clarify the issue.99

Instead of the 14 days limit, religious representatives championed the alternative of attributing human value to embryos from the point of conception.100 This was also what some of the referral answers pointed out as the most intuitively clear standpoint.101 Interestingly, they also based their argument on biology, that is, the fusing of egg and sperm constituted for them a human being, since the whole individual genetic makeup was established from that moment and onwards. However, in order to decide when in the embryonic developmental stage the idea of inherent human value gained relevance, it was not sufficient to back it up with solid biological argumentation. It was also a question of establishing a limit that would make it possible for medical research to (continue to) perform experiments. This became clear as the commission motivated what would become its first declared ethical norm (the 14 days principle).102 In this way, the needs of medical and biological science influenced and set the boundaries for what was regarded to be ethically acceptable. It was important not to hinder research by unnecessary restrictions. This somewhat more pragmatic view was advocated by chairman Bertil Wennergren. “The question of human life is a practical issue. One has to take it for what it is. If you think it is reasonable to use gene technology to cure genetic diseases,
one can disregard whether you call it human life or organism.”

The commission arrived at a set of ethical norms which consisted of fairly detailed accounts of what could be allowed or not. Three norms specifically had a bearing on the issue of embryo research, and gene therapy, numbers 1, 2, and 7.

1. Research and experiments on zygotes and embryos are acceptable, provided that they are medically well founded, that they are performed within 14 days after fertilization (freezing time not counted) and that the donor of eggs and sperm has given her/his free and informed consent. Embryos in vitro must not be allowed to develop after 14 days of age.

2. Human zygotes and embryos exposed to experiments must not be implanted and developed in vivo.

7. If gene therapy on human sperm, ova, zygotes and early cells (blastomeres) is possible to perform in a reliable way, and implantation is to be considered, then the operation must come under a severe ethical examination which should include full knowledge of all the consequences.

This meant that the commission’s ethical platform, that is its belief in an inherent human value, was meant to set certain bounds to the free conduct of science. Research on embryos, as long as they were medically well founded, was allowed up to a certain point in time. After that, the idea of inherent human value could be endangered, and further research could be construed as misconduct. The second norm made it possible for the commission to free itself from the haunting perspective of a eugenic rebirth. It made it impossible to implant an embryo that had been subjected to experimentation to develop in vivo, that is, inside living women. This meant that whatever designer babies could come out of research experimentation, they had no way of “growing up”, as it were. However, the caveat in the seventh norm, that gene therapy on human germ cells as well as pre-embryos could be accepted in the future – provided that experiments would be performed in reliable ways and be subjected to ethical scrutiny and include full knowledge of all the consequences – nevertheless opened up for exactly that. The “leap hole”

103 Arby, ”Jag tror att gentekniken”. Translation of: ”Frågan om mänskligt liv är en praktisk fråga. Man får ta det för vad det är. Tycker man att det är rimligt att använda genteknik för att bota ärfliga sjukdomar, så kan man bortse ifrån om man kallar det mänskligt liv eller organism.”
104 SOU 1984:88, Genetisk integritet, 23–24.
in the seventh norm was pointed out as unacceptable by certain referral bodies. The argument was that in order to protect the inalterability of the human genome of future generations, it needed to be clearly stated that gene therapy on germ cells or embryos was prohibited.\footnote{Referral answers, Agency for Social Affairs and Health, 06-26-85 and SMER, 03-20-87, vol. E1A:1988, Regeringsakter underserie A, Socialdepartementet, NA.}

The ethical discussions in the final report, as well as the proposed 14 days principle was generally approved of by different referral bodies. Very few explicitly objected to the ethical argumentation as such, other than saying that it was inconsistent and non-binding. But the connection between the ethical analysis and their practical consequences was by some considered fuzzy, as well as the justification for choosing to draw the line at 14 days. On behalf of the medical faculty at Göteborg University, Ulf Lagerkvist, professor of medical and physiological chemistry, wrote that: “The suggestion to restrict the time limit for experiments involving human zygotes and blastomeres to 14 days after conception, regardless of the ethical motivation, can be accepted with regard to the fact that this is the estimated time (freezing time uncounted) possible to keep them alive in vitro with today’s technology.”\footnote{Referral answer, Medicinska fakultetsnämnden, Göteborg University, 04-23-85, vol. E1A:1988, Regeringsakter underserie A, Socialdepartementet, NA. Translation of: “Förlaget att begränsa tiden för experiment med mänskliga zygoter och blastem till 14 dygn efter befruktningen kan, oavsett den etiska motiveringen, accepteras med hänsyn till att detta är den ungefärliga tid (frystiden oräknad) som dessa med dagens teknik kan hållas vid liv in vitro.” The commission knew about this since Ove Nilsson from the department of medical cell biology, Uppsala University, informed the members on a commission meeting that it was possible to keep blastocysts alive in vitro for about 2–3 weeks. Minutes, 12-09-83, vol. 1, the Gene-Ethics Commission Archive, NA.}

But even though the chosen limit was perceived of as arbitrary, it did not cause any direct objections from the medical community. One reason for that might have been, if we are to believe the statement of Ulf Lagerkvist, that experiments were not even practically possible to carry on with after around 14 days. So, what had started as a
risk of moral breakdown if society did not control this newly developed technology, ended up equating what was ethically acceptable with what was practically possible. Never was the rhetorical gap wider between correct and incorrect uses of science, and never could the practical divide so easily be bridged.

With still one year’s work ahead of them, the commission decided to publish an interim report presenting preliminary results. The report was discussed on October 26, 1983, at a public hearing where 70 guests participated. The motive was to “test” the ideas the commission had come up with and let them be subjected to public scrutiny. During the hearing, many participants were critical to certain aspects of the report, but generally the critique was not directed toward its basic argumentation. The commission had hoped to be able to create a broader public interest than what they actually achieved. One reason for wanting to include the public, was that the members of the commission felt as if the questions they had on their table were far too important and serious to be handled by a group of politicians and experts.

What we do with gene technology touches upon issues about the inner meaning of life and its value. That can not be solved by a handful of politicians together with a few experts. A broad societal participation is needed. If we do not have a common view on human dignity and human life, society can not stick together.

Again, the idea became clear that the preservation of the whole societal moral foundation depended on how the commission solved its assignment. According to media reports, the initiative with a public hearing was much appreciated, though. The ethicist Jarl Hemberg commented in *Dagens Nyheter*: “How many commissions tasked to deal with delicate issues have worked so exemplarily openly?”

---

In the interim report, not only technology already in use, but also future applications, such as gene therapy and reproductive cloning were addressed. A dilemma the experts had faced was how to discern credible predictions from wild speculations. During the public hearing in 1983, one participant commented on the commission's decision to include a discussion about human reproductive cloning in its analysis. This person told the panel that he/she thought it was “embarrassing” that it took human cloning seriously. The commission believed, on the other hand, that cloning had been in the media spotlight, and that it deserved to be taken seriously. With hindsight, the interesting thing here is not that human cloning would soon shake off the degrading term “science fiction” and enter the fine halls of ethical deliberations, but that the judgement of what sort of future applications were likely to be realised was highly intertwined with judgements about what the public needed to know and how it would react to certain information. Brita Åhman, author and journalist, also reacted negatively to the preliminary report, and to the role of the chairman Bertil Wennergren particularly. She was concerned about the report misleading the public.

Has Wennergren, by virtue of his chairmanship, consciously or unconsciously tried to influence the public to believe that a human development prompted by research, is something beneficial, humane and desirable? Does he try to manipulate the public to think that it should be a societal duty to give birth only to children who, if genetically engineered, can be guaranteed to become elite children?

Brita Åhman was also critical of politician Kerstin Anér’s role in the commission – she accused her of fantasising wildly about possible applications of gene technology, one of them being the commercial prospect of breeding human–monkey hybrids as work slaves. Åhman

---

112 Minutes, 02-25-82, vol.1, the Gene-Ethics Commission Archive, NA.
113 Notes, Referat av hearing rörande genetikens tillämpning på människa, 03-08-84, vol. 2, the Gene-Ethics Commission Archive, NA.
114 Memo, Genteknikens tillämpning på människa—reaktioner på en diskussionspromemoria, 06-03-84, vol. 1, the Gene-Ethics Commission Archive, NA.
116 Motion 1980/81:352, Kerstin Anér, om genetisk manipulation på människor.
called for more technical expertise, as well as a definition of ethical competence different from the one the commission, or the government, had settled for. In the meantime she did her best to raise general awareness about (what she thought) were issues in need of public debate.117

Concluding Remarks

As the Gene-Ethics Commission embarked upon its mission, the ethical risks of gene technology had become a political concern. The moral foundation of society was at stake, and time was pressing. It was important to be ahead of technical development, instead of letting it lead society in unwanted directions. The commission not only had the task of mapping the moral fibre of Swedish society, putting ethical norms to work in the area of human gene technology, but it also needed to decide how (or if) legislation could be formulated to guarantee an ethically sound practice of gene technology.

From the outset it was clear that the scientific community, or industry for that matter, could not be expected or trusted to handle these matters on its own. The regional medical ethical committees were relatively young, the first one established at Karolinska institutet in the middle of the 1960s. These committees were still being tried out and evaluated. Both the sociolobiology and nuclear power debate of the 1970s and early 1980s had called into question the benign character of new technologies, as well as the legitimacy of biologically informed understandings of human beings as social creatures. Politics was believed to have a role to play here, since values were at stake, not neutral technical facts. However, the very fact that the commission formulated ethical norms was seen as bordering on inappropriate politicisation. For example, the commission felt the need to justify that the chosen ethical norms had been initiated politically, not by the scientists themselves.118 But how could ethics and gene technology be integrated to become “gene-ethics”, and how could the inherent potential conflict of politicisation and scientification be resolved? The problem was resolved in two stages.

Firstly, by introducing a new sort of player who had been firmly institutionalised academically and throughout the international policy

landscape, that is, by equating ethics with ethics as an academic discipline. By also relying on official medical codes of practice, what was construed as “ethical” in relation to gene technology was equated with already existing medical ethics. The issue was understood, at least partly, as a problem for ethical experts to address. The commission could be seen as taking social and moral responsibility for gene technology, without compromising its scientific basis. In this way, anxieties about ethical risks could be addressed without simultaneously compromising the authority of the institution responsible for producing the knowledge and technology in the first place. It was not ideology speaking to science, it was one area of expertise speaking to another area of expertise.

Secondly, ethics was attributed a status of objectivity, even though it dealt with values. It was said to be based on facts and rational reasoning and was separated from ideology, subjective thinking and religion. Even though, at some point, the commission asserted that facts and values were interlinked, it was predominantly a one-way process. That is, values were influenced by facts, but facts could not be value-laden, or more correctly, they were treated as if they were neutral. One example to the contrary was the facts produced by sociobiological research, which were abandoned all together because they didn’t support a humanistic view. However, this was never fully acknowledged as a problem. On a general level, ethics and gene technology were never meant to collide. A humanistic view, stripped of its historical, ideological, religious or cultural origin, could eliminate the threat of misconduct in the name of gene technology. As an illustration of the public “success” of this fusion of ethics and gene technology, the newspaper Falu-Kuriren reported in April 1984 from a public lecture attended by medical expert Ulf Pettersson and ethical expert Holsten Fagerberg, under the heading “Gene Technology in Sweden: Technology and Ethics go hand in hand”. It was a factual ethics for ethical fact-makers.

The introduction of ethics in gene technology discussions was crucial for the establishment of gene technology as an issue related to politics as well as the general public. This reinforced the growing belief that the public should be granted a position and a possibility to express its views. However, the public was often not meant to directly influence decisions. Rather, “politics”, “society” or the “state” was believed to

counterbalance the interests of the scientific community as well as of industry by representing the public interest. As opposed to what had been the case in the recombinant DNA debate in the 1970s, concerns were now seen as stemming from the general public, not the scientific community. For example, in the case of deciding the moral status of embryos, the commission guessed that the public would be against embryo research as such.\textsuperscript{120} The concerns scientists had expressed almost ten years earlier in the international recombinant DNA controversy had not been focused on ethical, but on environmental or health risks, risks that were now judged to be fictional or exaggerated, whereas ethical problems remained to be solved. This idea was often formulated as a call for more open debates about different gene technology applications. One manifestation of this was the arrangement of the public hearing in 1983, when the Gene-Ethics Commission presented preliminary conclusions and suggestions. Here the commission gave the public a chance to have a say in the matter. Turning from risks to ethics meant that the whole gene technology “problem” could be redefined, in a broad sense, as belonging to the public. This did not mean that any energy was spent on investigating what the public actually thought about gene technology, as would later be the case in the 1990s, but it meant that any talk about ethics included an idea about a public whose interests and concerns were important. The public was still in 1984 a rather anonymous and absent media figure.

In the report \textit{Genetisk Integritet}, the commission’s own ethicist, the theologian Holsten Fagerberg, clearly made his mark. He was responsible for most sections that more systematically dealt with ethics.\textsuperscript{121} His line of reasoning had a clarity and acceptability to it that seems to have been well received by the media.\textsuperscript{122} The Faculty of Medicine at Linköping University said about Fagerberg’s influence that “The ethical sections seem to have been significantly coloured by the personal opinions of the

\textsuperscript{120} Working material on ethical norms, version 2, Vol. 1 the Gene-Ethics Commission Archive, NA.

\textsuperscript{121} This is evident if we compare what he said in the media with the formulations in the report, see Holsten Fagerberg, “Holsten Fagerberg om genterapi: ‘En osäker framtid’”, \textit{Dagens Nyheter}, 11-12-83.

commission’s own ethical expert.” Fagerberg did not escape criticism completely, though. For example, after taking part in a conference in 1982 where he spoke about ethical models and ethical reasoning, an attending reporter, Jörgen Eriksson from *Dagens Nyheter*, came to the conclusion that all ethical experts should be abolished:

I learned from the symposium’s ethicists that formal ethical competence by no means is incompatible with meaningless, spineless drivel. Of course, there exist no such things as ethical experts. [---] Get rid of the non-existent experts! Ethics belongs to us all – if not, the foundation of our social existence will collapse. Not only Fagerberg, but also the ethical credibility of Kerstin Anér (Lib) and the union representatives were questioned publicly. The journalist Brita Åhman and scientist Lars Rutberg called for the participation of people with a “documented” ethical way of thinking and a proven sense of social responsibility. As a result they inferred that “In principal the commission could include everything from social scientists and midwives to poets and metal workers.” Kerstin Anér felt compelled to defend the very ideas that the governmental commission relied on. Including “just anyone” would definitely open up for inappropriate politicisation.

Instead, as we all know, Members of Parliament call on different experts and listen to them and try to accommodate as many views as possible. The opinions later expressed by the commission members rest on a much wider basis than what single members brought into the marriage, so to speak.


125 Brita Åhman and Lars Rutberg, ”Vad vet ombudsmännen om etik?”, *Dagens Nyheter*, 04-07-82. Translation of: ”I princip skulle kommittén kunna innehålla allt från samhällsvetare och barnmorskor till poeter och metallarbetare.”

126 Kerstin Anér, “Vi är tvungna att ha åsikter: Är gen-etik något för riksdagsmän?”, *Dagens Nyheter*, 04-17-82. Translation of: ”I stället går det som bekant så till att riksdagsmännen och de andra kommitteledamöterna kallar in experter av olika sorter och lyssnar på dem och försöker få med så många olika synpunkter som möjligt. De åsikter som sedan uttrycks av kommittén vilar alltså på betydligt vidare underlag än vad
These reactions all show that the professional status of ethicists at this time, in a regulatory context as this, was not evident. To the contrary, critics accredited ethical competence not to people with academic training in ethics, but to us all, or “anyone”. It also shows that enrolling ethicists and simultaneously pointing to the fact-based elements of a correct ethical analysis, could end up being perceived as too technocratic.

The commission work can be seen as a pattern of forking paths where each choice of path seems to have been prompted by contextual contingencies. Reproductive cloning was believed to be highly “fictional”, but as a concession to public anxieties, it was dealt with in the commission report. The prohibition of human cloning was also what a number of newspapers pointed out as a main result of the commission work. The use of germ cell or embryo gene therapy, on the other hand, was believed to lie so far into the future that it did not need to be forbidden. Lack of knowledge about future prospects could be taken as an argument for postponing regulatory decisions. Many referral bodies came to the opposite conclusion, that a lack of knowledge called for a more direct political intervention. The decision to allow embryo research up till 14 days after conception was in line with judgments made by other countries at the time, but it could not find solid support in biology, ethical models or codes, or existing legislation. As it turned out, the 14 day limit coincided with what was possible to do in the laboratory at the time, so what was ethically acceptable was related to what was practically possible.

The commission could address ethical concerns but still research was being continued. It also refrained from proposing laws with reference to the rapid pace of technological innovation. Seen as a boundary organisation, the Gene-Ethics Commission balanced on the border of science and politics. It claimed that politics had a right to influence the conduct of science by initiating and deciding on ethical norms that the research society would need to conform to. But it left the task to the medical ethical committees to implement those norms, and it did not (in the case of embryo research) propose norms that would, at least for some time, entail any practical restrictions for existing research.
Aftermath

From 1984 to 1987 there was a dip in media coverage of gene technology, and without much fuss, the regulations from 1980 were weakened. It took the government six years to formulate a bill on the basis of the Gene-Ethics Commission report. By 1988, the Ministry of Health and Welfare let the Medical Research Council (MFR) make an update analysis of the report’s technical content. MFR concluded that the report’s description of gene technology was still correct, but that the development of the PCR method (Polymerase Chain Reaction) needed to be taken into account.

From 1984 to 1990, new governmental commissions were appointed that also dealt with issues pertaining to medical ethics. SMER, the Swedish National Council on Medical Ethics, was constituted in 1985 and functioned as an ethical advisory board to the Swedish government. Lennart Daléus (Cen), previously working for the Gene-Ethics Commission, was one of the people growing increasingly impatient with the long delays. He was to become a central figure of the Gene Technology Commission, which had already started working when the governmental bill was accepted in Parliament in 1990. For some time, Daléus had actively tried to bring political attention to biotechnology related issues. In January 1990, he expressed his disappointment with the long political delays in the newspaper Svenska Dagbladet.

Due to paralysis with regard to this topic, a situation has been created where Sweden lacks norms, boundaries and legislation. The development of modern biotechnology has generally not been accompanied by public debate, legislation and authorities taking responsibility. For more than five years, the report of the commission, “Genetisk integritet”, which in

127 This decision was preceded by a report, Ds A 1984:5, Behövs hybrid-DNA-kontrollen? (Stockholm, 1984).
128 This was mentioned in a Referral answer, MFR, 10-19-88, vol. E1A:1988, Regeringsakter underserie A, Socialdepartementet, NA. PCR is a technique for rapidly making millions of copies of specific DNA segments, requiring only small genetic materials. PCR has had a profound impact on life science research. See Paul Rabinov, Making PCR: A Story of Biotechnology (Chicago & London, 1996).
When the bill finally came in the autumn of 1990, it proposed two new laws regulating the use of gene technology in public health investigations as well as in research and treatment using human fertilised eggs. In line with the Gene-Ethics Commission, the bill approved of the continuation of embryo research up to the 14 day limit, forbade implantation of such embryos in a woman’s uterus and stipulated that experiments could only take place after the donors of eggs and sperm had given their informed consent. Research on human somatic cells and germ cells were also given a green light. Experiments with fertilised eggs aimed at achieving hereditary genetic effects were ruled out as forbidden, something that the Gene-Ethics Commission had not definitely excluded from what might become permissible in the future. According to the proposed laws, using gene technology in public health investigations required a medically well-founded motivation, permission from the National Board of Health and Welfare and again, informed consent from the participants.

However, the bill diverged from the analysis done by the Gene-Ethics Commission in one important respect, by proposing laws. The GEC had put its trust in the medical ethical committees established throughout the university landscape, even though these committees were not themselves regulated by law. With the new bill Sweden imposed a regulatory system that bore similarities to the British Human Fertilisation and Embryology Act of 1990.

Before the bill had been accepted in Parliament, it had been scrutinised (as is procedure) in a parliamentary committee, the Committee on Health and Welfare. The majority of the committee members supported the bill,

---

132 Governmental bill 1990/91:52, om användning av genteknik på människa, m.m.
but as many as 26 reservations were attached to it. The committee stated that “Like the Minister for Health and Welfare and before then the gene-ethics commission, the committee thinks that if research and experiments with fertilised eggs become possible on these conditions, important knowledge can be gained without compromising the humanistic view.”

In the media, the bill was discussed as providing political means to impose limits and restrictions on the freedom of science. Industrialist Bertil Åberg, who had been a strong advocate of recombinant DNA technology in the late 1970s, thought it was remarkable that the scientific community had not reacted against this “inappropriate regulation”. In 1990 Bertil Åberg and Lennart Daléus were portrayed as being on opposite sides on the gene technology issue, for or against stronger political control.

In Parliament, reflecting the political dividing lines in the parliamentary Committee on Health and Welfare, the question was rather if the proposed laws should not have “gone further” in order to safeguard against ethical risks of gene technology. Over fifty motions had been submitted on the subject, most of them opting for more explicit formulations on the inalterability and integrity of the human genome. These motions also showed what had been an emergent, but by now established, battle line between, on the one hand, the Left Party, the Green Party and the Centre Party, and on the other, The Liberal Party, the Social Democratic Party and the Moderate Party. This political positioning was built on a combination of what has been coined a “green” and a “blue” resistance to gene technology, uniting the concerns of the Left, Green and Centre Party. The green resistance primarily stems from environmental concerns, and the blue from concerns about human dignity and of a “right to

135 Reservations were made by members of the Center Party, the Left Party and the Green Party.
136 Committee report, 1990/91:SoU10, *Användning av genteknik på människa, m.m.* Translation of: "I likhet med socialministern och dessförinnan genetikkommittén anser utskottet att om forskning och försök på befruktade ägg blir möjliga under dessa betingelser kan angelägen kunskap vinnas utan att verksamheten kommer i konflikt med den humanistiska människosynen."
138 Annika Boltegård, “Paradis...eller mardröm?”, *Land*, 01-05-90.
life” principle, often expressed in the context of religious beliefs. Interestingly, these dividing lines crossed the typical Swedish Left and Right political blocks. The support for science and technology in general and the belief in scientists as guardians of the common good, was a more salient feature of Social Democrats, Liberals and Moderates. The resistance was more heterogeneous, but it pivoted on arguments for stronger state interventions, demands for more tangible benefits, and a wish for ethical norms to be “ahead of” technical development. Ingela Thalén, the current Social Democratic Minister for Health and Welfare, believed that the Governmental bill provided grounds for the latter. She said in a media interview that “Even if it generally is unusual to legally forbid activities which do not yet exist, I consider it to be justified in this case.”

When debating the bill in Parliament, it became clear that several political members thought the government could have been even more cautious, referring to the “delicacy” and “difficulty” of ethical problems. This was done, however, by the same actors who thought it best to decidedly and firmly establish political boundaries around gene technology, and to send clear messages about the unacceptability of certain activities. For them politics came to occupy a legitimate space for giving strength to ethical qualms. Ulla Tillander, speaking for the position of the Centre Party, painted a dystopian picture of ethical values fading away when faced with real economic values. This picture was so frightful, in Tillander’s view, that it should be rejected completely. Foreboding what would be a hot topic ten years later in the stem cell debate, Tillander cautioned against a gradual normalisation of human embryo experimentation. She also opened up for a discussion that would be less motivated by consensus on these matters. “I do not think we should ignore the possibility of confrontations on these issues. In fact, they are welcome. It can mean that for once we need to fight for the human values Swedish society allegedly stands for.”

142 Proceedings in the Chamber, Användning av genteknik på människa, m.m., 03-06-91, address 1.
143 Ibid., address 5. Translation of: ”Jag tycker inte att vi skall bortse från möjligheten
representing a different standpoint than the party as a whole, said that: “With all political questions, but perhaps most notably with this one, no one can say that I am right and you are wrong, but there are arguments for both standpoints.”

In the Chamber debate, the nature of ethical issues assumed a shifting character. On the one hand, they were matters that could only be dealt with individually, based on each and everyone’s conscience. No “rights” or “wrongs” could be established and it was not even appropriate to do so. But on the other hand, political measures to make sure that misuses of gene technology could be avoided, was exactly what was asked for. This opened up a question that had not been explicitly discussed before; what role did politicians have to play in the articulation of ethical norms? Were they there to represent citizens and the general public (or fractions of it), and/or were they meant to represent a certain ideology or party policy, or maybe the research community?

Ingrid Hemmingsson (Mod), stressed that the new laws would give scientists some peace and quiet to conduct their work, undisturbed by “misguided” debate and suspicion. In her view, it was important that politicians acted as promoters of all the good things gene technology could bring to humanity. Hemmingsson gave voice to an understanding of the “ethical” in relation to gene technology that would gain more ground as time passed, namely that the “ethical” needed to be taken out from the sphere of problems and concerns, and into the sphere of possibilities and hopes. Annika Åhnberg (Lft), herself by then a political member of the Gene Technology Commission (as was Ingrid Hemmingsson), also explicitly raised the question of the role of the politician. She emphasised what she saw as a gap between the public and the scientific community.

What role does society play? What is the political task? I would not like to say that we, as politicians, should stand between researchers and the

---

144 Ibid., address 14. Ingrid Ronne-Björkqvist had submitted a private member motion where she rejected the bill in its totality. Motion 1990/91:525, Ingrid Ronne Björkqvist (Lib), med anledning av prop. 1990/91:52 Användning av genteknik på människor, m.m. Translation of: ”Det är så med alla politiska frågor, men kanske alldeles särskilt med denna, att ingen kan säga att jag har rätt och du har fel, utan det finns argument både för och emot.”

145 Ibid., address 13.
public. And I do not think it is the role of politics or legislation to pass on researchers’ opinions to the public, or vice versa. The political task, and the role of legislation and regulatory systems, is to make co-existence possible and to find a way to positively recognise research and development. [---] As politicians we do so on the basis of ideologies, naturally. My basic ideology, which I think many share with me, is that this knowledge and this research should be used to meet people’s needs.  

This gap between the public and the scientific community to which Annika Åhnberg referred was to become of more central importance for the Gene Technology Commission, appointed in 1990. The core conflict for the new commission to solve was no longer about how to bring a humanistic view in harmony with the methods of medical and biological research, but how to eliminate the tension between an increasingly sceptical public and a growing gene technology sector. This happened at the same time that policy-makers, scientists and other stakeholders tried to find ways of reassuring themselves about the safety of releasing genetically modified organisms into the environment. Providing a solid basis for addressing these issues was, among other things, a task for the Gene Technology Commission.

GMOs Coming Out of Laboratory Closets

In the late 1980s and early 1990s, hybrid organisms, or what was now often called genetically modified organisms, GMOs, re-entered the political regulatory agenda. During the 1970s, recombinant DNA technology was primarily a technique for producing genetically modified microorganisms, mostly bacteria. Now higher organisms, such as plants and animals, came into focus. The Gene-Ethics Commission had mainly been struggling with gene technology in medical practice and research, such as genetic diagnosis, gene therapy, and human cell and embryo experimentation.

Although recombinant DNA technology had still been important when the commission addressed these issues, especially in the case of gene therapy, the commission never dwelt for long on the prevalence of GMOs. Now, knowledge and skills necessary to produce genetically modified plants and animals had improved, and this changed the political and scientific parameters of gene technology. It now became part of an environmental discussion which brought into focus much more than possibly contaminating microorganisms that might leak out from research laboratories. Now the question was how to handle genetically modified organisms that had been designed to survive in environments outside laboratories. Perceived risks and benefits were related to issues about what would happen when GMOs were intentionally released into the environment, not what could happen if they by accident escaped their laboratory containments. The key question was if such GMOs could do environmental harm, by virtue of being evolutionary innovations. GMOs were understood as being problematic in both ecological and ethical
Medical research and treatment had been the main focus of the Gene-Ethics Commission of the early 1980s. Conversely, in the first half of the 1990s, agriculture superseded medicine as the backdrop against which public debate and political analysis were carried out. Even though gene technology at this time was used mostly within research settings, the interest turned towards the benefits and dangers of cultivating or growing GMOs for commercial purposes. This also put focus on the marketability and demand side of GMOs – whom were they for? If GMOs were to be released into the environment deliberately, it had to be for a good cause.

The growing biotech industry marketed biotechnology as a “green” technology, as opposed to older dirty and polluting industrial technologies. It was also said to improve efforts to come to terms with global issues of starvation and malnutrition. Critics believed laboratory crafted organisms to be inherently harmful, unnatural, and posing threats not only to the environment as such, but also to what was seen as a sustainable agricultural production. At the time the Gene Technology Commission started working, contained field trials had already begun, both in Sweden and in other countries. A Swedish application from the plant breeding company Hilleshög AB for growing oilseed rape had been approved of in 1989. The ongoing field trials were reported on in the paper MiljöAktuellt under the heading “The chemical society.” The article addressed the issue of producing herbicide tolerant crops, and the desirability of the type of agriculture these crops entailed. This was a topic that would become increasingly contested during the 1990s as big multinational corporations marketed not only genetically designed crops, but also the herbicides to go with them.

Going from contained laboratory experiments to planned releases and industrial-scale applications, meant dealing with uncertainties that neither science nor regulatory policies were equipped to handle as matters of routine. What on a molecular level seemed to be a precise and predictable incision, became much more complex as altered organisms

entered uncontrolled environments. How to deal with these uncertainties became a major problem for policymakers in Sweden as well as in many other countries. Deficiencies in the current state of knowledge lay at the root of the European adoption of the “precautionary principle”. Compared to the U.S., European regulation saw gene technology as a process to be regulated, whereas the U.S. policy regime had chosen to handle gene technology as a generator of products. As gene technology products, they could be treated by regulatory authorities in the framework of other products and substances. It was up to the authorities to establish if these products had substantial similarities to other products. In Europe, the simple fact that a product had been produced through a process of genetic modification, qualified it for special policy treatment. Throughout the 1990s, the U.S. “took the lead” in approving GMOs for field trials, environmental releases, patents, and marketisation.

As possible objects of commercialisation, GMOs also highlighted the role of intellectual property law and spurred debates over the suitability of patenting “life”. In stark contrast to the U.S. situation, European controversies related to biotechnology patents were directly linked to questions of ethics. This caused long delays during the 1990s in the drafting of new legislation for the European Union. Swedish patent practice was already tied to international agreements and conventions, such as UPOV, The International Union for the Protection of New Varieties of Plants, WIPO, the World Intellectual Property Organization under the UN, and the EPC, European Patent Convention, in force since 1977. EPC’s Article 53 provided exceptions from the category of patentable inventions, on the basis of ethics. EPO, the European Patent Office, had received an application for the so-called “oncomouse” in 1985, a mouse genetically modified to develop cancer, and denied it in 1989 under Article 53. While the Gene Technology Commission was up and running, a new oncomouse application had been filed, but no decision had yet been taken. The oncomouse case signalled gene technology’s potential for doing harm to the welfare of animals and counterbalanced the positive argument that modifying laboratory animals genetically would in fact decrease the number of animals needed for research.

In Sweden, patenting living organisms was rejected publicly on ethical grounds by both politicians and NGO representatives. They advocated

---

4 Jasanoff, Designs on Nature, see for example chapter 2 and 4.
5 Ibid., 217–218.
the view that patents were, ultimately, political, and that the socialist
government in power needed to start treating them as such and not secretly
succumb to commercial interests.\textsuperscript{6} The fact that restrictions in patent
practice could be used to regulate gene technology, was something that
Sten Niklasson, director general of the Swedish Patent and Registration
Office, publicly objected to in May 1990.\textsuperscript{7} Whether intellectual property
law was a tool for achieving political control over biotechnology and
whether ethical considerations were to be taken into account when
approving or denying patent applications, remained at the core of these
discussions throughout the 1990s and into the new millennium.

The Swedish Environmental Protection Agency had alerted the
National Board for Recombinant DNA technology in 1988 about these
new topics, and the Ministry of Agriculture, Food and Fisheries had
produced an analysis of the current situation for transgenic animals and
plants.\textsuperscript{8} The author of the report, Madeleine Emmervall, emphasised
that a lot was happening internationally and nationally in the area and
that the state needed to improve and expand its regulatory oversight. She
also made several recommendations as to what guidelines an empowered
Recombinant DNA Board would follow. For example, research involving
gene technology on animals that would serve as food or pets, would most
restrictively be seconded by the authorities. It would be prohibited to
produce transgenic animals (for food and pets) if it involed increased pain
for the animal, if inserted genes originated from foreign species, including
humans, or if the modification aimed at enhancing yield or growth.\textsuperscript{9}

Most importantly, Emmervall meant that the state was not in control
of the situation, since it had no way of monitoring what was happening.
Therefore, she proposed new regulatory measures for control of GMOs,
e.g. requirements of notification and licensing. She also concluded that
the animal protection law would not fully cover all the ethical problems
that arose in the wake of transgenic animal production.

Emmervall’s report came shortly before the European Community
issued two directives for contained as well as deliberate releases of

\textsuperscript{6} Inga Lantz et al., “Är djur en upfinning?”, \textit{Dagens Nyheter}, 02-02-89.
\textsuperscript{7} Sten Niklasson, “Genteknik kan användas positivt: Etiska aspekter bör inte leda till ett
förbud mot patent på genteknik, menar Sten Niklasson”, \textit{Svenska Dagbladet}, 05-22-90.
\textsuperscript{8} Ds 1990:9, \textit{Genteknik –växter och djur .}
\textsuperscript{9} Ibid., 75–78.
gene technology at stake

GMOs. These directives were meant to create a European harmonisation of regulatory policies, and Sweden had to find ways to incorporate these directives into Swedish law. Six years before, a one-man commission had concluded that recombinant DNA technology was safe, and a few years later the obligatory notification and licensing requirements for conducting certain recombinant DNA technology experiments had been withdrawn. This period of de-regulation had not caused much debate, but in 1989 the media announced that Sweden because of it had become a “free zone” for gene technology.

In Parliament numerous motions were filed which called for a broad political gene technology oversight. The Centre Party, the Left Party and the Green Party, all agreed on two urgent political initiatives. They advocated the introduction of a temporal moratorium on deliberate releases of GMOs and the prohibition of patenting living organisms. Barbro Westerholm, heading the Liberal Party’s biotechnology section, called for a more well-structured biotechnological policy. She urged the current Socialist government to appoint a commission that would consider the whole gene technology area, propose legislation and deal with the specifics of ethical problems. The Liberal Party and the Moderate Party did not want to go as far as imposing a moratorium on deliberate releases, but they acknowledged that Swedish regulation needed to be analysed and improved. As a result of the “seal election” of 1988, the Green Party had gained seats in Parliament. Environmental issues were highly topical and gene technology’s role as a generator of environmental risks came to be the dominant political framing. The Socialist government appointed

13 Motion 1989/90:Jo616, Lars Werner et al. (Lft), Biotekniken; Motion 1989/90:Jo617, Olof Johansson et al. (Cen), Bioteknik – med respekt för livet; Motion 1989/90:Jo622, Roy Ottosson et al. (Gre), Genteknik på människa.
15 Motion 1989/90:Jo607, Bengt Westerberg et al. (Lib), Miljövärdering av den moderna biotekniken m.m.; Motion 1990/91:Jo606, Sven Eric Lorentzon et al. (Mod), Genteknikens tillämpning på växter och djur.
16 The death of a great number of seals in the Baltic Sea, believed to be caused by industrial pollution, coincided with the election.

**Getting to Grips with Uncertainty: The Gene Technology Commission**

The Gene Technology Commission, as the name in itself suggested, had a broad investigative scope. In the terms of reference, four major areas of inquiry were pinpointed as being especially urgent to work with. The present state of knowledge concerning ecological risks of deliberate releases of GMOs needed to be mapped and knowledge gaps had to be identified. Principles for ecological risk assessment were to be formulated as well as ethical principles for what could be accepted or not. The commission also had to make recommendations on future organisational control, such as procedures of notification and risk assessment. Finally, the commission was asked to address general questions in the area of intellectual property rights.

As with the terms of reference for the preceding Gene-Ethics Commission, the rapid development of gene technology and its possible implications for a diverse array of fields—plant and animal breeding, drug development, medical diagnosis, industrial applications, environmental protection etc.—were cited as a reason to call for a comprehensive overview of the gene technology field as such. Knowledge about ecological risks was judged to be “very limited”. The fact that gene technology sorted under a whole set of different governmental agencies also motivated a re-assessment of how the future control system would best be organised. Of special interest was the existing National Board for Recombinant DNA Technology, in operation since 1980, a central advisory agency tasked to promote safety, give advice, keep check on new technological developments and alert the government if new applications could be called into question. However, the rapid development, the lack of knowledge about ecological risks and the decentralised existing control system, were not the only explicit reasons for appointing a new commission. Gene technology, it was said, brought to the fore a set of “difficult” questions, that is, ethical questions. These questions concerned human

---

17 Commission terms of reference, Dir. 1990:16, Beredning för frågor rörande användning av gentekniken.
responsibilities for nature and the future of mankind. The “delicacy” of these issues made it necessary to secure a broad participation from all political parties in Parliament. The commission was placed under the Ministry of Justice.

Framing the Work

The broadly defined directives caused many internal discussions concerning the framing of what the commission work was all about. At the first regular commission meetings, several issues that would repeatedly resurface in the internal discussions for the next two years, were already on the table. These issues involved the naming of the commission, if it needed additional experts with other competences, if gene technology applied to humans (in addition to microorganisms, plants and animals), should be included in the analysis and if the commission should call for a moratorium on deliberate releases of GMOs.

What would the commission call itself – the gene technology commission or the biotechnology commission? Interestingly, the arguments put forward for choosing between the terms “gene technology” and “biotechnology” were not solely related to an understanding of what sort of activities the concepts referred to. Two political members, Annika Åhnberg (Lft) and Lennart Daléus (Cen) opted for biotechnology on the basis that this concept was more encompassing and in line with current debate. Medical expert Ulf Pettersson suggested that the term biotechnology, on the one hand, could exclude important applications such as prenatal diagnosis, whereas on the other hand, certain activities would be included that shouldn’t be, like certain microbiological industrial applications. Two other political members, Ingrid Andersson (SocDem) and Inger Hestvik (SocDem) declared that gene technology would be a more suitable name since it had a more direct impact on the public. The naming procedure involved both how to limit the questions the commission had to study and solve as well as giving the right signal to an imagined audience. On October 24, 1990, the secretariat had prepared a memo discussing the pros and cons of choosing between the proposed names – gene technology or biotechnology. The secretariat opted for calling the commission

18 Ibid.
19 Notes, 09-06-90, 09-12-90, vol. 1, the Gene Technology Commission Archive, NA.
20 Memo, Beredningens namn, 15-10-90, vol. 1, the Gene Technology Commission
“the gene technology commission”, for two reasons. Firstly, the name biotechnology was considered too vague. Secondly, the fact that the directives specifically pointed out gene technology, not biotechnology, was seen as “a solid reason” for picking that alternative. But, as a kind of compromise, the memo stated that choosing the name gene technology, would not allow for an exclusion of any relevant question. Until the end this proved to be a tricky issue to solve. Annika Åhnberg (Lft), Lennart Daléus (Cen), and later Annika Bladh (ChrDem) kept on insisting that it would be more appropriate to choose the name biotechnology, which is shown in their added reservations to the final report. Since the preference for “biotechnology” coincided with the generally more sceptical standpoint these politicians represented, the term was clearly not politically neutral.

The commission had at its disposal a long row of experts (see appendix). Annika Åhnberg (Lft) nevertheless wanted more experts to be consulted, experts with a background in the environmental movement, trade unions and LRF (the Federation of Swedish Farmers). Later in the autumn it was decided that no supplementary experts would be contacted, but that specific experts could be consulted on specific occasions. It was also considered impractical to include more experts, since it would make it difficult to bring all together for joint meetings. In Parliament, politician Roy Ottosson (Grn) addressed the issue of the overall composition of experts within the commission. He declared that:

Among these experts there is no representative of the environmental movement, the farmers or the trade unions. On the contrary, the major part of the expert group either benefits from giving biotechnology free hands, or they have an documented uncritical attitude to the development in the area of biotechnology we have had up till now.

What Roy Ottosson did, calling into question both the disinterestedness
of experts as well as the imbalance of represented interests in the commission, was not well received by the Minister for Justice, Laila Freivalds (SocDem). In her answer to his question she called him “rude” for questioning the experts’ ability to independently and impartially carry out their work. Rude or not, the commission had been set up as an expert-heavy organisation, largely recruited from the areas of natural science, ethics and law. Most of them held university positions or were tied to governmental ministries or authorities. Other social groups were denied a place at the negotiation table, but were consulted at specific commission meetings and as referral bodies. Hence, the gene technology commission deviated from the longstanding corporativist tradition of Swedish politics.

In addition to wanting the commission to be named the biotechnology commission, and to expanding the use of experts, Lennart Daléus (Cen), Annika Åhnberg (Lft) and Kerstin Persson (Grn) also requested that the commission should propose a temporal moratorium on releases of GMOs until the commission had finished its work. Several experts objected to this suggestion, advocating a rather different ground for action. For them it was important to get an overview of existing practice first, before a moratorium could be set in place. For those in favour of a moratorium it was exactly the lack of knowledge that motivated it in the first place, otherwise “the development would get out of hand”. The primary concern was to avoid unknown risks. For certain experts this involved several problems of specificity; a moratorium would risk putting a ban on all existing activities, that is, not only new ones. Charles Kurland, professor of molecular biology, gave a concrete example of what he considered to be an absurd problem they might face: “[I] eat yoghurt that contains genetically engineered bacteria from Japan. Is a moratorium meant to involve a control of [my] faeces?” A moratorium was feared

26 The Left Party and the Centre Party filed motions which addressed the issue of insufficient expert representation. Motion 1990/91:0627, Annika Åhnberg et al. (Lft), Genteknikberedningen and Motion 1990/91:50529, Lennart Brunander et al. (Cen), Genteknik.
27 Minutes, 09-12-90, vol. 1, the Gene Technology Commission Archive, NA.
28 Notes, 09-06-90, 09-12-90. Translation of: “utvecklingen springer förbi oss”, quoting Lennart Daléus.
29 Ibid. Translation of: “Han äter yoghurt som innehåller gentekniskt framställt
to delay the whole process of coming up with a regulatory framework for gene technology. For Parliament to instruct the government to issue a moratorium, it would need to be preceded by a thorough investigation of ecological risks and ethical principles, that is, exactly what the commission was assigned to do. The minutes do not provide any direct clues about how the commission members reasoned, but it is evident that their views differed considerably on this topic.  

When the commission members started working, they were still pending the long-awaited governmental bill, stemming from the Genetic Integrity report in 1984. It finally came in the autumn of 1990, and resulted in two new laws regulating research on human embryos and the use of gene technology for general health surveys. There was a disagreement as to whether gene technology regarding humans would fit into the commission’s scope of investigation, and the directives did little to clarify the issue. From early on Lennart Daléus (Cen) wanted to be ready for an undertaking involving gene technology on humans, whereas others thought that would lead too far or that it had already been dealt with. However, it was not until the beginning of December 1991, that a formal decision put an end to this recurrent issue, by stating it to be outside the scope of the commission’s area of inquiry.

To sum up, these internal controversies reveal problems of deciding what the commission work was all about. Choosing between “biotechnology” and “gene technology” meant choosing what sort of signals to give to an imagined audience. Calling for a moratorium, meant opting for an offensive political approach, taking on a role as a whistle-blowing authority. The wait-and-see solution chosen, strengthened the “scientific” role of the commission, as it involved the traditional stance of suspension of judgement until all the facts were at hand, voiced by the commission experts. Complementing the existing group of experts with experts from other areas such as the environmental movement or trade unions, meant suggesting that expertise was not solely a question of providing facts. In fact, it could be about representing certain perspectives, such as being generally critical or optimistic about gene technology. Finally,
those in favour of including gene technology applied to humans in the commission work, testified to a wish to re-open the gene-ethics debate of the 1980s, whereas those against considered it to be, however temporarily, a closed case.

**Risk Assessment and Risk Communication**

The commission met on several occasions to discuss matters related to ecological risks. They were assigned to map available knowledge and to judge whether additional knowledge was needed to perform reliable risk assessments, as well as what principles to conform to. During the first year, several issues were still open to debate, whereas during the second year commission members predominantly discussed preliminary chapter drafts.

In the final report, a specific chapter dealt with ecological risks. The first part of it gave an overview of possible ecological risks and what sort of biological issues that needed to be addressed in order to understand and predict these risks. This section involved descriptions of possible evolutionary and ecological effects caused by releases of GMOs into the environment. Then followed a section about how ecological risks had been managed internationally, and lastly followed a section about how to evaluate and assess risks. This part was based on a paper written by the expert Torbjörn Fagerström (theoretical ecology) and experts Göran Hermerén and P.C. Jersild (medical ethics), called “The Risky Risk Assessment”.

In the autumn of 1990, the commission started to deal with ecological risks. Ulla Swarén, an EPA expert, suggested that a process of risk management involved three major steps. Firstly, a scientific risk assessment which involved purely technical questions. Secondly, an evaluation taking into account socio-economic considerations and thirdly, measures for risk reduction. Kerstin Persson (Grn) raised the question of what separated political assessments from scientific ones. In a letter to the members summarising existing literature, the secretary Charlotte af Malmborg, had discerned three areas which seemed to stand out in relation to the GMO problem. These were, according to her, the need to handle matters

33 In Swedish, “Den riskabla riskvärderingen”.
34 Notes, 11-22-90, vol. 1, the Gene Technology Commission Archive, NA.
35 Notes, 10-25-90.
on a case-to-case basis, to use specified criteria for risk assessments and to provide as much open information to the public as possible. The idea that people understood risks in different ways and that there was a difference between political and scientific risk assessments was up for discussion.

Göran Hermerén (Ethical expert): [I] want to go further than Torbjörn Fagerström and Lennart Daléus in the discussion on risk assessment and risk management. First, one should analyse consequences and probabilities, but one should also from early on address value issues. What sort of values are guiding us? There is a spectrum of both scientific and political values. On top of that, we have different opinions/judgements of risks.

Ulla Swarén (EPA expert): Risk assessment isn’t solely a mathematical concept.

Hans Gustafsson (SocDem): [I] appreciate Göran Hermerén’s way of reasoning and wonder how it could be achieved.

Göran Hermerén: The alternative is to completely cut out all values or to take them into account.

Annika Åhnberg (Lft): Values are important since they influence decisions. Who should make the decisions? [It is] important with laymen influence!

Torbjörn Fagerström (Ecological expert): One has to make a distinction between objective values and other types of values. It can be seen as a scientific interest to affect nature as little as possible. [...] Scientists are more objective than politicians. That is a question that should be elucidated separately.

The cited section revealed several persistent problems related to questions about risk assessment, risk management and naturally, risk regulation. Göran Hermerén was the one stressing the importance of values for

---

deciding what could be considered as risks and how risks should be evaluated. He suggested that values could be guiding even the “technical” task of mapping probabilities for certain scenarios and the consequences of them. On the other hand, he made a distinction between “political” and “scientific” values. He also stated that an alternative to dealing with value issues was to cut them out completely, which can be interpreted as if he considered that to be a possibility. Annika Åhnberg’s response to Hermerén’s analysis, was very telling indeed. First she stated that “values are important since they influence decisions”. Then she went on to ask “who should make the decisions”? It is possible to read that comment as if values made it more legitimate to ask this question in the first place. Had it been only about objectively handling probabilities, then risk assessment would not influence decisions in any other way then providing neutral facts. Instead, values opened up for politics. If values were an essential part of the risk assessment process, then it was called for to ask “whose values”? Whose values should be democratically represented in the decision making process? The answer was, for Åhnberg, laymen’s values. Here a link between values and the public was strongly reinforced as a way of handling these issues democratically. But it could only be done if values, instead of facts, were the main priority. Whilst a technocratic understanding of risk assessments here was about to collapse, the following comments once again put it back in place. Torbjörn Fagerström said that one needed to distinguish between objective values and other values. The dividing line between scientific and political risk assessments was not that one was based on values and the other one wasn’t, but that the scientific one was based on “objective values” as opposed to “other values”. Hans Gustafsson (SocDem) ended the discussion by concluding that scientists were more objective than politicians.

In the memo _The Risky Risk Assessment_ prepared by the secretariat, but based on memos from three experts, the most elaborate analysis of the process of risk assessment per se, as well as about how/if values impinge on it, was presented. The document also made explicit important assumptions about the public. In the very first paragraph it was stated that people are always afraid of the unknown, and since biotechnology for many people is fairly unknown, it can be a cause of concern. Therefore, laymen pose questions to the experts, as they want to know whether something unpleasant might come out of biotechnology applications. The experts can never give laymen the answers they are looking for, namely that no
risks exist with a certain application in a certain context. The paragraph ended with the sentence: “To live and exist involves risks.”

Laymen’s views in general, were thus said to be determined by fear. Laymen were not knowledgeable and their attitude towards what they did not know anything about (the unknown) was characterised by fear. To juxtapose “people” with “scientists” or “researchers” so that we got the sentence “Scientists are always afraid of the unknown”, would in this context look odd. A second important assumption was that people were said to demand or want a situation with no risks whatsoever. This was, accordingly, presented as an unreasonable demand, because, “to live and exist involves risks”. Clearly, what distinguished the public was that it lacked the necessary knowledge to base its judgements on something else than fear, and this involved making unreasonable demands about safety, pressing experts for answers they could not provide. It was also established that there existed a pertinent difference between “experienced risk” and “scientifically estimated” risk. As scientifically estimated risks could only be legitimately defined by scientists, the only option must be to interpret this to mean that “experienced” was equated with something outside scientific reasoning, maybe again risks perceived through a veil of fear. Values were, we were told a bit further down, influencing risk assessments, and it was important to show how they determined the outcome. “In this way decision-makers are given an opportunity to better see through a line of argument and avoid to fall prey to manipulations and group pressure.” A sound process of risk communication was hence characterised by its transparency. Not only did the public as such benefit from such a transparency, but also policy-makers could be guarded against manipulations in this way. If the value-base for assessing risks was explicitly formulated, policy-makers would be able to “see through” certain kinds of reasoning.

The mass media was targeted as an institution that could “distort” values. If the general awareness of this was heightened, efforts to “sabotage” the democratic debate about gene technology could be limited. Evidently, not all values were welcome. Some could have been subjected to distortion, and employing them would sabotage democratic debate.

39 Ibid. Translation of: ”Härigenom ges beslutsfattare en möjlighet att bättre genomskåda ett resonemang och undvika att falla undan för manipulationer och grupptryck.”
It was never acknowledged what these values were and who represented
them. However, it was considered important that everybody could make
their voices heard, and to do that required a special effort made by laymen
to acquire necessary knowledge.

The important thing to observe from a democratic point of view, and
concerning issues of power, is to what extent different groups have the
opportunity to make their voices heard in public debate. This concerns
both laymen and experts. Special efforts may be needed if laymen are to
be able to assimilate the complexity of this material, and take a stand on
these issues.\footnote{Ibid. Translation of: “Det som är viktigt att observera ur demokrati- och maktsynpunkt
är i vilken utsträckning olika grupper har möjlighet att göra sig hörda I debatten. Det
gäller både lekmän och de som är insatta i sakfrågan. Särskilda insatser kan behövas för
att även lekmän skall kunna tillgodogöra sig det komplicerade material som krävs för att
man skall kunna ta ställning till frågorna.”}

Conjoined with the idea of a difference between “experienced” risk and
“scientifically estimated” risk, the notion of “objective values” versus
“other values”, built up a strong case for accepting only values expressed
by scientific experts as legitimate. Given that, in a European context, the
political tension between environmental organisations and other NGOs
and networks of scientific and industrial actors was growing, very much
due to different understandings of risks, these memos on risk assessments
were far from politically uncharged. Maybe that is why these first
sections of the document were not included in the final report. When
the document was discussed, Lennart Daléus (Cen) objected to several of
the above mentioned paragraphs and Annika Åhnberg (Left) questioned
if the document as such fitted in the report at all. It might not be too
far fetched to assume that their constant emphasis on the necessity to
include laymen and representatives of advocacy groups in policymaking,
contributed to this understanding.\footnote{Notes, 10-09-91, vol. 1, the Gene Technology Commission Archive, NA.}

It is illuminating that the process of communicating risks was treated
as an essential part of the “risk problem” itself. If knowledge about
ecological risks was limited, then communicating knowledge about these
risks meant communicating a great deal of scientific uncertainty. Several
problems regarding risk communication were identified. These had to
do with presenting uncertainties, but avoiding misunderstandings. It was
also important to be clear about what sort of risks they were; self-inflicted
or involuntary, short-term or long-term, known or unknown, avoidable
or unavoidable. But the problem of risk communication was also believed to be pedagogical and ethical in kind. Pedagogically, the information needed to be impartial and expressed in an understandable language, but it should also infuse curiosity and interest in the audience. It was then stated that “It is unethical to act on the basis on insufficient information. It is also unethical to pretend that the available source material is better than it is.”\(^{42}\) To oversell science by masking areas of uncertainty would only make the public more sceptical. “People generally have a fairly good ability to see through when experts don’t know and try to sound surer of themselves than they actually are.”\(^{43}\) Again it was established that openness in terms of both the present state of knowledge and the values underpinning judgements, was a prerequisite for sound risk communication.

In order to be able to avoid misinterpretations and pseudo debates a distinct and clear terminology was called for. Preceded by a case scenario conceived by Torbjörn Fagerström (theoretical ecology), a procedure for dealing with risks was proposed which also later was included in the final report.

Ecological risks and how to estimate and assess them, did overlap to some extent with what was considered to be ethical issues. For example, in the final report it was stated that it was an ethical problem how to decide what an acceptable risk level was.\(^{44}\) The report also concluded that it was unethical to reach decisions if the knowledge base was poor, and decisions could be postponed.\(^{45}\) Later, the members would rely on the so-called Doctrine on Environmental Protection as a value system meant to be guiding ecological risk assessments. In a way, this Doctrine could provide grounds for reconciling both “scientific” and “political” values, turning a potential conflict between them into an effort to reach a common goal. All in all, no matter how hard it was for the commission to draw a perfect line between political and scientific risk assessments, they were able to end up with a recommendation for how such an undertaking...


\(^{43}\) Ibid. Translation of: "Människor har som regel rätt stor förmåga att genomskåda när experterna inte vet och föröker låta säkrare än vad de är."


\(^{45}\) Ibid., 102.
best could be handled, and settle on the “value system” represented in the Doctrine on environmental protection. They also concluded that knowledge about ecological risks needed to be better, but that this did not motivate prohibitions, such as restricted field trials. More experiments were needed, not less, to achieve certainty:

The commission states that existing knowledge about ecological risks related to GMO releases into the environment in many cases needs to be improved in order to render the effects predictable. However, the commission does not think that the present state of knowledge motivates a ban on such releases, on the contrary, it thinks it is important that ongoing research and development concerning GMOs and their use in nature continues.

We can read the discussion on risk management as an effort to provide means to reduce uncertainty. In the section about risk assessments, both in its drafted form and in the final re-written version, this uncertainty was said to stem from the newness of the technology, the rapidness by which it developed and the untested nature of its applications. But the uncertainty was also fuelled by the media who had the power to “distort values” and promote misinterpretations and misunderstandings among the public.

The belief that more scientific studies had to be conducted to better understand and predict ecological risks relied on the assumption that knowledge about ecological risks generated from gene technology applications, could be neatly separated from the actual applications as such. A majority of the experiments involving GMOs at this time were made in the name of science. One can say that one of the institutions generating risks (unintentionally or not), nevertheless became the same institution mobilised for overcoming them.

There seemed to be a general consensus that ecological risks needed to be taken seriously, that more research needed to be done, and that

---

46 Ibid., 122.


48 A questionnaire was sent out to a number of research institutions to map the prevalence of GMO experimentation, vol. 6, the Gene Technology Commission Archive, NA.
risk assessments should precede approvals of GMO releases into the environment. The commission’s explicit assumption that uncertainty made the whole risk assessment issue ethically problematic was something that made it stand out, in comparison to discussions in the neighboring countries Denmark and Norway.\textsuperscript{49} However, what consequences the present lack of knowledge would have for how to regulate gene technology, was something that not all commission members could agree on. Lennart Daléus, who was among those who had wanted the commission to recommend a provisional moratorium on deliberate releases, propagated publicly as well as internally in the commission, for a more offensive biotechnology strategy. “Of course, there is an environmental risk in the fact that thousands of new bacteria, plants and animals might now be produced that have never earlier existed on the surface of the earth and then let out in nature, a situation that we know far too little about.”\textsuperscript{50} “The uncertainty surrounding GMOs was for Daléus reason enough to tighten regulatory control. But within the commission there were others who saw no reason to presuppose that GMOs were particularly risky, one of them being Olle Bosemark, an expert on plant breeding. Instead, he wanted to speed up the cultivation of transgenic plants.

[The cultivation of] Transgenic plants in agriculture is completely uninteresting if they are not totally free. Certainly, there is a spread of gene material. That occurs today already. We must embrace the new technology. Otherwise the world’s population will starve to death. WHO has alarming numbers of decreasing grain supplies. We take on a heavy responsibility if we say no to the new technology. We must balance the pros and cons.\textsuperscript{51}

An often used argument by the biotechnology industry, was that the world’s population would starve to death if the products of biotechnology

\textsuperscript{49} Achen, Den bioetiske udfordring, 183.
\textsuperscript{50} Lennart Daléus, “Strategi för bioteknik behövs”, Skånska Dagbladet, 01-22-92. Translation of: ”I detta att man nu framställer kanske tusentals nya bakterier, växter och djur som aldrig tidigare funnits på jordens yta, och sedan släpper ut dem i naturen ligger naturligtvis en miljörisk. Som vi vet alltför lite om!”
The recommendations the commission presented in the end, can be seen as an effort to reconcile the idea that releases of GMOs should be prohibited since they “naturally” constituted environmental risks, in the view of Daléus, with the idea that transgenic plants in agriculture should be “totally free”, in the view of Bosemark. The solution was to improve the basis of scientific knowledge, hence the call for more scientific funding, to clear up among the many different conceptions about risk, to decide what phases of the assessment process that should be guided by scientific values and what by political or other values (and if they could be combined), and then to trust the procedure to do the trick—that is, to provide trustworthy and credible assessments.

The idea that gene technology was not to be regulated as such, but rather products generated from using the technology, was repeatedly discussed during several commission meetings. The argument that it was product properties that could be risky, not the technique itself was supported by many experts. According to the commission, singling out gene technology in a regulatory context could give a false signal about its harmfulness, as well as drive producers and researchers to use other, not as safe or efficient, technologies instead. On the other hand, the commission had to come up with a regulatory suggestion that would meet the demands expressed in the European directives on contained as well as deliberate releases of GMOs. Those directives did focus on the technique used to produce GMOs. A genetically modified organism was defined as an organism in which the genetic material has been modified in a way that does not occur naturally by mating or natural recombination.

After discussing the risks of releasing GMOs into the environment, and the substantial knowledge gaps in the field, the commission concluded that using GMOs could, in some cases, be risky and that some form of control was needed. This measure of control would not take the form of a framework law for gene technology, as had been the suggestion of several political parties, but instead involve more specified formulations in existing laws regulating the use of, for example, animal fodder, biological pesticides and pet animals. It would be up to central governmental authorities to prescribe permit requirements in detail. Emphasis was put on the importance of not unnecessarily burden biotech corporations with regulations.

---

53 SOU 1992:82, Genteknik, 199.
with bureaucratic tasks as well as the importance of providing Swedish companies, in comparison with other industrial nations, with good working conditions.\footnote{Ibid., 199, 202.}

How to Arrive at an Ethical Standpoint

As stated by the government’s directive, the commission was supposed to establish a set of ethical principles for how to deal with gene technology. Three ethical experts were recruited to work for the commission. Göran Hermerén, at the time professor of medical ethics, Anders Jeffner, professor of theology and P.C. (Per Christian) Jersild, a well-known medically trained author and columnist.\footnote{It is my impression that P.C. Jersild, not being an ethicist by profession, primarily functioned as an ethical expert. In the following, I will refer to these three experts as “ethical experts”, overlooking any disagreement that might exist about what can “truly” count as ethical expertise. The fact that ethical expert competence has not totally been restricted to people with a formal training in ethics, is of course interesting in itself. A similar categorisation was made by Stellan Welin and Birgitta Forsman in their analysis of the Gene Technology Commission. Forsman and Welin, \textit{Treatment of Ethics}, 9.}

Initially, there was some confusion as to whether new ethical principles were to be formulated, or if “old” ones could serve as well. The existing ethics for how humans should relate to nature was considered to be underdeveloped, as opposed to the already established and institutionalised medical ethics. In the end, most questions relating to medicine were excluded. Instead the Gene Technology Commission focused on gene technology applied to plants, animals and microorganisms. Throughout this process, three areas stood out; Man’s relation to nature, the ethics of transgenic animals and the moral legitimacy of patenting living organisms.

The job of delivering ethical principles and how to come up with them, was not a straightforward process. It involved choosing between different ethical models, deciding what principles would be suitable for gene technology applied to animals, plants and microorganisms, and also how to demarcate what counted as a proper ethical analysis. As a result, effort was spent on demarcating ethics as a special area of competence, and in doing so it was contrasted to laymen’s moral attitudes.

Faced with a current ethical problem, most people will have an immediate opinion based on their views as to what can be acceptable or not. Such
immediate opinions mirror values and attitudes fundamental to this person. These should be taken seriously, but for us to arrive at a well-grounded standpoint, it is both desirable and necessary with a more thorough analysis of the ethical problem per se.\footnote{Ibid., 115. Translation of: “Ställda inför ett aktuellt etiskt problem kommer de flesta att ha en omedelbar åsikt om vad som enligt deras resp. uppfattning kan accepteras och vad som inte kan godtagas. Sådana omedelbara uppfattningar speglar grundläggande värden och hållningar hos den enskilde. De bör tas på allvar, men för att komma fram till en välgrundad ståndpunkt är det både önskvärt och nödvändigt med en mera ingående analyser av det etiska problemet.”}

The commission proposed a strategy for how to reach ethical decisions that was meant to function as a sort of protocol for agencies and government officials when handling GMO applications. Ethical knowledge was said to be the result of an ongoing societal dialogue, a step-by-step gradual insight. No simple or given answers to the question of what would be acceptable or unacceptable environmental interventions could easily be articulated.

What was needed for the commission was a well-grounded standpoint, as opposed to immediate opinions. These immediate opinions mirrored personal values and attitudes, whereas a thorough analysis went beyond this. Furthermore, ethics was not to be conflated with “emotional outbreaks”.\footnote{Memo, Den riskabla risksbedömningen.} Now, who could provide this penetration of ethical problems in a way overcoming the emotional limitations of separate individuals, and on what basis would such an analysis be build in order for it to be well-grounded? Who was rational, conscientious and emphatic enough to take part in such an endeavour? In a discussion on proposed ethical norms for humans, doubts were expressed whether politicians were suited to the job.

\begin{itemize}
  \item **Ingrid Hemmingsson** (Mod): What is the point of the distributed ethical norms on humans?
  \item **Martin H:son Holmdahl** (Chairman): To make concrete certain issues related to research and production e.g. genetically manipulated animals for research and products respectively: […] [I] want to go beyond cliché questions.
  \item **Ingrid Hemmingsson** (Mod): [It is] hard for the members to take a stand. We lack sufficient knowledge.
  \item **Martin H:son Holmdahl** (Chairman): Avoid emotional standpoints based on insufficient information. […]
  \item **Ingrid Hemmingsson** (Mod): [I] want to base it on facts.\footnote{Notes, 09-02-91, vol. 1, the Gene Technology Commission Archive, NA. Translation}
\end{itemize}
Clearly, the ambition was to take a stand on the basis of facts. The unacknowledged view that political standpoints could either be the results of emotions running wild or a pondering over facts, was taken as unproblematic. There was a more or less implicit ambition to let ethical principles provide a political common ground, a way of achieving consensus in this contested area. For the ethical principles to be logically consistent, though, they could not accommodate too many apparent differences of opinion. The tension between “irrational” opinions and rational evaluations continued to be a source of conflict within the commission, which can be seen in the discussion on patenting transgenic animals and “life”.

The commission proposed a strategy for how to make ethical judgements. This strategy stressed the importance of openness and non-judgmental testing of ethical principles in practical, concrete cases. When using this strategy, the analyst needed to assess if the possible outcomes of different actions were in accordance with chosen ethical principles, and to contemplate whose interests would be served, or not, by accepting or rejecting specific applications.59

Tampering with Nature and Patenting Living Organisms

In addition to settling for the ethical strategy, the commission was also assigned the task to provide ethical principles for where to draw the line between acceptable and unacceptable gene technology applications. A key to an understanding of what ethics was about in this context, was the preoccupation with the novelty and originality of gene technology. As a starting point, for it to be subjected to ethical analysis, it needed to be original and new. Establishing whether gene technology was new and original, came to be a problem that had consequences for how the commission solved almost all of its assignments. Could GMOs produce new ecological risks, or were they better understood as well-known risks? Was the production of transgenic microorganisms, plants and animals a

---

new phenomenon in the context of traditional breeding, or was it similar? Was patenting a modified mouse or a gene different from patenting, say, a pharmaceutical drug? Was research using gene technology in need of a higher degree of societal control than ordinary microbiological laboratory work? The novelty of GMOs was discussed at a meeting:

Olle Bosemark (plant breeding expert): There is no stable boundary between what you can do with gene technology and with traditional methods.

Kristina Glimelius (plant physiology expert): Define principally new. DNA comes from many sources, but what is new is [to] synthesise DNA.

Lennart Daléus (Cen): The way in which organisms can be produced is new. Several members think it is principally new.60

The ethical analysis of the commission depended on conceptions of novelty and originality. Most experts claimed gene technology to be new and unique, but not new or unique enough to deserve special political treatment and attention. In line with this reasoning, ethical expert Anders Jeffner claimed on several occasions that gene technology applied to plants, animals and microorganisms represented no new ethical problems, though it "sharpened" old ones.61

The first time the commission met to discuss ethical principles, they pondered differences between ways of conceptualising nature, as well as man’s relation to it. Nature, it was proposed by Anders Jeffner, could be seen as valuable because it was useful for humans, or as valuable in its own right, having intrinsic value. These two views could, according to a presented scheme (shown below), be combined with another set of views – one saying that humans have a right to intervene in the order of nature and the other that humans should follow the order of nature. Anders Jeffner highlighted the apparent problem of reconciling an attitude saying that humans should follow nature with one saying that nature is valuable only insofar as it is useful for humans.62

60 Notes, 02-12-92, vol. 1, the Gene Technology Commission Archive, NA. Translation of: "OB Det finns ingen fast gräns mellan vad man kan åstadkomma med genteknik och på traditionell väg. KGI Definiera principiellt nytt. DNA kommer från många källor, men det nya är att syntetisera DNA. LD Sättet att framställa organismer är nytt. Flera ledamöter tycker att det är principiellt nytt."

61 Notes, 04-11-91, vol. 1, the Gene Technology Commission Archive, NA.

62 Notes, 10-25-90. Translation of: "Människan har rätt att ingripa i naturens ordning, människan skall rätta sig efter naturens ordning, naturen har värde genom att den är nyttig"
Humans have a right to intervene in the order of Nature | Humans should follow the order of Nature
---|---
Nature is valuable because it is useful to humans | 1
Nature has intrinsic value independent of its usefulness | 3

This was clearly meant as a pedagogical tool, and the same type of reasoning using what (on the surface, anyway) seemed to be a dichotomy, reappeared in the ethical discussion later on. According to Jeffner, there had been a general change of attitude amongst the public from 1 to 2, and many conflicts had their roots in the incompatibility of 1 and 2. He also detected a streak of “anti-science” sentiments as the views represented in square 2 combined. In this discussion, ecological expert Torbjörn Fagerström strongly objected to view 2 by saying: “As is the case with other scientific ecologists, I represent the opinion that nature is valuable whether it is useful for humans or not and that humans have a right to intervene in the order of Nature. (3) [I] am a bitter opponent to view 2.”

Torbjörn Fagerström did not need to become bitter, though, he was among several like-minded people. The combination of attitudes represented in square 3, was chosen as a point of departure for further deliberation. The commission settled for the Doctrine on Environmental Protection and the Doctrine on Reverence for Life. “The former stated that nature was valuable in itself, but that this view did not mean that humans could not use nature for the purpose of improving their living conditions. However, they could only do so if apparent and probable benefits were in sight, and without inflicting harm to people or animals.

---

3 Jeffner had been involved in previous work studying these attitudes.

63 Jeffner had been involved in previous work studying these attitudes.

64 Notes, 10-25-90. Translation of: "I likhet med andra vetenskapliga ekologer, företrädjer i stället åsikten att naturen har sitt eget värde oberoende av om den är nyttig för människan eller ej och att människan har rätt att ingripa i naturens ordning (3). Är hätsk motståndare till 2."

65 In Swedish, “Naturvårddsdockrinen” and “Doktrinen om vördnad för livet”.

for människan, naturen har sitt eget värde oberoende om den är nyttig för människan eller ej".
The interventions should not be of a “serious nature” or “irreversible”. The latter stated that all living things should be treated respectfully. In many ways, this analysis incorporated the questions it was designed to overcome for it was still a question of judgement how far one needed to go in order to inflict harm, what counted as interventions of a serious nature, how to draw a line between probable or unlikely benefits and what it meant to show reverence for living things. To what extent it could be ethically acceptable to “intervene in the order of nature” and what it meant to show reverence for life, was more or less boiled down to a question of the value of modifying different organisms’ genome. This can be shown specifically in the discussion on transgenic animals.

The issue of transgenic animals revolved around several different applications. One had to do with using animals for the production of substances deemed valuable for some reason. One current example was the successful experiment of getting transgenic sheep to express human anti-hemophilic factor IX in the milk, useful for patients suffering from haemophilia. Barbro Westerholm (Lib) had in Parliament asked the current Minister of Social Affairs, Ingela Thalén (SocDem), about what she intended to do in order to stimulate the production of anti-hemophilic factor IX. Ingela Thalén answered that this was a question to solve for the Gene Technology Commission, but reaffirmed Barbro Westerholm about her own positive attitude toward this kind of application. Westerholm declared she would “do her best” to advance this view in the commission, being one of its political members.66 Apparently she was successful in doing so, since the commission concluded that it was ethically defensible to use transgenic animals for drug production.

Another application had to do with producing transgenic animals for research purposes. The “oncomouse” referred to earlier, was an example of this, as was the use of so-called mosaic or chimera animals.67 Up to this point, mosaic animals had been constructed out of cells from animals of the same species. They were used to understand fundamental biological processes, such as the function of genes. Medical experts Jan-Åke Gustafsson and Ulf Pettersson both claimed that mosaics were indispensable for medical research.68 Here was a practice valuable for

67 Mosaic animals have more than one type of genetically distinct population of cells.
68 Notes, 04-11-91.
research, but which could do a lot of harm to the animals. At the ninth commission meeting, they discussed mosaic animals.

Lennart Daléus (Cen): Gene technology is good as a research tool but [we] don’t accept every new variety of it. Unacceptable methods have to be eliminated. [I] welcome a discussion about mosaics.[…]

Torbjörn Fagerström (ecological expert): All sensible researchers want to eliminate bad methods, but one has to be able to explain the reason for doing so.

Kerstin Persson (Grn): That’s why benefits and alternatives should be presented.

Torbjörn Fagerström: Scientist cannot present objective benefits of a certain method.

Ulf Pettersson (medical expert): Funding bodies require precise motivations to support research projects. [---]

Hans Gustafsson (SocDem): The question is not self-evident. [We] should think the wording through carefully. Things can be repulsive even if there’s no scientific explanation for it.⁶⁹

So the question was if mosaic animals, or indeed any other transgenic animal, could be “repulsive” in their own right, regardless of their benefits for science? Torbjörn Fagerström thought that scientific benefits could not be proven to exist in any given case, but that no responsible scientists would accept to work with “bad” methods. Hans Gustafsson (SocDem) opened up a room for assessing transgenic animals on the basis of emotions alone. In the end, the commission decided that only mosaic animals that were the result of using cells from animals of the same species were ethically acceptable.

Not much was said about the third application, gene technology as an enhanced breeding technique for both food and pet animals. It was said to be, for the time being, not of immediate interest.⁷⁰ Instead, the commission discussed the need for labelling foods containing GMOs. It concluded that it was a “justified” consumer claim to demand labelling,


⁷⁰ SOU 1992:82, Genteknik, 192.
so that consumers would have the opportunity to refrain from eating transgenic foods on the basis of ethics. Thus, it was not considered an ethical problem to produce transgenic animals for food consumption, but unethical not to provide consumers with a choice to resist this kind of food on the basis of individual moral attitudes. This was an issue that several referral bodies commented on, most of them in favour of labelling food products containing GMO. However, this was an issue that was only superficially touched upon by the commission, and later in the second half of the 1990s, it would become a much more urgent political problem.

The commission arranged a meeting with representatives from the animal rights and environmental movement, among others, where several people expressed doubts about the value of transgenic animals, recollecting the conclusions drawn just a few years earlier in Madeleine Emmervall’s report. Birgitta Carlsson, representing an animal protection organisation, expressed the view that animals could not be treated differently from humans, on the sole basis that they were animals. This was also an opinion expressed in the referral answer from The Swedish National Council on Medical Ethics, SMER. However, in SMER’s case, it was knowledge about genetic similarities between animals and humans, that made it complicated to motivate a clear ethical distinction between humans and animals. SMER called into question, as did many other commentators, whether the commission had succeeded in the effort to reconcile the idea that nature had an intrinsic value (including animals) with the statement that humans had a right to interfere or meddle with nature. Accepting mosaic animals was, according to SMER, a way of letting instrumental arguments take precedence over the idea of nature’s intrinsic value.

In the end, the commission did not propose any direct bans on the production of transgenic animals, except for the production of mosaic animals if using cells from different species. Instead it kept the door open for new applications, such as using animals to produce human proteins.

71 Ibid., 192.
73 Referral answer, SMER, 02-11-93, vol. 1, E1 A:2261, Commission Archive, Prop. 198, NA.
The commission put its trust in the already existing means of ethical control represented by the ethical committees of animal experiments which had been constituted in 1979. The animal protection law from 1988, that took as its point of departure the well-being of animals, was judged to be effective enough. Many referral bodies perceived a discrepancy between the commission’s belief in the principles of nature’s intrinsic value and the need to show reverence for all living things, and the actual recommendations concerning transgenic animals the commission came up with in the end. Ethicist Stellan Welin commented on the report on behalf of Göteborg University. He was puzzled by the “insufficient” conclusions, and wondered if the commission’s own ethical experts had read them at all. “There was nothing left of the beautiful principles! Why should one have ‘ethical experts’ and verbally subscribe to beautiful ‘ethical principles’ if they are not at all applied?”

LRF, The Federation of Swedish Farmers, objected to the use of transgenic animals in food production, and considered the commission to be categorically positive and inconsistent in its ethical judgements. According to LRF, Swedish agriculture had to use techniques that were accepted by consumers of agricultural products, or its credibility could be seriously damaged. What consumers wanted would have to be regarded as a main political priority for assessing the introduction of novel agricultural techniques. LRF meant that approving transgenic animals for food production meant going in the opposite direction.

Intertwined with the ethical discussion, albeit finally presented in a separate chapter dealing with intellectual property rights, was the unresolved issue of the rights and wrongs of patenting living organisms, or parts thereof, such as genes, DNA sequences, cells and cell lines. On the agenda was thus not only the ethical acceptability of changing other organisms’ genome, but if it was acceptable to own them (more specifically, own the patent) and make money out of them, that is, the moral standing of a broader commercialisation of biological materials. Patenting living organisms, or biological entities making up these organisms, like genes, also begged the question of our rights to “own life”. Referring to “life” or

---

74 Referral answer, Göteborg University, vol. 1, Et A:2261, Commission Archive, Prop. 198, NA. Translation of: “Av de vackra principerna bidde det inte ens en tumme! Varför ska man ha ‘etik experter’ och verbalt ansluta sig till vackra ‘etiska principer’ om dessa sedan inte alls tillämpas?”

75 Referral answer, LRF, 02-19-93, vol. 1, Et A:2261, Commission Archive, Prop.198, NA.
“life processes” instead of “biological tissue” or “gene segments” was here, as it had been in the recombinant DNA debate of the early 1980s, a way of framing the issue as an ethical one.

However, experts of intellectual property rights made it very clear that in terms of regulation, patent legislation was not an efficient tool for controlling gene technology applications. Whether a patent would be granted or not, did not prohibit anyone from actually “inventing” or “producing” GMOs. It only put a halt to its commercialisation. Patent legislation, it was reiterated by law experts, was designed to stimulate technological development by securing exclusive rights to commercial exploitation for the patent owner. However, this legislation was not designed to restrict technological development. One caveat applied, though. New inventions could not be objectionable or contrary to accepted practice and public order.

The question was, were they? According to Lennart Törnroth (patent expert), patenting life was an “optical illusion”, since prohibiting organism patenting must first involve prohibiting gene patenting. Ragnar Ohlson, another intellectual property law expert, claimed life patenting to be a technical, not an ethical, issue.

Inger Hestvik (SocDem): Separate emotions from [the issue of] patents. Use the public legislation. To resign from EPO and stand aside of the EC is unreasonable.

Kerstin Persson (Grn): [I am] for the day not willing to comment on the presented memo. [I think] that the opposite side, e.g. the Norwegian commission, among other things, had been poorly illuminated. Animal ethics and the third world has not been included either. Who applies for patents? Big multinational corporations! [...]

Barbro Westerholm (Lib): [...] We cannot place ourselves outside international patent developments. There are filed patents which have not yet been approved. But the word patent in itself is value-laden. We shall not be inimical to development and third world threats can be dealt with by other means.

Lennart Dahléus (Cen) [...] [I] claim the right to a personal view on patents: the right to intuitively but without a factual basis, oppose “life” patenting. Single events can later be discussed separately. The factual discussion concerns whether patents are important and urgent, which

Notes, 01-08-91, vol. 1, the Gene Technology Commission Archive, NA.

Memo, written by experts Ragnhild Walles, Fredrik von Arnold, Ragnar Ohlson and Olle Bosemark, appendix to notices 05-13-91, vol. 1, the Gene Technology Commission Archive, NA.

In Swedish “strida mot goda seder eller allmän ordning”.

Notes, 04-11-91, vol. 1, the Gene Technology Commission Archive, NA.
is not evident here. Who professes the idea of bio patents? Well, large corporations. The question is why and if society should stand behind it.  

The cited discussion above touches upon different views illustrating that patents were not considered to be, at least for Lennart Daléus (Cen) and Kerstin Persson (Grn) only a “technical” matter. “Intuitively”, Daléus was against patenting life. Kerstin Persson addressed the issue of for whom patents were important, in her view multinational corporations, which highlighted the question of economic interests. In her reservation attached to the final report, Annika Bladh (ChrDem), stated that patenting living organisms was “ethically unacceptable”.  

After debating the issue of “patenting life” on many occasions, there was finally a majority of commission members that supported the idea that patents were, above all, an instrument for technological development, not an instrument for political regulation. There was no agreement, though, as Lennart Daléus (Cen), Annika Åhnberg (Lft), Kerstin Persson (Grn) and Annika Bladh (ChrDem), were against patenting living organisms. Efforts to couple patents with ethical problems, such as the right to patent life and global justice issues, had been turned down. On the other hand, ethics entered the analysis in a completely different way, when motivating support for patents:

Intellectual property law is motivated on the basis that it stimulates inventions which promote development and that the inventor should be rewarded. Such a reward must be considered to be ethically motivated. When it comes to stimulating development within medical care and


81 SOU 1992:82, Genteknik, 325.
food production one can even claim it to be ethically wrong not to allow intellectual property protection in these areas, since the lack of patents can hamper development.\textsuperscript{82}

In May 1992, the commission reached a decision not to recommend any restrictions in the use of patents for GMOs. However, it was suggested that the Swedish Patent and Registration Office would inform the Swedish Gene Technology Advisory Board (soon to be constituted) about ethically problematic patent applications.\textsuperscript{83} It was asserted that at present, no special conditions – be it ethical, economic, or other – justified principal changes in existing legislation.\textsuperscript{84} The Patent and Registration Office, when given a chance to comment on the report after it had been published, expressed satisfaction with the standpoints taken.\textsuperscript{85}

This view of the transformation of biological entities into commercial commodities was not shared by all. In the media several articles were published which questioned this extension of patent law into the area of biological experimentation. For example, environmentalist Peter Einarsson cautioned against the commission’s conclusions. “Shortly it will deliver a report which recommends that all remaining hindrances for animal and plant patenting will be removed.”\textsuperscript{86}

On a few occasions, the implications of a rapid biotechnological development in Western countries for Third World countries – especially in terms of issuing patents – were a topic of conversation. Could industrial patenting be a way of exploiting the genetic diversity in Third World countries? This issue remained on the margins, and on August 16, 1991, it was ruled out as peripheral to what the commission was assigned to do. The rationale underlying this stance was clear in the final report, where it said:

\begin{flushright}
Ibid., 303. Translation of: “Immaterialrätten motiveras av att upphfinningar som främjar utvecklingen bör stimuleras och att upphfinnaren bör erhålla en belöning. En sådan belöning får anses vara etiskt motiverad. När det gäller att stimulera utvecklingen inom sjukvården och livsmedelsproduktionen kan det t.o.m. hävdas, att det är etiskt sett felaktigt att inte tillåta immaterialrättsligt skydd på dessa områden, eftersom avsaknaden av patent kan hämma utvecklingen.”
\end{flushright}

\textsuperscript{83} Minutes, 05-06-92, vol. 1, the Gene Technology Commission Archive, NA.

\textsuperscript{84} SOU 1992:82, Genteknik, 295.

\textsuperscript{85} Referral answer, 02-15-93, the Swedish Patent and Registration Office, vol. 1, E1 A:2261, Commission Archive, Prop.198, NA.

\textsuperscript{86} Peter Einarsson, “‘Forskare vill manipulera kvinnor’. Nu finns en ansökan om patent på den gentekniskt manipulerade människan, avslöjar Peter Einarsson”, Dagens Nyheter, 03-29-92. Translation of: “Inom kort kommer den att leverera ett betänkande som rekommenderar att alla återstående hinder för patent på djur och växter raseras.”
According to the commission such problems should be solved through general measures promoting economic development in Third World countries and efforts to get a freer world trade, not by obstructing technical development in industrial countries.\textsuperscript{87}

Concluding Remarks

As has been demonstrated in this chapter, ecological risks and ethics were two themes that partially crossed paths. They were combined in the so-called Doctrine on Environmental Protection, which stated that it was ethically wrong to inflict irreversible or serious damage to nature. However, the commission did not make recommendations to forbid any gene technology activities with reference to this doctrine, with one exception – the production of cross-species mosaic animals.

It was hard for the commission members to agree on whether patenting was a technical or an ethical issue. When the ethical principles were formulated, there were no discussions about patents or commercialisation. This was a discussion that went on parallel to the task of formulating ethical principles. A majority of the commission members wanted gene technology applications to be treated within an already existing legal framework, if it was supplemented by a more thorough and transparent ethical analysis. Authorities dealing with applications could treat each case on a case-to-case basis, and gradually an accepted procedure would take shape. An expanded role for the Swedish Gene Technology Advisory Board as an ethical monitor could provide for a harmonisation of ethical assessments.

What counted as a proper ethical analysis was something that went “beyond subjective opinions”, and presenting a model for how ethical standpoints could be achieved, provided a sort of protocol for ministries and authorities dealing with gene technology. This strategy, which was meant to help regulatory administrators to handle applications from researchers and breeders, was never openly and explicitly followed by the commission itself. The principle that nature had an intrinsic value and that all gene technology practices should be guided by a reverence for life, in reality meant not forbidding patents on genes and organisms, the

production of transgenic food from plants and animals, or field trials and releases of GMOs into the environment. This was done without any clear reference to what groups or actors in society that would benefit, or lose, from such a standpoint. The strategy was built on the idea that interests could be balanced in an ideologically balanced way, by virtue of being an ethical strategy. But nevertheless it delegated to public officials the highly problematic task and contested issue of deciding whose interests – farmers’, chemical companies’, researchers’, consumers’ etc. – that would take precedence over the others’.

The Gene Technology Commission presented a report which had been preceded by a discussion about a clear distinction between the political and the scientific elements of gene technology. This distinction worked itself into conceptions of risk and ethics in very explicit ways. The risk assessment procedure was divided into two different sections, a scientific and a political one. Science provided facts about probable scenarios, the likelihood for certain situations to occur, the extent and seriousness of specific effects etc. Politics assessed whether these consequences were acceptable or not. Values were believed to influence both scientific and political assessment, but even those were either scientific or political.

For ethics, a distinction was put in place which did not as clearly demarcate “the political” from “the scientific”, but nevertheless reflected its inherent tension. On one side there were the immediate opinions of each and everyone of us, and on the other the well-grounded ethical analysis which went beyond mere opinions. The proposed ethical strategy which authorities or other parties were meant to consult when dealing with ethical issues, were about balancing different interests and testing the strength of different arguments. It was believed that a professional ethical analysis could function independently of these interests, which could not be said for ordinary citizens or laymen.

Was there actually any room for ethical assessments that did not take scientific facts as their point of departure? This question came up several times in the commission, for example when Lennart Dalèus (Cen) “intuitively” objected to patenting organisms, and when Hans Gustafsson (SocDem) explained that transgenic animals could be repulsive as they were, even if there were no scientific explanations for it. However, the commission report never advocated building policy suggestions on such a basis.

In this context ethics meant discussing what was new or old and
unnatural or natural about gene technology. That which was not new or unnatural, did not need specific ethical attention. The view that gene technology in itself was unproblematic, that is, that the process by which a new product came about was irrelevant with regard to policy, had more supporters than those claiming that using gene technology as such presented policy-makers with a fundamentally new situation. But as only the products of gene technology, in this case GMOs, were to be ethically scrutinised, and as they did not substantially differ from other known products, no new ethical principles needed to be formulated in order to deal with GMOs. Ethics also meant focusing on specific applications, instead of knowledge production per se, or the impetus for developing both knowledge and technology in different areas, be it scientific, medical, agricultural or industrial. Additionally, ethics was separated from global justice issues and processes of commercialisation.

As a boundary organisation, the commission could present a report that reinforced the idea of a political institution being in control although faced with unprecedented levels of scientific uncertainty. To achieve certainty, more science was needed, not less. Science’s role for politics remained unquestioned as science was mobilised as a means to manage risks. On a lower level, internally no such consensus as to where to draw the line between politics or science, existed. The commission could also present a set of principles that subscribed to the importance of environmental protection and reverence for life, but when deployed in practice, did little to motivate any direct prohibitions.

In addition to reflecting the view of many commission experts, the report was in many ways the result of a consensus among the two biggest parties, on the left side, the Social democrats, and on the right, the Moderates. On many issues, the Left Party, the Green party, the Christian Democratic party and the Centre party, were offering conflicting interpretations. This lack of consensus was clearly marked in the final report, as these parties (except the Green Party which had no place in Parliament at that time) used the opportunity to add reservations to the final report. These reservations displayed different views of the role of the state, citizens and what gene technology meant in social and cultural terms. The above mentioned parties advocated more direct prohibitions, eg. against patenting living organisms, as well as a stronger state control

88 References to “cooperative difficulties” can be found in Notes, 02-21-91, vol. 1, the Gene Technology Commission Archive, NA.
in the form of a framework legislation, more detailed requirements for advance notification and licensing, and a stronger representation of NGOs in policymaking. In the main, the gene technology “problem” was described very differently in these two camps. Did it require an analysis of the whole society, its goals and direction, or was it enough to handle specific issues related to specific GMOs? Liberals, Social Democrats and Moderates represented the view that technological innovation was good, but that for specifically new areas of application control needed to be safeguarded, without becoming too onerous for the scientific community to administrate. The existing methods of control were deemed well-functioning.

Aftermath

The Gene Technology Commission delivered its final report in September 1992. In 1994, under the leadership of the soon-to-be-replaced non-Socialist coalition, a governmental bill was passed in Parliament which proposed the realisation of a new gene technology framework law.\(^{89}\) This law singled out genetically modified organisms as in need of special regulation. What the commission had been at such pains to avoid – a general framework law targeted specifically for GMOs – became reality. It has been suggested that the bill came about as a compromise among the government parties.\(^{90}\) In the autumn 1994 the media reported on new field trials and insufficient risk assessments, but regulatory authorities put trust in the new law to handle these problems.\(^{91}\) The new law incorporated the European directives 90/219 EEC and 90/220 EEC into Swedish legislation and hence regulated both contained use and deliberate releases of genetically modified organisms. The bill also stated that ethical assessments needed to be performed on a case-to-case basis by regulatory authorities, a requirement that was not stipulated in the European directives, or in the commission report. This was also something that government representatives highlighted as a new element.

---

when announcing the bill proposal in the media. \textsuperscript{92} A Swedish Gene Technology Advisory Board was suggested to take over the role of the National Recombinant DNA Advisory Committee, with strengthened advisory and regulatory functions.

The parliamentary committee on agriculture supported the governmental bill in large parts. The committee stood behind the suggestion that the regulatory system needed to be designed so that ethical evaluations would become a “natural part” of it, on the basis that the public had expressed concerns that “apparent unethical applications” of gene technology otherwise might pass unnoticed. \textsuperscript{93} This way of letting all gene technology applications be subjected to ethical scrutiny was built on the idea that gene technology used in the production of GMOs was different enough to warrant ethical control. The Gene Technology Commission’s firm belief that gene technology, in itself, did not create new ethical problems was, in a way, overruled.

The parliamentary committee on agriculture, although supporting a proposal involving a strengthening of the political regulation of gene technology as such, called attention to the fact that gene technology research was of tremendous importance to Sweden, and that this new form of regulation would, in fact, only facilitate and advance “serious” research.

In this context it should be pointed out that an ethical assessment of the applications will not impede research in the area. Instead, the way that licences will be granted will facilitate and promote serious research, as well as foster public respect and trust in gene technology. In many cases the ethical assessment should also lead up to the conclusion that it would be inappropriate to stop a certain activity. \textsuperscript{94}

What would count as ethically defensible was for the committee, as it had been for the Gene Technology Commission, not an easy question to answer. Instead this judgement was delegated to the licensing authorities, that

\textsuperscript{92} Per Unckel and Reidunn Laurén, “Särskild nämnd skall ge stöd åt forskningen om genteknik”, Svenska Dagbladet, 03-15-94.

\textsuperscript{93} Committee Report 1993/94:JoU29, Lag om genetiskt modifierade organismer.

could take advice from the Gene Technology Advisory Board. Hence, the
competences of this board became a natural subject of debate. According
to the bill, the board would be constituted of “eminent researchers” and
people with “specific abilities to assess ethical questions.” As an advisory
organisation, the board was expected to provide ethical guidance so that
authorities would be able to conform to shared values. The motifs for
placing eminent scientists on the board were formulated as follows: “in
that way the board will gain authority within the scientific community,
and hence its work can win approval there.”

A group of Social Democrats, by then in political opposition, had
submitted a motion to Parliament calling into question the fact that,
according to the governmental bill, applicants were not obliged to
account for potential ethical problems as they applied for permissions,
which would give authorities little to base their judgements on. The
Committee on Agriculture rejected this motion with the argument that:

However, with regard to the character of ethical questions it should be
hard to present an evaluation that is in every respect objective. It can
therefore be assumed that the appropriate authority in all circumstances
has to make an independent ethical assessment.

Researchers were not believed to be able to objectively scrutinise the ethical
implications of their own projects. But would the public officials at the
licensing authorities know what was “apparent unethical applications”, or
the members of the Swedish Gene Technology Advisory Board?

The committee report served as a basis for debate in the Chamber in
June 1994. Ingrid Hestvik (SocDem), one of the previous members of the
Gene Technology Commission, regretted the fact that all the work put
into the commission had had so little impact on the following political
decisions. The commission report was after all, in her view, an analysis

95 Ibid. Translation of: "personer med särskilda förutsättningar för att bedöma etiska
frågor".
96 Ibid. Translation of: "på så sätt får nämnden auktoritet inom det vetenskapliga
samhället, och sålunda kan dess verksamhet förankras där."
97 Motion 1993/94:Jo62, Margareta Winberg et al. (SocDem), med anledning av prop.
1993/94:198 Lag om genetiskt modifierade organismer.
98 Committee Report 1993/94:JoU29, Lag om genetiskt modifierade organismer.
Translation of: "Det torde emellertid med hänsyn till de etiska frågornas karaktär vara
svårt att presentera en i alla avseenden objektiv värdering i detta hänseende. Det kan
därför antas att den behöriga myndigheten under alla förhållanden måste genomföra en
självständig etisk bedömning."
produced by “the country’s most prominent experts on bio- and gene technology as well as ethics”. Certain elements of the bill could, according to her, endanger Swedish research and make industrial entrepreneurs to leave the country. She cautioned against letting oneself get carried away by emotions. Lennart Daléus (Cen) answered that: “Inger Hestvik was worried about letting emotions run wild. The question is whose emotions, if it is the emotions of those being euphoric when faced with the new technology or the emotions of those who are a little concerned and want to be more cautious.”

Being emotional or not, the task of deciding what counted as ethically acceptable uses of gene technology, came to rest with the Swedish Gene Technology Advisory Board, as well as other relevant authorities. These authorities needed to independently assess the ethical content of each application. Doubts about whether the Board or different authorities were up to the task came up in the Chamber. Inger Hestvik (SocDem) again:

Ethical assessments are difficult. It is hard to define. What do we mean by ethics? Lennart Daléus has, just as I have, participated in the work of the Gene Technology Commission. We have had the ethicists there. We have discussed and found that the most difficult area of them all is the ethical assessments. They are many times so individual.

Annika Åhnberg (Lft), on her part, believed that it was neither possible nor desirable for the future Gene Technology Advisory Board to try to promote shared values or a common ethics. Instead she thought it was absolutely necessary to keep ethical questions “alive”. Inger Hestvik replied that arbitrariness in the area of ethical assessments was highly

99 Proceedings in the Chamber, Lag om genetiskt modifierade organismer, 06-02-94, address no. 17. Translation of: “landets främsta experter på bioteknik- och genteknikområdet liksom också på det etiska området”.
100 Ibid., address no. 17.
101 Ibid., address no. 18. Translation of: “Inger Hestvik var orolig för att känslorna skulle skena i väg. Frågan är bara vems känslor, om det är känslorna hos dem som är euforiska inför den nya tekniken eller känslorna hos dem som är litet oroliga och vill vara försiktigare.”
103 Ibid., address no. 22.
objectionable, but that it was difficult to set up a simple procedure for how to reach ethical decisions. “What I meant was that we somehow have to sit down and think through what basic rules or requirements we should expect of an ethical assessment.”104 Ironically enough, this was, if anything, exactly what the Gene Technology Commission had set out to do four years earlier. The apparent unethical applications were not so apparent after all.

104 Ibid., address no. 25. Translation of: ”Det jag menade var att vi på något vis måste sätta oss ner och tänka igenom vilka grundregler och grundkrav vi måste ha vid en etisk bedömning.”
In February 1997, the same year that the Biotechnology Commission was appointed, the Scottish Roslin Institute announced the successful cloning of the sheep Dolly, the first mammal to be cloned from an adult somatic cell. In March 1997, the Centre Party initiated a Parliamentary debate on the subject “biotechnology”, in which Dolly became a natural point of reference. In this debate, the current Minister of Science, Carl Tham (SocDem) declared that the government planned to appoint a new commission, which would later that year become the Biotechnology Commission.\footnote{Proceedings in the Chamber, 1996/97:77, 03-12-97.}

Dolly attracted massive media attention, suggesting that human reproductive cloning would not lie far behind.\footnote{The Swedish Gene Technology Advisory Board alerted the Government in 1997 about these events and the fact that Swedish legislation did not condemn human reproductive cloning explicitly. Letter to the Government, 05-12-97, a copy is archived together with the referral answers at the Ministry of Education and Science. Representatives from the Green Party and Christian Democratic Party submitted a motion in Parliament on the subject. Motion 1997/98: So265, Tuve Skånberg (ChrDem) and Eva Goës (Grn), Klöning av människor.} Round about the same time, Belgian Blue, a heavily-bred cattle unable to give natural birth, raised questions about the roads taken by a highly industrialised food industry. In the media, both Belgian Blue and Dolly were framed in the context of genetic modification, although Belgian Blue was the result of traditional breeding and Dolly, being a clone, was a genetic copy of another ewe. The BSE crises (“mad cow disease”) also contributed to uneasiness over what was considered to be a failure on behalf of regulatory authorities to foresee the effects of a highly industrialised food supply.
The first GMO food product had been approved for marketing in the EU in 1996. In the autumn of 1998, press coverage about new GM crops and foods flourished. Motions were submitted in Parliament on the issue of food safety and labelling. The global area of GM crop production grew from 1.7 million hectares in 1996 to 39.9 million hectares in 1999. The sales volume increased approximately 30-fold from 1995 to 1999. From 1991 to 2001 Sweden approved 61 field trials, 3.8% of the total number of trials in the European Union. A comparative European study of public attitudes towards gene technology published in 1998, showed that Swedes were among the most knowledgeable and the most critical of the use of gene technology in the areas of agriculture and food production.

In the middle of the 1990s, Swedish media reported more frequently and positively on medical breakthroughs. But this reporting was paralleled by negative news about unrealised expectations and the development of new areas of risk. For example, gene therapy had gone from being a practically untested treatment to entering the early stages of clinical trials. In 1999, a young male patient in the U.S. died as a result of gene therapy treatment, an event which came to seriously weaken the hopes for gene therapy as a quick remedy for a range of genetic disorders. The patent issue was also on the media agenda, as the American company Myriad Genetics claimed exclusive rights to medical screening for certain breast cancer genes. This again opened up the question of the ethics of “life patenting”. The EC had issued a new directive, 98/44/EC, on the legal protection of biotechnolgical inventions, and preparations were being made to deal with this. The mapping of the human genome was on its way to be completed, and new issues about how to store, use, and commercialise biomaterials, for example in bio banks, was brought

---

4 See for example Motion 1996/97:Jo529, Birger Schlaug et al. (Grn), Genteknik; Motion 1997/98:Jo542, Gudrun Lindvall et al. (Grn), Gentekniken och maten; Motion 1998/99: MJ512, Jonas Ringquist (Lft), Genmanipulerade grödor.
7 Fjæstad et al., “Sweden” 139.
to the fore. After the Biotechnology Commission presented its report in December 2000, the “race” between the publicly funded Human Genome Project and Craig Venter’s company Celera Genomics was over, as they jointly announced the publication of the finished sequencing of the complete human genome.9

The European directives 90/219 EEC and 90/220 EEC had been successfully implemented in Swedish law as a result of the new Gene Technology Law, taking effect in January 1995. But changes were on their way. When the Biotechnology Commission began its work in 1998, a revision of the directives had started in the EU. Also, the Ministry of the Environment was monitoring ongoing international negotiations on biosafety, finally resulting in the Cartagena protocol on Biosafety of 2000. Within those negotiations, the tension between Europe’s more precautionary stance, and the approach of the U.S. and the biotech industry, came into the open.10 In 1999, the Swedish Gene Technology Law was incorporated into the Environmental Code. The Environmental Code came into force in January 1999 and was built on the precautionary principle, also adopted by the European Union since 1993 through the Maastricht Treaty.11 The principle stated that lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental detriment and damage. The Code’s 13th chapter dealt with genetic engineering and contained special provisions whose purpose was to ensure that ethical concerns were taken into consideration in connection with contained use, deliberate release and the placing on the market of genetically modified organisms.12 This had also been a requirement expressed in the Gene Technology law.

The Swedish economic crisis of the first half of the 1990s had motivated economic restraints, turning science policy into a hotly debated issue.13

---

The turbulence of those years calmed down as the decade came to its close, and political parties began to excel in their efforts to demonstrate their support for science as a motor of economic growth. In 1998, a governmental commission working on a proposal involving a thorough transformation of Swedish research, delivered its final report, *Research Policy*. A government bill was presented in the year 2000, singling out biotechnology as one of eight prioritised areas of Swedish research. Since 1996, in the view of STS scholars Mark Elam and Hans Glimell, Swedish science and society relations have been about defending tradition and reasserting the belief in an orthodox pattern of scientific authority. Science policy has been reshaped in the name of the “Erlander tradition”, a tradition with its roots in the middle of the 1950s as the current Prime Minister Tage Erlander entered into close dialogue with some of the nation’s leading scientists. This dialogue was considered to have been of utmost importance for the establishment of Sweden as a leading industrial nation in the decades to come. The idea of the indispensable role and authority of self-governed basic research as a motor of progress, lay at the root of this tradition, and was after 1998 ceaselessly reiterated by people like the current Minister of Education, Thomas Östros. The Biotechnology Commission worked in this atmosphere.

18 Ibid., 31.
Breaking the Divides: The Biotechnology Commission

Biotechnology might come to influence the life situation and development of all people on the earth.\(^\text{19}\)

The totally risk free society runs a risk of becoming a society without progress and development.\(^\text{20}\)

Applications of biotechnology often have an impact on many people as well as future generations. It is therefore necessary to involve as many people as possible in the ethical discussion. Bioethics must be an issue for everyone.\(^\text{21}\)

In comparison with the Gene-Ethics Commission and the Gene Technology Commission, the Biotechnology Commission had an even broader mission. It was assigned to map opportunities and risks, as well as to provide an oversight of institutional systems of control, but on top of that to “look ahead” in order to formulate a biotechnology policy for the future.\(^\text{22}\) The final report, *Breaking the Divides*, was delivered in time for the dawning of the new millennium, and it included a Swedish biotechnology policy compressed into a 21-point agenda.\(^\text{23}\) The title of the report gave a hint of the approach taken; instead of policing existing boundaries around biotechnology, or to build new ones, the task had to do with breaking them. In a press release from the Ministry of Education and Science on December 1, 2000, it was stated that: “Biotekniken är sprängande gränser.” An editorial in *Dagens Nyheter* expressed the opinion that the

---


\(^{22}\) Commission terms of reference, Dir 1997:120, *Biotekniken i samhället – möjligheter och risker*. The Gene-Ethics Commission and the Gene Technology Commission also described opportunities and benefits, but were not explicitly asked to do so in the terms of references.


\(^{24}\) Press release from the Ministry of Education and Science, 12-01-00, as it was published on the Government’s homesite, 10-07-02. Translation of: “Biotekniken spränger gränser.”
report had been written “in a spirit of hope instead of doubt” and that “its main tone is research friendly”.  

The government’s terms of reference suggested a new position toward gene technology. The commission was assigned to assess Sweden’s potential for industrial biotechnological development and to identify impediments to such a development. It was Sweden as a research nation in a global context that centre-staged the political mind. What could biotechnology do for Sweden and what could Sweden do for biotechnology? However, in a European context, the 1990s had so far been a decade of turbulence and confrontation. Resistance to biotechnology was by no means at the margins of public discussions, and this came to elicit the democratic (or lack thereof) dimensions of technological innovation. Hence, the commission was also explicitly asked to investigate public attitudes and discuss ways to improve public influence, participation and insight into the biotechnology sector. While looking ahead into the future, the commission would identify the questions that were in need of a “deepened ethical discussion”. In line with this assignment, the commission was to promote debate and see to it that the conditions existed for channelling public interest into it. The commission would also take stock of the need of improving biotechnology education in different sectors of society.

The commission had its first meeting on March 17, 1998, and was expected to be finished in June 2000, but got approval for prolonging the work until the end of the year. In May 1999, the commission published an interim report on the role of the Swedish Gene Technology Advisory Board. As a preparation for the commission work, government had commissioned FRN (the Swedish Council for the Planning and Co-ordination of Research) to produce an oversight of modern biotechnology, and this compilation was distributed to all members of Parliament. Researchers from various disciplines provided material for this publication,
reflecting a broadened academic interest in these issues.30

In total the commission met on 31 occasions (out of which 5 were open to journalists), participated in 33 conferences, arranged 4 hearings and made 4 visits for educational purposes. Different experts were invited to different meetings, and some of them prepared written papers on their specific areas of expertise, to serve as a basis for commission discussions. The fact that the commission had no “in-house” experts had consequences for how the commission’s work was received by some referral bodies. The commission’s inability to speak authoritatively on a number of issues, to present clear lines of arguments, and to do in-depth analyses, was attributed to the members’ lack of direct cooperation with scientifically trained people.31

The Biotechnology Commission was set up as a parliamentary commission (representing all political parties in Parliament) but worked more independently in its relation to experts. The members opposed a proposal to include ministry experts, but engaged in different activities to gather knowledge by attending conferences, hearings, and arranging meetings with specially invited guests.32 However, the commission wished to get its conclusions and analyses accepted from the experts’ point of view, a wish that was reflected in a discussion to arrange an expert hearing as the inquiry drew to its close.

Marianne Håkansson (chairman): how do we go about the expert issue? Can we contact experts by the end of the inquiry and summon them to a meeting?

Lennart Brunander (Cen): it is a good idea, it will be sort of a hearing, but how do we know it will be a representative sample?

Tanja Linderborg (Lft): that would be good, it signals openness.

Majlène Westerlund Panke (SocDem): good, you get an indication if we are on the right track 33

30 Kunskap på gott och ont: Översikt över bioteknologins användning, risker och möjligheter, Forskningsrådsnämnden (Stockholm, 1997). Other background material was handed out, for example Jörgen Bäckström, Genteknik: Den nya biotekniken, Kemifakta, no. 7 (Stockholm, 1991).
31 Referral answers from SMER, 04-05-01, VR, 04-11-01, MPA, 04-19-01, RRV, 04-05-01, archived at the Ministry of Education and Science.
32 Notes, 06-03-98, vol. 1, the Biotechnology Commission Archive, NA. The reluctance to tie ministry experts to the commission might be a reason for the cold reception the final report got from many governmental authorities.
33 Notes, 12-02-98, vol. 1, the Biotechnology Commission Archive, NA. Translation of: “MH: hur gör vi med experter? Kan vi kontakta experter i slutet av utredningen och kalla
Early on, in the autumn of 1998, representatives from the Swedish Gene Technology Advisory Board informed the commission about its work. Commission members discussed the role of scientific experts on the board, and whether these automatically represented the public interest or if they stood for specific (self) interests. Göran Wahlgren, chairman of the board, asserted that it needed to stand neutral when faced with specific interests, in its role to inform the Swedish public. When asked about the possibility of including representatives of consumer organisations on the board, he said that: "[It] can make the work more difficult, build in a conflict. You have to aim for an optimal constellation of people to fulfil the duties of the state."3

From early on it is possible to detect this ambivalent attitude toward scientific expertise. On the one hand, it constituted a sort of highest authority which could be trusted to indicate whether the commission had been accurate in its analyses, but on the other hand could be seen as representing specific interests. The same tension was prevalent during the initial phases of the Gene Technology Commission, although much more strongly articulated.

The commission was supposed to work openly. The secretariat provided commission members with copies of recent press coverage on biotechnology generally, often 10–20 articles each month. At its disposal it had a media survey service which monitored not only the press, but radio and TV programmes as well. The members were fairly up to date with media reporting, as they discussed current topics at meetings with experts. One article came to attract special interest for the commission. This piece was published on January 29 1999, its author claiming that gene technology reduced biological diversity. The commission considered if it should actively partake in media debate, and publish a reply, or if some other action was to be taken. "After a discussion, it was decided that the debate article in question was not going to be met with a rebuff by

---

3 Notes, 06-03-98, vol. 1, the Biotechnology Commission Archive, NA. Translation of: "Kan försvåra arbetet, bygga in konflikt. Man måste sträva efter en optimal sammansättning för att uppfylla statsmakternas uppgifter".

34 Documents summarising media coverage can be found in vol. 5, the Biotechnology Commission Archive, NA.

the commission, instead they would work toward involving more experts in public debate on modern biotechnology.”

This suggests that the commission interpreted its role in public debate as that of a facilitator, not directly intervening in ongoing discussions. In 2000 it published a website where some background material and work-in-progress was presented.

Manageable Risks

Alf Eriksson (SocDem): We should focus on the positive sides first of all. Everything develops so fast that concrete questions soon become outdated.

Gudrun Lindvall (Grn): The commission won’t be credible if risks are concealed.

The quoted section above from an early commission meeting, indicates that the task of how to handle the risk problem implied an important dilemma. How would opportunities and benefits be reconciled with risks? Alf Eriksson (SocDem) suggested that the commission should, first of all, focus on “the positive” elements of biotechnology. Gudrun Lindvall, (Grn) said on the other hand, that concealing risks could jeopardize the commission’s credibility. So, how would risks be understood and presented in order to secure credibility, without simultaneously undermining an analysis of the opportunities represented by biotechnology?

This was all the more important since biotechnology’s capacity for “doing good” had been taken as a fact, more than ever before. Above all, its economic potential, stemming from the ongoing commercialisation of the life sciences in general, had risen to a top political priority. This transformation of biotechnology from being a new innovative technology somewhat on the margins of political interest, to becoming a flagship in the political self-understanding of Western states as “knowledge societies”, was part and parcel of the support for a proliferation of the biotech business sector. Hence, the commission was also asked to

37 Minutes, 03-17-99, vol. 1, the Biotechnology Commission Archive, NA. Translation of: ”Efter en diskussion beslöts att ifrågavarande debattartikel inte skall bemötas av kommittén, men att kommittén skall verka för att fler experter deltar i debatten om den moderna biotekniken.”

38 Notes, 06-09-98, vol. 1, the Biotechnology Commission Archive, NA. Translation of: ”AE: Vi bör ta fasta på det positiva i första hand. Utvecklingen går så fort att konkreta frågor snabbt blir inaktuella. GL: Utredningen blir inte trovärdig om man döljer risker.”
assess possibilities and identify hindrances for a Swedish industrial biotechnological development. If biotechnology was to deliver valuables to society, one needed to get rid of unnecessary industrial obstacles.

But what about risks? How important were they, who spoke for them, and could they be managed? As the government’s directives stated, this was about finding a “defensible” path for biotechnology to take.

In the past few years, developments within the biotechnology sector have promoted huge expectations as well as fears. There is a risk of abuse and negative consequences should not be trivialised. The ambition must be to take advantage of the benefits a balanced and ethically defensible application of biotechnology entails, at the same time as the risks of negative consequences are minimised.39

The scenario imagined in the early 1980s, where society needed to assert that it was in control of a (potentially) “runaway” science in order for it to generate possible future benefits, had been abandoned for a more moderate one, where risks were not eliminated, but minimised, and where decisions about what would be acceptable implications were made in a spirit of ethical discernment, not ethical condemnation.

Risks emanating from biotechnology were framed as potential negative consequences for human health and the environment, whereas ethical issues were presented in a separate chapter of the final report. After a short deliberation on different ways of assessing risks and problems of pinning down what the precautionary principle meant, the report listed short descriptions of risks belonging to different biotechnology applications, a majority of them gene technology applications.40 These were listed under the heading “thinkable” risks. It is not clear on what basis these specific risks were chosen, or how the commission itself assessed risks. The presentation of risks was kept short, general and descriptive.

Drafts on policy suggestions for different biotechnology areas circulated among the commission members as their work progressed. In these


40 The precautionary principle applied to environmental policy, for example reflected in the Rio Declaration on Environment and Development in 1992, has been hampered by interpretative difficulties. Its core idea is that preventive action should be taken if a practice could be harmful, even in cases of uncertainty or lack of scientific proof, and that the burden of proof lies with the polluter.
provisional policy suggestions, two aspects of the existing risk assessment process within governmental authorities were criticised. Firstly, that established risk assessments should not differentiate between products on the basis of the technology used creating them (as the gene technology law stipulated), but instead analyse product properties. The Swedish gene technology law had been designed to target gene technology activities specifically. Secondly, that risk assessments should be about balancing risks and benefits on a case-to-case basis, not exclusively dealing with risks. These suggestions made their way into the final chapter on risks, and also resulted in a recommendation that Sweden should implement a technology-neutral risk and benefit assessment. Below follows an overview of the more concrete risks the commission identified.

When it came to medicine and health care, risks deriving from production and use of pharmaceutical drugs, gene therapy, stem cells and xenotransplantation were all understood as health risks. Developing drugs could involve a risk of contamination from genetically modified microorganisms used in production, treatment with stem cells could possibly give rise to the development of cancer cells (since stem cells can differentiate into any cell type), gene therapy was said to be “relatively harmless”, but deaths had occurred due to allergic reactions to the genetically modified virus used to transfer genes into the patients body. Xenotransplantation, that is the transplantation of organs from animals to humans, could include unwanted transfers of hidden viruses in the genetic material of the donor animal.

Although these health risks were highlighted, they were at the same time downplayed by assuaging concluding comments. Risks of unwanted contamination when producing drugs, were said to be “very small or neglectable” (referring to statements made by the Medical Products Agency). Gene therapy was deemed to be “relatively harmless”, and certified knowledge about the likelihood of virus activation after xenotransplantation, was said to be lacking.

The sector involving most risks was listed under the heading Agriculture and Forestry etc. Several of the risks presented there dealt with the problem

---

42 SOU 2000:103, Att spränga gränsen, 32–33.
43 This tragic event was reported in several newspapers in the autumn 1999. See for example, Anna-Lena Haverdahl, “Dödsfall vid genterapi förtigs”, Svenska Dagbladet, 11-21-00.
of growing resistant crops. Gene technology had been used to develop crops resistant to certain herbicides, which could permanent high levels of biocides in agriculture at large. Another problem had to do with modifying crops so that they could be deadly to certain insects. Such an example was the so-called Bt-crops, which had been genetically designed to produce a toxin (by implanting genes from the bacterium Bacillus thuringiensis) that could kill off unwanted insects. A third risk problem related to the methods used to produce GM crops. A common way of tracing gene transfers had been to insert marker genes for antibiotic resistance into GM plants, so they would be easily detected at a later stage of selection. The fear was that these genes could spread, for example to bacteria.

With the introduction of new varieties of plants and animals into the environment, the question arose as to whether they could have a competitive advantage, compared to existing species in a specific environment, thereby causing ecological disturbance and threatening biodiversity. Another issue had to do with finding ways to contain growing transgenic plants so they would not affect ecological farming. Three examples of specific importance for the Swedish situation were picked out; potatoes, rapeseed and forest trees, out of which only rapeseed was seen as having a propensity for spreading pollen over longer distances. As in the case of medical risks, almost every listed agricultural and environmental risk was countered with remarks about the current lack of knowledge about these risks, or their neglectable character.

In the area of food and animal fodder, the fear was that food containing genetically modified organisms could be toxic, or generate cancer and allergies. The report also broadened the issue, to a question of whether not all transfers of genes could be risky, since inserted genes could influence surrounding genes in an unpredictable manner. In this way, man-made transgenic organisms were said to have natural equivalents: “however, genetic modification by man is similar to a natural, if uncommon, course of events. ‘Jumping genes’ can transpose in humans, plants and animal. As far as we know at present, jumping genes in agricultural crops have not

44 Entomologists at Cornell University had alerted the scientific community about harm done by Bt-corn to non-target species, in this case the monarch butterfly. The study attracted considerable media attention. See original article, John E. Losey, Linda S. Rayor and Maureen E. Carter, “Transgenic Pollen Harms Monarch Larvae”, Nature, vol. 399 (1999).
caused any risk to people’s health.”

What the commission identified and presented as risks ranged from stem cell research to growing transgenic crops. There was no in-depth analysis of any specific area, but rather it gave an overview of the whole field as such. Several of its targeted questions had been subjected to previous investigations, such as xenotransplantation and prenatal diagnosis. They were all understood as health or environmental risks. This also meant that the ethics of biotechnology was kept separate from risks. Most risks were downplayed by references to their uncertain character (“thinkable”), or their having natural equivalents. A strong case had been built for regarding risks to be manageable and possible to overcome. Finally, the benefits of biotechnology were woven into the presentation of risks, just as the commission recommended for future risk assessments.

The final report did little to clarify the “according to whom” question, but some clues were given in the commission’s work documentation. In a memo describing the present use of, benefits and risks of biotechnology, experts and industrial spokespersons were claimed to be the ones making assurances of gene technology’s safety, whereas the environmental movement and other groups were said to claim the opposite. It was also stated that the mass media had focused more on risks than opportunities. “This has, in Sweden as in most other European countries, caused a widespread concern and suspicion, primarily among food consumers, who see modern biotechnology as unsafe, strange and dangerous.” The memo continued: “Most people, including journalists and politicians, have too limited a knowledge of modern biotechnology to be able to fully understand it, or assess its consequences, but the questions are justified.”

The important task to secure credibility by not “hiding” risks, in Gudrun Lindvall’s terminology, or “trivialising” them, as the directive said, testified to the importance of securing credibility in the face of a concerned, albeit scientifically illiterate, public. The commission invoked

a discrepancy between expert judgements and lay understandings of biotechnology, but gave voice predominantly to the first one. It was also presumed that science here spoke with one voice – that the diffusion of expertise in what was now a global controversy on biotechnology’s safety and acceptability could be overlooked. This did not pass uncommented by certain commission members or by the referral bodies. According to Tanja Linderborg (Lft) releases of GMO into the environment has had “catastrophic environmental consequences”. Both Tanja Linderborg and Gudrun Lindvall (Grn) supported the demand of the Swedish Society for Nature Conservation for a 5-year moratorium on commercial cultivation of GMOs. The Swedish Society for Nature Conservation on its part, also considered the report to be unbalanced in terms of correctly and neutrally describing risks and benefits. “The report generally describes benefits as more or less self-evident, and risks as thinkable, which makes the material unbalanced and impedes every constructive assessment of the pros and cons of genetic modification.”

KSLA, the Royal Swedish Academy of Agriculture and Forestry, remarked that in some cases it was hard to see on what basis conclusions were drawn, that descriptions of biotechnology risks were close to trivialised and that this devalued the report as a review of the present state of knowledge. SLU, the Swedish University of Agricultural Sciences, on the other hand, believed there to be no evidence backing up concerns about resistant crops.

Benefits had been presented as unquestionable, and were even integrated into the risk identification process itself. But was it so easy to demarcate benefits from risks?

Business at Risk, or Risky Business?

If risks were demarcated as possible health and environment problems, the commission work, as well as the delivered report, was permeated by an underlying “silent” risk to be taken into account – the risk that biotechnology would not bear fruit, that something would get into

49 Referral answer, KSLA, 04-17-01, archived at the Ministry of Education and Science.
50 Referral answer, SLU, 03-28-01, archived at the Ministry of Education and Science.
the way of a realisation of all its inherent potential. This realisation was in practice synonymous to commercialisation, be it in the form of approved pharmaceutical drugs or marketing of new GM foods. This was a theme that can be traced in several commission memos dealing with biotechnological research, business, agriculture and risks. The relationship between basic research and industry was presented as follows:

Hardly any technological sector can exhibit such a strong link between research and technical application as the biotechnology case. Academic research is of tremendous importance to biotechnological companies, which often build research organisations of their own in order to cooperate with and develop results stemming from basic research. In addition to generating new knowledge, the universities can function as consultants or downright partners for companies and last but not least, they educate the qualified workforce needed for biotechnological R&D.51

In a memo on biotechnological industries, issues that could impede industrial European biotechnology development were presented under the heading, *Hurdles and Bottlenecks*. Several problems were listed, out of which a few were erased for the final version, such as “The toughest challenge to an increased industrial exploitation of modern biotechnology is most likely, especially for food and agricultural applications, the lack of public acceptance.”52 As we have seen previously, the lack of public acceptance was (partly) construed as a misunderstanding of the real risks related to biotechnology. This misunderstanding, caused by lack of knowledge, could not be taken into account when presenting risks. But it was also problematic for turning hopeful biotechnical prophecies into industrial realities. As a matter of fact, lack of public acceptance was the “toughest challenge” of them all.

But could there actually be something like a totally risk-free society? The

---


52 Memo, *Biotekniken i industri*, 01-00-00, vol. 3, the Biotechnology Commission Archive, NA. Translation of: “Det svåraste hindret för ett ökat industriellt nytjande av den moderna biotekniken är sannolikt den, särskilt för livsmedels- och jordbruksställningar, bristande acceptansen hos allmänheten.”
Gene Technology Commission had stated a few years earlier that “to live and exist involves risks”. Was the fear of adverse effects really reasonable and rational? A commission memo concluded that a political demand for a society completely devoid of risks would probably have hindered scientific progress in the past, such as the innovations of penicillin and kidney transplants, and hence “The totally risk free society runs the risk of becoming a society without progress and development.”

Another hurdle for European industries was a reported industrial discontent with the inappropriate European politicisation of the regulatory management of biotechnology. Industry, according to the memo, was troubled by the fact that assessments in some cases seemed to be based on political standpoints, instead of evaluations of risks in the light of current legislation.

If industry representatives believed that technology assessments should not fall prey to inappropriate politicisation, what did the commission itself think was “political” about biotechnology risks? The commission had concluded in a memo that “the biotechnological questions call for a political standpoint”. The political question, however, was boiled down to whether politicians should support progress and development, economic growth and a strengthening of national competitiveness. In the area of stem cell research, these concerns were highlighted at a meeting with two experts, Lars Ährlund-Richter from Karolinska institutet and Leif Carlsson from Umeå University. Faced with a fledging stem cell research, these invited scientists expressed doubts about Sweden’s chances of keeping up in global competition. About a month earlier, science journalist Karin Bojs had reported in Dagens Nyheter on the allegedly first successful cultivation of human stem cells. Stem cells were portrayed as future cures for leukaemia and diabetes.

Lars Ährlund-Richter (molecular embryonics): Industry’s involvement has been limited, efforts have been made to get them interested, so far

---


54 Memo, Biotekniken i industrin.


56 Paper written by Leif Carlsson, Stam celler, deras användningsområden och vad vi gör i Sverige idag, a shortened version of a presentation held on 12-02-98, vol. 6, the Biotechnology Commission Archive, NA.

they have been lacking knowledge, but now something is about to turn, when it might be too late. […]

**Tanja Linderborg** (Lft): Is it too late for Swedish industry? Does research disappear [move abroad]?

**Leif Carlsson** (microbiology): Technically, its new.

**Lars Ährlund-Richter**: We are lagging 10 years behind, it’s not too late, but we have missed the train. […] 58

In sum, risks of lagging behind industrially and risks of missing the chances of progress and development served as a “silent” undercurrent to the commission work, albeit not presented in the chapter on risks. Some of these risks had been voiced by industry representatives, some by scientific experts. However, much of the opposition to biotechnology that the commission encountered took the form of a partial or wholehearted rejection of the benefits biotechnology was said to deliver, or of the route taken to accomplish this; a tearing down of walls between science and industry.

The idea that commercialisation in itself constituted a biotechnological risk, was voiced by Lennart Brunander (Cen) and Tanja Linderborg (Lft) in their reservations to the commission’s majority conclusions. 59 For the majority, it sufficed to say that “The risk of companies abusing their market dominance must be monitored carefully.” 0 The idea that biotechnological commercialisation had a possible downside in a number of areas was not marshalled by certain political parties (Grn, Cen, Lef) and NGOs alone. 61 For example, SIDA, the Swedish International Development Cooperation Agency, emphasised the geopolitical aspects of trade and property agreements for the access of genetic materials in a global perspective, SBU, the Swedish Council on Technology Assessment in Health Care, cautioned against the dangers of naively adopting the pharmaceutical companies’ belief in gene technology as a remedy for a

---


61 Referral answer, Church of Sweden, 03-29-01; SNF, 04-06-01; Swedish Consumer Coalition, 04-06-01; DHR and SFR, 04-01-01, archived at the Ministry of Education and Science.
range of illnesses at the expense of other clinical research, and the Faculty of Medicine at Lund University believed the commission should have discussed the dangers of an increased free availability of gene tests on the market. The commission’s suggestion to allow temporary secrecy for publicly funded research applications, was also believed to come into conflict with the commission’s declared wish to make biotechnology, in the name of democracy, more open to public scrutiny. Consulted experts brought attention to the fact that the role of scientists as social whistle-blowers could be undermined if they were tied up by economic interests.

As the first draft for a national biotechnology policy was discussed on March 2 and 3, 2000, it was still an open question whether the state would actively support biotechnology or be more “restrained”. As the commission work came to an end, this was no longer an issue. Its support for biotechnology was vehemently enforced. The 21-point biotechnology policy stated that biotechnology research must be a prioritised area and that central funding should be increased. This national commitment to biotechnology was to be channelled into sectors where Swedish research was already “cutting edge”, such as functional genomics, areas with a potential for making an impact on the international market. The commission demonstrated its belief in the validity of widely held expectations about biotechnology’s potential of doing good, “for the benefit of the individual, industry and the environment”. This belief was coupled with policy suggestions (point 15–17) propagating for further commercialisation of university research. More concretely, this would take the form of provision of cost-free advice to researchers, the creation of new forms of cooperation between industry and the academia, and making it possible to secure confidentiality for research applications. When the commission was given the opportunity to comment on a government bill on the future research policy in spring 2000, it underlined the importance

---

62 Referral answers, SBU, 03-14-01; the Faculty of Medicine at Lund University, 03-30-01; SIDA, 04-02-01, archived at the Ministry of Education and Science.
63 Referral answers, SMER, 04-05-01; RRV, 04-05-01, archived at the Ministry of Education and Science.
64 See for example paper written by Wilhelm Agrell, Forskarens ansvar och forskningens konsekvenser – huvuddragen i och reflexioner kring en klassisk debatt om moral, politik och yrkesroller, vol. 7, the Biotechnology Commission Archive, NA.
65 SOU 2000:103, Breakthroughs, 22.
of a continued strong state support for biotechnology research.\textsuperscript{66}

To satisfy the demands of the labour market, a provision of biotechnological expertise was also seen as of paramount importance. Teaching on all levels was to be strengthened, for example by establishing a national special resource centre for biotechnology pedagogy. At an academic level, courses dealing with science, technology and ethics, would be offered to doctors, nurses and genetic counsellors.\textsuperscript{57} In order to deal with risks or other downsides of biotechnology, what we can call “compensatory” research was offered. More research on environmental risks by expanding the use of field trials, more research looking into alternatives to animal experimentation, more research for cooperation and transfer of skills and expertise to developing countries, so that these countries could also benefit from biotechnology. And as for addressing the problem of large companies abusing their market dominance, it sufficed to state that the situation needed to be “monitored carefully”.

\textit{Drilling the Ethical Minefield?}

The commission concluded that ethical questions unavoidably arose from biotechnological applications and that all people needed to be aware of them. Since biotechnology was believed to influence not only Swedes, but the life situation for all people on the earth, it was of paramount importance that the ethical discussion kept up with the pace of technical innovation. In fact, it was stated that a distinguishing feature of biotechnology was that research and technical development was many steps ahead of the ethical reflection.\textsuperscript{68} Nevertheless, the commission saw no reason for talking about an ethics suited to or designed for biotechnology specifically.

\begin{quote}
We arrive at the opposite conclusion. The ethical values which should form a basis for taking a stand on biotechnical applications, the value conflicts which can arise from such decisions and the ethical analysis which should precede them do not differ from what is the case concerning comparable actions.\textsuperscript{69}
\end{quote}

\textsuperscript{66} Commission reply, 05-11-00, vol. 5, the Biotechnology Commission Archive, NA.
\textsuperscript{67} SOU 2000:103, \textit{Att spränga gränser}, 34–35.
\textsuperscript{68} SOU 2000:103, \textit{Att spränga gränser}, 223.
\textsuperscript{69} Ibid., 224. Translation of: ”Vi kommer dock till motsatt slutsats. De etiska värderingar som bör ligga till grund för ställningstaganden till biotekniska tillämpningar, de värderingskonflikter som kan uppstå vid sådana ställningstaganden och den etiska analys
However, this would not stop ethics from having a “prominent place” in the biotechnological area. How would ethics achieve that position and what issues were going to be carved out as in need of a “deepened ethical discussion”? The answers to these questions depended on ideas about how ethics was believed to relate to politics and what constituted a proper ethical analysis.

If no “new” ethics was called for, did this mean that there existed an established “old” one? The commission never accounted for how it came to the conclusion that no new ethics was needed, but it tried to identify ethical principles which had been codified in agreements and laws. One such was the precautionary principle which was said to be supported by everyone. However, this principle could not be taken “too far”, and it remained somewhat unclear if the commission actually believed it should be a guiding principle in Swedish regulatory practice. The commission opened up the door for ethical pluralism, as a number of traditions and theories were accounted for in the final report, but priority was given to none of them. The fact that ethics as an area of academic research did not support one single view, but many, entailed that it could not be used as an unambiguous source of consensus-generating knowledge. How the commission was to manoeuvre in this minefield of opposing views was problematic. For example, Per Landgren (ChrDem) suggested that the commission needed to find a balance between different ethical perspectives, and that there existed no consensus as to which theory was correct. Referring to the attendance of two utilitarian ethicists at a recently held conference, moral philosophers Christian Munthe and Thomas Anderberg, Per Landgren proposed the inclusion of complementary views from theologist Erwin Bischopsberger.70

The ethicist Torbjörn Tännsjö, who had been commissioned to write on the subject of bioethics, is an outspoken philosopher, often causing media headlines. In the parliamentary debate on biotechnology in spring 1997, Tännsjö’s connection to the Left party as well as his alleged belief that gene technology choices needed to be made on an individual, rather than political, level, was criticised.71 In the paper Torbjörn Tännsjö provided as a consulted expert, he discussed the problem of “solving” ethical problems. Ethics, as an academic discipline, was “unusual” for not

---

70 Notes, 12-02-98.
71 Proceedings in the Chamber, 1996/97:77, 03-12-97.
conforming to specific established methods for how to go about solving research problems. This fact separated ethical problems from ordinary “scientific” ones. Based on that, what role could the commission play in choosing among conflicting ethical interpretations? Indeed, what could ethics contribute to politics? Torbjörn Tännsjö’s paper delved into these questions and suggested that politicians were forced to find provisional solutions to ethical problems, but that these provisional solutions could never be satisfactorily defended, from a philosophical point of view.

The real ethical analysis remained out of bounds to politicians, and simultaneously the role of ethics for improving political discussions and decisions was seriously weakened by the assertion that ethical problems were in fact unsolvable, even for professional ethicists. In a pluralistic society disagreement was to be expected.

In the final report it was declared that it was important to clarify what ethical principles should be guiding the use and development of biotechnology applications, as well as how to act if these values came in conflict with one another, but that “No proof in the form of simple and straightforward guidelines should be expected.” The commission underlined the importance of dealing with ethical questions, how they affected us all, how the ethical discussion needed to keep up with technical innovation and how important it was to clarify on what ethical basis a biotechnical policy should be built. But at the same time, it did not contribute to such a clarification. This meant that most of the biotechnological applications the commission chose to handle, such as gene testing, gene therapy, transgenic animals, GM foods etc., were only submitted to short descriptions, as had risks been. It had been considered an aim to facilitate for the citizenry to make its own decisions, rather than presenting fixed and ready answers.

Considerable effort had nevertheless been spent on separating a proper ethical analysis from what it was not. Most of these formulations did not make it into the final report, and it is not apparent on what grounds these

---

72 Paper written by Torbjörn Tännsjö, Bioetik, undated, vol. 3, the Biotechnology Commission Archive, NA.
73 Ibid.
74 Ibid.
75 SOU 2000:103, Att spränga gränser, 223. Translation of: ”Något facit i form av enkla och entydiga riktlinjer skall man dock inte vänta sig.”
76 Memo, document on ethics discussed on 01-20-99, vol. 1, the Biotechnology Commission Archive, NA.
sections were deleted. Two memos which constituted preliminary drafts of the final chapter on ethics, both dealt with this topic. In a memo sent out to the members at the beginning of January 1999 it said that:

A discussion on ethical questions related to biotechnology presupposes an analytical will and capacity. Intuition is not a good foundation for ethical decisions since it is highly influenced by the culture in which we have been brought up. Ethics and morals are not primarily about emotions, but require rational considerations.²⁷

In another draft dated from July 2000 it was said that an ethical analysis, in the right meaning of the word, meant rationally scrutinising moral problems, not subjectively forming opinions about them. The ethicist was said to base his/her judgement on relevant facts and good arguments.

In the same way as there is a difference between scientifically estimated and subjectively experienced risk, there is a difference between ethical analyses which are based on clearly presented values and which have considered all the relevant facts, and forming attitudes on looser and more unspecific grounds.²⁸

So, were opinions based on “misconceptions”, “general enthusiasm” or “instinctive concern” worth as much as those preceded by a stringent ethical analysis? Should it matter just how someone arrives at a conclusion?

However, in a democracy all opinions should be met with respect. People’s opinions can hardly be ignored because they have not used a scientific method or taken all facts into account. At the same time it can be perceived as dubious to place too much importance on views which, from what it seems, stem from spontaneous emotion rather than rational analysis. How to tackle such questions is an ethical problem in itself.²⁹

²⁷ Ibid. Translation of: "En diskussion kring etiska frågor förknippade med biotekniken förutsätter en vilja och förmåga till analys. Intuition är ingen bra grund för etiska beslut eftersom den är kraftigt påverkad av vilken kultur vi vuxit upp i. Etik och moral handlar inte primärt om känslor utan det krävs rationella överväganden."

²⁸ Memo, Etik, moral och bioteknik, 07-05-00, vol. 3, the Biotechnology Commission Archive, NA. Translation of: "På samma sätt som det är skillnad på vetenskapligt bedömd och subjektivt upplevd risk, är det skillnad på etiska analyser, där de underliggande värderingarna klart redovisas och alla relevanta fakta vägts in, och attitydbildning på löserare och mera ospecificerade grunder."

²⁹ Ibid. Translation of: "I en demokrati ska emellertid alla åsikter bemötas med respekt. Människors åsikter kan knappast negligeras för att de inte använt en vetenskaplig metod eller tagit alla fakta med i beräkningen. Samtidigt kan det uppstå som tvetsamt att fästa avgörande vikt vid åsikter som av allt att döma är resultatet av en spontan känsla snarare
This did not become an ethical problem, but indeed a critical legitimacy problem for the commission to solve. For how could it claim that the application of biotechnology had inherent ethical dimensions which should be a matter for “all” to discuss and influence, and at the same time privilege only certain views, the ones based on rational analysis and an understanding of all the facts? Was it democratically defensible not to give weight to those other views? And if politics or politicians could not perform accurate ethical analyses either, was it legitimate to try to settle ethical issues once and for all in a political context? Interestingly enough, not much of these discussions was kept intact for the final report. Instead, ethics came to be described as integrated with politics, in the sense that ideas about what it means to be human, what constitutes justice etc., were seen as irreducible parts of legislation and political decision-making. However, ethics was contrasted to religion, thereby pointing to its secular character.  

That ethics was understood as an inner element of politics, did not mean that the commission sought to formulate a shared ethical view on biotechnology. However, this was an open question for a long time. As a draft on the future biotechnology policy was discussed in spring 2000, the commission had the ambition to establish a “value foundation”, a common denominator, with the potential of becoming widely shared in society. The ethicist Torbjörn Tännsjö had formulated two problems related to such an ambition. Firstly, for ethical statements to be accepted by a majority they ran the risk of resulting in very vague pronouncements, and secondly, they could be perceived of as totalitarian. In another memo it was stated that: “How are the public institutions and separate individuals going to be provided with sufficient information to make judgements and take a stand? To what extent should the state or separate individuals be the primary judges of how biotechnology is applied?”

By refraining from deciding what was ethically acceptable or not in...
different areas of biotechnical activities, the commission minimised its role for deciding on the concrete ethical content. Instead, this was something that the public needed to get more involved in. The commission acknowledged that there existed an ethical minefield, but did not risk going into it itself. Instead it proposed two new organisations that could do that, through a transformation of the Swedish Gene Technology Advisory Board into a Biotechnology Inspection and the constitution of a Technology Council. The inspection was suggested to coordinate the work of the many different sector based authorities dealing with biotechnology supervision and oversight. The inspection was also meant to deal with biotechnology in general, that is both conventional and advanced biotechnology, both applied to humans and other organisms. It would focus on new and untested applications and have the authority to exercise the right of veto.\footnote{SOU 2000:103, \textit{Att spränga gränser}, 324–325.} The Technology Council would “promote the accumulation of knowledge, disseminate information, and create an active dialogue between researchers and other specialists, politicians and other citizens.”\footnote{SOU 2000:103, \textit{Breakthroughs}, 23.} The commission also proposed new laws for regulating biotechnology applications regarding humans, such as gene therapy and cloning, as well as a regulation by law of the existing research ethics committees. However, these laws were presented as giving just an “outline” of what legislation would look like, and most referral bodies did not know how to respond to such a suggestion. In a reservation to the commission report, Lennart Rhodin (Lib) expressed the opinion that the commission had started working on the law proposals too late for them to be treated satisfactorily.\footnote{SOU 2000:103, \textit{Att spränga gränser}, 352.}

Did the commission succeed in its mission to identify areas in need of a thorough ethical analysis? A long row of referral bodies thought not. The ethical discussion was generally considered to be superficial, ill-informed, sketchy, contradictory and based on false assumptions. Generally, the commission was believed to have failed to penetrate specific ethical problems, to account for different ways of seeing them, and hence to provide a basis for its different policy suggestions. The Federation of Swedish County Councils, LF, believed the quest for an all-encompassing ethical policy was an impossible project to engage in.\footnote{Referral answer, Federation of Swedish County Councils, 04-20-01, archived at the}
few bodies believing the commission had overemphasised the prevalence of risks and ethical problems was the newly formed authority Vinnova, the Swedish Agency for Innovations Systems. The Swedish Gene Technology Advisory Board was concerned that the commission had overrated the role of professional ethicists in the Biotechnology Inspection.

According to the proposal about a Biotechnology inspection […] an ethical evaluation is requested in all cases and ethical expertise should be available when making decisions. The lack of clarity as to what this evaluation and expertise should involve is therefore unsatisfying. It is also troublesome that this issue so one-sidedly is regarded as an expert issue.

The problematic role of ethical expertise was also commented on by the Faculty of Science at Lund university.

But no experts in the world, be it philosophers, theologians, humanists or biologists, know what is right and wrong in the world of potentialities that the modern biology opens up. A better guiding principle should probably be to assume that a sound ethical practice emanates from the acts of knowledgeable citizens.

The idea that it could be politically dubious to impose ethical principles or standpoints on the public, still begged the question of how ethics would become central in all areas of biotechnology? Could ethical decisions safely be delegated to the level of individuals? A proper ethical analysis, in “the right sense of the word”, presupposed access to fact-based knowledge and a competently performed rational (non-emotional, non-

---

Ministry of Education and Science. However, the commission had not presented such a programme, nor were they assigned to.

88 Referral answer, Vinnova, 04-04-01, archived at the Ministry of Education and Science.


90 Referral answer, the Faculty of Science at Lund University, 03-30-01, archived at the Ministry of Education and Science. Translation of: "Men inga experter i världen, må de vara filosofer, teologer, humanister eller biologer, vet vad som är rätt och fel i den värld av potentialiteter som den moderna biologin öppnar för oss. En bättre riktlinje är nog istället att utgå ifrån att god etisk praxis följer ur kunniga medborgares genomtänkta handlande."
intuitive, non-subjective, non-spontaneous) analysis. If ethics was not to be degraded to sheer opinion, or culturally contaminated intuition, it needed to be something else. And still, the main problem was that many people rejected certain aspects of biotechnology, or all of it together, on the basis of morality. Were they up to the task? How could this problem be handled? In the final report the commission inferred that:

> When it comes to biotechnology applications one could possibly say, a bit simplified, that the research community and the authorities focus on risks and cost/benefit analyses, while the citizens seem to put more weight on the moral issues. The politicians, who will make decisions about how to use new technology, have to balance these views. All parties expressed strong wishes for more information to more people and a broadened public debate, with questions of risks, benefits and ethics at the centre.\(^3\)

Previously it had been said that the research community had views which could be at odds with the public’s and that politicians needed to pay attention to the strength of different arguments before they made up their minds.\(^2\) So what did the commission know about the public’s attitudes and levels of knowledge? Biotechnology was said to bring to the fore ethical questions and these questions were predominantly of concern for the public. What could be more democratically legitimate than to include those views in a biotechnology policy for the future? As the commission stated, bioethics had to be a concern for all.\(^3\)

An organisation which, according to themselves, wanted to take public concerns seriously as a guardian of consumer interests, was KF, the Swedish Cooperative Union. In a meeting with KF representatives, the organisation accounted for its GM food policy. KF had chosen not to sell GM products, with the consumers’ health in mind. Majlène Westerlund Panke (SocDem) questioned such a position. “You participate in the process that only increases concerns. How much is built on knowledge and how much on the fact that consumers are worried. We must know to be

---


\(^2\) Memo, *Etik, moral och bioteknik*.

able to judge what you are saying.”

Could KF be trusted to make sound assessments if all they did was listen to consumers? Majléne Westerlund Panke’s doubts demonstrated the problem the commission itself faced: could it listen to consumers and build a policy suggestion based on their views, as KF had done, and did this not become an undeniably populistic approach at odds with the commission’s rational undertaking? Also, if the public views were to be taken into account, then it would mean coming into conflict with the research community, as the commission had conceded that there was a gap between these two groups. But minding the public view, would also impede any effort to formulate a policy for the future, if that future involved a strengthened biotech industry. One of the major hurdles for fully realising biotechnology’s industrial potential was its lack of public support. To accomplish a more positive attitude to modern biotechnology applications, companies, researchers and authorities were considered to need to be more open, the level of knowledge in society needed to increase, and more demander initiated products needed to be developed.

What the commission presented in order to handle its own concern about public concerns, must be seen in the light of its effort to propose a policy that was both democratically acceptable and rationally based.

**Majléne Westerlund-Panke** (SocDem): the new biology will constitute an equally radical transformation of our thinking as the realisation that the earth is round. The distrust of science and knowledge is worrying. It is important that scientists inform us about their work.

**Gudrun Lindvall** (Grn): On the contrary [I] think that we trust research too much, physicians and the medical industry are seldom called into question. It is good that people finally question natural science. The natural science also gains from more information.

**Niklas Öhrner** (author of scientific textbooks): both views are correct, the solution is to get research results more widely spread. Compare it with the U.S., there it works much better, researchers go on TV, participate in debates etc. The researchers there know more about what the public wants. You can see it as a “paradigm shift”, society opposes it to a certain point, after which it changes and then they support it instead.

---

94 Notes, 03-02-00, vol. 3, the Biotechnology Commission Archive, NA. Translation of: “Ni ingår i den process som ökar oron. Hur mycket bygger ni på kunskap och hur mycket på att konsumenterna är oroliga? Vi måste veta för att kunna bedöma det du säger.”

95 Memo, *Biotekniken i industrin*.

96 Notes, 11-12-98, vol. 1, the Biotechnology Commission Archive, NA. Translation of: ”Majlén WP: den nya biologin kommer att bli en lika radikal omvandling av tänkandet som när man insåg att jorden är rund. Misstron mot vetenskap och kunskap är oroande.
The commission chose to stand behind a broadened, well-informed debate, something that was said to be desired by industry, the research community, NGOs and the public at large. Distrust of science and knowledge, which worried Majlène Westerlund Panke, and a blind faith in the same, which concerned Gudrun Lindvall, were amenable if more, and better informed people took part in public debate. The imagined paradigm shift, would nevertheless undoubtedly mean that distrust was replaced by trust. Westerlund Panke expressed a similar view in the weekly magazine *Dagens Medicin* in December 2000, only days after the publication of the commission’s final report. Westerlund Panke was reported to have said that ethical boundaries were, in fact, negotiable and changeable over time. “As we go along, peoples’ levels of tolerance change, boundaries for how much one tolerates morally and ethically are redrawn. Now we witness the same discussion on stem cells and cloning techniques, as we hade before on organ donation.”

Concluding Remarks

For the Biotechnology Commission, risks could not, or should not, be analysed out of context. By focusing on risks alone, benefits never entered the scene of risk assessments, and a more balanced way of assessing risks. This was important, not least since risk assessments otherwise could foster attitudes at odds with progressive thinking. The problem was that those for whom this progress was meant, were more negative than ever. The response to this was a kind of “shortcut”. The Biotechnology Commision signalled that those risks that actually existed were manageable. If only the public could be convinced about all the good things biotechnology entailed – by letting researchers explain them and industry produce

---


97 Anna Bäsén, “Förslag om ny myndighet med helhetssyn på bioteknik”, *Dagens medicin*, 12-09-00. Translation of: ”Allt eftersom förändras människors toleransnivå, gränserna förskjuts för hur mycket man tolererar moraliskt och etiskt. Nu har vi samma diskussion kring stamceller och kloningsteknik som vi haft kring organdonation.”
them – they would stop resisting them and learn to accept a certain level of risk. But the commission also went through established paths of coping with public anxiety by proposing administrative, institutional or legal changes to gain public acceptance, but still keep it fairly open what sort of principles these new institutions would base their judgments on. This position was not accepted by the representatives of the Left Party, the Green Party and the Centre Party, nor by a large number of referral bodies, which saw industrial commercialisation as a risky business in itself.

Ethics for the Biotechnology Commission was a question to be delegated to individual citizens. Efforts to distinguish between a proper ethical analysis and subjective, intuitive and emotional standpoints were made, but it remained unclear whether politics could aspire to achieve the former. No actual guidance could be found within the bounds of professional ethics either. Ethical issues therefore came to be delegated downwards, trusting the ethical abilities of separate individuals. Stronger than the other commissions, the Biotechnology Commission subscribed to the idea of a citizenry involved in informed public ethical debate, but also that it was important for scientists to get more involved. If a proposed biotechnology policy involved refraining from a spirit of caution in favour of support, public resistance could not be overcome without the full engagement of a communicative research society.

No single ethical expert influenced the commission work, as it had done in the Gene-Ethics Commission. The one that provided written material did in fact problematise the role politics could play on the ethical area. Instead pluralism and an even more unclear role for professional ethics emerged. When discussing what experts to invite to the commission, the words *ethical professionals* had been surrounded by citation marks.98

As with previous commissions, the biotechnology commission encountered conceptional difficulties when deciding what was meant by “modern” biotechnology. It settled for a definition saying that “Biotechnology is a collective term for the use of microbiological, cellular biological and molecular biological methods for technological purposes.”99 It was a “basic” technology that had turned “cutting edge”. These problems of specificity worked themselves into the content of the proposed biotechnology policy and its different elements. If biotechnology

98 Notes, 06-03-98. In Swedish, “proffsetiker”.
was not problematic in itself – the idea underpinning the support for a technology-neutral risk assessment – then why did Sweden need a new authority to control it, a new Biotechnology Inspection? If biotechnology encompassed such things as ultrasound diagnosis, which was suggested, why not also x-ray methods? Did employing biotechnological methods such as gene sequencing and using bioinformatics resources in traditional biological research turn these disciplines into “modern” biotechnology?

Bringing it all together, modern and conventional, medical and agricultural etc., under one roof – the Biotechnology Inspection – did not solve these problems.

The Biotechnology Inspection and the Technology Council were never realised. Many referral bodies thought the commission was sending out mixed signals; on the one hand it asserted its belief in manageable risks and a biotechnology sector that would soon bear fruit, on the other it proposed regulatory measures that did not correspond to these conclusions. The commission did not fall prey to accusations of politicisation, maybe because it sent out such a clear message about its belief in biotechnology’s potential. But, with a few exceptions, neither governmental authorities nor non-parliamentary actors thought that the commission had penetrated the ethical problems satisfactorily or taken the risks of gene technology seriously. As a boundary organisation, it did not succeed to present a proposal that had enough scientific weight to be fully credible. The fact that the commission did not include experts was taken as a reason for its failure on this account.

Aftermath

Existing regulatory control of gene technology in Sweden, especially the laws from 1991 and 1994, had not been based on direct commission proposals, but were the results of political negotiations following the publications of the commission reports. The Gene-Ethics Commission had proposed ethical norms instead of laws, and the Gene Technology Commission had objected to a framework law on genetically modified organisms, like the one that took effect in 1994. However, especially for the Gene-Ethics Commission and the Gene Technology Commission, it had

100 Referral answer, VR, 04-11-01, archived at the Ministry of Education and Science.
101 Referral answer, Svalöf Weibull, 04-04-01, archived at the Ministry of Education and Science.
been an important task to try to “get ahead of” technical development, by reviewing existing regulation, as well as proposing new changes, if needed. There was a strong sentiment that gene technology could get out of hand, and that policy makers had difficulties in keeping up. Still in 2007, on a website commissioned by the Royal Swedish Academy of Engineering Sciences it says that:

The regulatory framework for parts of the gene technology sector is tricky and unperspicuous. Other parts are patchy and imcomplete, burdened by contentious questions of interpretation. For the pace of innovation is so fast that legislators and rule-makers can’t keep up.02

The Biotechnology Commission, on the other hand, inferred that most risks were manageable, and others acceptable, and that the precautionary principle on which the European directives were based, as well as the new Swedish Environmental Code, could not be taken too far. This may have marked a turning point in the Swedish political conception of gene technology regulation. For example, in 2003, Robert Andrén, director at the Swedish Environmental Protection Agency, considered Swedish regulation to have been very proactive, as it had developed “in tandem” with technological innovation. He expressed it like this at a conference initiated by the Swedish Gene Technology Advisory Board:

The unique feature of gene technology is that legislation was implemented in tandem with technical innovation. We got a regulatory framework before gene technology was applied on a large scale. In many other areas rules have usually been implemented after negative environmental and/or health effects have been manifested. This was the case for chemicals, alcohol and tobacco, for example.03

02 This citation comes from a public educational website commissioned by the Royal Swedish Academy of Engineering Sciences, www.genteknik.nu, produced in 2002. The material was written by Henrik Brändén. Translation of: “Kring delar av gentekniken är regelverket snårigt och svåröverskådligt. Kring andra delar är det ett lapptäcke med stora hål och besvärliga tolkningsfrågor. Ty utvecklingen av teknikerna går så fort att lagstiftare och regelmakare har svårt att hinna med.”


161
As we went into the 21st century, voices were heard which recognised that technical development now actually was under control, and that the precautionary stance had been exaggerating gene technology’s potential for doing harm. For example Torbjörn Fagerström, former expert in the Gene Technology Commission, regretted that Sweden in the gene technology case had failed its political tradition of handling questions like these rationally.

East Asia and the U.S. will take the lead if we can’t get rid of the dead hand lying over this kind of research. When a technique is new it usually causes concern and motivates strict rules. But eventually, in Sweden we usually settle for a reasonable and rational level. Instead, here the technique has been demonised [...] 104

Annika Åhnberg, former political member of the Gene Technology Commission and in the early 1990s an advocate for stricter regulatory control, had had a change of heart in 2006.

The precaution surrounding gene technology is exaggerated. [...] I think it is more a question of the principle of following the leader, than of serious considerations. Politicians put up their fingers in the air, or rather in the media, to see in what direction the wind blows. What is said in the media in the morning is what comes up in the Riksdag in the afternoon. 105

The government never presented a bill proposing a Biotechnology Inspection or a Technology Council. As for the outline of a law on biotechnology regarding humans, other commissions would soon deal more thoroughly with those questions.

Biotechnology had broken the divides, as the English report title tellingly suggested. The new thing with this formulation was not that boundaries had been crossed between the natural and the normal, between the ethically acceptable and unacceptable, the known and unknown, as

---


the commission itself put it, but that fuzzy boundaries were no longer automatically problematic. They had, at least to some extent, become normalized. Gene technology also came to occupy a more central position in politics than ever before. In the early 1990s, gene technology had its political home base in two different subsections, environmental policy and medical (ethical) policy. The only political party in Sweden with an explicit moral programme was the Christian Democrats, promoting a value-oriented policy based on Christian ideas. It was gene technology’s implications for health care and medical research that most often prompted this party’s ethical articulation on gene technology. In terms of gene technology’s role for environmental policy, the Centre Party and the Green Party, had been most politically active for raising the question to political awareness. Now, by the turn of the century, gene technology’s role for a whole new set of areas was unquestioned.

It is evident that biotechnology, in the year 2000, had broken its confinement in more or less narrow political subsections. The political expansion of biotechnology-related issues cannot be understood without taking into account its actual commercial implications. Above all, it came to affect international trade, agricultural policy, social policy, industrial policy, innovation policy, economic policy, environmental policy, EU policy, health and medical policy, foreign policy, third world development assistance policy, security and surveillance policy, among others. In the year 2000, the governmental bill Research and Renewal assigned an extra sum of 120 million Swedish crowns, to support research in the area of bioscience and biotechnology. This commitment was kept in the years to come, with the motivation that Sweden needed to remain a leading actor on the biotechnological arena.

There was a growing recognition of biotechnology as a policy area in its own right. Indeed, the 21 point biotechnology policy delivered by the commission, reflected this tendency. In 1999, the current Minister of the Environment, Kjell Larsson (SocDem), answered a question in Parliament posed by Barbro Westerholm (Lib). He said then that:

In the light of the rapid development of modern biotechnology – gene technology – and its growing importance for industrial processes and

---

106 Governmental bill 2000/01:3 120, Forskning och förnyelse.
107 Governmental bill, 2002/03:1, Budgetpropositionen för 2003, Utgiftsområde 16, utbildning och universitetsforskning.
food production, the question becomes harder and harder to handle as an
isolated phenomenon in society or in politics.\textsuperscript{108}

In \textit{Dagens Nyheter}, only about a week after the Biotechnology Commission
presented its 21 point agenda, three Social Democratic Cabinet Ministers
called for a comprehensive “gene politics” and rejected, on scientific as
well as ethical grounds, the patentability of genes.\textsuperscript{109}

In the next few years after the publication of the report in 2000, several
initiatives were taken to enhance democratic debate and public interest
in the so-called new biology, or science and technology in general.
These initiatives aimed at reforming science communication and public
learning, pressing the case for cooperation rather than information
dissemination.\textsuperscript{110} As the landscape for science funding was restructured
in 2001, a section within the newly formed Swedish Research Council,
“Research forum”, was constituted, among other things to engage in
public understanding of science activities, as well as act as a mediator
between funders, politics and science.\textsuperscript{111} This body addressed both the
“knowledge deficit” problem as well as issues dealing with public trust
in science.\textsuperscript{112} Research forum attempted to invent a new approach to
the public understanding of science, as previous efforts seemed to have
failed so miserably. Sociologist Mark Elam has studied a film production
called \textit{Life at Stake}, commissioned by the forum and broadcasted by
the Swedish Public Service, which aimed at constructing a new logic
of public engagement with science.\textsuperscript{113} However, his analysis concludes
that it remains unclear if such a logic was ever achieved. \textit{Life at Stake}
rather demonstrated the potential for biotechnology to alleviate private
suffering and bring salvation to people by playing on visual symbolism
and emotional experiences of lay people, using the same rhetoric as

\textsuperscript{108} Proceedings in the Chamber, answer to written question, 1998/99:733, \textit{om genpolitik
och svenskt utvecklingsamarbete}. Translation of: “I ljuset av den moderna bioteknikens
– genteknikens – snabba utveckling och ökande betydelse i industriella processer och i
livsmedelsproduktionen blir frågan allt svårare att hantera som en isolerad förete[else] i
samhället och politiken.”

\textsuperscript{109} Thomas Bodström, Kjell Larsson and Leif Pagrotsky, “Regeringen formulerar

\textsuperscript{110} This had also since 1997 been explicitly formulated in the Higher Education Act,
regulating Swedish institutions of higher education.

\textsuperscript{111} In Swedish, “forskningsforum”.

\textsuperscript{112} Research Forum was closed down two years later, in 2003. See Anom,

\textsuperscript{113} In Swedish, “Det gäller livet”.

164
organisations like Green Peace. Another initiative to revitalise public-science relations, was the launching of the non-profit organisation Public and Science in 2002. Social democrat Majléne Westerlund Panke was involved in the preparatory work for establishing this organisation which would, in her view, become “a new people’s movement”, thereby dusting off a longstanding Swedish tradition of science communication performed in the name of “public education”.

In the year 2001, embryonic stem cells attracted massive media attention, internationally as well as in Sweden. In August the U.S. President Bush announced a policy that in terms of federal funding would support research only on already existing stem cell lines. Despite the earlier warnings about Sweden’s missed opportunities and failure to take the lead in the stem cell race, Swedish researchers were nevertheless believed to be in possession of about one third of the worlds stem cell lines. The Biotechnology Commission had neither condemned, nor full-heartedly supported embryonic stem cell research. Two of its political members, Lennart Rhodin (Lib) and Per Landgren (ChrDem), had announced that their views differed from the commission majority’s, as they believed it to be ethically problematic to produce embryos for the purpose of enhancing research. The debate focused on different interlinked aspects such as whether embryo research should be accepted or encouraged, if only spare embryos would be used or if it was acceptable to create new embryos through somatic cell nuclear transfer, so-called therapeutic cloning, and if also human reproductive cloning might become acceptable. The Council of Europe’s 1997 Convention on Human Rights and Biomedicine did not allow for the creation of new embryos for research purposes, and if Sweden was to accept stem cell research it needed to declare a reservation.
on Article 18.2. After new ethical guidelines had been issued by the Swedish Research Council in December 2001, a new governmental commission was appointed, which was entrusted with the task of submitting a proposal for how to make necessary changes in legislation in order to permit research on stem cells, and to prohibit reproductive cloning. As a result, Sweden proposed one of the world’s most liberal regulations of stem cell research, only matched by countries like Belgium and the UK. In March 2004, the current Minister for Education and Research, Thomas Östros, and the Minister for Health and Social Affairs, Lars Engqvist, spelled out the hopes of the Social Democratic government that this new legislation would provide hopes for future cures and treatments, as well as helping Swedish medical science to maintain a top position in a global context.

The political history of gene technology, seen through the prism of governmental commissions is, to a great extent, a history about the hybrid understandings of hybrid DNA. It is a story of conceptual struggles, temporal closure and re-openings of old questions over again. Ideas about novelty, naturalness, originality etc., have been moving in and out of the political understanding of gene technology. As a laboratory technique, it has probably had, at any given time, a very concrete, fixed and limited practical meaning. But in politics, or in culture at large, its meaning has undergone several important changes. As we follow ideas about risks and ethics from the early 1980s and onwards, these developments come to light, but also many continuities.

What is “new” for the day, soon makes its way into the past, turning into something “old”. The rapid pace of this process has challenged both advocates and opponents of the latest gene technology application. Sometimes it has been taken as a reason to call for stricter control, sometimes quite the opposite. To stop and ask what the present state of affairs is (what has been done, what can be done, what will be done?), as all three commissions did, was never an easy task. Above all, it meant distinguishing between what was routine and untested practices, realistic prediction and “science fiction”, what was unique problems and what was substantially similar to old ones, what constituted a responsible approach as opposed to misconduct, and what it meant to let things “get out of hand” in contrast to being “in control”. In the process of deciding these things much of what had belonged to “history” would resurface, maybe in a different disguise, but nevertheless provoking new debates. For example, when the Gene-Ethics Commission struggled with how to

6. Hybrid Understandings of Hybrid DNA
regulate human embryo research, it settled for a fourteen-day barrier, after which it would be ethically unacceptable to carry on with experiments. This stance collided with the existing abortion legislation which allowed terminations far beyond that point in pregnancies. Dwelling on the moral status of human embryos inevitably meant, in one way or other, solving that conflict and re-assessing the ethical justification of abortions.

For the Gene Technology Commission, concerns about producing transgenic animals for foods and pets were turned down on the basis that it was not different from traditional animal breeding. In the name of coherence, opposing transgenic animals had to be about opposing animal breeding as such, a standpoint that seemed unreasonable. But this argumentation meant that qualms about the naturalness or risky character of transgenic animals spilled over to areas not under consideration, in this case traditional breeding techniques, thereby turning the issue of gene technology regulation into a broader assessment of cultural and societal customs and norms. The fact that Belgian Blue for many came to symbolize the downside of genetic modification, even though it had not been produced with recombinant DNA technology, is symptomatic of these phenomena. Gene technology came to raise questions about the desirability of an increased industrialisation of agriculture, and once raised, these concerns spilled over to other areas.

As research on embryonic stem cells caused a media flurry in the early years of the new millennium, the moral status of the embryo was, once again, on the agenda. Both in the U.S. and the EU, the acceptability of using spare embryos from IVF clinics for stem cell research was contrasted with the unacceptability of producing embryos for research purposes alone. But even though using excess embryos for advancing medical research seemed politically appealing, it nevertheless opened the question if spare embryos should be created in the first place, bringing the practice of IVF treatments once again under ethical scrutiny. A reflection on the political history of gene technology brings to the fore this mutable character of statements about what are “established facts” and what is “up for negotiation”.

On the surface, support for societal control, free research, democratic debate and ethical uses of gene technology, has dominated public debate. However, what society was supposed to be in control of was never evident, nor by what means control should be exercised. Who was to represent society? The reiterated defence for the freedom of research did not specify
how far this freedom could be taken. Were there any limits? There was a general assertion of the belief in ethical usage of gene technology. But what did “ethical” mean, and on what basis would an ethical policy be built? Finally, the public was always considered to be an important group whose needs and concerns should be “taken seriously”. What this public knew or valued, who could legitimately speak for it, and in what way it could participate in order to democratise policy-making, was another issue. All these questions got their specific answers depending on the core questions the different commissions had to solve.

Core Questions to Solve

**Late 1970s**  Is gene technology safe?

During the second half of the 1970s, gene technology was understood as a laboratory technique with its primary use in basic molecular, microbiological and biochemical research. The question was if this technology was safe, or more specifically, if it was safe for laboratory personnel. Focus lay on the workplace as such, whereas outer environmental damage came second place. It was also a discussion about recombinant DNA technology, not about adjacent technologies or established older biotechnologies. As the issue concerned engineered microorganisms, like bacteria, safety came to be about laboratory containment arrangements, the lack of or failure of these containments and the geographical siting of potentially hazardous laboratories.

**Early 1980s**  Is gene technology ethically acceptable and trustworthy?

In the early 1980s, the question was not if gene technology was safe to use in basic biological research, but if it was ethically acceptable to use in biomedical research and clinical practice. Was it to be trusted in the hands of doctors and medical researchers? Microorganisms were substituted for human somatic cells, germ cells and embryos. Gene technology and reproductive technology were treated very much as inseparable. For the Gene-Ethics Commission, the problem to solve was how to reconcile ethical principles with the idea of free research. The position taken was that politics should prescribe for the research community what it could do, or could not do, by formulating ethical norms. For this to work, collisions between medical science and ethical norms needed to be minimised. Gene technology and ethics would go hand-in-hand. Control
came to be about the scientific self-regulation through medical ethical committees.

**Early 1990s** Is gene technology predictable and manageable?

In the beginning of the 1990s, gene technology within scientific research, be it biological or medical, was considered to be well-ordered and routine. Now it was gene technology’s implications for “society” or “nature” that was controversial. For the Gene Technology Commission, the problem to solve was how it could reassure itself about the safety of releasing or commercialising genetically modified organisms, when so much uncertainty existed, even within scientific circles, about what these releases entailed. If science showed signs of uncertainty, did it call for stronger political interventions? Non-governmental organisations offered conflicting interpretations of these prospects, and added to the ideological tensions in European policies, as well as between Swedish political parties.

**Late 1990s** How can gene technology be more beneficial and profitable?

In the years preceding the turn of the century, gene technology’s implications for society were, on the whole, considered to be beneficial. But, paradoxically, risks had not at all disappeared from the scene, rather they were accepted as unavoidable. The question was how to separate gene technology applications in society that were undeniably good, from those that were not. For the Biotechnology Commission, the problem to solve was how to reap the rewards from previous political investments in gene technology, if large parts of the population resisted or doubted whether these rewards were good. How could gene technology be supported to produce concrete, reliable, useful benefits, and how could the public be convinced about the importance of that support?

**Politicisation and Scientification**

If governmental commissions are a typical historical feature of Swedish political culture, then they also represent a longstanding feature of Swedish public science. As mentioned in the introduction, analysts have discerned a tendency towards a less open and independent role for governmental commissions; more narrowly defined terms of references, more one-man/one-woman commissions, less involved experts and non-
parliamentary representatives, less knowledge production and less time to conduct their work, and so on. Commissions have been criticised for being efficient tools in the hands of governments, not independently and freely analysing political problems. This tendency is not reflected in the commissions studied here. They have accommodated political members from all political parties and, except for the Biotechnology Commission, a whole range of experts. They have had broadly defined guidelines to work with and a time limit of several years. The Gene-Ethics and the Gene Technology Commissions presented reports which were expanded upon and taken farther in the political process following the publication of the reports. The proposed ethical norms turned into laws in 1991 and the proposed revisions of existing regulations turned into a broad gene technology framework law in 1994.

Although there are some salient differences between the commissions, two other shared similarities must be mentioned. One is that the issues to be solved have been treated as fairly separate from those at the heart of science policy, that is the direction, funding and organisation of research. The other that the commissions were not in line with the corporativist tradition, since only the Gene-Ethics Commission included union members, and none of other commissions other non-parliamentary actors. In their study, Fjæstad et al., believe it to be noteworthy that Sweden in the case of its gene technology regulation, has departed from its tradition of taking public opinion into consideration before proposing major legislative changes.\(^1\)

All three commissions analysed in this thesis were appointed against a backdrop of a technical trajectory believed to be running, if not wild, so at least out of reach of political control. New areas of application became reality, or were about to become reality, and each commission had to figure out a way of assessing if these areas were covered by regulatory laws, rules and provisions. For society to be in control, the commissions needed not only to keep up with a high technological pace, but actually get ahead of it. If politics was not to become just reactive, it needed to direct future developments. For both politics and science to gain, or regain, public trust it needed to demonstrate that risks – be it environmental, ethical or health related ones – were under control. But deciding what counted as risks and how to deal with them, embodied the dilemma of reconciling political and scientific understandings of gene technology. Under the

\(^1\) Fjæstad et al., “Sweden”, 133.
surface, it was much more complicated than “science” helping “politics” to make informed and rational decisions on how to formulate a regulatory policy. Each commission report needed to provide a temporal solution of the challenges posed by rapid technical innovations.

Two essential conflicts were built into the commission work. The first one had to do with the role of expertise. Should the experts be viewed as representatives of an expansive technological development, the same development that generated all the risks? If so, could they be expected to be disinterested and independent parties? The other conflict had to do with the purportedly negative attitude the public expressed and the need to take these concerns seriously. If the public had expressed such high levels of resistance and scepticism, was it not the role of politicians to give it a voice? Was it not in the role of being politically elected representatives of the citizenry that these opinions, in the name of democracy, would gain influence? And above all, if the view of the public and the view of the experts diverged, was not that a democratic problem? You could say that the commissions’ analyses needed to ward off the threat of technocratisation and ideologisation.

Public Concerns and Concerns about the Public

The public went from being talked about, to an audience to be talked to or spoken for, to becoming a segment in society both politicians and experts, at least officially, wanted to listen to and engage more directly. The public started off as a fairly homogenous and anonymous group, and turned into a more diversified one, representing consumers, patients, voters etc. But gradually, public concerns about gene technology were juxtaposed with concerns about those public concerns. An acute problem had presented itself: scientific experts promoted a technology the public opposed, at least in parts. Could scientific experts on gene technology be trusted to participate in policy-making in a neutral way, and was it not important, in accordance with democratic norms, to involve the public?

Different strategic routes were taken in order to deal with the problem of a concerned public. Most notably, it was assumed that public resistance was correlated with a lack of knowledge, and that experts were the ones in possession of that knowledge. To be able to do both, maximise rationality and live up to democratic ideals, the concept of science needed to be possible to unite with the idea of democracy. For scientific experts to
make politics fact-based and rational, experts were assumed to be neutral and objective, in society as well as in the role as commission advisors.

One strategy was to separate pure science from applied science. Science in itself was not risky or ethically problematic, it was the consequences it had for society that could be the cause of concern. Scientific experts were not representing the applied stage of gene technology, but the knowledge production stage. In this way, experts did not become problematic as knowledge providers. They provided facts, but did not engage in discussions of how things should be. It was the role of politicians, or other actors, to decide whether certain applications were morally acceptable, fair etc. Elements of this strategy can be found in the work of the Gene-Ethics Commission. However, it was hard to uphold a distinction between pure science as ethically unproblematic and applied science as inherently value-laden, as the most controversial issue had to do with using human embryos for basic research purposes.

Another strategy was to conceive of experts as representatives of a science that was inseparable from society in the sense that it was taken for granted that science produced or provided societal benefits. Not only could experts be taken to provide objective and neutral knowledge, but they could also speak on behalf of the public interest. Experts were trusted to provide fact-based knowledge, but also to convince the public about the potential of science for doing good. More experts needed to get out in public, engage themselves as ambassadors of science. The Biotechnology Commission had this tendency to withdraw political positions, simply by equating political and public interests with scientific ones. This was done in a science policy regime emphasising the separateness of politics and science, but the closeness of science and industry, as if they had nothing to do with one another. In light of this, the many urgent requests from political quarters in the early 21st century, that the scientific community should need to get better at communicating and cooperating with “society”, convincing other sectors about the utility of science and its superior nature, make sense. In 2005, as Minister of Science and Education, social democrat Leif Pagrotisky expressed a need to inform Swedish taxpayers about the importance of supporting research and development: “The scientific community must take on the task of helping me there. I do not negotiate on budgets in a vacuum, the electorate is my employer, and they base their opinions on what they see in the newspapers and other media.”

As for getting to grips with the public, different ways of solving the tension between technocracy and democracy presented themselves. One such way was to define public concerns as being essentially the same as scientific concerns. The public was believed to worry about fraud and misconduct, the same thing that the scientific community acknowledged as legitimate problems. The public was concerned about what science already tried to combat through its own self-regulation. This was the position taken by the Gene-Ethics Commission, as it ended up defining what sort of norms the self-regulatory medical bodies were to conform to.

The other, and more common approach, was to interpret the alleged concern or lack of trust, as based on lack of knowledge or desinformation. A solution to this problem was to promote information and knowledge dissemination, partly to fill in knowledge gaps, partly as a counterweight to media distortions. But the basic conflict facing politics – a technological development the public seemed to resist – also required that conflicting interests (the legitimacy of ideology) was reduced to a matter of differences of knowledge levels, basically a difference between understanding and misunderstanding gene technology. A politically and scientifically legitimate solution was to call for more information dissemination. For the public to participate democratically in a meaningful way, people needed to be better informed. This was a standpoint that permeated the work of the Gene Technology and the Biotechnology Commission.

Any other strategy would probably have required either a revised understanding of lay knowledge, or a revised conception of expert knowledge. If the experts, or the science they represented, were not neutral, not objective in any meaningful sense of the word, then relying on experts would entail not only technocracy, but also ideologisation. It would mean letting a specific group of people, at the expense of others, exert great political power. If the public were to be seen as knowledgeable, a completely different room for democratic participation would open up.

Ethics as a Boundary Object

Nowhere in the material I have researched, at least from the early 1980s and onwards, have I come across an understanding of gene technology

Translation of: “Där har forskarsamhället en uppgift att hjälpa mig. Jag budgetförhandlar inte i ett vakuum, utan mina uppdragsgivare är väljarna, och de bygger sin uppfattning på vad de ser i tidningar och andra medier.”
that does not, in some way, include ethical questions. The opinion that
gene technology does not generate ethical questions at all or that they
are totally unimportant, has not been politically or scientifically correct.
People can disagree on to what extent they matter, but not that they exist.
Upon closer inspection, many differences exist as to how ethical analyses
or principles are meant to work, what they are based on and who are
competent to understand them. If we see ethics as a boundary object, it is
stable in the sense that it is embraced by all, but instable in the sense that
its meaning is highly volatile.

Ethics was both an area of expertise, and belonged to “us all”. It was
rational, but was believed to be able to accommodate public concerns. It
was individually felt, but universally shared. It was what was under threat,
but it was also put forward as a solution to those threats. At least some
aspects of this flexibility can be better understood if we take into account
the context in which ethics was defined. That is, ethics came right in
between natural and medical science (and to some extent industry) and
politics, right in between efforts to let politics be rationally infused and
science be morally responsible, right in between listening to experts or
listening to the public.

For all three commissions, ethics was coupled with the public at large.
If ethical problems had been ignored or discarded as unimportant, the
public would have been discarded as unimportant as well. Dealing with
ethical issues was seen as a way of claiming that the commissions had
worked in accordance with democratic ideals. But in order to channel
public ethical concerns into the commission work – without being
detrimentally reduced to them – ethical experts entered the scene,
providing academically based ethical analyses. This met the demand for
policy suggestions to be scientifically, or rationally, informed. Seen as a
boundary object, ethics was both an area for expert judgements, hence
the emphasis on “proper ethical analyses”, but also something that was
the result of an “ongoing dialogue between a variety of social actors”.
Ethics was not rational or democratic, it was both. It had a democratic
component as well as a rational one.

Ethics has become an accepted way for politics to influence and exert
control over science. If science is to be permeated by values, it should
be ethical and not ideological values, (not to mention religious ones).
For this to work, though, ethics must be demarcated in a way so that it
is not conflated with politics in the ideological sense, but with politics
in the democratic sense. The desired result, a non-ideological political direction and regulation of science, and a value-oriented, responsive and responsible science, solves both the political and scientific legitimacy problem that faced all three commissions.

One indication of the multivalent character of ethics is its not fully accepted status as an area of expertise, and the prevalence of doubts about whether it was possible, politically, to solve or accurately address ethical problems. The role of the ethical experts differed in that way from the experts of natural science, law and medicine. Claims by reporters like Jörgen Eriksson and Brita Åhman in the early 1980s to get rid of “so-called ethical experts” and replace them with people with experienced-based moral credentials, testify to this far from evident role of ethical experts in political deliberation. Social democrat Inger Hestvik, member of the Gene Technology Commission, commented in Parliament in 1994 on the political difficulties of resolving ethical problems, despite having had the top leading ethical experts of the country to consult. Ethical expert Torbjörn Tännsjö, consulted by the Biotechnology Commission, clearly played down any hopes that might have flourished among commission members to be able to handle ethical problems in a philosophically acceptable way. Still, mobilising ethical expertise seems to have been a standard solution to address the credibility problem of science and politics alike, here in Sweden as well as internationally.

Due to gene technology’s increasingly important role on the political agenda, politics has become “moralised.” Fundamental problems of moral philosophy has entered political deliberations and turned into top priority issues. I would like to propose a complementary analysis. But as much as politics has been moralised, you could say that when ethical issues are taken up in political discussions – when they take the form of ethics as an area of expertise – they can de-politicise science. Many advisory arrangements, such as governmental commissions, rely on ethical expertise, and this moralisation process, within politics, has taken the form of ethics as an academic endeavour. Within science-politics boundary organisations, the dilemma is not only about choosing to release scientists form the burden of making ethical decisions, or holding them ethically accountable, it is about releasing politicians as well. Can politicians or members of the public be trusted to make competent decisions about gene technology problems if they do not understand all

---

3 This has been discussed in Achen, *Den bioetiske udfordring*, 306–307.
the facts, or lack ethical training?

How then, did ethics become an accepted way for politics to influence science? To give some perspectives on this, I will here briefly discuss something that has been called value-bifurcation.

Political philosopher Laurie Anne Whitt has analysed the debate surrounding the HGDP project (Human Genome Diversity Project). Whitt uses the term value-bifurcation to highlight the way science can be excluded from moral evaluation by effectively channelling normative critique away from science to a narrowly defined ethics. First, the well-entrenched idea of value-neutrality on behalf of scientific knowledge is conjoined to a distinction between pure and applied science, which makes it possible to claim that science proper, unlike its use, is objective and neutral. But when ethics enters the scene, it is an ethics stripped of political aspects. Whitt says that:

> When deployed in the practice of science, value-bifurcation effectively channels normative criticism (i) by deflecting it away from the political and issues of power, and (ii) by simultaneously restricting normative critique to a cosmetic or surface ethics. This produces an apolitical ethics of science, where issues of power in ethics are either overlooked altogether, or are diverted into very narrowly envisioned accounts of informed consent and the violation of individual autonomy.  

All in all, this type of reasoning provides a rhetoric of research justification that protects the authority of science and makes it immune to criticism. “Both ethics and politics are moved out of the area of knowledge production, while a ‘de-politicized’ ethics is reserved for assessing knowledge use.”

In many respects, this type of reasoning can be found in all three commission reports. In the late 1970s some scientists expressed dissatisfaction with the politically meddlesome attitude to question the ethical responsibility of scientists. Recombinant DNA Technology did not deserve such political interest, but could safely be left to scientists to handle. Industrialist Bertil Åberg’s irritation as he complained about the “constant nagging about transparancy” and Lennart Philipsson’s appeal for (more or less) unconditional trust, signals that even talking about ethics in this context, was considered to be a dangerous balancing on the line

---

5 Ibid., 418.
of inappropriate politicisation. For the Gene-Ethics Commission, it was of utmost importance to establish the fact-based character of professional ethics. It aspired to produce a factual ethics for ethical fact-makers. In that way, ethics was not seen as corrupting or compromising the validity of scientific research, it was after all, “rational” and separated from the realms of politics, religion and subjective thinking. It was believed that a framework of biomedical ethics could engage public concerns about moral risks in a predominantly secular, rational and neutral way. And even though the commission prescribed in detailed norms what could be accepted or not, they left it to the regional medical ethical committees to implement those norms.

The understanding of ethics as a de-politicised area, in the words of Laurie Anne Whitt, also conjoins well with the efforts to exclude controversial issues from ethical deliberation, demonstrated in the workings of the Gene Technology Commission. In areas where members were greatly divided, such as those of commercialisation, patents and the Third World situation, the commission delivered a policy proposal consisting of some rather abstract principles for “how far” gene technology could be taken. The “ethical strategy” which was meant to inform the work of regulatory authorities, also suggested that balancing different interests could be done in a non-ideological way. The commission’s own analysis inferred that on the basis of the ethical doctrines and the ethical strategy, no practical prohibitions were needed. Society could be in control of gene technology, despite high levels of uncertainty, by relying on revisions of existing laws. Gene technology did not “in principle” generate new ethical problems.

One interesting aspect of value-bifurcation that Whitt does not discuss, is that as long as ethics is defined as something dealing with problems, the idea of value-bifurcation might very well serve as a rhetoric of research justification, that is, science proper is kept out of the sphere of ethical scrutiny. But, if ethics only apply to the consequences of using knowledge and not to knowledge production per se, it is hard to justify basic research in the name of ethics. Maybe this can explain why, in the 1990s, it is possible to detect a turning point in the use of the term ethics, illustrated by the idea that it would be “unethical” to stop technical and scientific development. The political image of a global high-tech race can today be found in innumerable documents and public statements, and the imperative not to hinder development is reinforced by a fear of
“lagging behind”. Instead of resisting the term or finding themselves being disqualified for ethical assessments, science and industry have promoted new images of themselves as being ethically concerned. The European Federation of Biotechnology’s Code of Conduct, or the Biotechnology Industry Organisation’s Statement of Principles, formulated in the mid-1990s, are good examples. In this way, new technological possibilities have been translated into ethical commitments. The ethically responsible is the one who wants to do good, and if basic research is about doing good, then basic research must be understood in ethical terms.

For the Biotechnology Commission politics needed to support science to reap the rewards of its investments, and ethical problems could be solved among equally ethically minded actors, be it scientists, industrialists, public interest groups, politicians or separate individuals. If only these groups got together and talked to each other, things would be fine. Hence, what was suggested was new arenas of communication and raised levels of ethical literacy. Compared to the early 1980s, ethics was no longer as politically charged and the area to be regulated was not as scientifically pure. The Biotechnology Commission pointed out some areas in need of further ethical discernment, but did not prescribe how or what those ethical analyses would include. In a way, how ethics was conceived mirrors an intensified tension between ideologisation and democratisation. The more people who needed to be listened to (ethics belongs to “us all”, “everyone” needs to participate in the ethical debate), the more interest-based understandings of gene technology had to be considered legitimate. The solution was to keep all doors open and delegate the difficult task of identifying what was acceptable practices to the individual. In this way, ideologisation could be avoided and democratisation supported. The commission’s acknowledgement that different ethicists represented different ethical perspectives and models, and that politics could have no ambition to solve “eternal” ethical problems, contributed to this process.

Best of Both Worlds?

Seen as boundary organisations, the commissions worked on the border of science and politics. In this thesis I have suggested that it is vital to pay attention to the different meanings of terms such as politicisation and scientification, in order to better appreciate the complexity of them. For the commissions and the reports they delivered to represent a legitimate
balance between science and politics, it needed to meet the demands of rationality and democracy, but ward off the threats of technocracy and ideology. It was about getting the best of both worlds – a rationally based and democratic analysis. In this thesis, I have also proposed an interpretation of how this was done, by thinking about “ethics” as a boundary object. As such, it could enable productive cooperation, establish acceptable roles for science and politics, provide an acceptable balance between scientification and politicisation so that the product of the boundary organisation, the commission report, could become credible.

On the basis of this study, I suggest that the idea that it is possible to neatly separate ideological from democratic politicisation is highly problematic. For an issue to be handled democratically, it must be considered to be an issue that different groups or individuals can have different understandings of, and opinions about. If that is not the case, if individuals or collectives must be informed about what they should think or believe, for them to be allowed to democratically participate in decision-making, it is hardly democratic. If there is in fact only one correct way of understanding gene technology, there is no need for public participation, nor for political negotiation. Hence, democratisation and ideologisation is a two-way street. The same goes for scientification. If scientification is a way of handling an issue rationally, and if that goal is to dominate governmental commissions, technocratisation will follow, as long as what is rational is equated with the pronouncements of scientific experts. Can you get one thing, without the other?
Appendix

Commission Members and Experts

The Gene-Ethics Commission

Chairperson
Bertil Wennergren, chief judge

Members
Kerstin Anér, Liberal Party
Göte Ekström, Centre Party
Per Israelsson, Christian Democratic Party
Ingrid Sundberg, Moderate Party
Aina Westin, Social Democratic Party
Erik Lundgren, professor
Kerstin Niblaeus, commission secretary

Experts
Björn Afzelius, professor
Lennart Daléus, information officer
Holsten Fagerberg, professor
Ann-Christin Filipsson, desk officer
Harald Linton, desk officer
Anders Lundin, director
Ulf Pettersson, professor
Bo Öberg, professor
Marianne Boivie, first secretary
Rune Karlsson, section manager
Ingemar Ernberg, associate professor
Kerstin Gustafsson, legal advisor
Bo Tengberg, ombudsman

Secretariat
Bengt Samuelsson, director
The Gene Technology Commission

Chairperson
Martin H:son Holmdahl, professor

Members
Ingrid Andersson, Social Democratic Party
Lennart Daléus, Centre Party
Hans Gustafsson, Social Democratic Party
Ingrid Hemmingsson, Moderate Party
Inger Hestvik, Social Democratic Party
Kerstin Persson, Green Party
Annika Åhnberg, Left Party
Barbro Westerholm, Liberal Party
Lennart Bergdahl, New Democracy Party
Annika Bladh, Christian Democratic Party

Kerstin Persson was replaced by Lennart Bergdahl and Annika Bladh as a result of the general election in 1991 when the Green Party lost its place in Parliament, and the New Democracy Party entered it.

Experts
Fredrik von Arnold, deputy director
Jonas Bodegård, director
Olle Bosemark, professor
Agnete Brasch, director
Gustaf Brunius, associate professor
Carl-Ivar Brändén, professor
Madeleine Emmervall, director
Torbjörn Fagerström, professor
Kristina Glimelius, professor
Jan-Åke Gustafsson, professor
Madeleine Holst, deputy director
Göran Hugosson, professor
Göran Hermerén, professor
Anders Jeffner, professor
P.C. Jersild, author
Lena Jonsson, desk officer
Charles Kurland, professor
Karin Larby, desk officer
Ragnar Ohlsson, professor
Ulf Pettersson, professor
Lena-Kajsa Sidén, graduate engineer
Katarina Sjölander, desk officer
APPENDIX

Ulla Swarén, director
Dietrich Timm, desk officer
Lennarth Törnroth, legal advisor to the Court of Patent Appeals
Ragnhild Walles, chief engineer

Secretariat
Thore Brolin, Associate Judge of Appeal
Charlotte af Malmborg, överingenjör

The Biotechnology Commission

Chairperson
Marianne Håkansson, director-general

Members
Lennart Rohdin, Liberal Party
Tanja Lindeborg, Left Party
Majlène Westerlund Panke, Social Democratic Party
Marie Wilén, Centre Party
Lennart Brunander, Center Party
Anita Persson, Social Democratic Party
Per Landgren, Christian Democratic Party
Alf Eriksson, Social Democratic Party
Gudrun Lindvall, Greenl Party
Bertil Persson, Moderate Party

Secretariat
Thore Brolin, District Court Judge
Lennart Pettersson, desk officer
Gunilla Wiklund, information manager
Aija Sadukis, senior lecturer
Berit Jigvall, assistant

Marie Wilén was replaced on November 6 by Lennart Brunander
Gene Technology at Stake

Glossary and Abbreviations

Official Public Records

Departementsserien
Kommittédirektiv
Motion
Offentligt tryck
Regeringsproposition
Regeringskrivelse
Riksdagsdebatt, interpellationer, svar på frågor
Riksdagsskrivelse
Statens offentliga utredningar, SOU
Svensk författningssamling, SFS
Utskottsbetänkande

The Ministry Publications Series
Commission terms of reference
Motion
Official Public Records
Government bill
Governmental written communications
Proceedings in the Chamber
Parliamentary written communications
The Swedish Government Official Reports Series
Swedish Code of Statutes
Parliamentary committee report

Political Parties

Centerpartiet
Folkpartiet
Kristdemokraterna
Miljöpartiet
Moderaterna
Ny Demokrati
Socialdemokraterna
Vänsterpartiet

The Centre Party (Cen)
The Liberal Party (Lib)
The Christian Democratic Party (ChrDem)
The Green Party (Grn)
The Moderate Party (Mod)
The New Democracy Party
The Social Democratic Party (SocDem)
The Left Party (Lft) (before 1990, The Left Party Communists)

Titles

Byråchef, departementsråd
Civilingenjör
Departementssekreterare
Docent
Förbundsjurist

Director
Graduate engineer
Desk officer
Associate professor
Legal advisor
Generaldirektör  
Hovrättsassessor  
Informationschef  
Informationssekreterare  
Kansliråd  
Lagman  
Patenträttsråd  
Rådman  
Sektionschef  
Universitetslektor  
Överingenjör

Director-general  
Associate Judge of Appeal  
Information manager  
Information officer  
Deputy Director  
Chief judge  
Legal advisor to the Court of Patent Appeals  
District Court Judge  
Section manager  
Senior Lecturer  
Chief engineer

Archives
Arkivet till Utredning om skyddslagstiftning rörande forskning om hybrid-DNA  
Bioteknikkommitténs arkiv  
Gen-etikkommitténs arkiv  
Genteknikberedningens arkiv  
Regeringskansliets arkiv  
Riksarkivet
Recombinant DNA Technology Commission Archive  
The Biotechnology Commission Archive  
The Gene-Ethics Commission Archive  
The Gene Technology Commission Archive  
The Government Offices Records Centre  
The National Archives

Ministries, Governmental Authorities and other Organisations
De handikappades riksförbund, DHR  
Delegationen för hybrid-DNA-frågor  
Forskningsrådsnämnden, FRN  
Gentekniknämnden  
Ingenjörvetenskaps-akademien, IVA  
Jordbruksdepartementet  
Justitiedepartementet
Organisation for people with mobility impairments  
The National Recombinant DNA Advisory Committee  
The Swedish Council for the Planning and Co-ordination of Research  
The Swedish Gene Technology Advisory Board  
The Royal Swedish Academy of Engineering Sciences  
Ministry of Agriculture, Food and Fisheries  
Ministry of Justice
### Genes Technology at Stake

<table>
<thead>
<tr>
<th>Swedish Cooperative Union</th>
<th>The Royal Swedish Academy of Agriculture and Forestry</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Swedish Trade Union Confederation</td>
<td>The Swedish Natural Science Council</td>
</tr>
<tr>
<td>The Federation of Swedish County Councils</td>
<td>Swedish Environmental Protection Agency</td>
</tr>
<tr>
<td>The Federation of Swedish Farmers</td>
<td>Swedish Patent and Registration Office</td>
</tr>
<tr>
<td>The Medical Products Agency</td>
<td>The Government Offices</td>
</tr>
<tr>
<td>Medical Research Council</td>
<td>Swedish National Audit Office</td>
</tr>
<tr>
<td>Ministry of the Environment</td>
<td>Swedish International Development Cooperation Agency</td>
</tr>
<tr>
<td>The National Board of Health and Welfare</td>
<td>Ministry of Health and Welfare</td>
</tr>
<tr>
<td>(previously the Agency for Social Affairs and Health)</td>
<td>The Swedish Council on Technology Assessment in Health Care</td>
</tr>
<tr>
<td>The Swedish National Council on Medical Ethics</td>
<td>The National Swedish Board for Technical Development</td>
</tr>
<tr>
<td>Swedish Church</td>
<td>The Swedish Society for Nature Conservation</td>
</tr>
<tr>
<td>Sveriges konsumenter i samverkan</td>
<td>Swedish Consumer Coalition</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Synskadades riksförbund, SRF</td>
<td>Swedish Association of the Visually Impaired</td>
</tr>
<tr>
<td>Utbildningsdepartementet</td>
<td>Ministry of Education and Science</td>
</tr>
<tr>
<td>Vinnova</td>
<td>Swedish Governmental Agency for Innovation Systems</td>
</tr>
</tbody>
</table>
Bibliography

Primary Sources

Official Public Records

Commission terms of reference


Dir 1981:03, Etiska, humanitära och sociala frågor m.m. kring hybrid-DNATEkniken.

Dir 1997:120, Biotekniken i sambältet – möjligheter och risker.

Dir 1990:16, Beredning för frågor rörande användning av gentekniken.

The Swedish Government Official Report Series (SOU)


SOU 1985:5, Barn genom befruktning utanför kroppen, m.m. (Stockholm, 1985).


SOU 1991:42, Aborterade foster, m.m. (Stockholm, 1991).


SOU 1999:70, Gentekniknämnden (Stockholm, 1999).


**The Ministry Publications Series (Ds)**

**Governmental bills**
1979/80:10, *om kontroll av hybrid-DNA-teknikens användning.*
1990/91:52, *om användning av genteknik på människa, m.m.*
2000/01:3, *Forskning och förnyelse.*

**Governmental Written Communications**

**Parliamentary Written Communications**
2004/05:152.

**Proceedings in the Chamber (debates, interpellations, answers to written questions)**
*Om förhandsprövningen rörande användning av hybrid-DNA-teknik, 11-27-81.*
*Användning av genteknik på människa, m.m., 03-06-91.*

*Lag om genetiskt modifierade organismer*, 06-02-94.

1996/97:77, debate on the topic of biotechnology, 03-12-97.


### Parliamentary Committee Reports


1990/91: SoU10, *Användning av genteknik på människa, m.m.*


### Motions

1978/79:1908, Bengt Kindbom et al. (Cen), *om genforskningen.*

1979/80:83, Rune Gustavsson et al. (Cen), *med anledning av propositionen 1979/80:10 om kontroll av hybrid-DNA-tekniken användning.*


1989/90: Jo6007, Bengt Westerberg et al. (Lib), *Miljövärdering av den moderna biotekniken m.m.*

1990/91: Jo6006, Sven Eric Lorentzon et al. (Mod), *Genteknikens tillämpning på växter och djur.*

1989/90: Jo616, Lars Werner et al. (Lef), *Biotekniken.*

1989/90: Jo617, Olof Johansson et al. (Cen), *Bioteknik – med respekt för livet.*

1989/90: Jo622, Roy Ottosson et al. (Env), *Genteknik på människa.*

1990/91: So25, Ingrid Ronne Björkqvist (Lib), *med anledning av prop. 1990/91:52 Användning av genteknik på människa, m.m.*

1990/91: Jo627, Annika Åhnberg et al. (Lef), *Genteknikberedningen.*

1990/91: So529, Lennart Brunander et al. (Cen), *Genteknik.*


1996/97: Jo529, Birger Schlag et al. (Gnr), *Genteknik.*

190
BIBLIOGRAPHY

1997/98: Jo542, Gudrun Lindvall et al. (Grn), Gentekniken och maten.
1997/98: So265, Tuve Skånberg (ChrDem) and Eva Goës (Grn), Kloning av människor.

Archive material

The National Archives
(Marieberg)
Skyddslagstiftning rörande forskning om hybrid-DNA, yk 3131, vol. 1
Gen-etikkommittén, yk 3692, vol. 1–3
Genteknikkommittén, yk 4200, vol. 1–7
Bioteknikkommittén, yk 5041, vol. 1–13
(Arninge)

The Government Offices Records Centre
The Ministry of Education and Research

Newspaper and Magazine Articles

Andersson, Birgit, “Bertil Wennergren: Avsteg i nödsituationer”, Ny Teknik, 06-29-83.
———, “Kerstin Anér: Man måste sätta gränser”, Ny Teknik, 06-29-83.
———, “Smugglande professor gjorde gentekniken lönsam”, Ny Teknik, no. 16 (1990).
———, “Kan människan skapa sig själv?”, Västerbottens-Kuriren, 10-16-74.
———, “Felfria kromosomer diskutabelt”, Svenska Dagbladet, 07-06-81.
GENE TECHNOLOGY AT STAKE

—-, “Vi är tvungna att ha åsikter: Är gen-etik något för riksdagsmän?”,
Dagens nyheter, 04-17-82.
Arby, Gunhild, “Jag tror att gentekniken kommer att lösa cancergåten”,
Östgöten, archived in the Gene-Ethics Commission Archive, vol. 3, NA.
Aschan, Jan C, “Fria gener”, Ny Teknik, 03-23-84.
Bjerke, Dag, “Gen-experiment ej naturstridigt”, Dagens Nyheter, 04-29-82.
Bodström, Thomas, Kjell Larsson, and Leif Pagrotsky, “Regeringen formulerar
genpolitik: ’Patent på gener måste förbjudas’”, Dagens Nyheter, 12-10-00.
Bojs, Karin, “Mänsklig grundcell odlad: Vetenskapligt genombrott. Stamceller i
laboratorium öppnar för bot av diabetes och leukemi”, Dagens Nyheter, 11-06-98.
—-, “Stamceller: Svensk kapplöpning om forskningsdollar”, Dagens
Nyheter, 08-31-01.
Boltegård, Annika, “Paradis...eller mardröm?”, Land, 01-05-90.
”, Dagens Nyheter, 02-22-78.
—-, “Lärdomar av hybrid-DNA-debatten: (1)Anställ forskare som
journalister!”, Dagens Nyheter, 02-06-79.
Bäsén, Anna, “Förslag om ny myndighet med helhetssyn på bioteknik”, Dagens
medicin, 12-09-00.
—-, “Förbjud petandet i arvsmassan”, Sveriges Dagbladet, 01-10-90.
—-, “KabiGen bygger högrisklaboratorium i innerstan!”, Dagens Nyheter,
08-15-79.
—-, “Lägg papperen på bordet””, Dagens Nyheter, 08-23-79.
—-, “Sluta manipulera med livet!”, Sveriges Dagbladet, 10-20-79.
Einarsson, Peter, “Forskare vill manipulera kvinnor’. Nu finns en ansökan
om patent på den gentekniskt manipulerade människan, avslöjar Peter
Einarsson”, Dagens Nyheter, 03-29-92.
Hammarén, Maria, “Har vi rätt att manipulera med människans arvsanlag, Ulf
Pettersson?”, Ny Teknik, 01-19-84.
Eriksson, Jörgen, “Avskaffa etikexperterna!”, Dagens Nyheter, 05-11-82.
———, “Holsten Fagerberg om genterapi: ‘En osäker framtid’”, Dagens Nyheter, 11-12-83.
———, “Dödsfall vid genterapi förtigs”, Svenska Dagbladet, 11-21-00.
Lagerkvist, Ulf, “Inga risker i dagens genforskning”, Svenska Dagbladet, 02-04-79.
Lantz, Inga et al., “Är djur en uppfinning?”, Dagens Nyheter, 02-02-89.
Editorial, “Forsknarna”, Västmanlands Läns Tidning, 11-29-84.
———, “Genetik och etik”, Upsala Nya Tidning, 12-01-84.
———, “Genteknik med garanti”, Ny Dag, 11-29-84.
———, “Gentekniken”, Göteborgs-Posten, 11-29-84.
———, “Normer för genteknik”, Svenska Dagbladet, 11-30-84.
Lindencrona, Gösta, “Nu är genvägens potatis här”, Göteborgs-Posten, 10-09-94.


———, “Professor Lennart Philipsson försvarar genforskningen: Ta av dig helgonglorian, Kerstin Anér!”, Expressen, 11-21-77.

———, “En häxprocess!”, Dagens Nyheter, 04-14-78.

Ramstrand, Magnus, “Oenighet i genetikkommittén: Vilka lagar ska dra upp gränser för gentekniken?”, Dagen, 08-29-84.

Reichard m.fl., Peter, “Hybrid-DNA-teknikens risker omvärderas”, Forskning och Framsteg, no. 6 (1980).

Reichard, Peter, “Massmedia måste ta ansvar”, Svenska Dagbladet, 09-27-78.

———, “Riktigt undvika låsningar”, Dagens Nyheter, 11-12-83.


Tännö, Torbjörn, “Kriminalisera inte forskning; Genterapi med effekter som går i arv kan inte avfärdas som rashygien, anser Torbjörn Tännö”, Dagens Nyheter, 02-28-91.


Westerholm, Barbro, “Lagstifta om gentekniken!”, Dagens Nyheter, 03-17-89.


———, “Varför förbjuds viss forskning?”, Sydsvenska Dagbladet, 03-08-91.


Åhman, Brita, “Ska vi förändra människans gener?”, Dagens Nyheter, 05-21-82.
Åhman, Brita, and Lars Rutberg, “Vad vet ombudsmännen om etik?”, Dagens Nyheter, 04-07-82.
———, “Forskningen och djävulsdoktrynen”, Dagens Nyheter, 01-30-78.

**Secondary Sources**


Ehrling, Guy, and Inger Ekengard, *Genetisk ingenjörskonst: Tjuvkoppling eller


**Gene Technology at Stake**

*Hybrid-DNA teknik*, Information från Delegationen för hybrid-DNA-frågor (Stockholm, 1982).


Ideland, Malin, *Dagens gennyheter: Hur massmedier berättar om genetik och genteknik* (Lund, 2002).


Kerr, Anne, and Tom Shakespeare, Genetic Politics: From Eugenics to Genome (Cheltenham, 2002).


G catering technology at stake

Lewin, Leif, _Ideologi och strategi_ (Lund, 2002).


McKelvey, Maureen, _Evolutionary Innovation: Early Industrial Uses of Genetic Engineering_ (Linköping, 1994).


Miksche, Gerhard, “Förord” in _Etik och Genteknik_ (Stockholm, 1982).


BIBLIOGRAPHY

Premfors, Rune, et al., Demokrati och byråkrati (Lund, 2003).


Rothstein, Bo, Den korporativa staten: Intresseorganisationer och statsförvaltning i svensk politik (Stockholm, 1992).


Runcis, Maija, Steriliseringar i folkhemmet (Stockholm, 1998).


Senker, Jacqueline, “An overview of Biotechnology Innovation in Europe” in


Sylwan, Peter, Bioteknik – vår sköna nya värld? (Stockholm, 1982).


Theories of Science in Society, eds. Thomas F. Gieryn and Susan E. Cozzens (Bloomington, 1990).

Tunlid, Anna, Årtfilsftsforskningens gränser: Individer och institutioner i framväxten av svensk genetik (Lund, 2004).


Turney, Jon, Frankenstein’s Footsteps: Science, Genetics and Popular Culture (New
Haven, 1998).


Zetterberg, Charlotta, Miljöättslig kontroll av genteknik (Uppsala, 1997).
GENE TECHNOLOGY AT STAKE

Åberg, Bertil, *Tillräckligt säkert hybrid-DNA: Kring införandet av en ny teknik i Sverige* (Stockholm, 1982).


Åsberg, Cecilia, *Genetiska föreställningar: Mellan genus och gener i populär/vetenskapens visuella kulturer* (Linköping, 2005).


Internet


http://www.genteknik.nu (09-15-07)
Skrifter från institutionen för historiska studier vid Umeå universitet:

