Controversy and Collectivity

- Articulations of Social and Natural Order in Mass Mediated Representations of Biotechnology

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I would like to try presenting culture as a dialogue. This is like joining a powerful movement in the social sciences to turn action into speech and text, and I should say firmly where it is different: I am not taking the Habermasian view of the ideal society as dialogue, because I am not emphasizing possible harmony, but the contrary. The aspect of the cultural dialogue that needs to be understood is accountability. Think of culture as essentially a dialogue that allocates praise and blame. Then focus particularly on the blame.

Intercultural dialogue is inherently agonistic; the outcome will at any one point be a victory for one and defeat for another of the contestants; the contest is about the form of the life to be led in common.

(Mary Douglas 1997:129)

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Preface

The basic question that drove me towards writing this thesis was a curiosity about our high expectations of public debate as a means of solving controversies about biotechnology. Throughout the analytical process, however, it became obvious to me that just like all the other productive practices of articulation, I, too, was producing something. I produced the actant 'articulated collectives' bound to the notion that whenever we make an argument about biotechnology, we are not just making a claim about the technology in question, but also about the order of the world and the way this social and natural order is constructed, maintained and restored. The following pages are an effort to inscribe this actant in a credible way and provide the reader with reasons to accept it as a member of the academic environment. It must be admitted that so far this actant is rather weak. Inscribing it in a dissertation is only a first step, but I hope that it will find applications outside the local context in which it was created so that it might gain in stability and substance.

For me, however, handing in the thesis is not a question of abandoning the actant in the text at the complete mercy of its readers. Since the fates of the actant and of the PhD student are inextricably linked to each other I cannot abandon it like an orphanaged child. Rather it is more like all the other children that we foster: they transform us for better and worse, but leaving them is impossible. The best we can hope for is that the sense of parental responsibility diminishes as their individuality grows. Until that happy day, however, I am prepared to assist the actant, just as it does assist me. For that reason I am grateful that the evaluation committee, Alan Irwin, Torben Hviid Nielsen & Merle Jacob, has given me the opportunity to defend it as part of a PhD dissertation and hopefully to mediate it into larger networks providing stability and substance, in short, the opportunity to make it more real.

Viewed locally, the network in which the creation of the actant took place does not feel weak. I am indebted to my supervisors: Anker Brink Lund, who has guided me with humour and care since I was a masters student, and to Niels Åkerstrøm Andersen, who provided the necessary challenges for this dissertation to take shape. They both offered indispensable points of reference when I lost sight of where I was going.

I would also like to thank colleagues at the two institutions where I have been working: The Department of Management, Politics and Philosophy at CBS and the Department of Health Services Research at the University of Copenhagen. Particularly, I would like to thank a number of colleagues who at various times have read part of the thesis and provided me with useful comments: Bent Meier Sørensen, Thomas Basbøll, Steen Vallentin, Thomas Hellstrøm, Birgitte Munch, Dorthe Pedersen, Peter Kjær, Asmund Born, Søren Wenneberg and Mette Lolk at CBS and Mette Nordahl Svendsen, Lisa Dahlager, Klaus Høyer and Margareta Bertilsson at the University of Copenhagen.

Helene Gram and Mette Bøgelund did an excellent job with the establishment of the archive of newspaper articles, the quantitative coding of the articles as well as with search of literature and reference work. Working as a true public philosopher, Thomas Basbøll's proof reading went far beyond the question of language and taught me much about my own epistemological bearing.

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Introduction
Public debate about controversial science

Biotechnology has been the centre of public controversy for some time, both in Denmark and internationally. The issues have proliferated in recent years, ranging from the development of genetically engineered micro organisms, plants and livestock, over advances in reproductive technologies and research on embryos and stem cells, to gene therapy, the cloning of humans and genetically enhanced normality. Each scientific and technological development has brought, it seems, its own controversies.

This is a thesis about some of them. It has been motivated by my curiosity about biotechnology and genetic research as themes in and of public debate, a curiosity which has been piqued by the intensity of interest in these issues, the many conflicts to which they give rise and, finally, the resolutions that are proposed. Is there something special about this theme that has kept it on the agenda for the past several decades? What are the core issues and how do we hope to address them?

In answering these questions, I have followed Bauer and Gaskell in defining 'biotechnology' as 'the processes and products that have been developed on the basis of intervention at the level of the gene.' (2002:3). While this definition is broad in scope, it has the virtue of centering my inquiry on a readily identifiable object of controversy, *viz.* the gene. My analyses suggest that controversies over this object, that is, 'biotechnological' controversies, intersect with fundamental political discussions in contemporary Danish society. They are best understood as disagreements about the regulation of science and technology in a complex and differentiated society as well as conflicts over basic conceptions of social order, that is, of social integration, differentiation and disintegration. The analyses therefore constitute a case study of present day political and social order, where each controversy can be seen to support the integrational processes of society while at the same time indicating loci of conflict. Conceptions of social order are embedded in and invoked by political controversies, and the disagreements over biotechnology here presented can serve as an exemplar for case studies of such conceptions.

The problematisations of science

Biotechnological controversies have been studied by international researchers using a broad range of methods, some of which I will survey in Chapter 1. The lodestar of these analyses seems to that the controversies exhibit central features of, and tensions within, the interface between science and other parts of society. For example, in their ongoing research under the banner of 'Biotechnology and the European Public', Bauer and Gaskell proceed from the assumption that 'resistance is not a problem residing in the public, rather it is a signal that something is going wrong with the technology; and that resistance acts as a catalyst for organisational and institutional learning' (2002:1-2). The diagnoses, however, often differ on precisely this question. Where some point to a need to improve the public understanding of science and the communication of scientific knowledge to lay audiences, others suggest a democratisation of science and technology itself, letting the public have greater influence on decision-making processes.

The controversies, then, can be seen as empirical cases in the ongoing discussion of the changing role of science in society that is currently taking place within several branches of the social sciences. The general line of argument is set down by the observation that the social contract of science, which once granted scientific freedom of research in exchange for the production of true and useful knowledge, is now changing. Science is losing its privileged status and has to be much more directly engaged with the rest of society. Ulrich Beck and other sociologists have, for example, argued that science has to become both reflexive and responsible in the emerging 'risk society' (Franklin 1998; Beck 1992). Others have argued that the forms of knowledge production have moved science 'into the agora', the public sphere where the basic problem is one of creating socially robust knowledge (Nowotny et al. 2001).

The social acceptability of science has become a problematic issue on the policy level as well, transforming both policy-analysis and policy-making itself (Weingart 1999). In an age of nuclear disasters, mad cow disease and genetically modified organisms (GMOs), it is argued that science is losing the legitimacy and credibility it needs to inform public policy processes. Researchers and policy-makers alike are trying to understand and come to grips with this decline of trust in science and its public acceptance. Means to improve this state of affairs are actively being sought, including a variety of experiments in public consulta-

tion and scientific accountability. Biotechnological controversies figure prominently in these experiments with new models of public participation.

The role of science and research in society, then, is being problematised both internally, which is to say, within the scientific community, and externally, in the policy apparatus of society in general. Internally, it is observed that science and research is part of a much larger social machine that makes demands and sets expectations of inquiry. Externally, it is noted that science and research is as much a source of social problems as it is a resource for their solution. Science itself, we might say, is becoming a social a problem, so that it is no longer adequate to discuss science in terms of its technical issues alone. Rather, it is the fundamental conception of science as a social phenomenon, a social activity that is being questioned. *Science is now construed as an area that is contested both from within and from without and defining the societal role of science seems to be an integrated part of the controversies.* When I use the term 'science' in what follows it is therefore meant as a general designation for a rather nebulous phenomenon, the definition of which is itself at issue, the struggles to define it themselves a part of the phenomenon designated. By contrast, I use the designation 'technoscience', drawn from the growing body of work known as science studies, as an analytical term for this heterogeneous network of social activities, which carry out research and create knowledge.

Biotechnological controversies can be seen as producing as well as being produced by the problematisation of science. This thesis takes the view that public debate about biotechnology is an exemplary case of how science is constructed as a controversial social activity. This distinguishes it from a more normative perspective, one that, for example, uses biotechnology as evidence in an effort to draw science into question as a social activity (Habermas 2003; Beck 1992). In this thesis no effort is made to settle the question of whether biotechnology is a boon for society or burden on it. It will very likely turn out to be a bit of both. Furthermore, it is not my intention to use these controversies in a case for the democratisation of an otherwise maverick science. Instead, I see these controversies over biotechnology as an occasion to study the problematisation of science itself.

Turning to the Danish context in particular, biotechnological controversies have been observable over the last quarter of a century. The introduction of foetal di-

agnostics as a matter of routine examination in 1978 and the birth of the first IVF (in vitro fertilised) baby in 1981 are some of the health care related technological advances that became the object of public debate in the beginning of the 1980's (Koch & Zahle 1997; Koch 1994). Furthermore, agricultural and pharmaceutical uses of biotechnology became the object of intense public debate following the introduction of GMOs by Danish pharmaceutical companies (Jelsøe et al. 1998). Since that time, biotechnology has frequently been the object of public controversy, debates which have been institutionalised in forums like the Danish Council of Ethics (from 1987) and the Danish Board of Technology (1986, with an organisational change in 1995) and the introduction of procedures like consensus conferences[1] and other public forums for debate. The latest example of an institution established specifically to engender and maintain public debate about biotechnology is called BioTIK, a governmental cross-sectorial project with a budget of approximately 3,5 million Euro (26 million D.kr) to be administered over a five year period. The stated objective of this initiative is to encourage citizens to form opinions on biotechnology and to inspire public debate.[2]

Ethics as politics

It is often claimed that public debate about these controversies is necessary because the controversies touch upon fundamental ethical questions. But whereas most observers agree that ethics is important in the development of biotechnology, it is not so easy to define what is actually meant by this term. It is most often treated as a self-explicating concept and issues are simply referred to as ethics or ethical problems. One example of this is the juridical foundation for the Council of Ethics, where it might be expected that the term 'ethics' be given an explicit definition. But this law only states that 'the council should build upon the presumption that human life begins at the time of conception', and that members should be appointed for their knowledge about 'ethical, cultural and

[1] In Denmark consensus conferences have been organised by two different bodies. The first conference was conducted in 1983 and dealt with early detection of breast cancer. It was organised in collaboration between the Danish Institute for Health Services Research and the Danish Medical Research Council. In 1987 the Danish Board of Technology arranged their first consensus conference over the issue of gene technology in industry and agriculture. Altogether more than 30 conferences have been conducted since then in Denmark, although the specific organisation of the conferences varies dependent on which one of these contexts they are organised in.

[2] http://www.biotik.dk/myndigheder/bioTIK/, 08.05.03.

societal questions which is of importance in the work of the council'.[3] On this background the council has interpreted the scope of ethical deliberation very broadly (Koch & Zahle 1997). The rather limited constraints on the definition of ethics in the statute, has left members of the council free to decide how ethics should be conceived, and which kinds of principles should be included (in addition to the principle about the beginning of human life). In this context it is worth noting that many of the council's reports include minority expressions of dissent based upon independent ethical views or foundations. In considerations of this council it is therefore useful to view ethics as a procedure for discussing biotechnology, which acknowledges that fundamental moral values can or should be drawn into particular decisions, though it makes no stipulations about the need to reach a common consensus.

The idea that ethics is a procedure has also been developed in the BioTIK initiative. In a small folder they present 'Ethics – a tool for making the right choices on biotechnology'.[4] Based upon an earlier expert report they present four basic principles of 1) Economic and qualitative benefits, 2) Autonomy, dignity, integrity and vulnerability, 3) Just distribution of benefits and burdens and 4) Codetermination and openness. These principles constitute the foundation for a set of ethical guidelines for assessing biotechnology, and should in this way be seen to be 'the tool' for making decisions. Compared to the conception of ethics that underpins the Council of Ethics, this construal of ethics is arguably rather technocratic. More important, however, is a possible inherent contradiction in these guidelines. On the one hand, they are interpreted as a tool for determining the 'right' choices. On the other hand, they stress the importance of open debate and the respect of individual self-determination as well as the necessity of public decisions to 'reflect the worries and wishes of the population'. This raises the question of what to do in those cases where the public or the individual citizen disagrees with the ethical guidelines that are arrived at. Another question, suggested by the reporting history of the Council of Ethics, runs: How should we decide in those cases where the ethical guidelines themselves lead us to contradictory answers? Do we expect continuous talk to be the solution?

[3] Act no. 353 from June 3 1987 on the establishment of an ethical council and the regulation of certain bio-medical research trials. The clause about the beginning of human life at conception was heavily debated.
[4] Beige folder from BioTIK, presenting the Danish action plan for biotechnology and ethics.

On the basis of these contradictions in the application of 'ethics', it may be plausibly argued that the definition of ethics or ethical foundations is integrated in the controversies just like the definition of science. Rather than a stable set of propositions, to which it is possible to refer unambiguously in order to settle controversies, we can view the invocation of ethics as a signal of problematisation. When it is argued that a scientific development poses ethical questions it is indicated that it might be touching upon fundamental differences of opinions. Ethical problems can thus be seen as fundamental disagreements over the conditions of human life, the exploitation of nature, and the relation between the individual and society. What should be protected – the autonomy of the foetus or that of the woman? Which kinds of vulnerability is most precarious – a GMO-free natural environment in Denmark or the problem of hunger in the third world that might be relieved by the introduction of GMOs? How do we best protect the dignity of cancer patients - by protecting them against experimental gene therapies that might have no positive result, or by letting them decide for themselves?

On the basis of these few examples, I want to argue that *the ethics of biotechnology could just as well be regarded as politics*. Not because ethical problematisations of biotechnology are political in a party-political sense of embodying conflicting interests, but because they are political in a broad sense. Whenever we make a statement about the rightness of something, we disregard other claims to justice or 'right'. When we defend an 'ethical position' about the protection of the human foetus, claiming, for example, that abortion should be illegal, we are at the same time defending a position that somehow disregards the autonomy of the woman. Ethical opinions and guidelines are a matter of priorities. The reason for considering this set of questions *political* is that continuous controversy surrounds them.[5] Despite numerous efforts to reach closure they have continued to appear on the public agenda as problematic.

Public debate as instrument for reaching closure

It is characteristic of the Danish debate that the articulation of these controversies has been accompanied by a call for public debate, which is thereby construed as an important means to solve these controversies (Lund & Horst 1999).

[5] Politics in this context is not defined as the content of the discussions in the constitutionally defined political arenas. Rather the implicit definition of the political as problematisations in public of collective issues bears much resemblance to the discourse theoretical definition of politics as basic and overt antagonism formulated by Laclau and Mouffe (Andersen 2003).

This is an idea that is also present in the previously mentioned institutions of the Council of Ethics, the Board of Technology and the BioTIK initiative. It is implied that through public deliberation it will be possible to identify acceptable as well as unacceptable uses of biotechnology. Public debate can in this view also be presented as a basis for policy recommendations.

Through the last decade it has been common to regard these initiatives as part of an international trend towards strengthening the accountability of science (Joss 1999; Durant 1999). But it can also be noted that the ideal of a deliberative, public dialogue has played a major part in the Danish social movement of folk high schools and the theological tradition inspired by N.F.S. Grundtvig (1783-1872) and, later, Hal Koch's (1904-1963) notion of 'democracy as dialogue' (Lund & Horst 1999). What is implied in this tradition is that public debate is important in itself because it serves an edifying function ('bildung') forming an understanding of the individual and collective human condition. To take part in a social dialogue is not just important as a matter of voicing one's preferences, but as a process of deliberation that shapes interpretations of the world. As a collective process, this deliberation also serves the end of integration, since citizens are supposed to form shared and common interpretations. This notion of integration through public debate can therefore be observed as an instrument of societal self-reflection. Public debate is seen as the mechanism through which society as a whole can reflect on itself and decide whether a given social trend is desirable or not.

The conception of deliberation as a feature of the public sphere that can turn particularities into mutually binding interpretations has been thoroughly discussed by Jürgen Habermas (Habermas 1991; Habermas 1990). In chapter 1, I will return to a discussion of the way this Habermasian ideal has been developed in the context of science and technology studies. The important point, here, is that the ideal has been a productive force in the Danish context in social movements of folk high schools etc. And the notion of public debate as the instrument for reaching closure in the form of legitimate political regulation is a common ideal in Danish controversies about biotechnology.

There are, however, also some peculiarities in the way this ideal is invoked in actual public debate. An earlier analysis of the controversies over foetal diagnostics (Horst 1996) revealed that the demands for more public debate were an in-

tegral part of the arguments in the controversies. Even when the debate was prominent both on the political and the mass media agendas, actors continued to issue demands for 'more public debate'. Moreover, as the example of BioTIK demonstrates, public debate is sometimes presented as a phenomenon in need of artificial life-support in order to function properly. Rather than emerging because members of the public find an issue worthwhile discussing, the debate is orchestrated, because the public apparently needs to be 'inspired' to debate and form opinions on the issues of biotechnology and genetics.

It is therefore possible to identify a paradoxical situation in these calls for public debate. The more public debate there is, the more it is in demand. And the more it is praised for its bottom-up qualities, the more it is orchestrated as a top-down process. The continuous presence of demands for public debate might indicate limits in the ability to reach legitimate closure through societal self-reflection in the public sphere. This paradox, however, is made less visible by the continuing demands for more public debate, which can be seen to be a way of preserving the ideal of public debate as such. In these demands, the inherent argument seems to be that it is not because public debate does not work as an instrument for closure that controversies persist; it is rather because we have not had enough public debate yet that the issues remain open. Although public debate appears to be valued as a democratic institution of legitimacy, however, there is no unanimous agreement on the specific definition of public debate or criteria for its social performance. It is not just a medium through which controversies unfold – rather it is explicitly thematised in the controversies as an instrument that should be applied in particular ways.

The identification of this paradox in the demands for public debate indicates a need to look at the concept of public debate in much the same way as the concept of science, that is, as a concept being problematised and negotiated as part and parcel of the issues being debated. On this account it is not the intention to analyse controversies in order to be able to judge the societal function of public debate. Whether the controversies concerning biotechnology signal a real need for more or less public debate in order to secure legitimacy is not the issue in this thesis, just as I will not discuss whether the notion of deliberation in the public sphere is normatively right or wrong. Rather I propose to *look at these problematisations of public debate analytically and see how the ideal of public debate emerges as a means of integration and societal reflection*, and discuss

whether this emergence is at the same time an indication of possible limits to the realisation of this ideal?

Consequently this dissertation will argue that the controversies about biotechnology are political because they have been continuously on the agenda of public debate, despite numerous efforts to reach closure in terms of legislation and non-statutory regulation as well as different participatory methods. The analyses are designed as an exploratory study of the thesis, that the concepts of science, ethics and public debate are debated because the controversies touch upon basic political opinions about the constitution of society. These concepts do not designate external mediators to which it is possible to turn in order to settle controversies. Rather they are part of what the political controversy is about. We do not just disagree about genetic technology, but also about the societal role of science, ethics and public debate.

Under these circumstances, a study of public debate is a study of the discursive conditions for the possibilities of regulating a controversial area of present society. Similar to the broad definition of politics adopted earlier, I employ the term regulation as an open term analogous to the use of governance within political theory. But rather than a policy-study of the actual formulation of regulation of biotechnology, the present dissertation is a sociological study of the discursive *conditions of possibility* for regulation in present Danish society. On this background I have chosen to study mass mediated debate, since it must be expected to convey a diverse set of opinions and arguments at the same time as it makes it possible to study public opinion formation as a dynamic process. Rather than a study of policy documents or interviews with key figures in the policy process, where the possibilities of regulation are already to a certain extent negotiated and delimited according to certain viewpoints, the mass mediated debate must be expected to provide access to a more diverse set of opinions, although this analytical strategy also has some problems, to which I will return to later. These considerations made me conduct an exploratory study from this problem statement:

> *The objective is to study mass mediated controversies about biotechnology as political controversies, by analysing how different arguments construct the relations between particular definitions of problems and their solutions, hereby pointing to the discursive*

conditions for the possibility of regulating biotechnology in present Danish society.

In the following section, I will clarify the analytical strategy behind this formulation of the problems as well as define the central concepts employed in this problem statement.

Conceptual clarification and analytical strategy

The term *controversy* is originally adopted from a tradition within the theory of science that focuses on scientific controversies as a particular object for the study of science as a social activity (Brante 1990; Brante & Elzinga 1988; Engelhardt & Caplan 1987). Here, controversy is defined as an explicit dispute between different parties interacting with each other. In order to study controversies, it is therefore necessary to define a set of actors and a core of the disputes coherently. Reviewing the public controversies concerning biotechnology in Denmark, however, I have found it difficult to establish this kind of identification as the basis for an analysis. It seemed more appropriate to regard the debates about biotechnology as an ongoing problematisation with an unlimited set of actors and with unlimited possibilities of association to other themes and issues. Rather than establishing a particular controversy with a particular set of actors as the object of analysis, I chose an analytical strategy that could make the identification of controversies the outcome of the analyses rather than its point of departure.

Networks of articulation

The basis for this analytical strategy is that controversies unfold in a medium of public articulation. The term public articulation designates a particular conceptualisation of public opinion formation as an ongoing, unlimited, and flexible production of articulation in a public space. In Chapter 2 I will present a theoretical framework for this understanding based on a *relational ontology* inspired by Bruno Latour. Central to this framework is that public opinion formation is defined as a continuous process of translation, inscription and association. Instead of speaking of public opinion as a particular form (as the outcome of some sort), public articulation is defined as a medium. It is a continuous production of propositions articulated in *public*, that is, in some sort of collective of other actors. In this process of articulation, relations between different propositions are

established continuously, but they are not the 'substance' of public opinion. Rather they are relations establishing a *network of articulation* that exists as long as it is being reproduced.

The example of human cloning can perhaps clarify this notion of *networks of articulation*. In 1987, on the background of distinct public articulations of this technique as an illegitimate and unacceptable way of reproduction, it became illegal to clone humans in Denmark[6]. Since the end of the 1990's, however, new articulations of the technique of human cloning have emerged and some articulations now distinguish between reproductive and therapeutic cloning. The term reproductive cloning designates the use of the cloning technique that is still articulated as unacceptable – the production of human babies. But the term therapeutic cloning designates a different use of the cloning technique – the production of human cells, but not a human foetus. And several of these articulations recommend new research with therapeutic cloning, because it might lead to new possibilities of therapy and treatment of diseases. In order to be able to actually conduct this research, however, it is necessary for the statutory regulation to be changed. And one of the necessary conditions for this change is probably articulation of general public acceptability.

This is the present situation in which we can say that there are competing networks of articulations of human cloning. New networks might be established in which the distinction between reproductive and therapeutic cloning is employed in a way that makes it possible to associate therapeutic cloning with treatment and care, rather than the manufacture of babies. And the more articulations that employ this distinction the stronger it becomes, so that eventually it might become stronger than the alliance around the previous articulation: Cloning as such is unacceptable.

In this way, public articulation of propositions can be seen as a continuous process of creation of relations, in which phenomena are connected to each other, establishing stronger or weaker alliances. This production is contingent, because relations could always have been established differently. But it is not arbitrary. It is always taking place in a pre-negotiated context of earlier connections (Lund 1997). It is not easy to create alliances with an articulation of cloning as the pre-

[6] Act no. 353 from June 3 1987 on the establishment of an ethical council and the regulation of certain bio-medical research trials

ferred way of human reproduction. It appears to be rather difficult to disconnect the previous network of articulation around cloning, which apparently includes notions of God's creation, the autonomous subject and Frankenstein's monster.

Arguments

This processual perspective on public opinion formation as a continuous articulation of propositions in public does not view public opinion as an outcome of controversies that can be analysed in order to explain the beginning and the end of controversies. Instead, public opinion formation must be viewed as an ongoing production of articulation that is never settled. Public opinion never becomes a substance that can be measured; rather it has to be studied as a dynamic process. In this process, controversies can be viewed as points of condensation in the constant production of public articulation. Controversies have a theme that makes it possible to speak of a controversy as an association of connected arguments. But how this theme should be defined is a question for the analyses to answer. So the definition of particular controversies is not the starting point of the analyses, rather it is the outcome. But what can then function as the object of analysis? I have settled for the *argument* as the analytical unit to be analysed.

In order to be able to speak of a controversy there must be conflicting articulations of a particular object. Controversies can therefore be said to consist of conflicting *arguments*, which construct particular relations between problems and solutions with the aim of making an audience adhere to a particular representation of a situation[7]. To speak of an audience is not necessarily to imply an actual addressee, but only to observe that an argument implies an imagined audience. Within the rhetorical tradition it is possible to speak of 'the universal audience' as the imagined audience of an argument that is not directed at a specific audience (Perelman & Olbrechts-Tyteca 1969:31-35). It is, therefore, plausible to say that arguments articulated in public are directed at a universal audience, but since it is a construction on behalf of the articulation there is nothing ontologically universal about this imagined audience.

It should be noticed that when I speak of arguments as the establishment of a particular connection between problems and solutions, they are not ontologically

[7] This notion of argument is modelled over the definition of arguments in The New Rhetoric: 'the discursive techniques allowing us *to induce or to increase the mind's adherence to the theses presented for its assent*' (Perelman & Olbrechts-Tyteca 1969:4).

given entities, but rather particular constructions that vary between arguments. One example is that the prohibition of human cloning can be constructed as both a solution and a problem. It can be seen as a solution because it prevents unacceptable research, and it can also be constructed as a problem because it is an attack on an ideal about freedom of research and a prohibition against a new and promising type of research. *Arguments are therefore a particular kind of proposition that establish connections between particular definitions of problems and solutions, hereby articulating phenomena in particular ways*. And the analytical strategy of the present analyses is to study arguments about the development and regulation of biotechnology with the aim of identifying controversies, defined as observable patterns of differences in these articulations.

As already mentioned, the dissertation is constructed as an exploratory study of the thesis that controversies persist because they bear upon basic political opinions about the constitution of society. During the study, however, I found it difficult to conduct the analyses with the sole theoretical inspiration of Bruno Latour alone. The relational ontology stipulates that phenomena can only be contextually defined in temporal relations to other phenomena. This analytical perspective is suitable for analysing different patterns of articulation, but the observed pattern does not hold any claim to stability. This became problematic in connection to the ambition of analysing the controversies as political conflicts. When I started to analyse how the phenomena of science, ethics and public debate were presented in different arguments, some stable patterns emerged which were hard to capture by the radically actor-oriented, processual perspective of Latour. Rather it seemed possible to classify the arguments in a relatively stable typology inspired by the theoretical framework of anthropologist, Mary Douglas' cultural analysis.

The combination of the actor-oriented concepts of Latour and the structural framework of Douglas is not of course without its tensions, as I will make clear in Chapter 2. But it allowed me to establish a heuristic typology of different articulations of science, ethics and public debate, which illuminate possible alliances and tensions in the discursive conditions for regulating biotechnology. This combination also made it possible to develop a conceptual framework of public opinion as medium for a constant cultural dialogue about the constitution of society, which I will discuss towards the end of the dissertation.

Empirical site and data collection

The last issue to be dealt with in this introduction is the question of empirical data. As it will become clear in Chapter 1, controversies concerning biotechnology have been studied internationally in polls, focus group studies, mass media content, popular culture, scientific texts and policy documents. All these kinds of material exhibit both advantages and problems. As mentioned I have chosen to study mass mediated debate since it provides access to diverse constructions of arguments, and furthermore makes it possible to study public opinion formation as a dynamic process. An important benefit of studying mass mediated articulation is that it is possible to follow controversies over time. Furthermore, many of the mass mediated articulations are explicitly put forward as arguments that present a particular construction of problems and solutions. This makes it a very good empirical site for the study of the continuous production of articulations in public, where arguments present problems and solutions differently.

This choice of data, however, also presented some notable challenges, since the mass media cannot be viewed as a neutral mediator of arguments. Rather mass mediated news must be seen as productive constructions of *representations* of the world. As I will argue in Chapter 2, however, this is not considered a problem for these analyses in particular, but rather a condition of *any* analysis of public articulation of opinions. Public articulation of opinion always has to take place in a medium, whether mass media, opinion polls, focus groups or consensus conferences. None of these are media, which neutrally transmit an underlying or 'authentic' public opinion. Rather, all these media are ways of negotiating or constructing the articulation of public opinions.

In this way the thesis inscribes itself in a tradition of work that views public opinion as a 'social construction' (cf. Vallentin 2002). Within this perspective, the objective has primarily been to identify the particular conditions for the production of public opinion in the mass media. For example Lund has focused on the journalistic production of public opinion in a particular pre-negotiated context (Lund 1997), whereas Pedersen et al. have focused on the institutionalisation of a political communication system with journalists as a central actors (Pedersen et al. 2000). The perspective in the present dissertation is slightly different since it is not my intention to search for particular features of the journalistic production of news. Rather I am going to argue in Chapter 2, that mass mediated articulations can be viewed as a proxy for the articulation of public opin-

ion in general. Based on Latour's theoretical perspective, I will argue that mass mediated articulations are not separate formations or reflections of public opinion, but rather a central part of the public production of opinions.

It is on this background that I have chosen to study arguments presented in mass mediated articulations of biotechnology. Establishing a credible data source for this study, however, turned out to be a challenge because of my inability to point to any particular controversy that could be defined and delineated as object of study. On this account, I decided to construct an archive of all the mass mediated articles that articulated biotechnology in a given period. In order to construct this archive, however, it was necessary to conduct a preliminary study of content, since content was the means to decide, which kinds of articles to include and which to exclude. The construction of this archive was therefore linked to an analysis of associations between articulated phenomena in these articles. This combined construction of archive and study of content is thoroughly documented in the appendix to this thesis, and it serves as the basis for the further empirical analyses undertaken in this thesis.

Here it should be mentioned that in the course of the establishment of this archive, the issue of biotechnology was narrowed to a focus on health care related biotechnology. This was due to a necessity of limiting the study, and articulations of GMO and agricultural gene-technology were found to constitute a vast body of material, which was fortunately relatively easy to disregard, as it seemed to be treated as a different sphere of application primarily articulated in separate articles. Furthermore, methodological considerations also led to a focus on four national daily newspapers, since national newspapers offer the best search facilities while being an important part of the mass mediated production of articulations.

Structure

The dissertation is structured in three parts. The first part consists of a discussion of the theoretical background as well as the methodological framework for the study. Chapter 1 is a discussion of the theoretical conceptualisations of the changing role of science and the function of controversies. The chapter concentrates on the academic tradition of studies in Public Understanding of Science (PUS), identifying three different models for the conceptualisation of the communicative relationship between science and the public. These three models can

be seen to imply three different ways of explaining controversies about biotechnology, the last of which is subscribed to in this thesis. On the basis of this model, Chapter 2 develops a theoretical framework for the study of biotechnological controversies inspired by the concepts of Bruno Latour as sketched in the previous section. The chapter ends by including the structural framework of Mary Douglas' cultural theory as a necessary counterpart to the relational ontology of Latour.

The second part of the dissertation studies how the inscription of occurrences into newsworthy stories constructs problems and solutions differently. Chapters 3 and 4 are empirical analyses of concrete cases of articulations of the technological application of human cloning and gene therapy. They both focus on concrete occurrences, which has been object of a large number of mass mediated articulations. The objective of these two analyses is to study concrete patterns in the inscription of problems and solutions. These patterns are termed scripts and in Chapter 5 the scripts are grouped in a typology of four modes of articulating the collective on the basis of the work of Mary Douglas.

The third part of the thesis deals with the question of the controversies as political conflicts over the constitution of society. In Chapter 6 the typology of four articulated collectives identified in Chapter 5 is used as a structured perspective in order to study how different arguments inscribe the phenomena of science, ethics and public debate, and the tensions and alliances between these different inscriptions are discussed. This leads to a concluding discussion in Chapter 7, in which the theoretical, empirical and practical results of the analyses are discussed.

Chapter 1
Science interacting with the public
- A background study of explaining controversies

Within areas such as sociology of science, technology, risk, innovation and public policy there seems to be a growing consensus that the social role of science is changing. Science is presented as having lost its authority. Public confidence in science is apparently declining as a result of scandals and 'unforeseen' accidents leading to increasing controversies. The proliferating controversies about biotechnology are often mentioned as prime examples of this trend. It is argued that they reveal an urgent need for improving the communicative relationship between science and its public. If science and the rest of society communicated more effectively with each other, it would be possible to reach closure on these controversies.[8] In this chapter I have let this hypothesis be the focus of a review of previous academic analyses of the proliferation of public controversies over science: How are public controversies over science conceptualised in different theoretical approaches as a lack of communication in a broad sense between science and its public?

It can be argued that posing this question is already to subscribe to a particular worldview in which science and public are defined as discrete entities with a relation to each other. This is not the intention. Rather, when I speak about a communicative relation between science and public it is out of a discursive need for a term for the object of interest. But it should be clear, that the nature of this relation is the very object of discussion. On this account, I will adopt the term 'publics' in a general and unspecified form as a term for all the possible ways of

[8] In the studies that have been made of scientific controversies, a large part of the analytical effort have gone into the construction of a taxonomy of the termination of controversy and a distinction between solution, closure and abandonment is frequent (Brante & Elzinga 1988; Engelhardt & Caplan 1987). According to this scheme, solution is seen as a termination where all parties agree on the outcome, whereas closure is seen as the termination by force, and abandonment designates giving it up. In the context of this dissertation this distinction does not work, since the relational ontology does not provide a point of observation from which it is possible to decide whether all parties agree or whether force has been employed. Instead the words solution and closure are used interchangeably about termination of controversies in the outset. During the analyses, however, it will become possible to identify a distinction between these terms but only as observable ideals in the controversies, rather than as analytical concepts making normative evaluations possible.

constituting a public for science communication that is in some way external to the scientific production of knowledge. Furthermore, the term science is employed as a general and unspecified, or contested, term for the organised activity of creating knowledge in systematic ways.

A frequently cited perception of the importance of a good communicative relationship between science and its publics is the notion of a mode 2 production of knowledge, according to which science has moved into the agora in order to produce socially robust knowledge (Nowotny et al. 2001; Gibbons et al. 1994). This account is an inspiring statement in the present discourse on the changing role of science, but I have found it difficult to use as foundation for a concrete study of public controversies, because the notion of the agora as a form of public sphere is very vague. Sometimes it seems to be equivalent to the Habermasian concept of a deliberative public sphere (Habermas 1991), when the focus is on participation and it is argued that the *agora* designates: 'the space in which market and politics meet and mingle, where the articulation of private emotions and meanings encounters the formation of public opinion and political consensus' (Nowotny et al. 2001:183). At other places, however, they present the agora in a way that seems to be different from this deliberative ideal. Then it seems that the general reason for participation is to pursue individual preferences, and the question of co-ordination becomes a question of aggregating preferences. This, however, must be seen in contrast to the deliberative ideal invoked above. In the ideal of the deliberative public sphere, identified by Habermas, the idea is precisely to leave individual economic and social interests at the door when taking on the role of enlightened citizen in the public sphere (Habermas 1991), see also (Lund & Horst 1999). Participants are assumed to engage in a dialogue as citizens, not as promoters for individual or collective special interests. This citizen role is a precondition for deliberation, aimed at reaching a working consensus on what could reasonably be viewed as a common good.

In this chapter I will argue that this distinction between participants as either consumers or citizens is of fundamental importance. The difference points to very different ways of conceptualising the publics, which also shape the way the agora can be conceptualised as a mediating space between *science* and *publics* in diverse ways.

In order to make this argument I have turned to the field of Public Understanding of Science (PUS) and Science Communication. These interdisciplinary fields of research have explicitly dealt with the relation between science and publics as a dynamic process of communication where the definitions of 'science' and 'public' are of great importance. Furthermore, the discussions on PUS and science communication seem to be far more applicable to concrete analyses than the more normative perspectives on the public sphere as an institution in political theory, which would be the outcome of a pursuit of the difference between deliberative and liberal perceptions of the public sphere as mentioned above. This, however, does not mean that I will not be returning to basic themes of political theory and the role of the public sphere in society, but this will be an implication, not an end in itself.

The literature on PUS and science communication is vast, and I will by no means claim to be covering it completely. Instead I will focus on different perceptions of the relation between science and publics in particular as well as definitions on these concepts. I will start by applying a commonly accepted distinction (Michael 2002; Miller 2001; Durant 1999) between two traditions of research into PUS, the traditional or positivist tradition and the critical or interpretative tradition. But in view of reservations that have been raised in some recent articles within the critical tradition I will argue that it is possible, at least by implication, to distinguish a third perspective on this relation. These three perspectives can be seen to imply three distinct conceptualisations of the mediating space between science and its publics. For reasons of clarity I have chosen to refer to these three different perceptions as three different models of the agora. The following presentation of each of these three models is exemplified by including references to different kinds of analyses of the public understanding of biotechnology and the controversies that surround it. This is done in order to show how different analyses of the controversies can be linked to different conceptualisations of the agora as the space for mediating between science and its publics.

Traditional PUS – enhancing 'scientific literacy'

As Robert Logan has shown, there has been a long tradition of scholarly writings on how to improve the public understanding of science by the mass communication of scientific knowledge (Logan 2001). The early writings of this tradition can be dated back to the beginning of the twentieth century. The norma-

tive basis of these writings was a conviction that it would improve the lives of individuals as well as their ability to make rational political decisions if pedagogical efforts where made to heighten ordinary people's understanding of science. It is obvious that this program was closely linked to a fundamental assumption that science is a factor in social progress. This assumption also guides many current accounts of science and science communication. As an example Gregory & Miller list a series of benefits for science, national economics, international relations, democracy, culture and the individual as likely outcomes of an increased public understanding of science (Gregory & Miller 1998).

A key term in this tradition is scientific literacy, though its precise meaning is somewhat contested. John Durant lists three different interpretations, where the public should a) know a lot of scientific facts, b) know how science works (according to the official epistemological theories) or c) know how science *really* works (according to sociology of science) (Durant 1993). In spite of these differences the notion of scientific literacy can be seen to indicate that the public needs to meet a certain standard of knowledge in order to deal with science. Although there is disagreement on the precise definition of what kinds of knowledge the public should be familiar with, the important thing is that the standard set for the appropriate level of information is derived from science itself. Thus the notion of scientific literacy brings the figure of authority and education in science communication clearly to the fore. It is from within science that the standards are set for what the public ought to know.

This view of science communication can be compared to the perspective adopted by communication studies, employing a linear 'transmission' model of communication, according to which a message is mediated through a channel from a sender to a receiver with some sort of effect (Cf. e.g. McQuail 1994). The sender has certain objectives and the problem becomes the instrumental one of designing the communication process accordingly, that is, to achieve them. A central issue, then, is the question of effect and, measurement of effect. Science communication should be designed so as to promote scientific literacy and increase the public understanding of science, and this increase should be evaluated according to the intentions of the communicating sender, primarily science or scientific actors. You know that science communication 'is working' to the extent that the public seems to be 'getting the message'.

Even though the transmission model has been heavily criticised, it still serves as the basic model in many analyses of the public understanding of science. In general, much health communication research is undertaken according to this model as well as more general examinations of the diffusion of innovations (Rogers 1995). The normative raison d'être in these explorations is a wish to disseminate a message in order to make improvements – be it in life conditions, cognitive understandings or rational policy making. As mentioned above, the implicit rationality of this approach assumes that the relation between the disseminator and the receiver of knowledge is asymmetrical: the diffuser of scientific knowledge knows something the receiver does not know.

This perception of science communication is fixated on the spread of information. The public should be educated about science according to the standards of science itself. In principle, science communication has failed wherever the public does not know (or believe) something the scientists know (or believe) or, at the very least, something that the scientists believe the public should believe. Although it can be necessary to let the information flow two ways – since science communicators might want to find out what the public is ignorant about – the basic feature of the agora as a mediating space between science and public is to be a medium for the dissemination of information. Viewed as a model for decision-making, this perception comes close to what, within public policy analyses, is termed the technocratic model of the science policy relation (Weingart 1999). Here politics is dependent on scientific council to a degree where politics itself could become obsolete. What matters is the informational content of scientific advice, since policy decisions should be firmly based on scientific knowledge. Obviously this perception of the agora has a strong bias towards elitism. Even though we cannot necessarily speak of a distinct social group or class as *the* elite, there is no doubt that the public is on the receiving end. Science knows, and the public should be made to know.

Along these lines, the model has had great influence in the question of risk perception and risk acceptability (Hellström & Jacob 2001; Douglas 1985; Kunreuther & Ley 1981). In a long lasting academic dispute about the assessment of risk, a central issue has been a distinction between the objective risk (the scientifically established risk) and subjective risk (risk as perceived by lay people). According to this distinction it has been seen as important to explain public deviance from scientific rationality – why do people sometimes fear the harmless

or unlikely things while accepting very high risks in other contexts? A great deal of scientific work has been done to determine how to diminish this gap and get the risk perception of lay people to be greater in accord with the 'real' or scientifically established risk.

In connection to genetics, too, the distinction between subjective and objective risk has been seen as an important feature in the public understanding of genetics. It has been argued that people over-exaggerate or underestimate their own risk and that this subjective risk perception leads to inefficient or simply 'wrong' health care choices (Morton & Duck 2001; Bosompra et al. 2000; Drossaert et al. 1996). On this definition of the problem, an important task becomes the enhancement of people's understanding of their objective risk for the sake of improving their 'health behaviour'. In this connection it is not unusual to point to a need for improving the mass mediated coverage of genetics because this is seen as important in shaping people's perception of genetics and risk (Condit et al. 2002; Rees & Bath 2000; Gunter et al. 1999; Henderson & Kitzinger 1999; Gerlach et al. 1997).

In this context I have found it interesting that other researchers have questioned the media coverage of genetics as being to simplistic and too positive towards genetic science. A frequently cited account is that by Nelkin & Lindee (Nelkin & Lindee 1995) in which they argue that popular media and culture present the notion of gene in a way that will increase genetic essentialism and determinism in the public understanding of genetics. Though the conclusions are somewhat different from the previously mentioned – mediated representations are too eager to 'sell science' rather than presenting science too badly – the inherent model of communication is similar. People are informed about science through public communication and it is important that the information is 'right' for public perceptions to be influenced in the appropriate way.

As mentioned above, however, it is most common that the reason for improving scientific literacy is a wish to enhance scientific legitimacy. The underlying assumption is that knowledge is convincing in itself, and if only people were better informed, they would see that the scientific understanding of the world is the most correct one. Consequently, controversies are also explained in terms of lack of information about science. If people are sceptical about science it is a direct result of their lack of knowledge (Weigold 2001). The more you know of

science, i.e. the more enlightened you are, the more you will accept scientific rationality and scientifically produced knowledge as a 'true' (and hence best) understanding of the world. Lack of consent for science and technology is seen as being due to deficiencies in knowledge. This explanation is especially in focus in the many surveys conducted in order to measure scientific literacy and the general public understanding of science.

The controversies surrounding genetic science and technology are no exception to this tendency. Most prominent is the study by the research group 'Biotechnology and the European Public,' a consortium which has produced several empirical studies which are interesting in this context (Bauer & Gaskell 2002; Durant et al. 1998). On the basis of a survey conducted in 1996 (Eurobarometer 46.1) they have analysed the public perception of biotechnology in 17 European countries. On the basis of this analysis it was argued that Europeans are more sceptical of biotechnology than other areas of technological innovation, but that people discriminate between areas of application so that the 'red biotechnology' of the medical sector is viewed more positive than the 'green biotechnology' being developed in the areas of agriculture and food production.

The study further identified three predominant logics for the public perception of future developments within biotechnology: A logic of support, a logic of risk-tolerant supporters (where expected benefits are seen to outweigh expected risks) and a logic of opposition. Regarding medical biotechnology (including genetic testing) approximately half the population was portrayed as supporting the developments and less than 10% were portrayed as subscribing to the logic of opposition (Durant et al. 1998). Drawing on the same data, Hviid Nielsen and colleagues have identified two qualitatively different types of opposition: a 'green', post-industrial opposition based on an argumentation about high risk, and a 'blue', pre-industrial opposition, in which biotechnology is against tradition and natural order, and therefore just basically wrong (Nielsen et al. 2002).

In the context of the present thesis it is interesting that this European study also linked the public's perception to an analysis of the characteristics of media coverage. They found a general pattern according to which relatively high degrees of scepticism in a country were positively correlated to the amount of negative press coverage. Compared to the rest of Europe, the Danish public was depicted as rather knowledgeable about biotechnology, but harbouring low expectations

for improvements in life due to biotechnology, much like other Northern European countries (Jelsøe et al. 1998). Furthermore, the Danish media coverage was found to be the most negatively framed coverage of biotechnology in Europe (Gutteling et al. 2002).[9] In a Danish context two later surveys have been conducted showing that the expectations of biotechnology with regard to the improvement of life conditions are still much higher with regard to 'red' biomedical research although the general attitudes to biotechnology have become more negative (Mejlgaard & Siune 2001; Thulstrup 2000).

The assumption that negative attitudes towards biotechnology are connected with a lack of scientific literacy, however, has not been supported substantially in these surveys, as there are a large proportion of sceptics even among the very knowledgeable (Mejlgaard & Siune 2001; Durant et al. 1998). This observation has promoted a search for other variables to explain the general attitudes towards biotechnology. Other socio-demographic indicators or political/religious values have been considered to this end, and differences between supporters and opponents have been found. Opponents tend to be older, to be women, to be less educated, to be more religious and to hold less materialistic values (Durant et al. 1998), the first three of these characteristics have been supported by Mejlgaard and Siune in the Danish context. Furthermore it has been argued that increased regional development (Allum et al. 2002), a general tolerance of risk (Mejlgaard & Siune 2001), and a general trust in science and authorities (Gutteling 2002; Mejlgaard & Siune 2001; Priest 2001c) can be connected to positive attitudes towards biotechnology. Other researchers, however, have argued that neither knowledge nor general values can be said to explain attitudes towards biotechnology since they only explain a remarkably small percentage of the variation (Midden et al. 2002). This has led these researchers to conclude that - at least by 1996, when the surveys were conducted - attitudes were not yet crystallised in Europe, but with further advances in biotechnology this will change:

> It seems plausible that, as biotechnology further develops, clearer attitudes will emerge. It should be noted that our data were collected before the important media events of, for example, the

[9] This result, however, is probably also connected to the particular methodological design, which only includes the two papers *Politiken* and *Information* as well as the fact that the selection was taken from 'Artikeldatabasen', which primarily include long newspaper articles. As the analysis of associations in the appendix shows, these are all factors that would lead towards a bias of negative framing.

> modified soya imports and the birth of Dolly the sheep, issues that projected biotechnology to the forefront of social debate. As it becomes apparent to more people that biotechnology is a diverse field, capable of producing a variety of very different products and services, people are likely to develop more differentiated attitudes. (Midden et al. 2002:223)

In this way the authors sustain the view that public understanding of science is a function of public communication, although they do not support the notion of increasing support as a linear function of increasing knowledge.[10] But it is also obvious that they seem to view controversies concerning biotechnology in an evolutionary perspective, where knowledge and communication is a decisive factor in the future development of the public understanding of biotechnology and science in general.

These measures of public opinion are important as overviews of the current status of public understanding of science, but they also reveal some of the shortcomings of this method. Without listing all the points of criticism that can be directed towards these measures of public opinion it should be mentioned that although it is possible to compare polls at different times, they are still a static measure in that opinions are viewed as a stock of individual attitudes. In this way they leave out the social and processual aspects of public opinion formation. Furthermore they often treat national publics as a general entity. They hereby enforce a view of the national public as a coherent entity, which can be opposed to science, albeit graduated according to different levels of scientific literacy. It is the public which is the object of study, not science which is seen merely as an externally and ontologically given entity.

In this section I have presented the traditional PUS tradition as exemplifying an asymmetrical outlook on the communicative relationship in the agora. It allocates a privileged place to science and scientific knowledge just as it perceives the public as a more or less ignorant mass in need of information and education. Accordingly, reaching closure in controversies is a matter of increasing the public understanding and acceptance of science through information campaigns. If the public is sceptical they need to be informed, educated or otherwise made sci-

[10] Rather they seem to subscribe to what has been termed the mobilisation thesis, where increasing knowledge is seen to leading to mobilisation of both positive and negative standpoints. This hypothesis has been contested in a Danish context (Mejlgaard & Siune 2001).

entifically literate. This will provide them with an increased understanding. And not only will this make them lead healthier lives and become better democratic citizens, it will also make them more favourable towards science and scientific knowledge. This is, in an important sense, simply what it means to 'improve the public understanding of science'.

Critical PUS – democratising science

The traditional model of PUS has been the object of much criticism over the past decade, where critics have referred to it as a 'deficit' model (Wynne 1996). What the critics point to with this criticism is the authority assigned to science and the unquestioned presumption of the superiority of scientific knowledge with regards to how to live a healthy life, how to make rational political choices, and the subsequent definition of communicative problems as a lack of understanding, a deficit on the part of the public. In this way, their critique parallels the existing criticism of the transmission model within general communication theory. Here it is argued that the 'syringe theory' understands the perception of messages as merely injecting information into a receiver, hereby construing the audience as far too passive. Rather than being passively injected with information in a process of transmission designed by senders, receivers actively select information according to its perceived utility, leaving information that does not gratify any informational needs unnoticed. Furthermore audiences are seen as actively constructing messages in the reception of information – making it impossible for senders to determine the outcome of the communicative process.

Along the same line of criticism, Irwin and Wynne edited a collection of essays in 1996, in which all authors were trying to temper the traditional conception of the words Public, Understanding and Science (Irwin & Wynne 1996). It was argued, that the public cannot be understood as a single, homogenous and ignorant mass, but is composed of locally situated groups, each of which make sense of scientific knowledge in their own way. When viewed in their local contexts, particular instances of sense making, previously characterised as 'deficient', now seemed perfectly reasonable. Likewise the term understanding had to be broadened so as to denote more than just a one-way transmission of knowledge. Finally, science should not be treated as an unquestioned and automatically privileged sphere of society, but as one social activity among others. The editors concluded by arguing that:

> The practical target of advancing the public understanding of science depends upon a willingness to facilitate a broader discussion of the contemporary – and changing – character of science and the relationship between this and wider relations of knowledge and citizenship. This will raise difficult questions about the limitations of scientific understanding, the direction of scientific research, the relationship between public needs and private profit, and ultimately, about who should control science. (Irwin & Wynne 1996:221)

This view, that is, has implications for the conceptualisation of both the publics and science. Parallel to the emphasis on multiple publics as active participants in the interpretative process, science is not depicted as a single autonomous authority. The asymmetrical relationship portrayed by traditional PUS is substituted with a different relation, where scientific knowledge is one kind of knowledge, which should be evaluated on equal terms with other forms of knowledge. Following these lines of inquiry many researchers have argued for the need to understand the way lay people make sense of scientific knowledge. With special regards to genetics some of these attempts have been carried out as focus group studies (Condit et al. 2002; Barns et al. 2000; Kerr et al. 1998a; Kerr et al. 1998b). These studies stress the capability of lay people to comprehend and appreciate complex sets of problems. It is argued that the large interpretative repertoire of lay people can serve as a valuable hermeneutic contribution to experts conducting bioethical discussions, because it enhances the experts' possibility of reflexivity and ability to evaluate biotech in a broad perspective of 'the good life' (Barns et al. 2000). Likewise Kerr et al. have argued that lay people possess a form of lay expertise and that their accounts of problems are much more open-ended and reflexive towards boundaries between autonomy and responsibility than traditional experts' accounts (Kerr et al. 1998a). These studies all stress that lay people's accounts should be brought to influence policy making since the technology has far reaching consequences for all members of society.

In these accounts science is not perceived as a privileged authority producing true knowledge. Rather science is viewed as one social activity among others and is therefore also presented as amenable to control by democratic institutions in society. In this way these writings can be seen as parts of a broad tendency within sociology of risk and public policy to talk about a democratisation of science. These tendencies have been reinforced by the reverberations of the publi-

cation of Ulrich Beck's *Risk Society* (Beck 1992). Beck stressed that science was changing and increasingly producing fallible, uncertain and de-monopolised knowledge. The risks implicit in the risk society are not of random accidents but have been manufactured by the advance of science and technology. As a consequence he instigated a call for science to assume responsibility and become reflexive. Science needed to pay much closer attention to its consequences. It should "install brakes and a steering wheel" (Beck 1992:180) by changing its self-conception and the political arrangement it is caught up in. Under terms like 'reflexive science' or 'citizen science' this request has gained wide support within the sociology of risk (Franklin 1998; Irwin 1995; Giddens 1990). It has thus reinforced a view of science as an activity that should ultimately be externally controlled. Science should be subject to political decisions made by societal institutions instead of developing according to its own internal logic.

In later years the term Public Participation in Science has come to emphasise this understanding (Joss 2002; Joss 1999). One of the reasons for the growing interest in participatory methods is an apparent observation of increased public scepticism towards science and technology. In this respect it bears much resemblance to the intentions behind the efforts to create scientific literacy. The problem of scepticism, however, is conceptualised differently just as the suggested solutions differ from the idea of scientific education. Under the heading of public participation, it is not information campaigns but participation in decision-making processes, which is supposed to reduce scepticism. For instance, the noted promoter of scientific literacy, John Durant, has recently argued that we need to understand public scepticism as a demand for greater equality between scientists and non-scientists (Durant 1999).

These diagnoses and problem definitions point to a different perception of the agora than has been presented in the previous section. Rather than being a medium for the diffusion of information, the agora is perceived as a sphere for democratic mediation and the exercise of control over scientific development. It is argued that ideals of equality and informed public debate is a precondition for creating socially sustainable public policies (Weale 2001; Davison & Barns 1997; Schwarz 1993). A more or less explicitly Habermasian inspired ideal of a public sphere is often invoked in this connection. As an example Edwards point to the public sphere as a vehicle for democratic control with science and for co-ordination between the public, policy-institutions and science (Edwards 1999).

Expert advice takes on a completely different role in this perception of the agora, since science is no longer an autonomous authority, but just one, fallible, voice among many. In this model different knowledge claims should be voiced on equal terms and solutions to problems should be reached through 'a thick democratic debate' (Davison & Barns 1997).

Within this specific framework of deliberative democracy, procedural standards of fairness and competence become crucial requirements for new participatory processes. As an example Webler and Tuler argue for the importance of fairness and competence, where a *fair* procedure means that everyone 'has an equal chance to make his or her voice heard and shape the final decision' (Webler & Tuler 2002:183). However, they make the case that the process should be 'competent' in order to ensure, that 'the best rules and procedures are used to gather, evaluate and select knowledge'. These procedural standards thus separate form and content in order to stress the importance of the former, arguing the crucial first step is to create consensus on how decisions are made.

The ideal of participation on equal terms has also had an impact on practical developments. Governments and other policy institutions in Europe have increasingly been experimenting with activities concerning public participation in science, especially within the field of technology assessment (Joss 1999; Wheale & McNally 1998). Models employed include consensus conferences (Joss 2002), citizens' juries, electronic public consultation (Finney 1999), and technology foresight (Borch & Rasmussen 2000). Although the practical models differ in scope and method, they all aim to ensure or improve public participation in the evaluation of scientific and technological development or policy formulations concerning science and technology. Much in line with Habermasian ideals of the public sphere and deliberative democracy, Joss outlines three characteristics in the development of participatory methods in Europe: 1) public access in terms of openness, 2) active actor involvement and deliberation in terms of empowerment of participants, and 3) institutional anchoring outside the formal state bureaucracy (Joss 2002).

In this connection Denmark is often mentioned as being in the forefront of the development of a participatory agenda with the Danish Board of Technology as an eager promoter. Especially the Consensus Conference is a procedure that has been adopted in many other countries (Joss 2002). In a consensus conference a

panel of citizens and a panel of experts adopt different roles as inquirers and expert witnesses, but the goal is a dialogue that treats all participants as equals in that they all contribute on equal terms. Thus it is the citizen panel, which writes the final consensus document and the experts have no way to influence the result at this stage in the process. Andersen & Jæger point out, that support for the consensus conferences in Denmark is probably linked to a strong tradition for integrative political processes in Denmark and a cultural bias towards participation or deliberation in the common Danish perception of democracy (Andersen & Jæger 1999). An argument that is similar to the previously mentioned ideal of public reflection as means for integration and public edification inherited in the Danish Grundtvigian tradition.

Not all scholars view the current experiment with participatory methods with equal approval. Levidow and Marris have argued that the participatory agenda and the rhetoric of openness employed within European policy formulation on agricultural biotechnology are part of an effort to increase public trust in science and policy making, but they also stress that these efforts are 'tagged on to the dominant models of science, technology and the public, rather than superseding them'. (Levidow & Marris 2001). On this account they issue a warning that these efforts might do more harm than good with respect to legitimation and public trust, if the publics do not perceive them as truly participatory, as openings for real democratic change.

Wheale and McNally have presented a somewhat similar critique (1998). In an edited volume analysing the social management of genetic engineering, they stress the importance of openness in public deliberation. They argue that the plethora of bioethics committees advising policy-makers pose a danger that politicians use these committees to abdicate from democratic responsibility. This is problematic because public debate should not be substituted with more or less institutionalised expert, i.e. elitist, deliberation on ethical questions. These kinds of criticism stress the importance of the authenticity of participatory methods. In order to improve democratic influence and reduce scepticism through participation it is important that the influence exercised is perceived as genuine.

Summarising we can conclude that critical PUS presents a different perception of the agora as a public sphere for democratic debate, where the central issue becomes one of reaching agreement within a community. Closure can no longer

be determined with reference to ´truth´ or certainty but should be determined according to what different social actors can agree on. In this deliberative model put forward by critical PUS, the communication process is presented as symmetrical, but it is very interesting that this symmetry apparently is not something that is there in advance or by nature. Rather it has to be constructed and safeguarded by institutional design. It is worth noticing that most of these notions of a democratic agora put forward strong requirements for procedural regulations in order to secure *real* dialogue and equality of communication partners in the process. It is not enough that science and policy-makers be more open, processes have to be designed for participation and the influence has to be 'real'.

A third perspective – negotiated credibility in networks

During recent years, however, criticism of the established critical PUS has emerged and within this criticism we might be able to identify a third notion of the agora as a space for mediating between science and publics. It should be noted, that I have only located this new type of conceptualisation sporadically in the literature. I will point to some contours of this new criticism by discussing some recent analyses by Mike Michael, in which he explicitly criticizes not just the deficit model but also the critical, interpretative PUS tradition. For other hints at this kind of criticism see (Miller 2001; Irwin 2001; Locke 1999).

Michael points to a tendency to romanticize the public within critical PUS (Michael 2001). The consensual aspects of lay local knowledge are stressed in an image of the lay public as devoid of internal conflicts due to power and diversity. The lay public is depicted as a homogeneous entity without any sensitivity towards internal differences and cultural dynamics stemming from relations to other cultural domains in society. As opposed to this image Michael argues in favour of stressing heterogeneity, making the move also to a *plurality* of publics. He conceptualises the relationships between science and the rest of culture in terms of a network, or *rhizome,* which stresses discontinuity, fractures and non-linearity. This image does not just have consequences for the understanding of how the relationship is perceived, but also for the notion of science and publics (or society) as distinct spheres. As he puts it 'this imagery of the rhizome suggests that there is no easy differentiation between the expert and the popular, between the scientific and the lay.' (Michael 2002:370)

In the next chapter I will return to the Latourian concept of network, which I will argue can be used as synonymous to the Deleuzian concept of rhizome in the present context. In my view Michael can be seen to be completely in accordance with Latour, whom he also cites, when he stresses that we should seek to place 'emphasis on the role of the corporeality, distributedness, hybridity, partiality, and emergence (or, what might be called, the 'process-uality') of the public' (Michael 2002:374). The public must be understood in terms of heterogeneity, always as several publics, and emphasis should be placed on 'the ways in which disaffection, resistance, or accommodation to expert knowledge are resourced by broader cultural dynamics' (Michael & Carter 2001:10). The perception or understanding of science by 'the publics' should thus be seen in a broader cultural context, where the diversity of publics is recognised, and where connections to other cultural influences and dynamics is given due reflection. Michael suggests, that, 'perhaps chief among such dynamics is the globalized rise of consumption' (Michael 2002:369).

Michael has elaborated on this figure of consumption as central to the meaning of PUS by emphasizing a shift from the role of citizen to the role of consumer (Michael 1998). Here he emphasises the shift from the role of citizen to the role of consumer, when members of the public are increasingly 'voting with their purchasing choices to make concerted efforts to influence policymaking' (Michael 1998:320). This increasing focus on the citizen as a consumer should also have implications for the understanding of PUS. He argues that along these lines we could begin to understand scientific knowledge as a consumable, which is being evaluated and valued according to different standards of usability. Among these standards we could count also its aesthetic value, that is, the ways in which it 'contributes to the expressive or stylistic dimensions of everyday life' (Michael 1998:316). Science is thus no longer only evaluated according to its own authoritative ideal, but is given to different standards of evaluation beyond its own control. With the increasing focus on the layperson as a consumer, science, too, becomes a consumable good, which is distributed, consumed and evaluated in competitive settings. As opposed to the ideal that guides critical or interpretative PUS, the rhizomatic view or network model is not grounded in the possibility of reaching a common understanding by following particular procedures. The consumption of science is distributed and fragmented, and the mechanism of evaluation is closely connected to contextual utility, which might differ between individuals.

It is precisely the same features of science as a consumable that Miller points to, when he in a critique of the paradigm of interpretative PUS states that 'people will pick up the knowledge they need for the task at hand, use it as required, and then put it down again' (Miller 2001:118). In line with traditional PUS, Miller argues that scientific knowledge can be viewed as a tool for people living their lives in the modern world. He differs, however, from the traditional view by stressing that communication is essentially audience driven. People will pick up the knowledge *they* need in a particular context, not the knowledge that science communicators see as universally important. This shift changes the focus in the perception of the members of (various) publics away from what is common within traditional PUS. As consumers they engage in communication about science motivated by an individual experience of their own particular needs, not primarily in order to fulfil a universal role as enlightened and educated citizen.

These examples develop a notion in which the agora as a mediating space between science and the publics is best depicted in terms of contextual networks of negotiations over usability, credibility and influence. *Publics* are temporal constructions of users of scientific knowledge with a plurality of ways of evaluating this knowledge. They cannot be viewed as a co-ordinated community with something in common, e.g. a wish for the common good or some kind of consensus. Rather, negotiations over credibility becomes of central importance, as socially robust knowledge is created through association. The better connected a given claim to knowledge is, both in terms of sheer numbers and the quality of allies, the more robust it seems to be. This reference to 'socially robust knowledge' is intended to indicate the affinities between this third model of the agora as a network of negotiation and the idea of an agora put forward by Nowotny et al. (2001).

The crucial difference between the deliberative model suggested by critical PUS and this third perspective is the question of achieving social integration through communication. In the deliberative model, integration is proactive and intentionally created through a communicative process. In the network model, however, integration is principally a result of dispersed, fragmented actions. In the network model only the network of associations can reveal which kinds of knowledge is considered most credible. It is not possible to look to authorities like science or procedures of dialogue in order to establish 'the better argument'

or ‘the best knowledge’ – it will have to be measured by connections. The case of BSE can be used to illustrate how analyses according to this model would look. If we view the slaughter of millions of cattle in Europe as the socially constructed ‘right thing to do’ this closure can be seen as a result of negotiations over credibility. Most of the public did not view assurances from scientific sources that eating beef was not very risky as credible, but demanded policy formulations to be based on other kinds of risk assessment.

In this perception of the agora as a network of negotiations, the identification of socially robust knowledge, always dependent on attributions of credibility, must deal with a time lag compared to the other two models, both of which stipulate proactive standards of judgement. In traditional PUS, expertise is a function of the authority of science, whereas in critical PUS it is a function of procedural rules. But in the network model, there is no way of establishing such authority in advance. ‘Time will tell’ is the ultimate answer to questions about the robustness of knowledge. Socially robust knowledge is that which people continue to subscribe to. Following this argument, science itself is also a much more openly contested construct. It is not possible to determine a priori or in any universal way, what is to count as scientific. Rather this is a matter of context and concrete negotiations.

On the other hand, this should not be taken to imply that expertise is deemed impossible in principle by this model. But the expertise is now more a function of trust and credibility than of truth and authority, or we might say that what matters now is the ‘expectation of expertise’ rather than the ‘stipulation of expertise’. Expertise is much more relational and relative in the network model than in the other two. In contrast to the other two models, where trust is the normative goal intended to be created through the process of communication, trust is an instrumental value in the network model, something that has to be actively created and maintained because it serves the function of increasing the smoothness of negotiations in the network. Whether or not a network is functioning smoothly can only be determined by observing it in action, and any such determination will therefore only be possible retrospectively.
A way of getting around the time lag in this model and explore the possible robustness of knowledge is to stage an interim settlement by having some kind of measurement of preferences (in the form of election or poll) or a negotiation between parties. The latter case bears some resemblance to the participatory or

democratic sphere of democratic debate as perceived within critical PUS, but in the network model there is no normative ideal of consensus. Rather, negotiation can be one way of engineering a measurement of preferences, so that the multiplicity of individual preferences can be made visible to the policy makers. The critique of the European policy experiments with participatory methods mentioned in the previous section can perhaps best be understood in this light. These experiments are carried out under the heading of participatory methods, but whereas European policy makers possibly intend these experiments to be novel ways of accounting for multiple judgements of credibility, as I have shown within this network model, the academic scholars base their criticism on a different ideal – that of a deliberative public sphere.[11]

Since the identification of this network model does not build upon a commonly accepted distinction within the tradition of PUS, it is not possible to point to analyses of public understanding of biotechnology that explicitly subscribes to such a third model. There are, however, quite a number of accounts of public perceptions and representations of biotechnology, which I view as more equivalent to this model than the other two (Michael 2001; Michael & Carter 2001; Priest 2001a; Dijck 1998; Turney 1998; Mulkay 1997)[12].

A common feature in these accounts is to stress the dispersed, floating and negotiated construction of both publics and science. For instance Priest stresses that if the American publics have been regarded as more or less unanimously positive towards agricultural biotechnology this is because analysts have disregarded the enclaves of resistance and the large amount of latent scepticism or indifference in the publics, and primarily relied on institutional sources. Similarly Turney, van Dijck and Michael & Carter stress the need to go beyond authorita-

[11] These tensions could also be conceptualised in the difference between bottom-up and top-down models, just as it was argued in the introduction to this thesis about the engineering of public debate in Denmark as a means to solve controversies.

[12] It should be noted that some of the studies of biotechnological controversies presented in connection to the former two models adopt this view as a general statement of intent. For instance the prominent study headed by Bauer and Gaskell formulate the overall perception of the nature of controversies like this: 'in the course of its twenty-five-year development: first, biotechnology regularly presented challenges to observers within the public sphere; and, second, these observers at times responded with counter-challenges or resistance that contributed to shape the continued development of biotechnology itself' (Bauer & Gaskell 2002:5). In many of the particular analyses, however, they do seem to subscribe to the traditional PUS model of the agora as a means to educate the public.

tively sanctioned representations of science and include both non-fictional and fictional sources, in order to portray the multifaceted cultural constructions of science and scientific knowledge. In his mapping of the social representations of the Frankenstein myth, Turney shows how this cultural 'script' has become 'one of the most important in our culture's discussion of science and technology' since it tends to polarise political debates about biotechnology in either all-for or all-against positions (Turney 1998:6). In these accounts, drawing on fiction as well as non-fiction, popular presentations of science are seen as having constitutive influences on the public construction of science and scientific knowledge.

These accounts also stress the adversarial nature of the public negotiation over science and technology and link the controversies to the influence of general 'ideological tenets' (Dijck 1998:4). In a study of biotechnology in the American media, Priest argues that biotechnology becomes news when it threatens central cultural values, as the issue of cloning threatened the fundamental value of individualism in US culture. Controversies of biotechnology are not just about technology, but embedded in other aspects of political and social debates: 'To understand the development and impact of news about biotechnology would not be possible without taking into account the influence of the cultural context in which public opinion is formed' (Priest 2001a:13-14).

Mulkay elaborates this point in the study of the dynamics of public debate and political struggle over embryo research in Great Britain. He demonstrates how the 'conflicting ideas about the place of the life sciences in present day society were publicly formed and displayed, as [people] struggled to respond to the challenge posed by embryo research' (Mulkay 1997:2). Mulkay portrays the approval to conduct embryo research within a period of 14 days after conception that was eventually granted, as the triumph of the rhetoric of hope over the rhetoric of fear. In a multi-layered analysis, he concludes that this triumph was negotiated in many different forums and by different actors in different combinations. Within parliamentary circles a pro-research lobby was able to establish embryo research as an exemplary case of controlled scientific progress with major benefits and without significant infringements of existing moral values. In the media, public opinion was won by a combination of scientific authority and moving personal testimony from happy families with healthy babies. More generally, the proponents of research were able to present science as the rational alternative to religious dogma, here using the example of Galileo as a convinc-

ing image of the need to free science from these 'irrational' constraints. In this context, Mulkay also shows, how the Frankenstein myth 'backfired' on the opponents, because it could be used by proponents to discredit any resistance as based ultimately on myth rather than rational arguments.

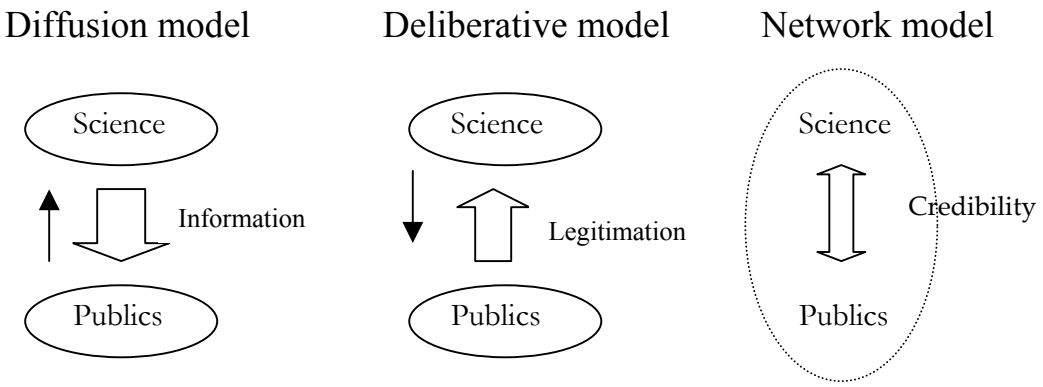
Summarising, I propose that besides the two perceptions of the agora as a space for diffusion of knowledge in order to educate the public or as a sphere for the exercise of deliberative democracy, it is possible to identify a third perception of the agora as a network of negotiations over credibility in competing knowledge claims. In this perception, the relations between science and its publics are diverse, just as neither 'science' nor 'public' can be universally defined; rather, these phenomena are contextual constructs dependent on their mutual relations. This model has a distinct view of the evaluation of scientific knowledge, since robust knowledge is not identified by authority or by deliberation. Instead credibility and negotiation is crucial in any evaluation, as robustness is determined by exploring which knowledge claims can gain most support in the form of allies and/or votes. This, on the other hand, means that public opinion is presented as volatile and heterogeneous, with different and contextual standards of usability.

Implications for the present study

At least two implications for further research can be drawn from this identification of three different perceptions of the agora as the mediating space between science and its publics, each with specific standards for evaluating scientific knowledge. One is to follow the difference between appealing to citizens or consumers in participatory methods, and explore different criteria for success in connection with participatory methods in policy processes. This strand of analysis can lead to theoretical arguments in favour of one of these models, but also to empirical analyses of actual policy processes. In this way it might be possible to explain why the mechanisms of participation do not always seem to have the intended effects as implied in the criticism mentioned in connection with the deliberative model. It makes a critical difference whether members of the public are addressed as citizens supposed to be educated, citizens partaking in mutual deliberation, or consumers exercising consumer choices, for the expectations entrenched in the communicative relationship. And these expectations are decisive for the outcomes of the communication. The experience of 'failure' proba-

bly has a lot to do with heterogeneous and unclear expectations.[13] On the other hand, it can perhaps be argued that it is precisely the ambiguity in the account of these participatory methods that makes it possible to gain broad support, both in normative theory and in concrete experiments with actual policy-making. In order to keep the scope of this thesis within reasonable bounds, I will not pursue these questions any further, and offer the hypothesis, that vagueness at the same time supports consent and causes controversy about the experienced content and outcome of public participation, as an interesting topic for further study.

These different models can be seen as three different perceptual frameworks for the analytical interpretation of public controversies as a social phenomenon. I have identified them as three different models for an understanding of the agora; i.e. models for the conceptualisation of the mediating space between science and its publics. In the following figures I have tried to explicate the crucial feature of each of these models for the explanation of controversies.



Following traditional PUS, the most important feature of the agora is that it can be viewed as a means of disseminating information about science and scientific knowledge to the public. Consequently controversies are seen as instances where this diffusion of information has gone wrong. Lay people have not got the message right, either because information has been distorted or because they have not been presented with the message at all. This can make feedback proc-

[13] Previously, I conducted an analysis of a Consensus Conference in Denmark that arrived at precisely this conclusion (Horst & Horst 1996). The analysis pointed to a need for organisers of consensus conferences to make the precise intentions crystal clear to the participants, experts as well as lay people. Confusion led to frustration on behalf of all the participants. Either because their expectations were not met or because they were unclear about the nature of the dialogue undertaken.

esses necessary in order to understand why the public does not understand the information. But the fundamental idea here is that controversies arise as a result of badly conducted processes of diffusion of information and knowledge.

In the second model of critical PUS the problem is not that the public does not listen to science, but that science does not listen to the public. In this model, controversies are signs of scepticism and revolt because the sciences and their publics have become alienated from each other. Although scientific openness about progress and problems is seen as a necessary precondition for diminishing this alienation, the main focus in this perception of the agora is to secure legitimacy through deliberative dialogue and democratic control over science. The direction of information is therefore basically *from* the public *toward* science, since it is science, which is supposed to know and follow the consensus, created in the public to serve as the basis for legitimate knowledge creation.

In the third model, controversies are seen as struggles in the constant negotiation over the development of technology and the changing and relational definitions of science and publics. It stresses heterogeneity and adversarial mutuality, and does not view controversies as instances of badly conducted diffusions of technology, nor as indisputable, normative calls for democratising science. Rather it views them as integrated and normal features of the mutual constitution of both science and publics. Solving controversies in this model is therefore a question of reaching a provisional closure of a distribution of credibility, but this distribution can in principle always be problematised all over again.

These models can be viewed as three different perceptions of the agora as a space for communicative relations, where the medium for relations is construed differently in each case. In the diffusion model the medium is *rational arguments based on information about nature* with the aim of improving instrumental decision-making. In the deliberative model the medium is *rational arguments based on social and cultural norms* with the aim of improving an ideal of legitimacy. And, finally, the medium in the network model is *rational arguments based on pragmatism and credibility* with the aim of reaching interim closure in political negotiations. Viewed in this way these different models can be understood as perspectives on the agora or the communicative relation between science and its publics, each of which stresses different aspects. The identification of these three models should therefore not lead to a judgement as to what is bet-

ter or worse, but rather to a sensitivity towards the strengths and weaknesses of each model.

In the present dissertation, I have adopted the third model since it is the explicit ambition to study the processual aspects of the controversies with the aim of understanding how problems and solutions are defined in mutually constitutive relations. An important feature of this network model is an ability to analyse public opinion as a process rather than as an institution with a particular normative function as in the two former models. In traditional PUS, for instance, public opinion can be measured in polls, but strict methodological rules will have to be respected in order not to distort the 'objective' description of people's attitudes and opinions. Critical PUS criticises this conception of public opinion as a passive stock of opinions and argues that attitudes are always socially constructed. Therefore special procedural rules for deliberation have to be followed if a valid process of opinion formation is to be established. In this way, it is possible to argue that critical PUS also institutionalises public opinion to a certain degree, as a phenomenon with special rules that have to be observed if we are to get access to 'real' public opinion. I will argue that the emphasis on heterogeneity in the third model abandons this possibility of accessing a particular essence of *public opinion.* There is no *true essence* in public opinion – rather it is always mediated – whether in the form of opinion polls, focus groups, mass mediated debate and so on.[14]

As I have already indicated by the use of the word 'network' to describe the third model, it is analytically equivalent to the concepts employed by Latour's theories. The following chapter is a presentation of the theoretical and methodological framework for a network perspective in the study of mass mediated controversies concerning biotechnology. With inspiration from Latour, I will develop an analytical framework that subscribes to a relational ontology in which the definition of phenomena and actors always is contextual. In this framework, mass mediated controversies on biotechnology can be studied as a dynamic processes of articulation, incorporating a heterogeneous plurality of actions from dispersed actors constantly negotiating public opinions on biotechnology.

[14] A different way of saying this is to claim that of these three models, the network model is the only one that allows for a second order perspective, that is, a perspective which observe observations (Andersen 2003)

Chapter 2
Mass mediated networks of articulation
- a theoretical and methodological framework

The mass media are a major arena for public debate about biotechnology. The sheer quantity of information and the enormous complexity in modern societies make mass media an indispensable medium for those social actors who seek to spread their messages. But, as Eide and Hernes have pointed out, mass media is not just an arena were different actors can compete for influence by diffusing their message; media can also be understood as actors in themselves in that they select and represent different messages in particular ways (Eide & Hernes 1987). This double function indicates that mass mediated public debate cannot be taken merely as the reflection of a debate originated outside the realm of mass media and subsequently portrayed in the media. Rather, mediated public debate must be understood as the complex result of processes of opinion formation that take place both inside and outside the realms of mass media.

The problem is further complicated by the fact that defining the realms of mass media is not straightforward. We could, of course, conceive of mass media simply as those organisations that normally produce mass mediated communication, such as newspapers and electronic media. This, however, seems to be a rather narrow notion, since it excludes many important actors such as the communication departments of many firms and whole organisations devoted to conducting strategic communicative actions in order to attract mediated attention (PR firms and advertising agencies as primary examples). We could, therefore, consider the mass media as an arena for communication, which includes all kinds of communicative actions that aim at reaching a wider public through mediation. This expansion of the realms of mass media further complicates the causal complexity, which arises from the double function as arena and actor, because it expands the relevant number of actors radically.

Briefly put, the resulting causal complexity can be expressed as follows. When analysing mass mediated debate about biotechnology, we are at one and the same time analysing the outcome of a journalistic practice and the sedimentation of a general, social discourse about biotechnology. Accounting for this double influence, many analysts of mass mediated coverage of biotechnology have em-

ployed a two-pronged explanatory approach.[15] Mass media coverage is influenced by broader cultural contexts, but it simultaneously influences these contexts in particular ways. Neither of these influences can be left out of an analysis of mass mediated coverage of biotechnology, but rather than treating this as a fundamental problem, I want to circumscribe it by *combining the perspectives of arena and actor in a dynamic comprehension of mass mediation as the production of articulation rather than as a mirror of reflection.*

This chapter provides a theoretical and methodological framework for such a study by drawing on a relational ontology inspired by Bruno Latour. In this perspective, the mass media is at the same time an actor and an arena. Several features of journalistic practice can explain why journalists might be more inclined to do one thing rather than another, but it is equally important that journalists are at the same time completely dependent on all the other actors and institutions existing both inside and outside the organisations of the mass media. And rather than trying to disentangle this complexity, and sort it into different kinds of influences, I will focus on the outcome – the mass mediated network of articulations.

The social construction of news

The central point in the perspective adopted here is that news is a product of a social process in which a phenomenon is shaped into a newsworthy story. In order to be covered in the mass media, biotechnological occurrences have to be presented as newsworthy stories. But this constructive view does not imply that journalists can construct news in any way they see fit. Journalists cannot write everything they want, but have to make news out of the admittedly large, but also limited, number of available occurrences, sources and sustainable interpretations. So even though news is a constructed reality, there are limits as to how they can be constructed.

[15] In the words of Dorothy Nelkin and Susan Lindee: 'We assume that the images and stories of genes in popular culture are not isolated artifacts but social products that both reflect and affect the cultural ethos' (Nelkin & Lindee 1995:ix). Similar arguments can be found in other analyses (Gutteling et al. 2002:95-97; Priest 2001a:13-15; Dijck 1998:4). With special reference to public opinion formation, Bauer has argued that mass media can be seen as a proxy for public opinion at the same time as it sets the agenda and hereby cultivate particular views (Bauer 2002:155)

We might therefore argue that the productive work of creating news is not done by journalists alone, but rather in a relational process of trial and error exploring what kinds of connections between sources and occurrences are possible. In principle this process includes an unlimited number of actors, all with a possible influence on what can be made to seem newsworthy. Rather than ascribe influence to actors, we should insist that journalistic practices, news values and so forth are created in productive relations of negotiation between actors. Journalists do not decide by themselves what is a good story. They rely on an ability to make productive connections between sources and other news stories, between editorial practices and narrative possibilities. In short, the news are not constructed by journalists alone, but in productive networks of an in principle unlimited set of relevant actors.

It should be noted that this perspective, inspired by Latour, has great affinities with the constructivist tradition within media sociology, where mass mediated news are analysed as a productive practice of constructing socially viable representations of the world (Berkowitz 1997). The reason for choosing the Latourian framework, rather than that of constructivist media sociology, is that the relational ontology of Latour and his focus on productive associations make explicit what media sociology only implies, namely, that a news story is not a particular instance of construction, posterior to, or disconnected from, the phenomena they are constructed around. Rather mass mediation can be viewed as a mode of production connected to the totality of productions of propositions about the world.

That the creation of news should not be seen as fundamentally different from other social practices of representing the world is central to this view of the mass media. Everywhere people articulate propositions, they are engaging in a productive practise of establishing socially viable representations of phenomena in the world. The media, of course, is a particular field of action with particular rules of engagement, but in the framework inspired by Latour, relational construction in the media is not ontologically different from other social practises. This also implies that mass mediated representations of public opinion are not different from other mediations of public opinion, like opinion polls or focus groups. They are each a particular way of constructing public opinion by mediation. They are real as concrete constructions in a particular context, but there is no prior essence that we acquire access to in any direct way. Therefore mass

media studies of public opinion formation do not pose a particularly constructed case in opposition to other ways of measuring public opinion.

Representation of biotechnology in the mass media can accordingly be studied as one among several ways of constructing public opinion on that issue. It is not a reflection of more 'true' or 'original' interpretations and images created in other contexts, subsequently being represented in a more or less distorted way in the mass media. Just as mass media is not a tool for doing away with information or legitimation deficits (as in the traditional and critical PUS traditions), it is not a filter, which somehow distorts another 'more true' formation of public opinion. But this will be much clearer after I have conducted a little detour into the laboratory of the French bio-chemist Pasteur, where a long list of 'microbes' were 'found' in the 19th century.

Articulation of facts

In the relational ontology presented by Latour, the work done by scientists is always basically productive. A successful experiment produces something – for instance the lactic acid ferment as Pasteur did in 1856 (Latour 1999b:113-73). This should not be interpreted to mean that milk could not turn sour before 1856, but the lactic acid ferment did not exist before 1856. Before that fateful year, curdled milk was a result of 'spontaneous generation' or of such abstract forces as invasion, disease, or mishap. But Pasteur constructs an experiment, which renders lactic acid ferment into that particular actant that makes milk turn sour:

> Let us say that in his laboratory in Lille Pasteur is *designing* an *actor*. How does he do this? One now traditional way to account for this feat is to say that Pasteur designs trials for the actor to show its mettle. Why is an actor defined through trials? Because there is no other way to define an actor but through its actions, and there is no other way to define an action, but by asking what other actors are modified, transformed, perturbed, or created by the character that is the focus of attention. (Latour 1999b:122).

The design of the actor is done through a process of *inscription*, a term used about 'all the types of transformations through which an entity becomes materialized into a sign, an archive, a document, a piece of paper, a trace.' (Latour 1999b:307). In the case of the lactic acid the inscription devices are the set of

instruments cleverly arranged in a particular experimental design, which constructs lactic acid as a particular entity with particular characteristics that constitute the actant. A constitutive characteristic of the lactic acid ferment, for instance, is that it can make milk into yoghurt if it is treated properly. The vocabulary, however, of designing experiments in order to inscribe entities as actants should not be taken to imply that Pasteur is free to construct lactic acid ferment as he pleases (Latour 1999b:122-26). The *something* Pasteur is observing can resist inscription in many ways. If temperature is too high or too low, nothing will happen. The laboratory, therefore, is Pasteur's examination room – how is the unknown actant reacting to different questions (experimental trials). Through a long list of questions the hitherto unknown actant is inscribed as lactic acid ferment, able to ferment milk if treated in particular ways.

In regard to the production of facts, Latour proposes that we substitute the model of *statements corresponding to the world* with a model of *articulation of propositions*. Pro-positions are not statements aiming at correspondence, but "*occasions* given to different entities to enter into contact. These occasions for interaction allow the entities to modify their definitions over the course of an event" (Latour 1999b:141). In this way, inscription by articulation is not performed solely by human actors, but is the common feature of different entities entering into relation with each other. Likewise, propositions are not distinguished from each other by one single test of correspondence but by the many differences between them that make new phenomena visible in the cracks that distinguish them:

> articulation is in no way limited to language and may be applied not only to words but also to gestures, papers, settings, instruments, sites, trials. (…) If Pasteur is able to speak truthfully about the ferment, it is not because he says in words the *same thing* as what the ferment is – an impossible task since the word "ferment" does not ferment. If Pasteur, through his clever handiwork, speaks truthfully of the ferment, it is because he articulates entirely different relations for the ferment. He *proposes*, for example, that we consider it as a living and specific entity instead of as a useless by-product of a purely chemical process. (Latour 1999b:142-43).

But the inscription of lactic acid through the experiments is only visible to Pasteur, and therefore the actant is still rather unknown and insecure. In order to

make the inscription of the actant more stable, Pasteur has to introduce the ferment to other actors by *translating* the inscription in the laboratory into propositions articulated in other relations.[16] So Pasteur writes a scientific paper about his newly found associate. At first, the scientific community disagrees about accepting this new ferment. But slowly a long list of *associations* between other actors (both humans and theories, experiments, other bacteria and so forth – what Latour calls non-human actors) and the ferment is forming. The ferment is making so many connections that it becomes tightly weaved into a huge *network*, which makes it hard to ignore. In Latour's relational ontology, this network is the same as existence. Latour argues that the length and stability of associations 'make for a great deal of what we mean by existence and reality' (Latour 1999b:161). The stronger the network, the greater the existence (Latour 1987).

Around 1856 it was not very difficult to reject the lactic acid ferment and still be taken seriously by both scientists and other actors. Even Pasteur would take such a rejection seriously. But these days it is not just the ferment, Pasteur and his scientific experiment, which would have to be refuted – it is also necessary to cut connections to a large field of actors encompassing dairy production, biochemistry, primary school education and much more. Latour has spoken about *the power of associations* for this notion that the creation of associations is the productive force that makes things come into existence (Latour 1986). Forming associations to other phenomena in the world creates ferments and other facts. The basic work of technoscience is therefore to ask questions about *what can connect to what*? And the more associations that are created, the stronger the alliances that are formed, the more real any actant becomes:

> through the artifices of the laboratory, the lactic acid ferment becomes articulable. Instead of being mute, unknown, undefined, it becomes something that is being made up of many more items, many more articles – including papers presented at the Academy! –

[16] Latour uses the word *translation* for the productive process of transformation in which a displacement of a phenomenon from one context to another is taking place: 'Chains of translation refer to the work through which actors modify, displace, and translate their various and contradictory interests' (Latour 1999b:311). It is important, that the concept of translation is understood as a processual concept. Latour describes translation as a process of mediation, which always exceeds its original conditions. Translation, thus, is not a question of a purely mechanical exchange where input equals output. Rather, the process is productive, since there is always some kind of change.

> many more reactions to many more situations. There are, quite simply, more and more things to say about it, and what is said by more and more people gains in credibility. The field of biochemistry becomes, in every sense of the tem, ”more articulate” – and so do the biochemists. Actually, thanks to Pasteur’s ferment, they come into existence *as* biochemists, instead of having to choose between biology and chemistry as in Liebig´s day. (Latour 1999b:143)

In the year 2000 it is hard to understand lactic acid ferment as something other than a brute fact just waiting to be discovered. In the eyes of Latour, however, this is how it looks in hindsight. In 1856 no one knew whether Pasteur had the right connections to last into the following centuries. In *Science in Action* Latour formulated two parallel rules of method stating that *since the settlement of a controversy is the cause of Nature’s representation and Society’s stability, we cannot use either Nature or Society to explain why a controversy has been settled*. [17] We should rather consider the efforts to enrol human and non-human resources in the productive work of creating facts symmetrically (Latour 1987:258). Neither Nature nor Society can be seen as underlying structures, or a priori determinants of the given outcome of a controversy. Rather the representation of nature and the stability of society are produced in the settlement of controversies. The solution of a disagreement is the result of productive work, not just the activation of a determining potentiality. This in turn means that the closure of controversies is a matter of granting some phenomena a relative existence only:

> When a phenomenon “definitely” exists this does not mean that it exists forever, or *independently* of all practice and discipline, but that it has been entrenched in a costly and massive institution, which has to be monitored and protected with great care.
> So, in the metaphysics of history that I want to substitute for the traditional one, we should be able to talk calmly about *relative existence*. It may not be the sort of existence science warriors want for objects in nature, but it is the sort of existence science studies would like propositions to enjoy. (Latour 1999b:155-56)

[17] These rules of method also contain an indication of Latour’s criticism of social constructivism, which he later elaborated in, for instance, ’We have never been Modern’ (Latour 1991). The argument is that social constructivism often just substitutes one determining factor (Nature) for another (Society).

What Latour wants us to notice with the phrase 'protecting with great care' is that institutions are in a sense fragile. Without the concrete actions that uphold the institutions, the institutions will immediately go out of existence. If lactic acid ferments were not used in the production of yoghurt, education of dairymen, biology classes in high school, et cetera, they would not exist as lactic acid ferments. I find Latour's use of the term *institution* complicated. My own understanding starts with the notion that associations are what constitute actors in relation to other actors. An actor is therefore always an actor in relation to a particular network. Stabilised networks that endure in time and space can be called institutions, and the term can be used as a short cut for the depiction of a network that continues to establish relationally defined actors (human and non-human) in particular ways[18].

Latour's attribution of fragility to this institution is a bit ostentatious. The efforts it would take to stop this production are enormous, as hundreds of thousands of connections had to be substituted with other connections for the institution of lactic acid to disappear. Instead of talking about *entrenchment* of the institution, I would rather talk about *embeddedness* because it signals less need for active protection. To be sure, the life of an institution is in the hands of actors, human and non-human alike, but a well-embedded institution is well connected and thus not easily dissolved.

Important is that institutions are relationally defined. If institutions endure, it is because actors keep relating to them as institutions. And secondly, that which counts as an institution in one connection (for instance democracy on the day of general election) might be an object of fierce controversy in other connections (for instance in discussions on whether the government has a democratically legitimate right to declare war on Sweden). On a general level I have found this theoretical framework in which all phenomena have relative existence according to their contextual associations very fruitful for this study of public articulation of biotechnology and as a short hand I have termed it *a relative ontology*.

[18] '…institutions provide all the mediations necessary for an actor to maintain a durable and sustainable substance.' (Latour 1999b:307)

Articulation of news

Viewed in this theoretical framework, I will argue that there is no ontological difference between the productive work of constructing scientific facts and that of constructing news. Also in editorial offices, actants – news – are articulated when journalists are exploring what is connected to what. How can a given occurrence be interpreted in relation to other occurrences? What sources will give a statement and how can different statements be connected to each other? How is any news article connected to other news? What stories will the editor in chief accept and what about the format and editorial style of the paper? The journalistic work of creating news is a question of exploring possible connections just like the scientific work of establishing facts.

This should not be taken to imply that there is no difference between the news and the scientific facts. An important part of the networks in which scientific facts are constructed is the *institution* of science, which in many ways is different from the institution of mass media. But as mentioned previously, the institutions can only be studied retrospectively. They are the hitherto observable stability in networks, they can be used as shorthand for the account of stability, but they only exist as long as the relations in the network they designate are being reproduced.

This also means that, in the concrete production of a scientific fact, the institution of science can be seen as a multitude of actants influencing the new creation of associations. Norms and rules of objectivity, professional disciplines, organisation of expertise can all become important actants that make Pasteur or any other scientific researcher form associations in particular ways. And vice versa: as far as Pasteur and all the other scientific researchers keep reproducing these norms and rules in their daily practice of producing associations they also reproduce the institution of science. When we say that the institution of science differs from the institution of media it therefore means that the enormous amount of relations, which uphold the phenomena of scientific facts and journalistic news, differ from each other. But this is not a pre-given feature of the phenomena of scientific facts and mediated news, but a concrete and historical production of networks. Speaking about the institution of mass media in this Latourian context is therefore a way of incorporating all the different features of media as an actor and an arena. But these features can only be identified retrospectively – as the outcome of a dynamic process.

This need for a retrospective perspective can be illustrated with the concept of news value, which is common as shorthand for the patterns in the selection of news (McQuail 1994:213-14). With Latour we should insist that this pattern is the result of processes of selection, not an input in the form of a determining structure. Although most journalists and media analysts (as well as ordinary people) have a pretty good idea of what kinds of phenomena will make news, the news values of identification, sensation, actuality, importance or conflict, are basically elastic and hard to use prescriptively. In principle any occurrence or phenomenon can always be pushed aside by other occurrences or phenomena and, conversely, almost any story can be presented as newsworthy in one or another way. We can therefore use the notion of news value as a pattern visible in hindsight, but not as a causal explanation. Something is produced in the process of constructing news and that is precisely the *news value*.

When I argue that the creation of news is a productive process, it is because a particular story derives from a multitude of possible connections. In the following I will employ the concept of *inscription* to pick out this process in which an occurrence is associated with other occurrences and sources in a particular way, hereby inscribing it as a newsworthy story. Inscription is productive work, since input does not equal output. We should acknowledge that not all journalistic efforts result in actual pieces of news, and view the institutional influence in the creation of news, as a network of pre-negotiated relations that make some inscriptions easier than other. The fact that a journalist is writing an article, which is actually printed, on page 5 in today's paper should not be causally explained by determining influences in the institution of mass media.

In this thesis, *news is identified as the tangible result of chains of translations that has led to a particular inscription of an occurrence or a phenomenon*. In this inscription the occurrence is associated with sources articulated in different roles (such as researchers, politicians, citizens) just as non-human actors are aligned in particular ways. This perspective circumscribes the two distinctions made in the beginning of actor/arena and inside/outside mass media. Mass mediation should be understood as a network of production where all the productive forces can be seen as actors. The arena can be seen as the institution of mass media, but this terminology is only shorthand for the stabilised network, and the institution is only an institution as long as it is not problematised.

The same can be said of the distinction between inside and outside. As soon as connections are made, the associated actors are all inside the network and hence on the same side. The productive force is not located at any particular place in the network. It is not the journalists who produce the inscriptions, but neither is it the sources, the media organisations or the institution of mass media. It is the network – the totality of associations between all the different actants – that produces the news. This is precisely the reason for talking about chains of translation. There is no initial object that is set in motion by a mastermind subject, hereby creating newsworthy stories in the papers. Rather the chain of translations that 'leads to' a newspaper article is constructed by actors following their various and contradictory interests. The question of subjects – who inscribes – thus has to be answered with either nobody or everybody.[19]

On the background of this theoretical framework it is possible to construct at least two different analytical strategies for a study of mass mediated articulations of biotechnology. One is to follow the work of journalists as chains of translation, in which the occurrence is negotiated into a newsworthy event. In this dissertation, however, I do not focus on the way journalists negotiate associations with sources and phenomena in order to create news. The focus of the present study is not on how the actors in the mass media act. Rather, I am interested in the mass mediated inscription of news, because it is a way of studying public articulation of biotechnology. I have therefore chosen a second strategy by studying the networks produced in the outcome of mass mediated inscriptions. This choice of methodological strategy means that I will leave the productive chains of translation black boxed. But it should be remembered that, like any black box, it can in principle always be opened, in which case we would find a multitude of different translations as trajectories of any news article.

Script, inscription and subscription

Rather than following the chains of translation, I intend to study patterns in the traces of the productive work of journalists – the news articles. This objective rests upon an observation, that although there are no determining structures in the creation of news, this does not mean that it is impossible to look for some

[19] This description is parallel to the notion of a news institution (Lund 2002) or a system of political communication where the agenda is an independent political institution (Pedersen et al. 2000; Cook 1998).

sort of pattern in the mass mediated articulation of biotechnology. Any description of these patterns, however, is never more than an account of *the observable patterns in the news inscribing particular occurrences in particular ways* – they are not effects of an underlying structure that was there all along, controlling the work of the journalist and just waiting for the analyst to excavate it.[20] The patterns in these inscriptions can be termed scripts. The crucial point is that when an occurrence is inscribed as a newsworthy event, it at the same time organises associated occurrences, sources and phenomena in particular ways. And the term script is employed about a generic pattern in a number of concrete inscriptions of biotechnological occurrences.

Before the particular methodological strategies of the study of these scripts is elaborated, however, it is necessary to explore the relation between the notion of script and the notion of argument since a script is not the same thing as an argument. Analysing scripts is a necessary step, since it is the analysis of the networks in which it is possible to articulate a given phenomena as a problem or a solution. But whereas 'script' is defined as the organising network, which lets phenomena appear as particular phenomena, the argument is defined as the establishment of a particular argumentative relation between problem and solution. To study the patterns in these argumentative relations, I have found it necessary to develop a methodological framework for classifying arguments. Central to this framework is the notion of subscription, which is a parallel term to inscription in that it designates a relation between the singular articulation of a phenomenon and the networks of articulation.

In order to define this notion of subscription it is necessary to touch upon the sociological discussion of action and structure. In the context of this dissertation, articulation can be seen as the constant flow, the medium in which inscription takes place. Networks of articulation, on the other hand, are the term for the particular shape that is created in the process. In this way, 'networks of articulation' is a term for a structure that can be analysed by studying scripts. The term script, however, implies a post-structural approach that I will argue is implicit in the

[20] As may be apparent in my use of the term 'pattern', I am also inspired by the discourse analytical tradition originating with Foucault (Andersen 2003; Foucault 1992). I have however found the concept of discourse so multi-faceted that it was difficult to employ in concrete analyses. So the concept of networks of articulation has functioned as my analytical term for discourse. In general it can be argued that the combination of Foucault and Latour is not so problematic as one might think, since they share a non-subject oriented ontology.

Latourian ontology, although he claims to be dissolving the structure/actor division. In a recent essay about the future development of the research program of actor-network-theory, for instance, Latour has stated that it would be more precise to adopt the terms of *framing* and *summing-up* instead of the notions of actor and network, because these notions keep us alternating between the actor-structure divide (Latour 1999a:16). Rather than being held prisoner by this dichotomised thinking, he argues that we should realise that it is a false dichotomy. According to Latour, becoming an actor is a 'local achievement of obtaining a "total" structure', (Latour 1999a:18) that is, a local *framing* by an immense array of relations, in principle unlimited, but given a particular form precisely by this local achievement.[21] In the same essay, Latour also argues that the network is not just another word for structure:

> The network pole of actor-network does not aim at all at designating a Society, the Big Animal that makes sense of local interactions. Neither does it designate an anonymous field of forces. Instead it refers to something entirely different which is the *summing up* of interactions through various kinds of devices, inscriptions, forms and formulae, into a very local, very practical, very tiny locus. (Latour 1999a:17)

The summing up of networks is 'the folding' of the many different relations into a coherent locus, which makes the framing of actors possible. Framing and summing up are therefore two perspectives of the same process, not two opposite movements divided by an origin in either structure or action. As mentioned previously, structure can be understood as the result of pre-negotiated actions – as a result of the various shapings of actors in their local totalities:

> 'Nature', 'Society', 'Subjectivity' do not define what the world is like, but what circulates locally and to which one 'subscribes' much as we subscribe to cable TV and sewers – including of course the subscription that allows us to say 'we' and 'one'. (Latour 1999a:19)

[21] This is the crucial point in the relational ontology in general, since it points to the radical indeterminacy of the actor (Callon 1999). The point is not that actors are socially constructed, but that actors only become actors in concrete relations and this state of becoming is universal.

It can be argued that the conception of structure that Latour is deploying here is a very structuralist notion of structure as determination of action. But surely we do not have to subscribe to structuralism just because we look for observable patterns in actual processes.[22] Rather the structure, which is identified by the analysis of scripts is a pattern visible in hindsight, but not a structuralist determination of action. On this basis, I will argue that the dissolution of the actor-structure divide, which he advocates, does not make the division disappear, but rather constructs it as two dialectical perspectives, which mutually constitute each other.[23]

For my purposes, *subscription* is the central term in the previous quote, since the relation between inscription and subscription can be seen as equivalent to the relation of framing and summing up. Inscription designates the process in which a phenomenon is inscribed in a network that makes it possible to frame it in a particular way. Subscription designates the summing up of the total structure in the local framing, which is obtained in the same movement.[24] Any phenomenon in the controversies concerning biotechnology can only become a phenomenon by being inscribed in a particular script, but at the same time this script subscribes to a particular way of summing up the world. Rather than 'world', however, Latour uses 'the collective' to denote this combination of nature and culture (society) into *one liveable whole*:

> While a division between nature and society renders invisible the political process by which the cosmos is collected in one livable whole, the word "collective" makes this process central. (Latour 1999b:304)

[22] A point, which has also been stressed by interpretations of Foucault's work (Dreyfus & Rabinow 1982).

[23] Talking about dialectics in this context is probably heretical. Since a full theoretical discussion of this point is outside the scope of this dissertation, however, I will not pursue it further here. I will simply emphasize that I speak of dialectics as an analytical perspective for a study of processes. It is not an ontological description of a particular outlook on society or sociology.

[24] In this context it can be noted that the term framing is central in media sociology and also often used as an analytical concept in the analyses of mass mediation of biotechnology. The use in these contexts, however, is not compatible with the presently adopted perspective, because it is most often used to construct a hypothetical taxonomy, which is then used deductively to classify articles.

The collective is made of humans and non-humans together as an immense set of associations, 'folded' or black-boxed into a workable practice, but always with the possibility of unfolding. Therefore, the collective is always in flux, always being explored through the processes of translation, articulation and inscription (Latour 1999b:193). Harmony is not part of this perception; rather, conflict and controversy are central features in the constant exploration of the collective.[25] Furthermore it is obvious that the collective only exists by being constantly articulated. The central notion of this argument is that subscription and inscription are part of the same movement, which means that the collective is always articulated simultaneously with the singular phenomena. When we inscribe the phenomena in particular ways we are at the same time subscribing to a general *articulation of the collective*, which makes this inscription possible.

In the introduction I defined controversies as instances of competing networks of articulation. Now this statement can be qualified as follows. As I have just argued, any script is always also an articulation of the collective in a particular way, that is, it articulates a particular way of maintaining, re-storing, recognising or re-establishing the social and natural order of the collective. In making any argument, an actor is always establishing some implicit or explicit way of articulating the collective – a notion of how the world works and how social and natural order is composed and restored.[26] It is therefore possible to claim that *when arguments are adversarial in a controversy, they subscribe to different scripts that articulate the collective in different ways.*

On this background an analysis of patterns in the inscription of phenomena (scripts) simultaneously points to patterns in the ways that the collective is articulated. In the present dissertation this move from an analysis of scripts to an identification of modes of articulating the collective is conceptualised as induc-

[25] Although I have chosen not to use a Habermasian analytic in this dissertation, it should be noted that this perception is not far from his notion of communicative action. Although many followers have stipulated the ideal of consensus, as mentioned in the deliberative model presented in the previous chapter, Habermas' own description also stresses that any consensus is always contextual and volatile: 'the complexity of any lifeworld is narrowly restricted by the limits of the strain that can be placed upon the mechanism of mutual understanding. (…) Ordinary language is a risky mechanism for coordinating action; it is also expensive, immobile and restricted in what it can accomplish.' (Habermas 1987a:349-50)

[26] This construal of arguments is comparable to Stephen Toulmin's model of argumentation (Toulmin 1983), consisting of premises (problems), conclusions (solutions), and warrants (elements of the collective).

tion. The analysis of scripts points to a number of inductively defined ways of articulating the collective. Analysing patterns of *subscription* is therefore partly the same process as analysing patterns of *inscription* but the patterns are sought in the way the arguments subscribe to different modes of articulating the collective rather than the way singular phenomena are articulated by inscription.

In order to be able to identify a pattern in these different *modes of articulating the collective*, I found it useful to complement the theoretical framework of the relational ontology, with a typology of four cultural forms identified by Mary Douglas and her colleagues under the term 'cultural theory'. The original reason for the interest in Douglas was that the inductively defined scripts appeared to have certain similarities with the Douglas' cultural typology. An exploration of these similarities led to a view of this typology as a powerful heuristic tool in the analytical condensation of the inductively defined scripts into four modes of articulating the collective.

The combination of the theoretical framework of Bruno Latour and the more structural analysis of Douglas, however, is not straightforward. Like the extension of most networks, introduction of cultural analysis brings new problems with it. I will therefore present a short introduction to cultural theory, one which is guided by a wish to make it explicit in what way it is possible to combine the theories, but also to exhibit points on which they are incompatible.

Cultural theory

In their widely cited book from 1982, *Risk and Culture*, Douglas and Wildavsky (Douglas & Wildavsky 1983) made the provocative claim that it is not so-called objective and rational estimates that guide the selection of those environmental risks that people will most fear, but rather that people fear the dangers that suit their view of the world and preferred social order. They wrote that dangers 'are selected for public concern according to the strength and direction of social criticism' (Douglas & Wildavsky 1983:7). When members of American society choose to fear asbestos poisoning more than death from house fires (that asbestos is supposed to prevent), this is because it fits with an anti-industrial criticism that particular cultural and material trends in America have provided the breeding ground for.

In their analysis of the increased focus on the risks associated with pollution in America, they identified three types of social order with a particular and distinct set of values and beliefs: Hierarchy, Market and Sect. Whereas the first two were primarily identified by reference to mainstream political theory about bureaucracies and markets, it is obvious that Douglas' previous work to establish the grid-group schema and its four distinct cultural types or cosmologies were also a heavy influence.[27] A cosmology can be described as a coherent pattern of norms, specifying rewards and punishments, by appeal to which the individual would know how to behave in sanctioned ways, how to justify oneself to others, and also to judge the actions of others. Being a system of rewards and punishments, a cosmology is therefore defined as the perception of a system of social accountability, a notion of how the world is expected to work and the way society is organised – in short it is the perception of a naturally ordered *social context* (Douglas 1978:52-54). On the basis of two structural variables Douglas defines four possible cosmologies. Hierarchy and Sect have a high sense of group belonging, whereas Market and Isolate are low on this dimension. On the second dimension, Hierarchy and Isolate experience a highly pre-structured set of rules and regulations for action, whereas Market and Sect do not experience this outer

[27] She originally introduced the scheme in *Natural Symbols* (Douglas 2001[1970]). When she later elaborated the scheme in *Cultural Bias,* the ambition was to produce a universal classification of different social contexts, which could be seen to have permissive and constraining effects on individuals' choices (Douglas 1978:6). Here she refines the grid-group scheme in which grid is the perceived sense of restriction by formal rules and regulations, whereas group is the perceived sense of belonging to a group. Thus, *Cultural Bias* can be seen as the *locus classicus* of the theory, there stated in its pure form. It should be noted, however, that this book should not be seen as an authoritative source for the typology I employ here since it has been under continuous development both by Douglas herself and by a group of other researchers in the following decades. Douglas herself has put the cultural typology to use in many different contexts, such as for instance cognition (Douglas 1986; Douglas 1982), consumption (Douglas 1996b) and risk (Douglas 1996a; Douglas 1985; Douglas & Wildavsky 1983). In this dissertation I have primarily followed the trail of the typology as it has been developed in connection with the notion of risk. This is for two reasons. First, the arguments on risk and culture have many similarities with the present analysis of controversies on biotechnology. Secondly it seems that the arguments on risk are somehow less structural in orientation, than for instance the writings on cognition. Comparing a reading of *How Institutions Think* (Douglas 1986) and *Essays in the Sociology of Perception* (Douglas 1982) with a reading of *Risk and Culture* (Douglas & Wildavsky 1983) and the essays collected in *Risk and Blame* (Douglas 1996a), it seems that institutions do more to determine thought styles than social organisation does to determine risk perceptions. I am not hereby claiming to have identified a consistent or constitutive difference in the writings of Mary Douglas. It should just be taken as an indication of how I have found it easier to combine Douglas, the risk-analyst, with Latour than Douglas, the analyst of individual cognition.

pressure. At this point in the dissertation, however, I will not present these four forms any further, since it makes more sense to introduce them in more detail in Chapter 5 in connection with the definition of the inductively defined modes of articulating the collective.

The argument put forward by Douglas and Wildavsky in *Risk and Culture* does not imply that some societies (or collectives) are more rational than others, or that some societies choose to fear the wrong things. Rather it means that any form of society or social organisation produces a particular view of nature and the natural environment, and that this view influences which dangers are selected for social action and criticism. Out of an immense array of dangerous possibilities some things are selected for attention and this selection is not arbitrary but closely interwoven with the needs of social organisation. Thus, their argument was not intended to suggest one-way causality. Rather they argued that the choice of risks and the choice of how to live in a society are taken together. Producing particular patterns of risk assessment is thus a simultaneous production of a particular social order, and in this respect their argument is very similar to the relational ontology hitherto adopted in this thesis:

> There is no gap between perception and reality and no correct description of the right behavior, at least not in advance. The real dangers are not known until afterward (there always being alternative hypotheses). In the meantime, acting in the present to ward off future dangers, each social arrangement elevates some risks to a high peak and depresses others below sight. This cultural bias is integral to social organization. Risk taking and risk aversion, shared confidence and shared fears, are part of the dialogue on how best to organize social relations. For to organize means to organize some things *in* and other things *out*. When we say, therefore, that a certain kind of society is biased toward stressing the risk of pollution, we are not saying that other kinds of social organization are objective and unbiased but rather that they are biased toward finding different kinds of dangers. (Douglas & Wildavsky 1983:8)

This use of the term 'organising' can be seen as similar to the previously defined concepts of *inscription* and *subscription*. And just as I have argued that subscription is not determined by structure, but instead produces structure, Douglas rejects determination and presents social context in a way that is very similar to

the notion of actions taking place in networks. She speaks of the social environment as consisting of the 'deposit from myriads of individual decisions made in the past, creating the cost-structure and the distribution of advantages, which are the context of present-day decisions.' (Douglas 1978:6) Each day the context is new, but some of its effects are long term, just as the choices we make each day stretch in their longest effects way back into the past and far into the future. This is true of both its affirmative and subversive consequences. A given social order does not exist independently of the simple little daily choices of its inhabitants.

> A group is not taken to be formed, solid, existing independently of the volition of its constituent members. Their investment of time and energy quickens its life and marks its boundaries. Once they withdraw their own commitment, it dissolves away. Every time a member appeals successfully to the paramount need to ensure the survival of the group, its being in existence can be used as a more powerful justification for controlling individuals. (Douglas 1978:13)

The general idea behind the theory is that the cumulative effect of individual choice is the social situation itself. The social environment is not given a priori, but precisely created by the many choices of the individuals. Choices are not pre-determined, though the costs of some choices may be higher than other choices. The individual and the environment interact and either can move, because the environment is defined so as to consist of all the other interacting individuals and their choices. These interactions of individual subjects produce a public cosmology, a world-view, capable of being internalised in the consciousness of individuals if they decide to accept it and to stay with it. Individuals can choose to buy the whole package, so to speak, but Douglas stresses that the approach does not assume that they must. 'It is not an exercise to demonstrate the sociological determination of thought.' (Douglas 1978:14)

This construal is equivalent to the notion of subscription in which the articulated collectives exist because they are invoked in the scripts that are used for shaping phenomena in particular ways. The notion of internalisation in individuals, however, is not compatible with Latour's relational ontology. In his perspective the individual subject is just as relationally constructed as all the other actors and internalisation is not an issue. On the other hand, Douglas herself stresses that

the relation between the individual and the cosmology should not be understood in terms of one-way causality:

> Although the argument involves this directionality, it is not intended to imply that a causal relation exists between cosmology as effect and social context as cause. In any social context, it may be assumed that the chains of cause and effect between the structures of social interaction and cosmological and cultural system, which are supporting them, are indefinitely interwoven and interdependent. Cosmological values, being used to provide justifications for the actions expected from a person by the constraints of his social environment, are likely to be involved in the choice of actions. Consequently a stabilising factor is identified. However, the individual, not seen here as being passively acted upon by the forces of his social context, is himself a part of that social environment, and he will be actively maintaining and constituting it. Any individual can interact at any level and choose to accept or reject the social pressures and prevailing cosmology in which he finds himself. (Douglas 1978:53)

Cosmologies therefore do not determine actions but are rather created as a result of actions, just as the inscriptions of phenomena in the controversies about biotechnology produce a pattern of subscription to modes of articulating both the technology and the social and natural order of the collective. When people disagree over biotechnology, they can simultaneously be seen to disagree about the way the world is made into a coherent whole, but there is no priority in either of the two perspectives. The influence is simultaneous and should be analysed as such – rather than seeking causal explanations behind particular arguments, the objective is to look for patterns in connections.

On this background I have found that Douglas' perception of culture, as a conflictual dialogue about the exercise of power, fitted the earlier characterisation of controversies as political conflicts about the social and natural order of the collective. She defines culture as equivalent to politics, if politics is defined in a broad sense as power games over who should decide what in any social (political) order. In this definition culture is inherently adversarial. Culture *is* confrontation, since any perception of a social relation only exists in contrast to other relations. It can always be questioned and contested. Any exercise of power can

be challenged by an exercise of counter power, although it can be more or less manifest. Finally, there is no division between small and large political and cultural conflicts, between practical daily conflicts and general, ideological conflicts. Rather, they are extensions of each other in different contexts. Explicit controversies can be about particular details of the daily business of organising a life in common, but can at the same time be seen as general struggles over social order and the principles and institutions to be held sacred.

In this connection, however, it should be emphasised that this is a particular reading of the cultural theory of Douglas, which stresses the indeterminacy in cultural forms. It is guided by the intention to make it compatible with Latour's relational ontology. In some versions of cultural theory, especially when the focus is on epistemological consequences, it seems that determination is more predominant as cultural restraints on cognition (Douglas 1986; Douglas 1982). These approaches have been criticised by Latour for granting undue priority to society. He argues that they wrongly replace nature with society or culture, hereby disregarding the fundamental principle of symmetry as presented earlier.[28] On account of this criticism, I have chosen to speak of *articulated collectives* rather than *cosmologies* or *social order*. The term 'collective' implies a symmetrical consideration of both social and natural order, and the term 'articulated' stresses the fact that the collective is not a structure with an independent existence, but is invoked in arguments by being articulated.

The most crucial point in which the present dissertation differs from the cultural theory of Mary Douglas, however, is her structural perception, according to which there are only four kinds of cosmologies and that they can be identified with universal validity on the basis of two structural dimensions. To serve the purposes of this dissertation the typology must be the outcome of a concrete analysis. It is not seen as a structure determining the possibilities given to actors. It will appear from the presentation in Chapter 5, that I have employed the typology as a heuristic device, but I have not hereby proved it universally right or inclusive in connection to any political controversy. Rather I have found the typology useful as a compressed description, which improves the inductive empirical analyses by providing an analytical framework, which makes for greater clarity in the analysis of patterns in arguments.

[28] Latour has criticised the sociology of science perspective for this asymmetry (Latour 1999a:21; Latour 1991:27-32).

The force of this analytical condensation is to be very productive in the efforts to answer the second part of the problem statement: *how different arguments construct the relations between particular definitions of problems and solutions, pointing to the discursive conditions for the possibilities of regulating biotechnology in contemporary Danish society.* The analytical typology provides a way of classifying arguments according to the relations they establish between problems and solutions – the way they articulate the collective. On the basis of this classification it can be analysed how different types of arguments frame the question of regulating biotechnology differently. Taken together, these differences are seen as the discursive conditions for the possibilities of regulating biotechnology.

Three kinds of analyses

In the foregoing, a theoretical and methodological framework for an analysis of patterns in networks of articulations has been presented. I will finish the chapter with a short introduction to the concrete methods of analysis that will be employed. The dissertation is constructed around three different kinds of analyses. An analysis of associations, which is documented in the appendix, two parallel analyses of inscription of occurrences into newsworthy events, documented in Chapter 3 and 4, and finally, an analysis of discursive possibilities of regulating biotechnology as expressed in arguments subscribing to different modes of articulating the collective documented in Chapter 6. Rather than providing an exhaustive account of the methods and data employed at this point, I have chosen to treat the concrete method of analysis in connection to each of these chapters. At this point, however, I will give an introduction as to how the four analyses are related to each other.

Associations in news articles

In mass mediated articulations of biotechnology, phenomena are inscribed in particular ways by being associated to other phenomena in particular ways. In order to study these inscriptions, however, it was necessary to establish an archive. And, as already mentioned in the introduction, this demanded a preliminary analysis of content, since the archive could not be constructed without a certain amount of knowledge about the content of the articles. On the back-

ground of the theoretical framework presented in this chapter, this analysis of content can now be conceptualised as an analysis of *patterns in associations*. In the appendix this analysis of associations between different kinds of technological applications, health care related problems and sources are thoroughly documented. It was conducted by working out a coding scheme applied to each article in order to count the frequencies in the appearance of different types of associations and it serves as the basis for the analyses of inscription in this thesis. On a general level it can be said to have created a map of the landscape of genetic news from the following questions:

- What is associated with what in mass mediated articulations of biotechnology?
- When do these associations seem to point to controversy – divergent notions of the technology as problem and/or solution?

In this context it should be noted that the finished archive has come to consist of 1575 articles from four national daily newspapers. For practical reasons I have had to limit the number of media included in the search process, but it was important that the chosen media represent a fairly broad spectrum in order to give the analysis a reasonable amount of generality. Unfortunately, I had to leave electronic media out, since the search process within these media would have been too extensive. This is true of TV and radio, where it is very time consuming to search systematically for coverage of particular issues in Denmark. A slightly different argument pertains to the Internet, where it is relatively easy to search, but where it is extremely difficult to know what archive one is actually searching in. On this background I have chosen to study the written media, more specifically, the national newspapers.[29]

Focusing on newspapers has a further advantage; it is a type of media that most clearly has a distinct editorial style. This means that it is possible to make some informed choices on which media to choose, since I also had to limit the number of written media. The choice fell on four national newspapers exhibiting characteristic differences. Included are the two large broadsheets, the social-liberal *Politiken* and the conservative-liberalist *Jyllandsposten*. In order to broaden the analysis, two other newspapers have also been included: The tabloid *Ekstra*

[29] A study of the food chains in the Danish Media supports this method, since it was shown, that electronic media to a very large degree replicate news stories from the printed media (Lund 2002; Lund 2000).

Bladet, and the intellectual niche newspaper *Information*. *Ekstra Bladet* has a general reputation of being the most populist and radical tabloid in Denmark. In contrast, *Information* has a reputation for being elitist with leftist leanings and focused on environmental issues. In the appendix, I present some quantitative figures for the overall editorial style of the articulation of biotechnology in these four papers and I have also included some considerations about other daily newspapers, which are left out of this analysis.

A systematic full text search was carried out on these four papers on the basis of a list of keywords and covering the period from August 1997 to December 2001. The archive includes all articles, both news and views in this period, which articulate genetic technology in connection with the human body. It was found to be too comprehensive to also include agricultural technology. Of the 1575 articles, 405 did not cover health care related issues, but rather the use of biotechnology in relation to forensics, for instance DNA fingerprints or other non-health care related issues. They were treated separately, since they appeared to be inscribing problems and solutions differently than the 1170 articles, which covered health care related gene technology. On this account it is mainly these 1170 articles that have been the basis of the analysis of associations in genetic news.

Inscription of occurrences into news

On the basis of this mapping of associations, it has been possible to select two concrete cases for the study of the inscription of occurrences into newsworthy events. They are both cases, in which a particular occurrence has generated much articulation as well as much controversy, and they are therefore seen as exemplary cases for the study of inscription. The first occurrence is an announcement by an American researcher that he intended to clone a human being for reproductive purposes. The second occurrence is an announcement that a Danish experiment with gene therapy as treatment for liver cancer had been suspended. On the basis of the analysis of associations, documented in the appendix, it is obvious that cloning and gene therapy has been articulated in different ways in the Danish mass media. Human cloning is part of the articulation of a problematic field of applications intervening in human reproduction. This also includes foetal diagnostics and other reproductive technologies. Besides being articulated as rather problematic, these applications are also more often articu-

lated as objects of routine use and public regulation, whereas the other gene technologies more often are articulated as objects of basic and applied science. Gene therapy, on the other hand, has been articulated as less controversial and is very often articulated as an object of applied research. On this basis, I have chosen to call them the technologies of fear and hope[30] respectively, hereby viewing them as exemplifying two different points of condensation in the complex networks of articulation of health care related biotechnology.

The notion of inscription implies that precisely this process of inscription creates the newsworthy event. When cloning is articulated in a particular way, it is not just cloning, which is constructed in a certain way, but all the other associated entities whether they are human or non-human actors. Since the objective of this dissertation is to study arguments, and since arguments are constructed as relations between problems and solutions, the analysis of these two cases in Chapter 3 and 4 will focus on how phenomena are presented as problems and solutions. The search for scripts in this particular context is therefore conducted in order to answer the following research questions:

- How is the concrete occurrence inscribed as a newsworthy event?
- What is constructed as problems and solutions in these inscriptions?

In Chapter 3, the analysis is primarily conducted on the articles that address human cloning in the four national newspapers in a three-week period after Seed's announcement hit the front page on January 7th 1998 (there are 54 articles of this kind in all). This includes both news and views since the purpose is to investigate the whole spectrum of inscriptions of Seed's announcement as a newsworthy event. As could be expected, a comparison between the four papers shows a great deal of difference in the way the four media have edited their coverage of the story. Generally, the two big broadsheets, *Politiken* and *Jyllandsposten*, have printed the great majority of the articles (21 and 20 respectively) while also keeping the story running for the longest period of time. The coverage in the other two papers is less extensive and spans a shorter period of time (*Information* 8 articles and *Ekstra Bladet* 5 articles). Moreover, *Ekstra Bladet* and *Jyllandsposten* have the majority of letters to the editor and other opinion pieces

[30] Inspired by Mulkay's analysis of the rhetorics of hope and fear in the British embryo debate (Mulkay 1993).

(approximately half of the articles are debate contributions) whereas the other two only have half as many.

In chapter 4 the story is conducted on all the articles (here again, both news and views are included), which articulated the suspended experiment in Århus (98). This coverage is also unevenly distributed between the four papers. *Jyllandsposten* covers the case very intensely (38 stories in the following two months and subsequently 26 articles in the next half year). In this context it should be noted that *Jyllandsposten* is based in Århus (it is the only national daily newspaper not based in Copenhagen).[1] Politiken covers the story less intensely (17 in the two following months and only 3 in the subsequent half year). It should also be noted, that Politiken uses a high degree of wire service news. *Ekstra Bladet* covers the story with 3 articles in the first two months and 5 articles in the following half year, whereas Information almost totally ignores the story, with only 5 small notes in the first two months and subsequently one little note in the next month.

Arguments subscribing to different articulated collectives

The result of the analyses of the inscription of these two occurrences is a set of scripts that leads to the development of the typology of four articulated collectives in Chapter 5. On the basis of this typology, the basis and direction of the analytical movement is subsequently changed in the last analysis presented in Chapter 6. Instead of studying the inscription of events in mass mediated stories the strategy is to study subscription of arguments to different articulated collectives, categorised according to the typology of articulated collectives. With the establishment of the typology in Chapter 5, all the different scripts are 'folded' into four modes of articulating the collective. In the third kind of analysis in chapter 6, this fold is then used as a structured perspective for classifying arguments in order to analyse the discursive possibilities for regulating biotechnology. On the basis of the introductory problematisation of the concepts of *science, ethics* and *public debate* I have chosen to structure the analysis around the way different argument articulate these three phenomena.

The analysis was therefore conducted with two objectives in mind. The first was to classify a set of arguments according to the typology of four articulated collectives. This was done by analysing the kinds of social and natural order that

was implicitly or explicitly formulated in the particular construction of a relation between problems and solutions. The second objective was to look for patterns in the way the arguments subscribing to different collectives articulate the phenomena of science, ethics and public debate differently. Altogether, the analysis was therefore conducted from the following research questions:

- What kind of social and natural order of the collective is implied in the arguments?
- How are the phenomena of science, ethics and public debate articulated differently in these arguments?

As empirical material for this analysis, I chose to focus on arguments about regulation of biotechnological research. And in order to identify these arguments I have selected a particular sample of articles. It consists of all the editorials as well as other long opinion pieces, which express arguments about the regulation of biotechnological research as a societal activity, that is, of arguments about the preferred relation between biotechnological research and the natural and social order it is part of. The reason for choosing this sample is that views (as opposed to news) are explicit formulations of arguments and by choosing long contributions the arguments are most extensive. This sample also has the quality of combining explicit editorial views with views from outside commentators.[31] The sample consists of 34 (15) articles from *Politiken,* 31 (4) articles from *Jyllandsposten,* 33 (12) articles from *Information,* and 6 (3) articles from *Ekstra Bladet* – altogether 104 (34) articles, where the figures in parenthesis indicate how many of these where editorials.

Altogether these three kinds of analyses constitute a set of related analyses that build upon each other. In this way it should be observed that the first analysis also establish the basis of reliability and validity on which the last analysis is dependent, just as the last analysis has served as a lodestar for some of the methodological choices made in the previous analyses. So although they are presented as independent analyses, they should not be evaluated as completely detached from each other. In this context it should also be noted that although the first analysis counts frequencies, all the analyses are basically qualitative in nature and should be evaluated as such. In order to strengthen the transparency of

[31] Opinion pieces are edited too, but there is much less direct journalistic influence on the arguments as compared to articles written by journalists.

the analyses, I have quoted the mass mediated articulations at length. These quotes should generally be seen as illustration of the arguments made in the text, rather than proof that my arguments are true. Furthermore, they have all been translated into English; a job, which has not always been easy, since one is often faced with strange sentences and mixtures of metaphors. I have therefore aimed at making the translation as literal as possible.

The overall objective is to establish a qualitative framework for the understanding of how biotechnology is inscribed in public articulation and, taken together, these analyses make it possible to answer the problem stated in the introduction – how do the arguments inscribe problems and solutions hereby pointing to the discursive conditions for the possibilities of regulating biotechnology in present Danish society.

Chapter 3
Cloning Sensations
- Inscription of a technology of fear

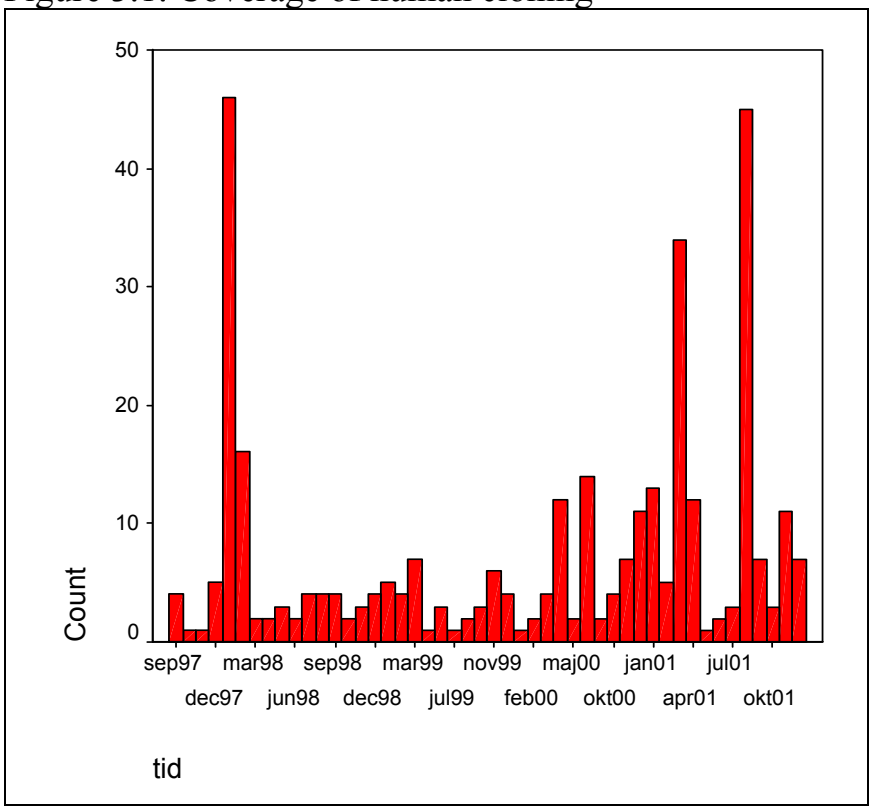
The cloning of Dolly the sheep was the subject of wide public debate in both North America and Europe in the spring of 1997. The mass mediated coverage of this occurrence has been the object of several analyses (Nisbet & Lewenstein 2002; Einsiedel et al. 2002; Priest 2001b; Neresini 2000). It is argued that this occurrence transposed the notion of human cloning from the realm of science fiction into the real world (Einsiedel et al. 2002:340) while at the same time revealing this notion to be a particularly explosive issue. Looking at the Danish media coverage, as presented in the analysis of associations in the appendix, it is obvious that human cloning has been articulated often and not seldom as controversial.[32] Moreover, after Dolly became a familiar sheep in the Danish media, human cloning has been a persistent topic of interest in the coverage of health care related gene technologies. Of the eight different fields of application for gene technologies, identified in the analysis of associations, it is the most frequently articulated (The appendix). Indeed, it is articulated as one of the most controversial fields of application with a high focus on regulatory issues. It furthermore appears that the coverage of human cloning has been very unevenly distributed and concentrated in three different peaks (see fig. 3.1).

The first of these peaks of attention was occasioned by an announcement by Richard Seed that he intended to conduct a reproductive cloning of a human being in order to help childless couples reproduce. This claim was presented as highly controversial and its announcement received more attention (measured in number of articles) than other biotechnological occurrences including, notably, the announcement that the human genome mapping project had been concluded in June 2000. When the two fertility researchers, Antinori and Zavos, later entered the scene with approximately the same claim, media attention also peaked twice, in March 2001 and again in August. It should be noted, however, that not

[32] In this context it should be noted that human cloning has been object of discussion since the beginning of the 1980ies, see for example the two reports from the minister for the environment: Indenrigsministeriet, 1983: *Etiske sider af gensplejsnings-, ægtransplantations-, fosterundersøgelses- og inseminationsteknikken*, og Indenrigsministeriet, 1984: *Fremskridtets Pris*. Human cloning has been prohibited by law in Denmark since 1987.

all of the articles involved in these peaks articulated the claim made by Antinori and Zavos. The surge of attention in March was also fuelled by the publication of a report on human cloning from the Council of Ethics, which introduced and employed the distinction between reproductive and therapeutic cloning. In August 2001, the articulations concentrated on Antinori's associate, Zavos, who had announced at an international conference that their team of researchers were in contact with several hundred couples who had consented to be part of research trials with reproductive human cloning, and that these trials were set to begin by November 2001.

Figure 3.1: Coverage of human cloning



There is a difference between the articulation of Seed's announcement in January 1998 and that of Zavos and Antinori in August 2001. Seed was the first to announce deliberate experiments with human cloning and by August 2001 the story had lost much of its novelty. In 2001 reproductive human cloning seems to be articulated as a scientific fact, since most articles present it as certain that a human clone will be born at some point. So the shock that seemed to be the primary reaction to Seeds announcement, seemed to have abated by 2001 and developed into a more normal state of affairs, in which human cloning is regarded

as a fact, albeit one that is unanimously rejected as a socially acceptable way of reproduction.

In contrast to this, the 'facticity' of Seed's announcement was more fluid. Several of the mediated articulations of this claim in 1998 at the time explicitly question whether the enormous amount of media attention given to this announcement is justified. In line with several academic studies of mass mediated coverage of science and technology they argue that the level of attention is an expression of undue sensationalism.[33] The issue of sensationalism, however, installs an ontological distinction among occurrences, which is not a fruitful trajectory for the relational perspective adopted in this thesis. Instead of registering a 'sensational' gap between the empirical facts (about cloning) and the articulation of these facts in the media, the accusation of sensationalism here becomes an important empirical fact in its own right. The newspaper articles themselves raise as an explicit theme the question of whether there are limits as to what can be articulated as news in biotechnological controversies. The case of Richard Seed's announcement thus constitutes a paradigmatic case for the study of how occurrences are articulated as news: How has this occurrence, whose newsworthiness is explicitly questioned, generated such a large amount of media coverage? This is the reason for considering the mediated articulations of Seed's announcement as the most interesting case history in the coverage of human cloning. On this account I will deal most explicitly with this story in the following analysis, but the articulations of Antinori and Zavos' experiments will be referred to later as a way of putting the case of Seed in perspective.

As explained in the overall analytical strategy presented in Chapter 2, the objective in this chapter is to analyse how cloning is inscribed in a network of articulation that constructs particular definitions of problems and solutions. On this background I have conducted an analysis of the way Seed's announcement of the intention to clone a human being is articulated as a newsworthy story. I acknowledge that the process of translation began long before the story entered the Danish media, but I have left the black boxes of these chains of translation closed in order to focus on articulation through inscription alone. In the follow-

[33] The critique has often been put forward by natural scientists, but also some social scientists seem to share the view, see for instance (Nelkin 1995). In connection with the mediated coverage of cloning the critique of sensationalism has been discussed by Gunter et al. (1999).

ing sections I will present these inscriptions after an introduction about the way Seed's announcement was introduced as breaking news.

'Danes shocked at plans to clone baby'[34]

On January 7 1998, the morning news on the main Danish radio news channel, DR, brought the first report of an American scientist, Richard Seed, who had announced that he was now ready to clone people for the purpose of producing children for infertile couples. The statement was originally put forward at a scientific meeting in December 1997, but it wasn't until it reached American national radio on January 6th that it created headlines internationally (Nisbet & Lewenstein 2002). The news evoked a response in most Danish media in the course of the following days.

On January 8 and 9, the Danish newspaper coverage consists mainly in reports about Seed's announcement and articles reporting national and international reactions. It is noteworthy that the articles about this issue often include a perspective that suggests Seed's lack of credibility, which in some sense takes the edge off the way the announcement is otherwise articulated as a sensation. Nevertheless, the event is articulated as a major problem, one which Danish readers ought to be aware of. Even though it seems like an exotic piece of news from abroad, it is still close enough to home to pose a threat to our domestic conception of the 'good life':

> Danish researchers and politicians are angry and astounded over the plan by the American researcher Richard Seed to start experiments with human cloning.
> Attempting to produce cloned babies is absurd and perverted, exclaims Peter Holm, a researcher in genetic engineering at the Centre for Embryology in Foulum who also works with cloning. (...) Richard Seed's plan about cloned babies confirm for many people that certain researchers will do whatever seems possible even if the majority is against it.
> Spokesman for the Social Democrats Torben Lund:
> - American researchers have now confirmed the existence of an unacceptable and unethical slippery slope when progress is

[34] Headline in the daily paper *Politiken*, January 1998.

> controlled by the moral and economic interest of the individual researcher alone. This development[35] must be curbed.[36]

In this way, human cloning is articulated as a potential disaster, which should be avoided, and Richard Seed is cast in the role of the villain against whom forces must be mobilised in order to protect ourselves. Seed is presented as the stereotypical mad (if ingenious) scientist who unscrupulously conducts hazardous scientific experiments that pose a threat to the rest of society.

In the course of several days, however, the announcement comes to be articulated in a different context. It emerges that the European Council has already prepared a declaration, which prohibits human cloning, to be signed on one of the following days. It is probably fair to assume, that this occurrence is granted more attention because it can be associated with the story about Richard Seed. The declaration fits in the narrative as a kind of solution to the problem posed by Seed's plans. Although the signing of the declaration is not directly linked to the story about Seed, the coverage implies a connection. It is presented as a more or less direct consequence, and so it seems that political action has been taken in order to prevent human cloning from happening:

> Frankenstein is to remain a movie monster, and the American expert on cloning, Richard Seed from Chicago, must be stopped at any price. The European Council will lead the way and demand a worldwide ban on the copying of human genes. Last night in Paris, 19 of the Council's 40 members signed a convention, which makes it a crime for scientists and laboratories to carry out human cloning[37]

The story about Richard Seed could have ended here. Viewed as a mediated narrative, the declaration from the European Council could function as a plausible ending, which re-establishes a sense of calm in the articulations and allows an

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[35] The translation of the Danish term 'udvikling' is tricky throughout the dissertation and I am not always satisfied with the solution. This passage is a good example. To want to 'curb progress' is almost a contradiction due to the positive connotation of 'progress', which it does not necessarily share with 'udvikling'. My solution in this case came at the cost of using two words to translate the same Danish word in two different sentences. This was in order to capture, in my opinion, the different senses which 'udvikling' takes.

[36] "Danes shocked at plans to clone baby," *Politiken,* 8 January 1998.

[37] " Europe against cloning," *Jyllandsposten*, 13 January 1998.

implied reader to sleep peacefully, order now having been restored.[38] The problem of the possible human clone is curbed by the solution brought forward by Europe's decision to pass a bill against cloning. The association between the two events creates an interim closure or solution[39] to the problem of cloning. The story of Seed does not, however, disappear from the mass mediated agenda in the following weeks. On the contrary, articulations about the probability of creating a human clone proliferate and different inscriptions of problems and solutions occur.

Below I will identify the main patterns in these different inscriptions, using the way cloning is articulated as problem as the analytical discriminator. All articulations reject cloning as a legitimate means of human reproduction, but there is a great variety in the reasons for this rejection, just as there are large differences in the solutions proposed. A preliminary three-fold division has been found appropriate as the articulations primarily problematise technical, regulatory and wider societal aspects more or less discretely. This division does not imply any essential difference, but just that the primary focus in a given articulation is on one of these three aspects.

Technical aspects

Many of the articulations deal with the technical aspects of cloning. Cloning is presented as a technical procedure, which should be evaluated according to its technical viability. A central issue seems to be the probability that Seed will actually succeed in cloning a person, both in terms of the present stage of the technology, but also in terms of whether *his* technical skills are adequate. Several comparisons to the cloning of Dolly are put forward, often used as a means of evaluating the probability of technical success as well as a general evaluation of the technical problems in human cloning:

> The 'fathers' of Dolly the sheep reject the possibility of cloning people at this stage. (...) Harry Griffins argument is not, that it isn't theoretically possible. The cost and risk of trying is simply far too

[38] Elsewhere I have argued that this is a common feature of the mass mediated dramaturgy of serialised risk stories (Horst & Lolk 2000).

[39] As mentioned in Chapter 1, studies of scientific controversies have used the terms 'closure' and 'solution' to signify different ways to end a controversy. The fact that the story of cloning continues in spite of the EU declaration's seemingly unanimous rejection could be taken to indicate that closure or solution is not easily reached.

> great. (...) - In order to make Dolly we used 277 fertilized eggs, which required 430 un-fertilized eggs. Every donating woman in Seeds experiment can supply 10-12 eggs, but in the clinic the fertilization will only be successful in 10-20 per cent of the cases. This means, that Seed needs between 100 and 300 donating women to make one child. This is the first obstacle, says Harry Griffin. – The second obstacle is worse. As surrogate mothers these women will carry all the defective experiments – dead foetuses, abnormal and deformed children. Abortions and even birth of handicapped children will follow, so who will volunteer, asks Harry Griffin.[40]

The implications of this comparison with Dolly are clear. It is assumed that it is roughly the same kind of technical endeavour to clone a human, but it was only because this experiment was performed on sheep that the costs in terms of dead and abnormal foetuses were acceptable. Cloning is thus articulated as a more or less neutral technical procedure that can be applied to different ends. In itself the technique is not controversial, even though it might be demanding and even exciting. Rather it is the particular application on humans, which is problematic.

Technical evaluations are also applied to articulate future possibilities and implications of human cloning. Although they often leave open the question of whether or not it will actually be possible to clone a person one day, a central feature is a preoccupation with scientific knowledge or facts. This is used to discuss the possibility of an actual human clone, but also to assess the benefits and dangers in the process. Furthermore, technical facts can be used to discuss the outcome, that is, the kind of creature that a human clone would be. Indeed, it appears to be an object of sizable interests, what it means to be a clone:

> Even if we were to succeed in the cloning of a human being, it would never be an identical copy. If we were to clone Elvis, the clone would not be a new Elvis. There are several relevant factors: First of all, the conditions in the uterus during the embryonic development would be different, secondly, new genetic components would have arisen (the mitochondria from the egg cell contain their own DNA and is thought to contribute 0-10 percent of the hereditary characteristics), and thirdly, family background will be different for the copy.[41]

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[40] "Baby cloning is unlikely," *Politiken*, 18 January 1998.
[41] "The Lab is swarming with sheep," *Politiken*, 18 January 1998.

It is typical for these articulations of cloning as a technical procedure to rely heavily on scientific expertise by including quotes from researchers articulated as scientific authorities, for example, and by presenting scientific facts as the basis of the assessments. In the above example, the influence of mitochondria and their relative contribution works rhetorically as a sign that this is not mere speculation but in fact an estimate on the basis of scientific knowledge. These articulations can be understood as efforts to enhance the implied reader's factual knowledge about science in general and genetic research in particular, through communication of factual information and knowledge about the scientific rationality. They are generally presented with emphasis on the hopes connected to genetic research and a basic faith in the scientific community.

> Cloning and recombinant DNA research are not just notions from science fiction, which researchers grapple with in order to prove their own virtuosity. The most important application and the most important objective of research comes via these new techniques for developing new treatments, diagnoses and pharmaceuticals for the benefit of people all over the globe. And this trend started long ago. In this connection human cloning is merely to be seen as a curiosity – at least for the time being.[42]

As this quote implies, Richard Seed is often articulated as an exception to a general rule according to which science is a means to create a better world. Many of the articles explicitly establish a distinction between genetic researchers in general and Seed, who is often presented as a complete outsider. He is articulated as not having the right credentials, and therefore he should not be trusted to be able to do what he claims. As a leading gynaecologist puts it:

> I have very little confidence in the American, Richard Seed, who believes that he will soon be able to clone humans. Nobody has seen his name in acknowledged scientific journals. He is, as far as I have understood, not even a medical doctor, but a physicist.[43]

In this way human cloning is articulated as an anomaly. It is the exception to the rule of science as a beneficial activity in society. Seed is an outsider, rather than

[42] "New and better medicine," *Politiken*, 18 January 1998.
[43] "Danish doctors refuse cloning," *Jyllandsposten,* 12 January 1998.

a proper scientist, and it is 'bad' science to clone a human, since the procedure has not yet been perfected on animals, and therefore can be expected to create many unwanted side effects. These articulations also imply that it is unlikely that Seed will succeed in actually cloning a person, since it is so difficult and costly in terms of both money and participants in the trial. Yet, it is not ruled out that it is possible, but only that under the present circumstances it is irresponsible because of the present state of the art.

On this basis, I will call the pattern found in these inscriptions *the script of scientific information*. This script inscribes cloning in a network of articulation that draws heavily on the articulation of scientific facts and scientific authorities. In this script science is generally articulated as an advantage because it provides society with effective means to cure diseases. Cloning is presented as a more or less neutral technology, but the specific application of human cloning for reproduction is rejected, because it is technically unfeasible. In this script Seed's announcement is primarily problematic because it reveals him to be irresponsible; i.e. he does not adhere to scientific and rational evaluations of what is sensible and feasible. This is problematic in two ways; firstly, because Seed might do something that is against scientific standards for good behaviour; and secondly, because it can give science a bad reputation if people outside the realms of science believe that human cloning is just around the corner.

The solution to this problem seems to be twofold. First, it is argued that it is highly unlikely that Seed will succeed in cloning a person, because it is technically unfeasible. Second, a distinction is created between 'proper' scientists and people like Seed, where 'proper' science is articulated as an activity that is beneficial to society and would never experiment with human cloning in order to create a human baby. So in spite of its immediate ability to stimulate popular anxieties, Seed's announcement is not very worrying, since it is highly implausible that he will actually be able to clone a human person, while those scientist who might be able to succeed are not willing to undertake such experiments. In this script problems are generally articulated as caused by ignorance or neglect of scientific knowledge and therefore information and education seem to be solutions to the problem. The public is articulated as in need of information about relevant technical details in order to evaluate the possibility of cloning on the basis of factual information, rather than be frightened unnecessarily by people like Richard Seed. Within the scientific community knowledge about the techni-

cal details also ought to prevent researchers like Seed from engaging in these kinds of experiments.

Regulatory aspects

A second type of articulation focuses on regulatory aspects and presents human cloning as a problem that can be dealt with in terms of political, social or professional regulation. These articulations do not question the scientific plausibility of Seed's announcement, but asks what kind of regulation is necessary in order to prevent this kind of deviant behaviour by some researchers. They all unanimously back the intentions of the EU declaration against cloning and articulate prohibition as an obvious precaution against the dangers of cloning:

> Tomorrow Denmark and 11 other European nations will sign a declaration, which prohibits human cloning. All other countries ought to follow as soon as possible. We will undoubtedly hear several worn-out phrases about not being able to hinder progress and that inventions cannot be undone. It will not hold. That something is possible does not automatically mean it has to be permitted. The technologies of cloning are an instance of scientific progress, which must be met immediately by restrictive international legislation.[44]

The particular articulation of Denmark as a regulative arena is interesting as many of the articles specifically refer to the fact that Denmark has already had a statutory ban on research in human cloning for some time. The implications seem to be that Denmark is somehow in the forefront of 'ethical' regulation of biotech. Sometimes this is made explicit: 'It gives us a global responsibility to show the rest of the world, that a ban is most effectively enforced when it is based on the ethical views in the population.'[45] It is interesting to note how ethics in this context is articulated as an essence. Ethical views seem to be a substance in the population, which is furthermore presented as a unified container for this substance. The ethical views of the Danish population is somehow a unified entity that can be measured and compared to legislative regulations – as if they were independent from each other at the outset.

[44] "Copy Humans," Editorial in *Jyllandsposten,* 11 January 1998.
[45] "Debate on Cloning brings great emotions to boil," *Jyllandsposten,* 12 January 1998.

As in the above example, the focus on regulatory aspects often leads to a kind of ethno-centrism, where it seems to be taken for granted that the population of Denmark is somehow taking the ethical high road on biotechnology. It is common in this context that human cloning is primarily articulated as a problem for less ethically responsible cultures or nations. This also appears in connection with evaluations of the European ban on cloning. In spite of widespread support for this ban, the question of whether it will actually have the desired effect seems to be a recurring theme. It is claimed that researchers like Seed are always able to find some country where it is not illegal or the ban is not enforced: 'It will be like prohibiting the pill or abortion,' says jurist and commentator Paula Metzger. 'If you can't get it here you will just have to go somewhere else'.[46] Statutory regulation is therefore not unanimously articulated as the solution to the problem of cloning because even if it were globally prohibited some countries might not enforce this regulation.

In light of these discussions, it is also questioned whether legal constraint is the most desirable form of control or whether there are better options. A major issue is the question of freedom of research versus external regulation of research. Two issues are articulated as relevant in these discussions of pros and cons of the external regulation of research. The first is the problem of delimiting and specifying regulation: How should regulation be designed in order to achieve its goal in the best possible way? The second issue is that of agency and authority: Who should be the regulating authority?

In several articulations it is presented as premature to create statutory regulation since there is still far to little scientific knowledge about cloning. If we establish a ban on cloning we might prevent research that will later prove useful:

> The immediate reaction to the news about researchers experimenting with human cloning is to impose a total ban on cloning. But that requires a scientific definition of the limits of acceptable experimentation in the fight against genetic diseases, and we have not yet gotten that far.[47]

[46] "The Dream of Cloning Humans," *Jyllandsposten*, 9 January 1998.
[47] "WHO: Cloning of humans is reprehensible," *Jyllandsposten,* 9 January 1998.

The assumption implicit in this quote is an expectation of great positive outcomes of future medical science, and the objective of regulation should be not to limit these possibilities unnecessarily. In this way many of these articulations engage in questions of striking the right balance between restriction and permission, thus articulating a distinction between 'good research in animal cloning'[48] and bad research in human cloning. Two years later this distinction between good and bad research in cloning is rearticulated as the distinction between therapeutic and reproductive cloning, but these terms were not used in the mass mediated articulations of 1998. The articulation of this pragmatic distinction is explicit in presentations of the British rejection of signing the European declaration against human cloning:

> The British leave the possibility of human cloning open. A scientific committee is to review the presumed advantages within the next ten years. And experiments with human cloning could be possible in Great Britain from 1999. (...) Like President Bill Clinton in the USA, British Ministers have responded with utmost scepticism to the break-through in the cloning of the sheep Dolly in recent years. However, the British will not reject all possibilities of human cloning experiments as long as their aim is to remedy serious hereditary diseases.[49]

The other issue concerning regulatory aspects and freedom of research is the question of who should be in charge: 'Is it legislation, public opinion or the personal ethics of researchers, which will determine whether or not we can welcome the first little cloned baby to the world in a couple of years time?'[50] This issue is naturally linked to the previous one – the argument about legislation being premature leads to arguments in favour of leaving it to professional standards and collegial pressure. 'I don't think any proper medical doctor would give it a try. He or she would be frozen out of the scientific establishment'[51]. Other articulations pinpoint public opinion as an important factor: 'The most effective weapon is debate and resistance in the public together with condemnation from scientific colleagues.'[52] So it seems that although there is unanimous

[48] "Clinton wants to ban cloning," *Politiken,* 2 February 1998.
[49] "The British leave the possibility of cloning open," *Jyllandsposten*, 12 January 1998.
[50] "Debate on Cloning brings great emotions to boil," *Jyllandsposten*, 12 January 1998.
[51] "Danish doctors reject cloning," *Jyllandsposten,* 12 January 1998.
[52] "WHO: Cloning of humans is reprehensible," *Jyllandsposten,* 9 January 1998.

agreement that human cloning should not be performed, there are different articulations of the preferred means of regulation. Some articulations point to statutory regulation, but others point to professional discipline, public opinion or personal ethics as the basis for regulating human cloning. What they all, however, have in common is that they articulate the cloning of humans as a problem, which should be prohibited by some form of regulation.

Like articulations, which follow the script of scientific information, these inscriptions of cloning as a problem for regulation also articulate science as a fundamentally beneficial activity for society. But they do not seem to articulate the same kind of distinction between 'proper' science and human cloning. Instead, science is articulated as an activity that can lead to both positive and negative results. Unlike the script of scientific information, they do not articulate a low probability of human cloning, but seem to take it for granted that it is a viable technology. The important question in the articulations focusing on regulatory aspects is therefore a pragmatic question - of finding the best way of doing it, so that it only prevents the kind of science that society does not want, but leaves researchers free to pursue 'good science'. These articulations therefore first and foremost establish a framework for the assessment of the advantages and disadvantages of different types of regulation. Cloning is a problem that should be solved by effective regulation, but this regulation should not undermine the expected positive outcome of genetic research. Many actors seem to be entitled to speak in these articulations of cloning, but administrative roles are often articulated as sources of authority in explaining pros and cons of different kinds of regulation. Furthermore, researchers seem to have a slightly different role than they do in the script of scientific information, since they are often presented as interested parties. Accordingly they can be allowed to voice their opinions *as* opinions.

On this basis I have termed the pattern in these inscriptions *the script of pragmatic regulation.* Like the *script of scientific information,* this one also establishes a framework for the assessment of Seed's announcement. But rather than evaluating the technical aspects, it takes the technical plausibility of cloning for granted and inscribes cloning as an object in a juridico-regulatory network of articulation. This script asks what kind of control system would be relevant in order to prevent human cloning from happening. Science is articulated as a valuable activity in society, and the main problem with cloning is articulated as

a question of striking a pragmatic balance between granting permission to those who pursue beneficial research and prohibiting the activities of those who are likely to produce the unwanted side effects (such as the cloning of humans). The solution to the problem of cloning presented in this script therefore amounts to a decision on the most appropriate form of regulation. In order to make this decision a *pragmatic* assessment of different types of regulation will have to be carried out.

Wider societal aspects

A third kind of articulation does not focus on the particularities of human cloning but articulates Seed's announcement as a symptom of a more general problem of science and modern society gone awry. These articulations do not deal with concrete technical or regulatory aspects of the particular case. Rather the announcement is presented as an important event because of its symbolic implications. Seed's announcement is not a problem in itself, but it is a symbol of science as a problematic activity in general:

> When we concern ourselves with Seed's fantasy, it is obviously in the light of a fear that the seed he has sown will one day grow into something that could become reality. (...) Dizzying perspectives present themselves: Eugenic cloning of particular supermen, hosts of genetically identical parents and clone-children – or the establishment of banks with humanoid transplant organs, possibly in the form of headless homunculus', which only exist as a stock of spare parts such as hearts, livers, kidneys and so on.[53]

This articulation of Seed's announcement as a kind of omen is even more obvious in the next quote, where the cloning of humans is explicitly linked to other fields of genetic research. In contrast to the previously identified scripts, there is no distinction between different kinds of research. Human cloning is not presented as a particular case or an anomaly in the otherwise beneficial activity of science. Rather cloning is presented as an integrated and 'natural' extension of earlier research:

> The mad Seed is just taking the consequences of a set of scientific and societal developments, which will undoubtedly lead to a brave new world. We – and, truth be told, many others – have pointed

[53] "Homunculus" Editorial in *Politiken,* 11 January 1998.

> this out several times during the discussion about in vitro fertilization and genetic engineering. These developments undermine the basis for our cultural notions on Life and Man. It violates what we hitherto thought was inviolable. It started with surrogate mothers, test tube babies and genetic engineering. It ends with eugenics and laboratories fabricating human copies.[54]

This third group of articulations differs from the others (on technical and regulatory aspects) in the status they grant to Seed. Viewed as a symptom it is unimportant whether or not Seed is able to actually clone human beings. The mere proclamation that he intends to do so is enough. Besides, even if he does not succeed, other scientists with better skills and more resources will surely follow him and succeed where he has failed, as it is proclaimed in the previous quote. Thus, Seed is not presented as an outsider, but as a typical scientist doing what other scientists do. On this background it can be articulated as natural, albeit in a satirical mode, that Seed's intentions should be associated to visions of other scientists speculating about future uses of gene technology:

> Naturally it will be a problem to create a human, animated creature, which will serve solely the purpose of being another human being's potential organ donor. But here Dr. Seed can get assistance from another idealist, professor Slack from Bath University in England. Professor Slack is an expert in embryonic development and gene technology and has recently managed to create a frog embryo without head or tail. The professor has simply turned off the genes which control the development of head and tail, for which reason only a torso will be developed, a bag of organs, which will never be able to stare accusingly and ask 'why?'[55].

Although satire is often used as a way of creating ironic distance, thereby morally discounting these visions, they are nevertheless articulated in a factual way, rendering them not wholly implausible. In contrast to the script of scientific information, the references to scientific knowledge are articulated with an enormous (sometimes ironic) distance, as in the following quote where the 'professor believes in his idea'. This distance construes the information about 'scientific

[54] "The sheep, the man and the bishop," Editorial in *Ekstra Bladet,* 9 January 1998.
[55] "Man of Seed," Editorial in *Information*, 9 January 1998.

facts' as reason to reject science rather than reason to accept science as a beneficial activity in society:

> With reference to the fact that cloning of frogs 30 years ago has led to the cloning of a mammal – Dolly – the professor believes in his idea, that a combination of cloning and genetic engineering can make human organ banks possible. After all, his colleague, Ian Wilmut, has created the sheep Polly and Molly using a combination of cloning and genetic engineering.[56]

Articulated in this way the actual creation of a headless bag of organs does not seem implausible. Although Seed and professor Slack is presented with a mixture of satire and detest, the overall impression is that genetic research will probably have revolutionary, dystopian outcomes. As in the previously identified scripts human cloning is not the least bit desirable, but the implications of Seed's announcement is articulated as far more significant. In contrast to the script of *scientific information*, it seems probable that human cloning will happen and that it will have widespread dystopian consequences. And as opposed to the script of *pragmatic regulation*, there is no pragmatic evaluation of possible valuable outcomes of this kind of research. Seed's announcement is a symptom of a general societal trend, one that is deeply reprehensible. It is therefore not just Seed's announcement, or even the probability of cloning which is the problem. Rather these problems are symptoms of a much broader set of problematic developments, leading directly to the creation of 'headless organ banks' and other instrumental exploitations of human life. Science in general and its societal role is the 'real' problem in these articulations.

In terms of solutions, however, these articulations of cloning as a symbol of problematic social changes leads to the articulation of two distinct possibilities of response. In some articulations a general resistance towards the changes is articulated as the proper way of reacting to Seed's announcement:

> What if the only response to human cloning, this most recent example of the striving in the natural sciences to invent, map out, and be masters of God and everything, is either acceptance or resistance. In that case, I resist. First and foremost for obvious social reasons, when not only respectable men at the Panum

[56] "Man of Seed," Editorial in *Information*, 9 January 1998.

> Institute [The medical faculty of Copenhagen University, MH] but also madmen in remote and exotic laboratories are in a position to reproduce an army of new Hitlers. In that situation, not even an army of Mother Teresas would provide sufficient protection."[57]

In these articulations resistance to cloning should not be differentiated since no forms of cloning are more acceptable than others: 'The answer to cloning just has to be "no"'[58]. The cloning of a human being is irretrievable and appalling. In this light, resistance is not a matter of striking a pragmatic balance between 'good' and 'bad' science. On the contrary, genetic scientists are presented as fundamentally untrustworthy, and therefore society must take action, securing resistance in the form of universal prohibition. Resistance is articulated as a means of drawing a line that fundamentally constrains scientific exploration.

In other versions of the articulation of Seed's announcement as a symptom of dystopian societal developments, no prescriptions for action that could serve as solutions are presented. Whereas the previously mentioned quotes articulated the urgent need for resistance in the form of universal and absolute prohibition, other articulations adopt a fatalistic stance where action is more or less pointless since research is outside all forms of control, anyway:

> Only nature can stop a man like him [Seed]. Like it has stopped all of his predecessors, because the perverted dream about creating humans in one's own image is almost as old as humankind itself. Nevertheless it cannot be denied, that the dream – or nightmare – has moved closer to fulfilment. Hitler, Himmler and all the others would rub their hands in glee if they had had Richard Seed's technology at their disposal."[59]

In these fatalistic articulations science is fundamentally rejected as a beneficial activity, but this rejection is articulated from a standpoint that assumes any form of influence is impossible. Research has gone astray and the only thing we can do is to laugh at it: 'We are going to laugh at him. The mere fact that his name is Seed! He is sowing the seeds of vanity and arrogance.'[60] Fatalism thus seems to

[57] "Man in the machine," *Politiken*, 18 January 1998.
[58] "Europe against cloning," *Jyllandsposten*, 13 January 1998.
[59] "Frankensteins heir," *Ekstra Bladet,* 9 January 1998.
[60] "The sheep, man, and the bishop," Editorial in *Ekstra Bladet*, 9 January 1998.

be the obvious response to a trend that is basically reprehensible, but at the same time beyond our control.

Common for all these articulations is that Seed's announcement is presented as a symptom of a broader social trend. It is presented as a warning or omen of a particular social tendency in which research has gone astray and become a threat to the rest of society. Seed is not articulated as an outsider but cast as an example of a typical researcher. In these inscriptions most researchers would do what Seed is doing if they could. So it is not so much Seed's announcement, which is the problem, but rather the general development within science. Science is articulated as a system run wild that cannot be trusted since it does not adhere to the same values as the rest of society. Furthermore science is capable of revolutionary effects, which makes it a threat to society as a whole. Rejecting cloning is therefore not a question of striking a balance but a symbol of absolute resistance to the logic of genetic of research in general.

As illustrated earlier, these inscriptions present two different solutions or possible societal responses to the situation occasioned by Seed's announcement. Based on the previous presentation I have called them *the script of absolute resistance* and the *script of fatalistic irony* respectively. Both of these scripts articulate the societal trend, of which human cloning is the symptom, as reprehensible. But there are decisive differences in the way this trend is articulated. In the script of absolute resistance it seems to be possible, as well as necessary, to fight progress. In the script of fatalistic irony, however, the trend is not something that can be curbed. The difference is one of different implied readers of the scripts. The script of fatalistic irony implies a reader that is without influence and detachment is therefore articulated as the obvious response. Contrary to this, the script of symbolic resistance implies reader, who holds some measure of power to affect the course of events, and accordingly articulates the need for resistance, and raises a call for action. Like other movements of resistance, it might have difficult conditions to work with but it is nevertheless a necessary political expression. The difference between absolute resistance and fatalistic irony, then, is a difference that is ascribed to the readership; each implies a reader that is with and without influence respectively.

Post-script to the story about Seed's announcement

I have only found a few references to Richard Seed in the mediated articulations of human cloning in subsequent years, and none of these present him as a successful researcher in the area of human cloning. But from 2001 the two researchers Antinori and Zavos seem to be articulated in a role similar to that of Seed in 1998. On February 28, 2001 a report about human cloning from the Council of Ethics is presented in Denmark in which the distinction between reproductive and therapeutic cloning is articulated as a means to distinguish between different kinds of application of the cloning technique. This report is articulated in several news articles and after the March 9 it is associated with an announcement by Antinori that he intends to begin trials involving reproductive cloning. In August 2001, this claim becomes articulated again when Antinori's colleague has apparently made a presentation at a conference claiming that they had contact with several hundred couples consenting to partake in the trials, scheduled to begin November 2001.

The articulations of the statements by Antinori and Zavos follow the same scripts as Seed's announcement. In many ways their announcement is presented as a re-awakening of the threat posed by Seed. But in these articulations from 2001 the focus is more on the regulatory and societal aspects than on the technical aspects. It seems to be taken for granted that cloning is technically feasible, so the focus is directed towards the possibility of regulation:

> Let us face it. At some point in time a human clone will be presented. Irresponsible researchers without ethical breaks, let alone common human decency are working at it and will do everything to carry their preposterous projects through without pangs of conscience. Sooner or later they will succeed, but by that time, at the latest, international regulation ought to exist, which warrants prison terms for such a crime against humanity. This will not prohibit them from carrying their experiments out in states that have a more relaxed attitude on human rights and ethical problems, but civilised societies ought to take vigorous exception.[61]

Furthermore, it should be mentioned that in 2001, cloning is no longer unanimously articulated as a problem. Rather, the scripts of scientific information and

[61] "Mad research" in *Jyllandsposten*, 10 August 2001.

pragmatic regulation employ the distinction between reproductive and therapeutic cloning to articulate the first kind of application as a problem, but the latter as a possible solution to problems of disease. Especially in the script of pragmatic regulation this distinction is used to establish a possible difference between good and bad research, but the articulations are diverse on this point. In this way regulation is still articulated as a contested area, where a pragmatic solution has not yet been reached. A similar observation can be made from the inscriptions following the scripts of absolute resistance and fatalistic irony, in which the distinction between therapeutic and reproductive cloning is not accepted as a pragmatic solution, but is instead seen as yet another reason to reject cloning as such.

Four different newspapers

In the previous presentation of the articulations of cloning, I have not distinguished between different newspapers and types of articles, but the analysis did reveal some distinct differences that I will now summarise. Generally, it should be noted that the different types of scripts are not used in newspaper articles on a one to one basis. Instead, several articles employ more than one type of inscription in each article. Furthermore, the use of these different inscriptions does not follow simple demarcations between different types of articles such as a distinction between 'news' and 'views'. Still, some patterns can be detected. The scripts of *scientific information* and *pragmatic regulation* often dominate the news articles, whereas the scripts of *absolute resistance* and *fatalistic irony* often function as a kind of counter-perspective towards the end of news articles or as the main script in opinion pieces.

Following the articulation of the announcement as a far-reaching threat in the first couple of days, the subsequent inscriptions in *Politiken* primarily follow the script of scientific information. They use Seed's announcement as an occasion for presenting the trend within genetic science and human cloning - how far has it come, what are researchers capable of? Reproductive cloning is articulated as very problematic but also as considerably more unlikely than a more positive application of cloning techniques for the purpose of manufacturing medicine and transplant organs – what is later termed therapeutic cloning. *Politiken*, however, also articulates Seed's announcement in the script of absolute resistance – in particular in opinion pieces and editorials. The general picture in this paper is a dualistic articulation of genetic science as an activity that holds a great deal of

potential but also great risks. As citizens, we (the implied readers) are inscribed as having an obligation to be on the alert, but also to familiarise ourselves with science. We might say that the inscriptions in *Politiken*, taken together, seem to represent a tempered form of the script of scientific information. Fundamentally, science is presented as a benevolent activity in society, but this is tempered by articulations of a concern over whether science 'really' represents progress. In this way, *Politiken* can be said to articulate a dilemma between, on the one hand, accepting science and, on the other, taking a critical stance.

In contrast, *Jyllandsposten* mainly employs the script of pragmatic regulation and presents Seed's announcement as an occasion for articulating opportunities for the regulation of research. A general theme in these articulations is the question of how to work out regulation that allows, on one hand, for the desired research to take place, while on the other hand preventing unwanted research like reproductive cloning. The articulation of this objective is presented as a pragmatic evaluation of possibilities of striking the right balance, for instance in discussions of whether national legislation is adequate and whether professional self-regulation is better than statutory legislation. On the whole, the articulations in *Jyllandsposten* seldom inscribe Seed's announcement in the script of symbolic resistance or fatalistic irony. And they also rarely employ the script of scientific information. One example of this, though, is an editorial that articulates the clone as comparable to an identical twin – that is, something exceedingly recognisable and therefore rather harmless. It therefore seems that *Jyllandsposten* inscribes Seed's announcement as less alarming than *Politiken*. Furthermore, it is interesting to note, that *Jyllandsposten* articulates the subsequent announcements of Antinori and Zavos in far less news articles than *Politiken* and *Information.*

The articulations in *Information* cover Seed's announcement mainly in notices concerning international reactions, but also through opinion pieces inscribing the announcement in the script of absolute resistance and fatalistic irony. There are almost no inscriptions of the concrete technical aspects of Seed's announcement, that is, almost no articulations of the question of whether Seed is actually capable of human cloning. But when the general growth and development of genetic science is articulated it is inscribed as having far-reaching consequences. Thus, human cloning is primarily articulated as a realistic future development of present day scientific trends – as method for reproduction and for other uses, e.g.

the production of organ sacks that can be used as donors. Unlike the presentation in *Politiken* therefore, the critique of technology is not articulated as a dilemma of simultaneous consent and rejection, but in unanimous rejection. It should also be mentioned that the later announcements of Zavos and Antinori generate many articles in *Information*, including reports from the press conferences by a journalist who has been in Italy. Compared to the articulation of Seed's work, however, the articulations of this event are more often scripted according to the script of fatalistic irony, describing cloning as an inevitable fact.

Ekstra Bladet, likewise, articulates Seed's announcement as symptomatic of a wider societal trend and makes almost exclusive use of the script of fatalistic irony. *Ekstra Bladet* does not articulate Seed as a scientific outsider at all – rather he is articulated as a typical or 'normal' scientist. In this way *Ekstra Bladet* can be said to articulate a counter-discourse, one that is directed against science. In contrast to *Information*, *Ekstra Bladet* articulates a critique of science that does not present science as something that can be regulated or even made understandable, but only as a detestable, uncontrollable 'other'.

To sum up, it seems that *Information*, an intellectual niche paper, appears to have similarities with *Ekstra Bladet*, a tabloid, in the way they inscribe cloning as a problem. They both question science in general and articulate far-reaching consequences of the technological trends, although the articulations in *Information* more often use examples offering concrete technical details. The difference between the two is that *Ekstra Bladet* primarily adopts the script of fatalistic irony, whereas *Information* more often employs the script of absolute resistance. There are also similarities in the adoption of the script of absolute resistance in *Politiken* and *Information* along these lines. But this should not obscure the fact that the largest overall similarity in articulations can be found between the two broadsheets *Politiken* and *Jyllandsposten* on the one hand, where the articulations primarily employ the scripts of scientific information and pragmatic regulation, and *Information* and *Ekstra Bladet* on the other hand, where the articulations primarily adopt the scripts of absolute resistance and fatalistic irony.

Four scripts of social response

With the use of the conceptual framework of inscription in networks of articulation, four scripts have been identified in the way Danish media have inscribed

Seed's announcement into a coherent news story. As scripts they can be seen as four distinct patterns, all which articulate cloning as problem, but each pointing to different solutions (or responses) to the problem. In the following scheme I have summarised the way the four scripts present Seed and his announcement in different networks of articulation constructing problems and solutions differently.

Figure 3.2	Articulation of Seed	Problem	Solution
Scientific information	Outsider – and probably harmless	Frightened public and possibly irresponsible scientists	Information and knowledge diffusion
Pragmatic Regulation	Outsider – point to a need for regulation	How to regulate without preventing good science	Pragmatic evaluation of pros and cons in regulation
Absolute resistance	Normal scientist	Symptom of harmful trends	Resistance and delimitation of scientific development
Fatalistic irony	Normal scientist	Symptom of harmful trends outside control	Fatalistic detachment

This analysis has shown that all scripts reject cloning and thus cultural unanimity could be stressed. The issue of cloning revives the powerful myth of Frankenstein (Turney 1998) and hereby the questions about creating life and designing babies, which is generally articulated as very controversial (see also the analysis of associations in the appendix). Along these lines it is argued, that cloning is articulated as a fundamental threat to notions of individuality and uniqueness in most western cultures and this is why this issue receive much attention (Priest 2001b; Hopkins 1998). On the other hand, this analysis has shown that there is differences in the way cloning are constructed as problematic. Notions of individuality are not all that is at issue in this connection. Rather cloning is also problematised as a general symbol of a scientific trend on the wrong track. While it is no doubt true, that the issue of cloning pinpoints particular cultural values it is also important to notice, that the scripts reveal distinct differences in the way problems and solutions are constructed.

In spite of the unanimous rejection of human cloning, the mass mediated articulations are not homogenous in their inscription of the issue. And I will argue that the most striking difference between these four scripts is the divergence in the articulation of science and the scientific trends. The difference is comparable to

the rhetorics of hope and fear as identified by Mulkay (Mulkay 1993) in the analysis of the English debate about embryonic research, see also (Einsiedel et al. 2002). As in the rhetoric of hope, where science is presented as the means to create a better world, both the script of scientific information and pragmatic regulation articulate science as a fundamentally beneficial activity. In these scripts human cloning is an anomaly, an unwanted side effect of the otherwise desirable activity of genetic science. The crucial point in these scripts is that it is possible to act within an existing framework of society (either in terms of science or politics) in order to prevent cloning from happening. Society is perceived as basically controllable and therefore it is possible to foster sensible and efficient progress in both genetic research and society at large. We can also say that these positions fundamentally articulate the social order positively.

In contrast the scripts of absolute resistance and fatalistic irony articulate science as a fundamentally problematic activity much in line with Mulkay's identification of the rhetoric of fear. Science is presented as an activity, which is beyond our control and proceeding according to its own disconnected and undesirable norms. It grows without any form of actual control and general reason, and must therefore be regarded as a threat to 'the good life'. These scripts inscribe science as something that is beyond (and perhaps out of) control. The rejection carried by the script of absolute resistance is not one that implies the exercise of control in order to turn genetic research towards acceptable trajectories, but an act of resistance in terms of a fundamental – one could say dogmatic - rejection of the whole logic or rationality of contemporary genetic science. By contrast, the script of fatalistic irony articulates detachment as the obvious social response to this development run wild. In Chapter 5, I will return to a general discussion of the differences and similarities between these scripts, but I will first conduct another analysis of inscription of problems and solutions where the focus is on the issue of gene therapy.

Chapter 4
Gene Therapeutic Experiments
- Inscription of a technology of hope

Like cloning, gene therapy is a technological application that has been discussed for several decades; but there are also some clear differences between the two fields of application. In this chapter I will develop these differences in an analysis of the mass mediated articulation of gene therapy, parallel to the previous analysis of cloning. Unlike cloning, gene therapy seems to be an accepted area of research with high amounts of positive attention in the media. In a US context, Alan Stockdale argues, that gene therapy has been surrounded by an aura of 'miracle technology' and that this aura was 'initially fed by research hype and extensive, but uncritical, media coverage' (Stockdale 1999). Nevertheless, according to Stockdale this aura has changed in recent years in the US. Despite many experiments, the great expectations have not been followed by corresponding successes in actual patient treatment, and by 1995 a report from the National Institute of Health recommended lower expectations towards gene therapy. A similar trend can be observed in Denmark, where a special committee established to review gene technologies in the health care sector in 2002 suggested a wait-and-see policy on gene therapy.[62] It should be noted in this context that only a few experiments with gene therapy have been conducted in Denmark and so far none have reported significant effects.

As it appears from figure 4.1, one incident has generated many mediated articulations. This is an experiment with gene therapy on liver cancer patients at Århus municipal hospital. Although the attention peaked in July this experiment continued to be articulated frequently in the following months, and more than a third of the entire number of articles on gene therapy within the 4½ years in fact articulate this particular experiment. From the analysis of associations (see the appendix), it is also clear that the articulations of this experiment are important in the frequencies counted. The association between gene therapy and cancer is very high and gene therapy is very often presented with a focus on the tech-

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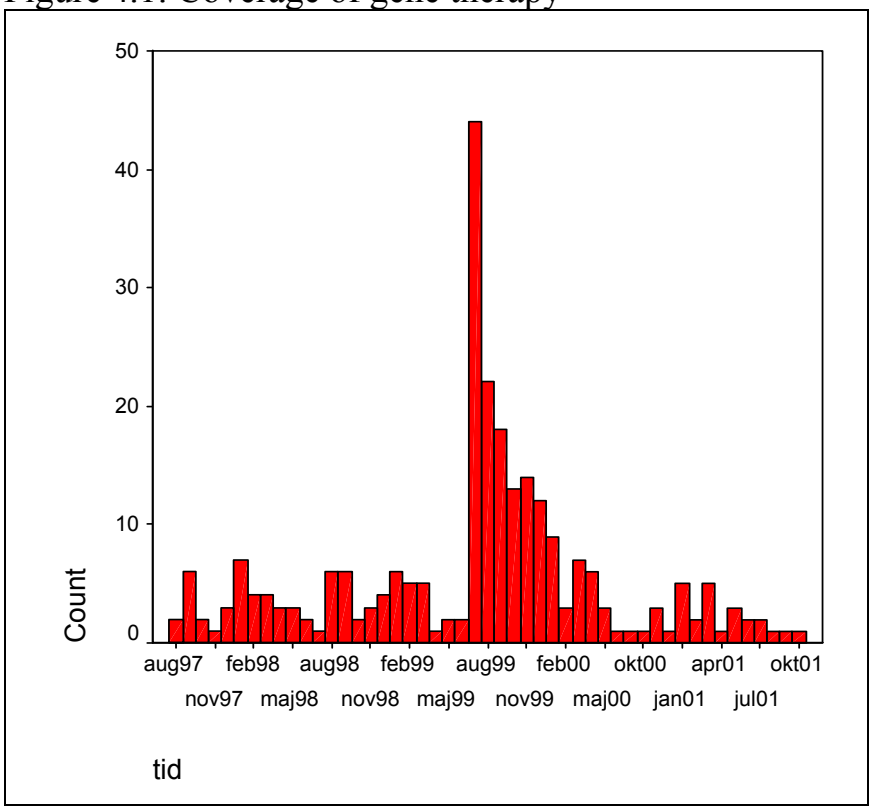
62 Genteknologiudvalget: Fremtidens bioteknologier – muligheder og risici. Videnskabsministeriet http://www.vtu.dk/fsk/publ/2002/genteknologi/genteknologi.pdf

noscientific stage of applied science rather than on basic science or public regulation. I have therefore chosen to focus this chapter on the articulation of this experiment. I will, however, also briefly sketch the mass mediated inscriptions of gene therapy in the time before July 1999 as a sort of 'pre-script' to the articulations of this experiment.

Figure 4.1: Coverage of gene therapy



Like the preceding analysis of the inscription of cloning, it is my intention here to analyse how gene therapy is inscribed as news stories in order to make news in Danish mass media. The objective is to study patterns in these inscriptions by focusing on the way they construct particular definitions of problems and solutions. I found that the division between technical, regulatory and wider societal aspects, employed in the previous analysis of cloning, were also useful in the analysis of the pre-script, but it had to be revised for the analysis of the articulations of the experiment after July 1999. Regarding these articulations, it seemed more appropriate to make an overall distinction between two different ways of presenting the experiment. The first focuses on therapeutic aspects and primarily articulates the experiment as a problematic treatment of patients. The other primarily articulates the experiment as a problematic research experiment and fo-

cuses on technical and regulatory aspects. In this manner the case is more complex to analyse than the case of Richard Seed's announcement, since it results in a more complex pattern of inscription, where several competing scripts articulate problems and solutions differently.

It should be mentioned that I also investigated whether the four different newspapers could be said to follow similar or different patterns as in the analysis of cloning. The mediated articulations, however, turned out to be very unevenly distributed between the newspapers, and therefore it is not possible to identify the same kind of distinct pattern between different newspapers. I have therefore chosen merely to note the differences whenever it seems relevant as information about the general pattern of inscriptions.

Pre-script

Before July 1999, the articulation of gene therapy must generally be said to be rather positive. In contrast to cloning, gene therapy is presented as a solution to health problems. High hopes are associated with this application of genetic technology, even though the factual reports on successes seem to be lacking. This generally positive emphasis aside, however, the articulations in the period from August 1997 to June 1999 vary substantially across the four different newspapers in the analysis. The coverage in *Politiken, Jyllandsposten* and *Ekstra Bladet* is only scattered. *Information,* on the other hand, stands out as the paper with the most diverse and frequent articulation of gene therapy, presenting it as both a possible solution and a possible problem by focusing on technical, regulatory and wider societal aspects.

In *Politiken* and *Jyllandsposten* the articulations of gene therapy focus primarily on either technical or wider societal aspects. The articulations of technical aspects seem to be short presentations of single experiments, all of which present gene therapy as an inevitable solution, bringing effective treatment for humans. Among these is also the first articulation in *Jyllandsposten* of a doctor in Århus, Steen Lindkær Jensen, who is at that time attempting to get permission to start a promising treatment of liver cancer with gene therapy. In these articulations, technical problems of the technology are mentioned, but they are presented as temporary and surmountable.

The two papers do, however, differ in their articulation of gene therapy as a symptom of a wider societal trend. In *Politiken* the few articulations of this kind, do not place this technology at the centre of attention, but mention gene therapy as one out of several technological applications, which are all presented as problematic. In *Jyllandsposten,* however, the articulations are reversed so that gene therapy is presented as a positive symptom of an inevitable progress brought about by technological development. Here, too, gene therapy is not the central theme, but is mentioned along with other technologies as a symbol of humanity's effective struggle with nature's imperfections. The only critical articulation of gene therapy in *Jyllandsposten* is concerned with gene therapy as a new form of doping within elite sports. This issue is also found in *Politiken*, and in this context gene therapy is articulated as plain and simple cheating, undermining chances of fair play. Taken together these two broadsheets present gene therapy as a coming solution to health problems, although they stress the need to be careful in choice of applications. This largely positive view of the future is not anchored so much in estimates that draw on technical evaluations as it is in high hopes for technological progress. The only obvious inscriptions of gene therapy as a problem consist of sporadic presentations of gene therapy as a means to improve normality, for instance in elite sportsmen, such improvements being construed as 'cheating'.

Compared to the two broadsheets, the tabloid paper *Ekstra Bladet* has even fewer articles about gene therapy. It does not seem like a newsworthy issue in itself, but on three occasions it is articulated in a way that can be viewed as presenting 'counter' inscriptions to articulations in other newspapers. By this term, I mean that they refer to the same occurrences as the other papers, but with reverse inscriptions of problems and solutions. Most interestingly is that several articles in *Ekstra Bladet* present a critique of the experiment with gene therapy in Århus half a year before it is articulated as a problem in the other papers. The first of these articles focus on a concrete patient articulating him as victim, because he had apparently been treated badly by Steen Lindkær Jensen. The next article casts doubt upon the doctor's integrity, but after a few weeks a third article presents the experiments with gene therapy in Århus as more promising. These three articles cover many of the features later articulated as problems in the other papers: the financial dependency of foreign hospitals, the quality of treatment, the abuse of trust in patient-doctor relationships, the connection between public and private health care, and so on. Nevertheless, these articulations

apparently didn't have the explosive force of the later story, since it is not taken any further by any of the media.

Finally, the articulation in *Information* is more diverse than in the other papers. Although this paper also articulates gene therapy as a potentially revolutionary technology, this potential is presented as a very complicated affair, with both auspicious and problematic features. The articulations of technical and regulatory aspects construe gene therapy as a problematic application, with an emphasis on both the hopes and the fears connected with the use of gene therapy. They emphasise the many unresolved technical problems, but also underscore the positive expectations in the form of possible cures for diseases. In the articulations of regulatory aspects the main problem seems to be a question of using the application for either the cure of diseases or the enhancement of normality. Articulated as a cure, gene therapy is presented as a solution; but as a means to enhance normality, gene therapy is a problem in itself. Finally gene therapy is often presented as a symptom of wider societal trends, in which case it is invariably presented as problematic.

In this way, the overall articulation of gene therapy construes it in terms of small steps on the road of progress through a landscape of great expectations. Gene therapy is presented as a technological application that will eventually have revolutionary outcomes, but these outcomes are mostly articulated on a very general or even symbolic level. Only *Information* gets into the technical details and offers evaluations of different kinds of gene therapy, as well as making continuous distinctions between different kinds of gene therapy with respect to desirability.

The only articulation of gene therapy as a problem that all papers seem to share is the possibility of an unacceptable enhancement of normality. The topic of doping in elite sports can be seen as a condensed version of this problem, where genetic doping is presented as equivalent to cheating. This is comparable to articulations of gene therapy as a problematic means to genetically design children so they become more intelligent or beautiful. This can also be seen as a kind of cheating in regard to the prospect of a good life that apparently breaks the norm of individuals being born equal. On this articulation, it is not fair to use gene therapy to enhance normality, whether in adults or off-spring, an observation which also fits the trend identified in the appendix of the greater controversy

associated with the application of genetic technologies to the field of human reproduction. Reproducing human babies seems to be a particular area of technological application in which genetic enhancement or 'tinkering' with genes is far more problematic than in other areas of health care related gene technology.

This is the setting for the articulation of the experiment with gene therapy in Århus in July 1999. Until then gene therapy had primarily been presented in a context of great expectations as a solution to the problem of illness, a revolutionary technique, which was soon to unleash its potential, even if these revolutions might also bring a set of problems. This was also employed in the first presentation of the new experiment with gene therapy in Århus, almost a year before the problems appeared:

> In an effort to save incurably ill patients a research team headed by liver specialist, professor, dr.med. Steen Lindkær Jensen, Århus, recently received approval to test a new method of fighting cancer by gene manipulation. This will happen by guiding cancer-impeding synthetic genes directly into the liver of patients. Here they are meant to destroy the sick genes and assume their function."[63]

Before I proceed, however, it is necessary with a single note on language. The Danish word for both medical experiment and medical trial is 'forsøg'. From the mediated articulations it is not possible to distinguish between these two kinds of 'forsøg'. In the following, I will primarily use the term 'experiment', since I find it the most suitable terminology in this context. In a medical sense, however, it is probably most correct to sort the activities of Lindkær Jensen under the headings 'clinical experiment' and 'experimental treatment', but it will become clear that these definitions themselves, and especially the lack of distinctions, are crucial to our understanding of the way these experiments are articulated.

A promising experiment suspended

On July 1, 1999 the two large national broadsheets both feature a story about the extraordinary decision to suspend the clinical experiment with gene therapy at a hospital in Århus. The story is articulated in two different ways in the two pa-

[63] "Gene therapy against liver cancer" *Jyllandsposten* 22 September 1998.

pers. In *Jyllandsposten* it is a problem for patients: "Hope taken from cancer patients", whereas *Politiken* focuses on the role of the researcher: "Sloppiness stops gene experiment"[64]. These two different ways of articulating the story continue to divide the inscriptions throughout the following months. The case is presented as both a story about possible mistreatment of patients and a story about a badly conducted research project.

Early coverage presents the head of the Department of Liver Surgery as the trigger of the story, because he has informed the directors at the hospital that there were too many irregularities in the gene therapy experiment. Safety procedures had apparently been contravened, the clinical protocol of the experiment had not been followed, and patients had been sent to London for treatment in return for large financial donations. According to the media this had lead to the suspension of the experiment and the resignation of Steen Lindkær Jensen, the doctor in charge. In the following weeks the articles concentrate on a group of 8-10 patients, now barred from gene therapy because of the suspension. Since these patients had apparently been promised gene therapy within the frame of the experiment, an extra-ordinary emergency plan for the treatment of these patients is organised.

Two different articulations of the case are subsequently developed. This first type is primarily articulated in *Jyllandsposten,* which covers the story in many more articles than the other newspapers. This is the concrete history of the experiment in articulations of 'new revelations' about 'Cancer patient denied free therapy', 'Discarded virus used for two years', 'Professor faxed money claim to patient', 'Numerous violations in gene case' and 'Evidence ruined in gene case'[65]. As some of these headlines suggest these articulations bear much resemblance to the unfolding of a detective story with *Jyllandsposten* as the central character. They reach a kind of culmination when a report from a team of five professors is made public in the beginning of September. Apparently the report criticizes the management of the experiment, but since Lindkær Jensen has resigned no further action is necessary:

[64] Front-page in Jyllandsposten 1 July 1999 and second page in Politiken 1 July 1999
[65] *Jyllandsposten* 27 July 1999, *Jyllandsposten* 6 August 1999, *Jyllandsposten* 8 August 1999, *Jyllandsposten* 9 August 1999 and *Jyllandsposten* 12 August 1999.

> In a long expected report about the disputed experiments, Århus County and the University of Aarhus state that most of the accusations put forward by the management of ward L at Århus municipal Hospital to the management of the hospital in May were justified. Among other things security stipulations were neglected, demands for financial donation in connection to treatment have been made and there was no documentation of the purity of the preparations that patients received. Still, the report recommends that the responsible professor, Steen Lindkær Jensen, is not met by a police indictment and, since he is no longer employed by the hospital, it is superfluous to contemplate possible disciplinary sanctions.[66]

The second overall type of articulation focuses on those, more general, aspects of the case, which suggest it is a research project gone wrong. The Danish Medicines Agency (the body in charge of approving medicine and treatment) is criticised for granting its approval to the experiment. This criticism leads to general articulations of problems in the regulation of these kinds of experiments. The experiment of Lindkær Jensen is presented as a messy combination of both a real research project, subject to one kind of regulation, and an experimental treatment, which is defined as a license to use a concrete treatment on a concrete patient. A central issue in this context is whether experimental treatment ought to be licensed when an ordinary research project is simultaneously undertaken. This issue is presented as especially problematic because experimental treatment is not subjected to the same strict process of ethical evaluation (by the system of scientific ethical committees) as ordinary research projects. A mixture of the two can therefore be seen as a way of evading the regulations on medical research:

> Assistant professor of law at the University of Copenhagen, Lars Adam Rehoff, finds the approval granted by the Danish Medicines Agency discomforting. "- If the Medicines Agency was aware that a scientific experiment with the same gene therapy at the same hospital had already been approved, the general approval comes close to a circumvention of the regulation on experiments. A practice like that should be stopped," he says.[67]

[66] "Research mess at Århus Hospital" Jyllandsposten 7 September 1999
[67] "Agency approved of gene treatment" *Jyllandsposten,* 8 July 1999.

Later, in the beginning of October, the experiments of Lindkær Jensen are again subject to mediated attention. This time it happens on the basis of the publication of an internal report about the effect of the particular gene therapy in this experiment. The mass mediated presentation of this report is interesting, because it is articulated in completely contrary ways in different newspapers. In *Jyllandsposten* the report is an authoritative scientific statement, proving that the experiments had no effect. In *Ekstra Bladet* on the other hand, it is construed as part of a smear campaign, with different actors indicating that it is not scientifically sound. At the same time the local scientific ethical committee is reported to call for an indictment of Lindkær Jensen for a breach of the legislation concerning conduct of medical research:

> After two months of independent investigation the research ethical committee has asked the prosecution to charge the responsible professor in the gene case from Århus Municipal Hospital (...) The committee has reported the professor to the police because it claims that the treatment [of patients outside the protocol] illegally were similar to a research experiment. This has happened without the knowledge of the patients and without an official licence to carry out this kind of experiment.[68]

The background to this call for an indictment is that an ordinary research project, as mentioned, has to be authorised by the system of Scientific Ethical Councils, whereas an experimental treatment has to be licensed by the Medicines Agency. Lindkær had only obtained the latter regarding some patients, but apparently he had been collecting information in a way, that suggested a scientific research purpose. As far as mediated articulations of Lindkær Jensen's experiments, this indictment seems to be the end of the story.[69]

The foregoing is a short version of the story as it is articulated in *Jyllandsposten, Politiken* and *Ekstra Bladet*. In contrast to the previous coverage of gene therapy, it emerged that apart from a couple of small notes, *Information* did not articulate the story about Lindkær Jensen. In this context it should be noted that the frequency of coverage in the other three papers also varies, with *Jyllandsposten* as the paper that articulates the story most frequently.

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[68] "Gene researcher reported to the police" Jyllandsposten, 25 November 1999.
[69] This indictment was later dropped by the police and no further action has been reported

It did not, however, make sense to use the same preliminary distinction between technical, regulatory and wider societal aspects exactly as it was employed in the analysis of cloning. Instead, the most obvious distinction in the articulation of the experiment seems to be whether the focus is on the experiment as a problematic treatment of patients – and hereby on the therapeutic aspects of gene therapy – or on the experiment as a problematic research experiment – in which case a distinction between technical and regulatory aspects has proved fruitful.[70] As mentioned earlier, however, the articulation of the experiment with gene therapy is more complex with different articulations of problems and solutions. The focus on therapeutic, technical and regulatory aspects, therefore, produces sets of competing scripts.

Therapeutic aspects

The first set of scripts is found in a number of articulations focusing on the therapeutic aspects, that is, the use of this technology as a cure for cancer. Especially when the story breaks on the first day the treatment of patients seems to be central to the articulation of the experiment as news. It should be noted that there generally seems to be mediated confusion about which kinds of authorisation has been obtained to treat different patients. There is seldom a clear distinction between different kinds of approvals, experiments and patients. In this context, it should be remembered that the present account focuses on the mediated articulations in order to see the productive pattern of inscriptions, rather than the shortcomings of the way these articulations present a different reality outside the media. Therefore, having noted these absent distinctions, the focus will be on the actual articulations, rather than the lack of clarification. And with this focus it is interesting to note that the missing distinctions can function as discrediting elements in the articulation of Lindkær Jensen's experiments:

> The experiment originally included six patients. But, parallel to this, the doctors have treated five to ten patients, who were not

[70] An obvious script that I do not deal with in what follows is the above-mentioned detective story, where the journalist or the paper is cast in the role as the active investigator. This script is common in present Danish journalism (Lund 2002 and Pedersen & Horst 2001), and in this context I view it as a generic script, which is used in connection with all media stories articulated as some sort of scandal. It does therefore not say anything in particular about the articulation of gene technology as such and I will leave an analysis of this script out of the present context.

> included in the project. The treatment of these patients has therefore not been authorised by the scientific ethical committee. Furthermore, at least one patient has felt pressured to pay 15.000 British pounds to an account in London as payment for the unauthorised treatment.[71]

In this way the story is presented as a story about a doctor not managing his relationship with his patients according to Danish legislation. Since it is mandatory to have experiments on human beings approved by the scientific ethical committee, the information that patients have been treated outside the guidelines of the experiment implies that Lindkær Jensen has been violating current restrictions on experiments with patients and abusing his position of power in order to make illegitimate financial demands of the patients.

At this point, however, there seems to be a dilemma in the mediated articulations. It is one thing is that the activities of Lindkær Jensen are shady and subject to investigation, but the suspension of the experiments has had the added consequence that the involved patients have been barred from gene therapy previously scheduled. This suspension is presented as highly problematic for the patients who are in turn presented as completely dependent on this therapy for survival:

> Advanced liver cancer is equivalent to a death sentence, but scannings of the patients in professor Lindkær's experiment showed unique results. Several people spoke of an out right miracle. About the very solution of the mystery of cancer. But if the experiment were to stop now, the patients' cancer could spread again within few weeks, while the staff at L2 would be unable to do anything. Without new inoculations of gene-manipulated virus the patients would die. The staff knew this and so did the administration. Also the managing staff at the ward, which had forwarded their knowledge to the executive office [and triggered the suspension of the experiment], realised that this would mean death of the patients. Still they had chosen to talk about the professor's conduct of the experiment.[72]

[71] *Politiken* 1 July 1999: "Sloppiness stops gene experiment".
[72] *Jyllandsposten* 4 July 1999: "Professor under pressure".

As the very dramatic style of this quote underlines, the story is here presented as a drama about individual doctors who take responsibility for deciding upon patients' life and death. At this point many articulations leave open the question of who should be cast in the roles of hero and villain. Is Lindkær Jensen a villain because he has abused his position of power and failed in his responsibility towards the patients, or is he a hero fighting to cure patients by all available means? It is however clear, that patients are articulated as the unfortunate party. They are the ones who are seriously ill, regardless of whether Lindkær Jensen was trying to rescue them or take advantage of their situation. Gene therapy, on the other hand, is articulated as a cure for cancer and the main problem is therefore to find a way of securing patients access to the therapy. The context of great expectations, as presented in the pre-script, means that gene therapy can be inscribed as an unproblematic tool in the battle against cancer. As the articulations proliferate they seem to follow three different scripts that construct the parts, or roles, as victims, heroes and villains differently. In the following sections I will present these scripts.

The script of patient rights

During the first weeks, it seems that the mediated dilemma about the withheld treatment finds a dramaturgical solution when the interest is concentrated on the small group of 8-10 patients. Apparently they had been promised gene therapy by Lindkær Jensen, but had not received it before the suspension. On this account the authorities are seen as saviours when they establish an emergency plan in order to fulfil this promise. This plan is subsequently closely followed in the media. It appears to be quite difficult to acquire a portion of manipulated virus to treat the patients, and the efforts by the authorities to secure the continued treatment is articulated as an important and prominent story:

> Negotiations in London secure cancer patients continued treatment with gene therapy (..) states chairman of the health care committee in Århus regional council, Knud Erik Særkjær [the liberal party] to Ritzau. (…) Særkjær received confirmation by phone from London.[73]

At the same time as the 'negotiations' over access to manipulated virus is covered in minute detail, the principles behind this 'emergency plan' is also dis-

[73] *Politiken* 11 July 1999: "Patients secured gene therapy"

cussed. It is presented as extraordinary to offer this treatment outside the scope of a research experiment, but the emergency plan is commonly articulated as a justified solution. The epithet 'emergency' as applied to the plan is justified by articulating the patients as victims, with a rightful claim to the gene therapy, since they are seriously ill and had previously been promised this treatment:

> Chairman of the central scientific ethical committee, Kamma Bertelsen, is in principle against permitting gene therapy as treatment, when there is no documentation of effects and side effects: "The fact is that nobody knows anything about the treatment. But because an unfortunate situation has arisen, where ten patients have been promised hope, I find it justified that they receive treatment as long as the authorities will vouch for it" she says[74].

More common, however, is that the emergency plan for continuation of experimental gene therapy is presented almost as if it was a routine treatment of patients. In this way, the experimental and highly insecure status of this therapy is not articulated as a problem. Rather it seems to be of paramount importance to ensure that these patients receive the therapy they have been promised since they are victims in a double sense: They are ill, and on top of this they have been promised and then denied what seems to be an effective therapy. None of the mediated articulations of this emergency plan seriously question whether the gene therapy will work at a basic level, but seem to take for granted that it will have some sort of positive effect. The articulated problem is not whether the therapy will work as treatment, but rather whether the patient will get access to it:

> As late as last Friday this patient envisaged his own death by September 1st at the latest, if the suspended treatment was not resumed: - I know that otherwise I will only have a month or two to live" said Peter Balle. – But now I believe I have a chance.[75]

On this basis I have termed the pattern in these inscriptions *the script of patient rights*. It is characterized by a focus on patients and the treatment they receive or do not receive in the health care system. The issue is not whether the therapy

[74] *Jyllandsposten* 10 July 1999: "Tightened regulations
[75] *Ekstra Bladet* 7 July 1999: "Now I believe in life again"

will work, but rather their rights to receive a treatment when promised one. Once this promise is made, the health care system is obliged to deliver. In this way the patient is a user with certain legitimate rights and the health care system is contractually obliged to fulfil certain obligations towards the patient.

The script of comportment

When the little group of patients had received gene therapy according to this emergency plan, the articulations move the focus back to the whole group of patients treated by Lindkær Jensen. As mentioned above, *Jyllandsposten* continuously articulates new 'disclosures'. One recurrent issue is the clinically and technically careless execution of the experiment. For example, it was alleged that the genetically manipulated virus in use had been contaminated. Another issue is the apparent financial demands made of the patients, which is articulated as particularly morally reprehensible:

> The researchers responsible for a cancer experiment at Århus Municipal Hospital has on a number of occasions charged incurably ill patients 170.000 Danish kroner in exchange for treatment with gene therapy. The demand for money was put forward by the British-Egyptian liver specialist Nagy Habib and passed on by the Århus professor Steen Lindkær Jensen. This is revealed by documents that Jyllandsposten has come into possession of."[76]

These disclosures of demands for payment raises a fundamental question about whether Lindkær Jensen has honoured his obligations as physician treating seriously ill patients. In Denmark health care service is free of charge; introducing the question of paying for a treatment for cancer is articulated as decisive and very problematic, although the problems are presented in different ways. At times, Lindkær Jensen and his partner in London are articulated as common criminals trying to defraud patients out of substantial sums with the offer of an unproven, and possibly ineffective, therapy. And even if this accusation is not articulated directly, the two doctors are still frequently presented as being morally in the wrong:

> Patients with advanced liver cancer were promised a 70 per cent chance of positive results, when they came to see Nagy Habib in

[76] *Jyllandsposten* 8 August 1999: "Cancer doctors demanded money"

> London. According to relatives the promise was made by the British-Egyptian liver surgeon in connection with the payment. (…) Chairman of Danish Cancer Society, Jens Kristian Gøtrik, criticises the liver doctors for having suggested great prospects to the patients: "It is quite unfair to suggest great prospects to very ill people, when you don't have any documentation that it is true and on top of that to demand money for it." (…) "The doctors have no guarantee or documentation that the treatment will help. Still you suggest great prospects. Anyone would sell all their belongings and this is why it is close to deception", says Yvonne Herløv.[77]

This quote presents patients as subjects who would be prepared to do anything in order to be cured of cancer. In this vulnerable situation it is especially important that doctors do not take advantage of the situation and exploit their position of authority to further selfish interests. Since cancer patients are unable to look after their own best interests, it is of vital importance that doctors assume responsibility for the patients, both in concrete experiments and in medical research in general:

> As a responsible doctor you withhold comments on research until it is concluded and you know the facts. Otherwise you risk making a lot of unhappy people insecure and confused and creating false expectations. Mortally ill patients' time is precious," says Kamma Bertelsen.[78]

By articulating the time remaining to dying patients as too precious to squander on false expectations, a particular moral is articulated, where the important thing is to face one's fate. It is important that dying patients acknowledge that their time is running out instead of clinging to a false hope of being cured. These articulations imply that scientific (statistical) evidence is equivalent to the truth, and that disregarding statistics is the same as believing in fairy tales. So, rather than occupying themselves with the unrealistic expectation of being cured, they ought to focus on the really important task, which is to understand their fate and come to terms with it. In this way patients are presented as subjects in need of guidance. They are easily led astray by a false hope, because they are trying to avoid their fate.

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[77] *Jyllandsposten* 22 August 1999: "Patients given good odds".
[78] *Jyllandsposten* 25 July 1999: "Doctors criticise Århus-politician

As a counter weight in this situation, doctors are articulated as subjects who need to assume the responsibility for guiding patients in the proper direction. To be a responsible doctor is to avoid inspiring unrealistic expectations or false hopes. This is a central issue in many articulations of Lindkær Jensen as an irresponsible practitioner of medicine. He did not behave properly since it was irresponsible to induce false hopes, when the patients should have been guided towards accepting their fate. In contrast to Lindkær Jensen, however, other researchers are more responsible. Simultaneous to the case of Richard Seed, these articulations employ the distinction between proper researchers and outsiders, such as Lindkær Jensen, where 'proper' and responsible doctors ought to behave according to certain norms:

> Doctors and researchers behind clinical experiments are often under pressure from dying patients who view the experiments as a last chance. (…) "As a doctor it can be very difficult to say no. The temptation to venture outside the protocol is extremely high," says Jens Astrup. "But from the point of view of medical research one must insist that experiments with experimental treatment have to follow the protocol strictly. Otherwise we will treat a lot of patients without knowing for certain whether the treatment has worked. In the worst case we would be tempted to use a lot of resources on a promising treatment, which is later demonstrated to have no effect, and then we have given patients a false hope," says the professor.[79]

As exemplified in this quote the battle against cancer will only be successful if doctors and patients behave according to certain prescribed roles and rules. In these inscriptions patients are articulated as vulnerable subjects who will want any possible treatment, but where it is important that they face the facts and realise their destiny. The role of the patients is therefore to acknowledge the scientific claims of medicine as the truth about their destiny and to face this fate and realise that time is short. The understandable, yet 'irresponsible', wish of patients to receive any treatment, should be countered by responsible doctors, who put the situation in its proper perspective. Doctors are hereby presented as the active subjects, responsible for order, so that patients do not expect to be cured, when the statistical chances are minimal or non-existent. It is very typical that researchers and medical doctors are articulated as sources of authority in this

[79] *Jyllandsposten* 25 July 1999: "Doctors under severe pressure from patients"

type of inscription. Since both patients and doctors have to behave according to pre-defined roles and rules of behaviour, I have chosen to term this pattern in inscriptions the *script of comportment*. Central in this script is that both doctors and patients have to behave responsibly in the face of cancer and not go around expecting cures when they have not been scientifically proven.

The script of heroic action

In stark contrast to these inscriptions of the importance of responsibility and facing one's fate, other articulations present the patient's battle against cancer completely differently. In these articulations the high expectations seems to be a positive resource for patients struggling to find a cure for their cancer. In an interview, Steen Lindkær Jensen denies the accusations of financial gain as his motivator:

> The professor emphasises that money was never his incentive. It was the patients and the hope of saving lives. "Many of them were young people, as young as 30 years, who had been given up on by everybody else. They had been told that it was over. But they deserved a chance and I tried to give them that," he says.[80]

Rather than false expectations, Lindkær Jensen is here talking about a 'last chance' for patients that nobody else cares about. And he is not the only actor associated to this kind of articulation. Some of his patients and their relatives are also presented as sources in a presentation of his experiments as a last chance. In this connection the articulation of Lindkær Jensen is completely different from the previous scripts. Rather than a criminal outsider or an irresponsible practitioner of medicine, he is presented as a hero and a genius. Normal rules of conduct should not apply to him because his efforts to cure cancer patients are so important that they allow for smaller mistakes and carelessness:

> Professor Lindkær is really a friend of the patients. It may be that he has left some things in a mess and that safety procedures have not been followed and that the manipulated virus was contaminated. But what does it matter, when it helps," says the son. "My father has gained 10 kg after the gene treatments. Now he can fix both the house and the garden and he couldn't do that three months ago," says the son and compares Lindkær to Einstein,

[80] *Jyllandsposten* 11 July 1999: "Professor speaks out"

> who also needed help with practicalities from those around him. "Who wouldn't take a risk, if you had been told you were going to die," says the son.[81]

Two things are worth noticing in this quote. First of all the treatment is presented as a working therapy, or at least it is not seen as problematic. But secondly, this is not a decisive fact. It does not matter fundamentally, whether the chances are large or small, in the judgement of the experiment. Even the slightest chance is reason enough to justify the experiment. What was 'false expectations' in the previous inscriptions is here articulated in a positive way as 'a last hope'. Correspondingly Steen Lindkær Jensen is praised for offering this last chance. He is a hero.

> My wife did not make it long enough to receive gene therapy, but she had a hope that she held on to for several days. Then the cancer tightened its grip and by the end of March it was over. Thank you Steen for your fight to change the establishment, for your efforts to find new means in the fight against this terrible disease. I am convinced that you will find a place where your will to help mortally ill patients will be appreciated![82]

Whereas medical researchers serve as sources primarily in articulations of Lindkær Jensen as an irresponsible practitioner of medicine, the picture is more diverse when it comes to patients. It seems that the different inscriptions of Lindkær Jensen are rather closely associated with the individual progress of a patients' disease. Two relatives (of dead patients) are presented as sources in articulations of Lindkær Jensen as a common criminal, but many patients present him as a true hero fighting for the cure of the patients in the manner illustrated by the foregoing quotes. Two of the patients interviewed have apparently been cured of their cancer and their articulation of Lindkær Jensen and his partner Habib is very positive. But the presentation of these doctors as heroes seem to lead to an articulation of other actors as villains:

> I feel fine and the British-Egyptian professor, Nagy Habib has told me that I do not have cancer in the liver any more. The ten tumours have disappeared after my gene treatment and I feel privileged that

[81] *Jyllandsposten* 22 August 1999: "The price of hope"
[82] *Politiken* 25 July 1999: "Thank you for the hope"

> I had the 210.000 kroner that my treatment has cost me. But I think it is scandalous that Århus Municipal Hospital is so oriented towards economy that I survive because I have the money, while the person in the next bed dies.[83]

It is interesting to note how the saving of this patient is articulated as almost dependent on luck. He was privileged to have the money, while the imagined patient in the next bed was not so fortunate. The hospital, on the other hand, is presented as a system that ignores the interests of the patients and acts instead on financial grounds. In this way the health care system seems to be a kind of inhibitor to the cure of cancer, rather than a system for taking care of patients. Thus, in order to be able to defeat cancer, it is necessary for the patients also to fight 'the system', because the establishment and its book-keepers have abandoned the chance of curing cancer on the grounds of what is seen as irrelevant:[84]

> The case tells us something about bookkeepers and a machinery of power, which runs whatever way the wind is blowing. The victims are the mortally ill cancer patients, which on top of their harsh destiny have experienced that the treatment was suspended, resumed and stopped again while the parties involved in the smear campaign against Lindkær ran to and fro with vague rumours and hear-say. Formalities and loose allegations were more important than the cries for help of mortally ill patients, and the continuation of a treatment that has given them one last hope. Now the politicians and the hospital promise to turn over a new leaf. The treatment will be resumed immediately. But without Steen Lindkær. He was cut out by the bookkeepers. They way the system works, they win almost every time.[85]

On the basis of these quotes I have called this pattern in inscriptions the *script of heroic action*. In this script, the main roles as hero and villain are completely opposite from the script of comportment. Here Lindkær Jensen is a hero because he fights to give patients a last chance, whereas the health care system is the main villain, since it is bureaucratic and does not serve the interest of the patients. The patients on the other hand are still, of course, victims of cancer, but

[83] *Ekstra Bladet* 19 September 1999: "Liver cancer patient cured with genes"
[84] This type of story about the 'little man' against the system is traditionally associated to *Ekstra Bladet*, but it should be noted that the previous quotes are from other papers.
[85] *Ekstra Bladet* 7 September 1999: "The system requires bookkeepers"

they are not in need of guidance in order to face their destiny as in the previous script. Rather it is articulated as natural that they fight in order to get a 'last chance'. It is also interesting to see, how this 'last chance' is really only a *possible* chance. Since patients cannot rely on the health care system for a fair treatment, they have to count on heroic action from men like Lindkær Jensen as well as their own ability and good fortune - finding Lindkær Jensen, travelling long distances to receive the therapy, and paying the bills out of their own pockets.

Summarising we can say, that the articulations of the therapeutic aspects of the experiment presents gene therapy as a tool in the ongoing battle against cancer and are dramatised as stories about heroes and villains trying to rescue concrete patients from imminent dangers. This type of articulation follows three different scripts that construe patients and doctors in different roles. In the script of *patient rights*, the patients are presented as subjects with a right to receive treatment in the health care system. The problem is the broken promise of therapy and a re-establishment of the contractual order is, therefore, the solution.

In the script of *comportment* Lindkær Jensen is articulated as a villain taking advantage of the vulnerable situation of patients in disregard of his duty as a responsible doctor. In this script patients are irresponsible subjects unable to look after their own best interests. And although the doctor can be tempted to follow the wishes of the patient it is unacceptable since it induces false hopes instead of leading the patients on the right path. The basic problem in this script can therefore be seen as a lack of recognition of pre-defined roles and responsibilities, and the solution is to enforce these roles and rules. Only responsible action will make patients face their destiny, and make doctors fulfil their function.

In contrast to this, the third script of *heroic action*, articulates Lindkær Jensen as a hero fighting to cure patients in spite of resistance from the established health care system. In these inscriptions treatment of the patients is the only important issue and even a small hope is worth fighting for. Central to this second kind of script is a belief in chance rather than rule-following behaviour. Lindkær is a hero, because he is taking chances in the struggle against cancer instead of just adhering to statistically established predictions of incurability. Patients are correspondingly articulated as legitimately trying to win the fight against cancer by believing in 'the last hope'.

Figure 4.2

Focus on therapeutic aspects	Inscription of Lindkær Jensen	Patients	Problem	Solution
Patient rights	Context-dependent	Subjects with rights to treatment	Broken promises of therapy	Reestablishment of contractual order
Comportment	Irresponsible villain	Victim in need of guidance to accept fate	Lack of recognition or respect of rules and roles	Enforcement of rules of responsibility
Heroic action	Acting hero	Subject pursuing chance of luck	Lack in systems ability/willingness to fight cancer	Belief in and support of heroes of action

Technical aspects

As mentioned in the shorter version earlier, many of the mediated articulations focus on the general aspects of the experiment as a research project gone wrong. Initially the dominant theme is the professional credibility of Steen Lindkær Jensen and his partner, Nagy Habib. Subsequently the accusations diversify so that actions and merits of several authorities are put in question also. As a general pattern in this diversification it seems relevant to distinguish between articulations of technical and regulatory aspects.[86] The articulations of technical aspects focus primarily on the question of effect. Did the gene therapy have positive effect on cancer patients in this particular case and will it be an effective therapy in the future? The articulations of regulatory aspects focus on the question of legality and control. Was the experiment conducted according to current regulations and how should regulations be designed in order to prevent future problems? I will deal with these two kinds of articulations separately in the following because the patterns in these articulations also lead to the identification of different scripts with different articulations of problems and solutions

The first set of articulations focus on gene therapy as a technical issue, and the central issues focus on effect, that is, whether it works as a therapy for cancer or not. As early as three weeks after the first mediations of problems in the experi-

[86] It is worth noting that with one exception I have not found any equivalent to the focus on wider societal aspects in the coverage of this scandal.

ment, a medical doctor from another hospital states that the experiment with gene therapy on liver cancer has not had any effect:

> The results from the scientific experiments with gene therapy at Århus Municipal Hospital show no effect on patients with advanced liver cancer. So far four patients out of a group of five have been MR-scanned after treatment at the hospital with gene manipulated virus, and in none of these patients have the tumours diminished, states the head of the MR centre at Skejby Hospital, head of department, dr.med. Thorkil Christensen.[87]

This statement, however, does not receive a lot of attention in the subsequent media coverage, where the question of effect in the particular experiment seems to be overshadowed by articulations of general expectations towards future effects of gene therapy. Later, in the beginning of October, interest in the effect of the particular experiment is renewed, as doctors at the Municipal hospital have finished an internal report, which is primarily presented as a scientific statement, showing that the experiment did not have effect:

> When county mayor Johannes Flensted Jensen (Social Democrat) announced after the September report that experiments with gene therapy should be resumed in Århus County as soon as possible, the doctors at the wards of radiotherapy and of liver treatment decided to systematically review the results of the gene therapy on liver cancer patients. "The result is important, because there are still cancer patients who think that this treatment is the one and only for them," says chief consultant Anne Grethe Jurik from ward R at Århus Municipal Hospital, where the report has been prepared. Today it is clear, that the gene experiment will not be resumed. 13 out of 31 patients are dead, while the disease has worsened in 11 other patients. In a single case the condition of the patient is unchanged, while it has been impossible to establish any change in the last six patients. The scientific material was too insufficient.[88]

As mentioned previously, this report is presented in a variety of ways. In *Jyllandsposten* and *Politiken* the lack of effect is articulated as a fact in the manner

[87] "Gene therapy without effect" Jyllandsposten, 24 July 1999.
[88] "Gene therapy without effect" Jyllandsposten, 3 October 1999.

of the example just given; the articulation in *Ekstra Bladet*, however, fundamentally questions this status. The difference is a very appropriate illustration of differences in the inscriptions of problems when the focus is on technical aspects of gene therapy.

The script of anti-scientific information

The most striking feature of the articulation in *Ekstra Bladet* is that the report is not presented as scientific documentation, but rather as part of a political power struggle and a smear campaign against Lindkær Jensen:

> Two chief consultants are now accused of misleading the public and manipulating scientific facts – probably as part of a power struggle with the aim of stabbing a knife into the back of the leader of the ground-breaking research project, cancer researcher professor Steen Lindkær Jensen. (..) Nor does Knud Erik Særkjær [chairman of health service committee in Århus County] mince his words, when he criticises the consultants for misleading of the public. –"Those gene therapies have to be continued, not opposed. It is the future. There is no doubt, that there were good opportunities in them," he says. – "This is also why it is regrettable that Jurik publicly states that they don't have an effect. Primarily on account of the 18 patients, who are still alive. That is ethically tough, I must say." On the question of whether the whole case basically is about a power struggle between consultants, who cannot stand each other, the committee chairman answers: "well yes, that has a lot to say."[89]

Although this quote articulates scientific evaluations of a research experiment, it seems to move the focus away from a discussion of scientific knowledge towards a question of power relations. The scientific evaluations ascribed to the chief consultants are disregarded as false and guided by extra-scientific reasons. Whereas the two broadsheets *Politiken* and *Jyllandsposten* articulate this statement from researchers as a scientific fact, the articulation in *Ekstra Bladet* does not present these sources as having credibility. Instead of drawing on the assessments of medical doctors, they articulate the politician, Særkjær, as a credible source in explaining the contents of the report. This statement does not refer to any kind of scientific argument and in this way the articles in *Ekstra Bladet*

[89] "Reprimands to consultants in the gene case from Århus" *Ekstra Bladet,* 15 October 1999.

seem to reject the scientific claims to knowledge and explain the whole case in terms of a power struggle – hereby presenting the problems as caused by political actions rather than scientific knowledge. Furthermore the unproblematised future expectations articulated by Særkjær should be noticed as well as the fact that he is presented as the credible source on this.

Quantitatively speaking, this positive articulation of a definite effect is not very prominent in the coverage; it is primarily articulated in *Ekstra Bladet.* It is interesting though, that as far as media coverage goes this dispute is never settled and the position presented in *Ekstra Bladet* is qualitatively very important. It demonstrates a distinctively different way of inscription, where gene therapy is presented as a working therapy and it is claimed that the experiment was stopped for political reasons as part of a smear campaign against Lindkær Jensen. Thus, the authority of scientifically established knowledge and its principles of inquiry are not articulated as credible and trustworthy. Rather these authorities are disqualified since they only conceal a power struggle, which is presented as the basic explanation of the problems in the experiment. In this way, the scientific assessment is disregarded as false and substituted with a politically informed explanation. On this background I have chosen to term the script used in *Ekstra Bladet* the script of *anti-scientific information*. The basic problem in this script is the power struggle, with some doctors trying to stop people like Lindkær Jensen from achieving the medical breakthrough of finding a cure for cancer. In this way the anti-scientific information script is closely connected to the script of heroic action. They both articulate Lindkær Jensen as the hero stopped by the establishment, but in connection to the evaluation of the effect of the scientific experiment it leads to a general articulation of disregard for scientific authority. The solution to this problem of power struggles, however, is not clearly articulated, as it seems that the demonstration of the problem is the most important. Yet, the implicit solution would be a dismissal of the smear campaign and an acknowledgement of the heroism of doctors like Lindkær Jensen.

The script of great expectations

There is one feature of *Ekstra Bladet's* coverage, which can also be found quite often in the other papers. This is the great expectations and an unquestioned and unfettered hope vested in gene therapy. The politician, Særkjær, who is quoted in *Ekstra Bladet* above, is a common source in other newspapers articulating similar arguments about the unquestioned great prospects for the future. But he

is not the only actor associated with these future expectations. Fellow members from the liberal party are articulated as equally optimistic, but also politicians from other parties are connected to this view. For instance the mayor of Århus, who is a member of the Social Democrats, is also quoted as having no doubts about the great promise offered by gene therapy:

> Bad results with the ongoing gene therapy experiments on liver cancer patients at Århus Municipal Hospital will probably not make politicians abandon new projects with gene therapy. The largest parties of Århus County still backs the experiments (..) "I want to see the report [proving no effect] before I comment on it," says county mayor Johannes Flensted Jensen, "But I have no doubt that gene therapy will be a future form of treatment. Therefore it is important that we get going again, possibly in combination with other forms of treatment like chemotherapy and under more controlled conditions.[90]

In articulations like the previous, it is possible to say that (the lack of) documented effect is made up for by a faith in some future effect as the argumentative support. It might be, that the therapy has not yet proved effective but this problem is presented as merely a question of time, so the concrete experiment is thus one step on a road that will unquestionably lead to the future success. This preserved faith in the scientific development is often put forward without references to scientific documentation, as in the previous quotes. In other articulations, however, it is explicitly based on scientific knowledge, as in the following quote from an opinion piece. The writer has not revealed his professional background, but from the arguments and language used it seems to be a medically trained person:

> So far the means of treating widespread liver metastases have been limited, but internationally a breakthrough in cancer treatment is probably emerging, including treatment with gene-manipulated virus. This treatment is based on the fact that many cancer cells have a genetic defect in that part of the genome called p53. This gene is normally plays a discriminating role in the regulation of cell division and the control of natural destruction of cells. In order for a tumour to grow it is necessary both that the cells can divide

[90] "Continued support of gene therapy" Jyllandsposten 4 October 1999.

> unrestrained and that they do not disappear again by cell death. By injecting a virus, which has had a particular small part of its genome removed, directly into tumours or blood vessels that lead into tumours, it is possible to induce cell death in those cancer cells, which have the mentioned defect in the p53 gene, while normal cells are not damaged. This is clearly shown in cell cultures and mice with implanted human tumours. In an American experiment, where 25 patients with an advanced form of lung cancer participated, this form of treatment has demonstrated positive response in 8 percent and stabilisation of condition in 64 percent, while it didn't have effect in 28 percent. (...) I am sorry for Danish cancer patients, because a splendid initiative turned into a truly damned Århus-story [equivalent to the wise men of Gotham]. Many people will probably profit from treatment with gene-manipulated virus in the future. (...) If there is a scandal in this story from Århus, it primarily consists of destroying a necessary clinical experiment in this country.[91]

The reason for quoting this at length is that it is a clear-cut example of the great expectations towards gene therapy where the poor results in Århus is disregarded as an indication of general problems in gene therapy. Rather, great expectations are articulated as resting on scientific evidence, but it should not go unnoticed that from a scientific viewpoint it is possible to be somewhat critical of the statistical evidence that seems rather narrow. In the mass mediated context, however, it has the function of establishing the great expectations on scientific authority, so that the high hopes can be articulated as based on preliminary scientific results. Science has brought us this far, so it is only natural to expect a genuine break through in the near future. These inscriptions of gene therapy as the continued source of hope for a cure for cancer can be seen as the most obvious continuation of the pre-script fostering great expectations. They articulate gene therapy as an unquestioned solution to the problem of cancer (and disease in general), and the problems with lack of effect is articulated as technical problems that must be expected to disappear shortly. On this background I have chosen to term this the *script of great expectations*. In this script, problems, both in terms of technical problems and problems of disease in general, stem from the fact that scientific progress has not yet come to its fulfilment, but if we just wait

[91] "A truly damned story from Århus" Jyllandsposten 4 September 1999.

and see, science will satisfy our expectations and bring effective solutions to problems of disease and suffering.

The script of scientific comportment

It might be expected that the use of scientific knowledge in order to sustain unfettered hopes for the future would often be articulated in association with actors like researchers and members of the medical scientific community. But many of these sources seem to put a lot more emphasis on the necessity of hard work and conditioned expectations, instead of an unconditioned faith in science:

> Genetic material will probably be the drug of the future for all types of conditions. But realistically one should not expect an immediate miracle cure. It is more likely going to be a long and laborious process, which will only gradually begin to bear fruit," says one of the country's leading geneticists, professor and dr.med. Lars Bolund.[92]

The notion of a miracle is used several times as an articulation of what medical science is *not* about and what researchers do not do: They are not miracle workers. Quite on the contrary, as seen in the above quote, it is hard work to make the gene therapy effective. On this account it is necessary that patients do not expect too much, too soon. Rather, as shown earlier in the script of comportment, cancer patients must endure and accept that a miraculous cure is not the immediate consequence of this research:

> [Jens Astrup] has not lost faith in the idea that gene therapy will one day be used against brain cancer. "But first the methods must be developed, and the treatment must become more effective. Maybe it will take 10 years before we can expect a proper breakthrough," says Jens Astrup. The other experts that Jyllandsposten has spoken to also maintain that we shouldn't use the poor results to disregard gene therapy: "You have to take into consideration, that only desperately ill patients can participate in gene therapeutic experiments like the ones in Århus," says Claus Nerlov from Rigshospitalet. "The medical-ethical rules are so strict that you cannot give patients an experimental treatment with unknown effect, if you have another well tested treatment that works. The criterion to be included in the experiments is simply

[92] "Doctors under severe pressure from patients" Jyllandsposten 25 July 1999

> that all other forms of treatment have been given up. This means that it actually takes a miracle for the gene therapy to lead to full recovery. And it is always hard to launch a new treatment by producing a miracle.[93]

These articulations of the necessity of moderating expectations all seem to subscribe to a general sense of hope and progress brought about by medical science. Gene therapy is expected to be a future solution to the problem of cancer, but in these articulations, this solution will not just come about by itself. The development of effective solutions depends on hard work and the right attitude – and therefore 'we' have to be realistic about the rate of progress and discuss this new technology with due respect to its problems and shortcomings.

As already mentioned, this call for moderation seems to be prevalent in many articulations associated with medical researchers. Generally it seems to be linked to an idea of responsibility in the conduct of scientific research. Precisely because gene therapy is at a very early stage, is it important that all parties involved act responsibly and follow central prescriptions of the 'proper' scientific production of knowledge. Just like the call for patients to be responsible, medical researchers also have to behave properly. Following this argument, the experiment in Århus is seen as problematic because it violates the rules of conduct in proper scientific research. In this way it almost seems that it was medical science that was a victim in the experiments in Århus:

> The idea behind the disputed experiment is so good, that it should be tested in clinical experiments, but the course of events has been so messy and unprofessional, that it almost does more harm than good. We are in a preliminary phase with gene therapy, where we have to do all to make sure, that all results are documented in a correct fashion, so that we will get a clear answer to whether they work or not. By allowing experimental treatment outside the scientific protocols, the door to quackery in the health care service is opened," says Lars Bolund.[94]

The quote implies an expectation that gene therapy will become an effective solution in the future. But rather than presenting this expectation unconditionally,

[93] "The quest for geniality" Jyllandsposten 25 July 1999.
[94] "Doctors under severe pressure from patients" Jyllandsposten 25 July 1999.

it is presented as conditional on an ability to behave properly. Gene therapy will not work just because we keep experimenting with it. Rather it will only work if researchers behave properly and follow rules of conduct for the proper and responsible scientific production of knowledge. In this way these articulations appear very similar to the earlier identified script of comportment. The solution to cancer is dependent on all actors behaving according to their predefined rules. Researchers have to follow rules of conduct for research. Patients have to be prepared to wait and submit themselves to research experiments; the rest of us have to respect the hard work of researchers, rather than expecting miracles. I have therefore also identified the pattern in these inscriptions as a *script of comportment*, where the 'proper' rule-following behaviour, according to an appropriate code of conduct, is central for the great expectations to come true.

Figure 4.3

Focus on technical aspects	Evaluation of experiment	Problem	Solution
Anti-scientific information	Lindkær is an unrecognised genius and experiment was stopped for political reasons	Envy and power struggles between consultants	Rejection of smear campaign
Great expectations	One step on the road towards effective cures for cancer	Lack of scientific progress	Faith in scientific experiments
Comportment	Irresponsible experiment violating rules of scientific conduct	Lack of recognition and respect for rules in scientific search for knowledge	Enforcement of code of conduct

Summarising the patterns in the inscriptions of the technical aspects, it has been possible to identify three different scripts articulating different problems and solutions as I have summarised in the following table. They are similar in that they all expect gene therapy to be a possible future solution to the problem of cancer and other deadly diseases. But they differ in the way they present the problems in reaching this solution.

Regulatory aspects

The second set of articulations of the experiment as a problematic research experiment focuses on the regulatory aspects. It questions whether the experiment was violating existing regulation and also whether present regulation of research experiments is sufficient in order to avoid a similar case. After the first few weeks of interest in the emergency plan, many of the articles turn toward more general issues of legality and control in medical experiments including human patients. Central are the questions of whether it was illegal and who should be blamed, and these articulations reach a dramaturgical culmination in the beginning of September, with the publication of a report by five university professors, examining the scientific and regulatory aspects of the conduct of the experiment:

> The disputed experiments involving a gene manipulated virus for patients with advanced liver cancer will never be resumed at Århus Municipal Hospital. This is made clear by University of Aarhus and Århus County after the committee on health care service in Århus County Wednesday put an end to the case by accepting the newly published report about the case. "The experiment in question will never be resumed. If a similar project should be undertaken in the future, it will be with completely new protocols and on a quite different and more qualified basis," says head of Institute for Experimental Clinical Research at Aarhus University, professor Jens Christian Djurhuus, who is responsible for all health care research at the Århus Hospitals.[95]

Apart from the previously mentioned counter narrative in *Ekstra Bladet*, most of the articulations of the regulatory aspects subscribe to an interpretation of the experiments as more or less illegal and certainly on the edge of current regulation regarding research on humans. The legal problems are primarily articulated by stressing the necessity to conduct future research with much higher quality standards. There are, however, different conceptions of the way to ensure this higher standard. Whereas some point to a need to change the rules in order to prevent similar problems in the future, others articulate the current system of regulation as sufficient.

[95] "Cancer experiments will never be resumed" Jyllandsposten 9 September 1999.

The script of consumer protection

Many of the articles take as a point of departure the actual course of events in Århus, and subsequently articulate more general implications regarding the issue of control and regulation of medical experiments on patients in the health care system in general:

> The experiments with gene therapy at Århus Municipal Hospital were never controlled by the Research Ethical Committee in Århus County, which has approved the project. This became clear under a hearing in the committee for research in parliament, where minister of research Birte Weiss (of the Social Democrats) explained the suspended experiments with injections of gene manipulated virus in cancer patients. The government is prepared to change the rules, so that medical experiments with humans in the future will be subject to intensified regulation. "We must seize the opportunity to build confidence. Maybe it takes a change in legislation, maybe just a clarification. But it is a problem we have to solve," said Birte Weiss after the hearing. She is now expecting an initiative from the Central Research Ethical Committee on how to improve control of research.[96]

The question of building confidence is a common theme and it is articulated as important in order to secure patients' trust in researchers and medical research. The experiments conducted by Lindkær Jensen are seen as endangering the public's trust in science and scientific researchers, hereby creating difficulties for research itself in a very direct sense. If people do not trust scientific research, they will not partake in scientific experiments and this will be devastating to the future development of new therapies and scientific knowledge in general, since such development is dependent on the willingness of patients to volunteer for these research projects. On this account action has to be taken in order to re-establish the public trust in science:

> If we are to maintain the peoples' trust in scientific experiments we have to give the research ethical committees a practical way of following up on the licences they issue to the researchers. It would also be appreciated if it were complemented with random controls. As long as researchers know it can happen they will have a preventive effect. The ministers of health care and of research have

[96] "Intensified control with gene research" Jyllandsposten 10 august 1999.

> to do something about this. Otherwise we, the opposition, will press for action," says Ester Larsen.[97]

This quote illustrates a kind of articulation, where researchers are presented as subjects that have to be controlled in order to behave properly. In order for the patient to be treated fairly and decently it is necessary for an external agent to control the actions of researchers. Otherwise they might act in their own interest and in disregard of the interests of the patients. Patients seem to be viewed as consumers in a health care system, consumers, which have to be protected against unwarranted actions by the providers of the service, i.e. medical doctors and researchers. In this way, control of research in the health care sector is articulated as a kind of consumer protection. This interpretation is explicit in the following quote where the actor has a reputation (at least in medical circles) for being very critical of the lack of protection for participants in medical research:

> Lone Scocozza has been a member of a research ethical committee for six years. Here she got the impression, that many doctors view the committees as an irritating encroachment in their freedom of research. They find the control difficult, bureaucratic and costly. "But in reality the control ought to be intensified. An ethics patrol could be set up to make unannounced inspections at the hospitals. Restaurants have to submit to this kind of inspection by the Food Safety Agency. As it is today far too much goes on in hiding in the hospitals. Only what the press discovers by chance comes out."[98]

In this quote government regulation is suggested as a means to defend the consumer rights of the patients, just as regulation protects the consumer rights of customers in restaurants. It is necessary to have an external guarantor, who will make sure that doctors are not taking advantage of patients in an 'unfair' way. The articulation of the need to conserve the trust of patients therefore seems to be a question of ensuring that patients believe they will get a just and fair treatment when participating in medical research in the health care system. And researchers are articulated as unable to be a guarantor that this belief is justified. Thus external regulation can be seen as a remedy for the imperfections of the health care system in securing a fair or well functioning relationship between the

[97] "Reprimand in cancer research case" Politiken 28 July 1999.
[98] "Sloppiness stops gene experiment" Politiken 1 July 1999.

two parties – patients and doctors/researchers. On this account I have called this pattern in inscriptions the *script of consumer protection.*

It is interesting that this script is often connected to great and unquestioned expectations of future therapies as presented in the script of great expectations. In these cases the argument seems to be that if left to pursue its own logic of inquiry, research in gene therapy will undoubtedly lead to a breakthrough. Society does, however, need to make sure that researchers do not violate the interests of patients in this quest and external regulation is therefore needed to protect the weaker parties. In this way the argument bears some resemblance to the regulation of market forces undertaken in most welfare states. But in this connection it is not the negative consequences of economic market forces but of the logic of scientific inquiry, which has to be controlled by the central authority of the state.

The script of self-discipline

The previously identified script of consumer protection is often associated with politicians or other actors outside the medical establishment. In contrast, it is by far the most common journalistic practice to present medical professionals as actors stating that external regulation is unnecessary or even damaging to the scientific production of knowledge. Especially in the latter period of mediated coverage many researchers are presented as sources in articulations where it is argued that the general lesson from the experiment in Århus should not be more external regulation:

> The head of research at the three hospitals in Århus now warns the politicians and the Central Research Ethical Committee against imposing further control of medical research after the case with gene therapy in Århus. "I fear that we will end up with much more government and more control of research. It is completely unnecessary. We already have sufficient possibilities for protection," says Jens Christian Djurhuus, head of the Institute of Experimental Clinical Research at Århus University.[99]

Furthermore, external regulation is articulated as unnecessary since the current system is presented as sufficient. The experiment in Århus did not go wrong because of a lack of regulation, but because Steen Lindkær Jensen was an outsider,

[99] "Warning against increased control" Jyllandsposten 16 August 1999.

who did not act according to the rules. On this background some of the researchers quoted leave a door open to tighten the control of science, like for instance the head of the Central Scientific Ethical Committee, Kamma Bertelsen. At the same time, however, it is pointed out that it will be impossible to create a system of regulation in which it is not possible to bend the rules or simply cheat:

> Kamma Bertelsen consider the system of Research Ethical Committees, which has to approve all experiments with humans, as well functioning (...) "It is not the fault of the system, that researchers in Århus have behaved stupidly. No matter how much you check, it will always be possible to cheat," says Kamma Bertelsen.[100]

Thus it is not the system of regulation, which is articulated as a problem, but the occasional outsider, who cheats or otherwise does not respect the current regulation. External regulation is not presented as a solution since it will not have the intended effect of stopping the outsiders from behaving wrongly. Rather external regulation is presented as a problem. It will only make research more difficult, since the jurisdiction of researchers conducting scientific research will be curtailed. Thus more external regulation is articulated as nothing but an extra burden on the well-behaved researchers, without having any intended effect on the outsiders. Consequently, strengthening internal self-discipline within the research community is the most effective remedy for 'black sheep'. As an example of this, the head of the Medical Research Council (SSVF) argues in an opinion piece in *Politiken*, that the research council will be happy to assist in a professional evaluation of research projects, with the explicit purpose of avoiding further legislative initiatives. This articulation clearly argues against external regulation and presents internal discipline and order as a much better solution:

> It is the hope of SSVF that this case will not lead to a tightening of legislation or regulations so that clinical research will be bureaucratised to a degree that will put obstacles in the way of a continued advancement of patient treatment. We do not find evidence to support this. The necessary regulation is already in place and SSVF would happily take part in a better implementation of it. We also have suggestions for a strengthening of the regulations. Our proposal is built on recognition that centralised

[100] "Hard to control experiments with patients" Politiken 29 July 1999.

> mechanisms of control often become bureaucratic and costly and only has preventative effect in those who already adhere to the rules. If there are black sheep (and where is it possible to avoid this) they will hardly ever be stopped by systems of random checks. We are therefore in favour of decentralised self-discipline. (...) Let us not be caught up in a panic and introduce restrictions that will harm research and hereby the treatment of patients. Let us instead use the debate to strengthen clinical research to the benefit of the patients, so they can feel secure also in the future, and so doctors and other research personnel can take on the task with their heads held high. Do not forget we all have a common goal that the treatment offered in Danish hospitals are well founded. The only way to secure this is through clinical research.[101]

The argument towards the end of this quote fits well with the above-identified script of comportment. We all have to realise that doctors are carrying out a task in the interest of the common good, and the successful fulfilment of this task is dependent on a respect for the proper conduct of clinical trials. Society should not hinder this task by imposing external regulation that might inhibit scientific researchers in the performance of their task. In stead it should be left to the scientific system and its internal hierarchy to make researchers behave in the proper fashion.

I have called the pattern in these inscriptions the *script of self-discipline*. In this script medical research is presented as a self-disciplinary system, where irresponsible 'black sheep' are best dealt with internally. Rather than increasing external regulation, proper conduct should be ensured through internal standards. External regulation is presented as unnecessary and bureaucratic measures of control, which will only have preventative effects on the already well behaved. It will not prohibit black sheep, but only make research more difficult. The problem of 'improper conduct' on behalf of some 'black sheep' is not fought by external regulation but by internal self-discipline in accord with the code of conduct already existing within scientific practice.

Summarising the inscriptions of gene therapy as an object of regulation, they basically follow two opposite scripts. The script of *consumer protection* articu-

[101] "Beware of panic decisions" opinion piece by chairman of the Danish Medical Research Council, in Politiken, 29 August 1999.

lates a need for increased external control in order to ensure that researchers do not mistreat patients. This leads to the articulation of a kind of consumer protection needed in order to regulate the imperfections of the scientific endeavour by protecting the weaker parties. Lindkær Jensen is seen as an outsider, but he is the expected villain, whom society has responsibility to protect patients against. In contrast to this, the script of *self-discipline* articulates external regulation as a problem since it will make scientific research more difficult and bureaucratic. This script presents the internal system of order and discipline produced by the scientific system as the best solution to problems of misconduct. Increasing the internal mechanisms of control and discipline should therefore solve problems like Lindkær Jensen.

Figure 4.4

Focus on regulatory aspects	Evaluation of experiment	Problem	Solution
Consumer protection	The present system failed in stopping illegitimate experiments of Lindkær Jensen	Researchers unable to guarantee the consumer rights of patients	External regulation of research
Self-discipline	Lindkær Jensen is an irresponsible black sheep, who ought to know better	Preventive measures directed at irresponsible black sheep, should not compromise scientific freedom of research	Self-discipline and responsibility in scientific conduct

Three different super-scripts

Throughout this chapter I have identified eight different scripts. Although it seems like a fairly large amount of differences, it is possible to detect an overarching pattern. I will argue that there are different super-scripts that can be identified on the basis of the way they articulate Lindkær Jensen, the patients, the objective of genetic research and the articulated possibilities of finding a cure for cancer. Certain similarities make it possible to talk of super-scripts as a ‘meta-pattern in the eight scripts according to the following scheme:

Figure 4.5	Super-script 1	Super-script 2	Super-script 3
Therapeutic aspects	Heroic action	Patient rights	Comportment
Technical aspects	Anti-scientific information	Great expectations	Comportment
Regulatory aspects		Consumer protection	Self-discipline

The first super-script is primarily identified on account of the particular articulation of Lindkær Jensen as a misunderstood genius, who was fighting to save his patients, but lost a battle against the bureaucracy. The scripts of *heroic action* and *anti-scientific information* do not present science as a beneficial activity leading to the development of a cure of cancer. Rather they articulate the possible cure as a result of action on behalf of exceptional heroes. In these scripts the patients are presented as subjects, who understandably pursue even the smallest 'last chance', if it provides a hope of being cured of cancer. Furthermore, the patients are basically 'on their own', since the system of the health care sector is not articulated as beneficial or even motivated by an intention of helping the patients. Rather it is bureaucratic and oriented towards political and economic priorities.

The single individuals acting to save concrete patients are therefore heroes in these scripts, whereas the health care system in general is presented as problematic or even detrimental, since it lacks the ability or willingness to fight cancer. Closely connected to this articulation of the health care system is the rejection of any scientific claims to knowledge in what I termed the script of anti-scientific information. The core of this script is a rejection of the scientific logic of inquiry as a systematic or general means to create a better world. In these scripts, Lindkær Jensen is a hero, not because he is a scientist, but because he is a man of action who is betting on chance instead of following general rules and procedures. It should be noted that these two scripts seem to be the standard choice of script in *Ekstra Bladet*, but especially the script of heroic action is also articulated in both *Jyllandsposten* and *Politiken.*

Presented like this, the division between these two scripts and the others are similar to the difference identified in the last chapter between the inscriptions of science as a basically beneficial or a problematic social activity. In particular I will argue that these two scripts can be seen as closely connected to the script of

fatalistic irony identified in the previous chapter, since they present a situation in which the individual is basically alone, not able to depend on systems or general norms or regulation, but left to fend for itself in a hostile world. Similar to the script of fatalistic irony the scripts of *Heroic Action* and *Anti-scientific information* also portray society in general as uncontrollable or controlled by 'the others'. But rather than detachment, as in the case of cloning, the response in these scripts is to focus on the individual hope of surviving a deadly disease by pursuing individual chances created by heroic action.

Figure 4.6

Super-scripts	Articulation of Lindkær Jensen	Articulation of patients/experiment	Problem	Solution
1. Chance (*Heroic Action* and *Anti-scientific Information*)	Unrecognised genius, victim of smear campaign	Patients are subjects trying their luck, but experiment was stopped for political reasons	Lack in systems ability and willingness to fight cancer	Belief in and support of heroes of action
2. External regulation (*Patient rights, Great expectations* and *Consumer protection*)	The expected villain, who should be stopped by regulation	In general, experiments are a necessary step towards development of cures, but patients are subjects with consumer rights	Researchers unable to guarantee the consumer rights of patients	External regulation enforcing contractual order
3. Discipline (*Comportment* and *Self-discipline*	Irresponsible villain and outsider	Experiment was violating rules of scientific conduct. Patients are victims in need of guidance to face their fate	Lack of conduct according to rules and roles	Discipline and comportment

The second super-script is based on two observations. To begin with, the script of *patient rights* and *Consumer Protection* seems to be closely connected in that they both articulate patients as a kind of users or customers in the health care system, which includes medical science. Whereas the first script focuses on the right to receive a treatment once it has been promised, the second emphasises that, as users of the health care system, patients have to be treated according to a certain standard very similar to consumer rights in a market place. Both of these scripts seem to articulate the relation between patients and health care system as

a contract, where each party has to act according to the contractual standards, but where the patients are articulated as the weaker party and the health care system as the stronger. On this account a kind of external regulation can be necessary to enforce the contract.

The second important observation in connection to this set of scripts is that the scripts of *Great expectations* and *Consumer protection* are often associated in the articulations. In this case it seems that left to pursue its own goal of producing scientific knowledge, science will undoubtedly lead to a cure for cancer, but precisely because researchers are following scientific goals it is not possible also to guarantee the consumer protection of the patients involved in scientific research. Lindkær Jensen is therefore articulated as a kind of 'inevitable villain', since the search for scientific knowledge must be expected to lead researchers inevitably to disregard the interests of the patients. On this account it is necessary to create an external regulation that will guarantee the patients rights.

This set of scripts articulates medical science as a kind of sub-contractor to the health care system. As a subcontractor science is expected to deliver the cure for cancer, but this relation is not the main focus in these scripts. Rather, the most important relation is that between patients and the health care system. And the important problem is to secure that patients' rights are not violated, which means that external regulation is necessary. The ability of science to create effective solutions to problems of disease are not questioned, just as the internal function and regulation of scientific research is not the issue. But the external relations of science, including the relations between medical research and patients, has to be managed in order to make sure that researchers do not create problems for other actors of society, and therefore a pragmatic external regulation is necessary.

The third super-script rests on the fact that two of the included scripts were seen to be so closely connected so they were both termed the subscript of *Comportment*. In these scripts it is presented as fundamental, that researchers and patients behave properly according to their pre-defined role. Researchers should acknowledge their responsibility to protect patients from false expectations and patients should cooperate as 'proper' patients accepting their destiny and realising that they are mortally ill. An important feature in this script seems to be that researchers and patients should pay due respect to the logic of scientific inquiry.

They should not have high hopes, or wait for miracles, but realise that the eventual cure for cancer by gene therapy is dependent on hard work and the respect for designated roles.

The theme of scientific knowledge as the result of hard work and respect of the logic of scientific inquiry is important in this connection. Science will not deliver results out of thin air, since scientists are not in the business of making miracles. Rather scientific knowledge will only be produced, if standards and norms are respected, and if actors behave according to their prescribed roles. On this account I have found that the script of *self-discipline* also belongs in this association. What is important is the presentation of science as an activity where internal rules have to be respected if it is to bear fruit. In this script the problem with external regulation is not regulation in itself, but the fact that it is external, because external regulation might not respect internal norms and standards and therefore it will probably cause more harm than good. Just like in the script of comportment, the script of self-discipline also stresses that scientific research needs to meet certain standards if it is to result in effective solutions to problems of disease. The problem of 'improper conduct' on behalf of some 'black sheep' is not fought by external regulation but by internal self-discipline enforcing the code of conduct already existing within scientific practice. Consequently, it can be argued that the common feature or these three scripts is to present the main problem as a lack of conduct according to prescribed rules and roles. Thus, the solution should be to emphasise discipline and comportment in order to strengthen the proper conduct of all actors.

This set of scripts consequently resonates with the need for more information and education, presented in the script of scientific information in the previous chapter. The core of this script was constituted by references to scientific knowledge as the basic standard for reactions to cloning. In this context, this standard also applies, when science or the logic of scientific inquiry is articulated as the basic means to fight cancer, but success is dependent on scientists conducting research according to the rules. Revolutionary results are not a natural and inevitable outcome, but dependent on the 'proper conduct' by researchers.

In the above table I have summarised the three super-scripts under the headings of *chance*, *external regulation* and *discipline*, since these words seem to summa-

rise their respective commonalities. In the next chapter I will pursue the discussion of the similarities between the present analysis and that of the articulation of human cloning in a general comparison with Douglas' typology of four cultural forms.

Chapter 5
Articulated collectives
- Theoretical translations

During the analyses certain resonances with the cultural analysis of Mary Douglas became more and more intriguing, as the pattern that emerged inductively in the previous chapters came to resemble the four cultural types identified by Douglas. The last part of the thesis is devoted to explore these similarities. In this chapter I will translate the scripts into a typology of four modes of articulating the collective with the help of Douglas' cultural analysis. In order to do so, the four types of culture will be presented and the different scripts will subsequently be related to this typology. By way of conclusion, I will examine the link between scripts and arguments in the move from a typology of cosmologies to a typology of articulated collectives.

In a recent essay Douglas reformulated the cultural typology in terms of attitudes to power:

> I can shorten the introduction to the theory of culture that I wrote with the late Aaron Wildavsky by summarizing four kinds of competing dialogues about risk in any industrial society. The basic discriminator is the attitude to power and authority: There are two ways of exerting power, one bureaucratic and hierarchical, and the other by bargaining and exchanging; there are two ways of resisting the influences from these bases, one by active criticism, and the other by withdrawal. The four cultural types that are thus distinguished (you can call them hierarchy, market, critical activist, and isolate) are always in flux, always open to conversion to one of the other positions. (Douglas 1997:129)

Throughout Douglas's body of work the names for the four types have varied.[102] I have found diverging attitudes to power a very productive discriminator in the

[102] Originally the four fields were labelled as different types of individuals. This fits with the predominant perception in *Cultural Bias* that an individual can only belong in one culture at a given time (Douglas 1978). Naming the inhabitants can thus identify the culture. In the context of this thesis, however, I cannot use this notion of individuals as bearers of particular cultures. In a relational ontology an individual cannot be defined by culture as if it was an intrin-

following presentation of the four types. Firstly, because the attitude to science seems to be important in the different scripts, and this can be seen as adjacent to the attitudes to power, since science is generally articulated as a powerful community, activity or system.[103] Secondly, as I argued in Chapter 2, the combination between Latour and Douglas has had the consequence that the universalistic, structural part of the argument in Douglas' theory has been left on one side. In this dissertation it is not claimed that these four typologies are the result of a structural typology with two constituting dimensions of grid and group, but rather as possible worldviews in a heuristic typology that has proved productive. On this account I have chosen to speak of four ways, or 'modes', of articulating the collective rather than four cosmologies.

In order to emphasise that the typology is not a classification of individuals, but of ways of thinking about social order I have chosen to construct a set of names for the four different articulated collectives, which are inspired by Douglas later writings,[104] but are not completely similar:

Establishment exercising power	**Authoritative Hierarchy**	**Competitive Individualism**
Opposition to exercise of power	**Sectarian Egality**	**Fatalistic Isolation**

In the following sections I will present these different modes of articulating the collective and also illustrate how I see the previously identified scripts as subscribing to these four modes. I should make clear that the following sections are not an exhaustive presentation of the four cultural forms and the changes they subsequently appear to have undergone at different times in the writings by and on Mary Douglas. Rather I have selected elements useful in the particular context of analysing public debate on biotechnology. Thus it will be fair to say that I am translating bits and pieces from the large body of theory provided by Doug-

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sic property. Rather the cultural stance will always be an outcome of a particular relational context. Douglas herself replaces the word *cosmology* with *thought style* (Douglas 1996b), but for my purpose it still puts too much emphasis on individual thinking.

[103] It will be a central focus in chapters 6 and 7 to discuss the different attitudes to science as a powerful system.

[104] Primarily (Douglas 1996b:43)

las into a working framework for the present analysis of the similarities between the previously identified scripts and four modes of articulating the collective.

Authoritative hierarchy

The social order of the *Hierarchy* is highly structured in separate and graded compartments resting on a common notion of authority. In this form, the parts are oriented towards the whole, so that hierarchical relations are relations between 'larger and smaller or more precisely between *that which encompasses* and that which is encompassed' (Douglas & Wildavsky 1983:90). The unity of the hierarchy has precedence over the parts, but this does not mean that the parts are neglected. The hierarchy is oriented towards the separate compartments because they are the building blocks of which the hierarchy is constructed, but each separate compartment has to fulfil a special function in order to maintain the whole. The individual is thus characterised by an assigned role, more than a status as individual actor. The hierarchy operates with a great potential for a specialisation of roles, and it may consequently distribute its resources unequally between members. The legitimacy of this specialisation and the authority vested in higher positions is based on the common acceptance of the unity and precedence of the whole, since each individual fulfils a particular role with assigned privileges and obligations.

The hierarchy tends to be deductionist in its style of reasoning and rule following in its behaviour (Douglas 1997). In principle, members of the hierarchy should be able to deduce a right course of action from the unifying order on which the hierarchy is based. Subsequently the identification of a 'right' course of action can be the basis of common rules and regulations that guide the actions of the members of the hierarchy. Since people are normally understood to be more fallible than institutions, the appeal to common rules tends to produce stronger institutions. It means that controversies are resolvable through an appeal to universal principles or general rules of behaviour. Adversarial positions should be reconcilable at a higher level; we just have to make the general order to which we belong manifest. Douglas (Douglas 1997) notes that in regard to risk assessment, science serves the function of formalising the questions, hereby keeping them out of politics. Science is the realm of cool evaluations whereas politics is likely to be viewed as an avatar of untimely emotional interference and extra-rational influence. Ultimately, it seems that the hierarchical idea of

solving controversies over risk is extremely technocratic, but it is also quite robust:

> The hierarchist cannot envisage the continuity of past and present being seriously threatened. He expects that the same stable social system that has protected his people so well in the past will be able to do so in the future. It is not that he is willing to let the future go to hell. Just the opposite. By maintaining the advantages of the hierarchy in the present, he is, in his view, giving future generations the best possible protection. (Douglas & Wildavsky 1983:99)

Traditions are important in hierarchy as the future is predominantly seen as a linear extension of the past. Just as the whole is more important than the parts, the longer term seems more important than the shorter. It can be seen as quite appropriate to make small sacrifices for the common good in the long run. Sustaining the hierarchical order is equivalent to protecting the common good since the logic of the system is based on the hierarchical relations that guarantee the meaning of each separate entity. In relation to the issue of power, we can say that hierarchy is a way of reproducing existing power-relations, but from the presentation it should be clear that this reproduction is not primarily a matter of protecting privileges – although this is a very obvious consequence. Rather, the protection of privileges is a derivative of the need to protect the hierarchical order. It is because the hierarchy should be kept intact that the authority of the leading positions is respected, not because the individuals occupying the leading positions should be kept in power. As an ideal, power is exercised in the hierarchy for the sake of the common good, not in order to privilege certain positions.[105]

The focus on responsibility and education in the script of *scientific information* as identified in Chapter 3 makes this script seem to belong in this context. In this script problems are seen to be caused by ignorance or neglect of scientific knowledge, and therefore public information and edification ('bildung') seems to be the solution. Seed is a problem because he does not respect the scientific code of conduct. He does not accept the obligations connected with his role as

[105] It is obvious that this ideal of power is in line with the weberian ideal of legitimate bureaucratic power, just as the general presentation of the authoritative hierarchy is similar to the general notion of bureaucracy within political theory.

scientific researcher – for instance that he should not involve himself with human cloning when it is not scientifically viable. On the other hand, the threat Seed poses is not devastating. The fact that he is not behaving properly is precisely what causes him to be excluded from the institutional settings of science; he will therefore not be able to create a human clone. The real problem resides with the general public: it is ignorant of scientific knowledge and therefore seems to be frightened by the news of Seed, who is really not worth worrying about. This problem, however, can be solved by raising the general level of scientific literacy within the public so that it will be brought to see and accept scientific rationality. In this way the public should be brought to accept the institution of science as a rational system of knowledge creation, in which problems are solved by searching for scientific answers.

Secondly, the notion of a need for individual members to realise their prescribed role in the super-script of *discipline* in Chapter 4 also appeared as connected to the authoritative hierarchy. Scientists, patients, citizens and politicians have roles with duties and obligations. Roles and norms need to be followed since it is by respecting the hierarchical institutions, that problems will be solved. If we want science to deliver solutions to problems like cancer and other deadly diseases we have to behave properly. Patients should not expect miracle cures, but accept the scientific authority of researchers and participate in scientific trials conducted according to the general rules of conduct for science. Likewise, researchers should behave with respect for their own scientific authority and not violate the rules of the scientific community. The super-script of discipline articulates improperly behaving researchers like Lindkær Jensen (and Seed for that matter) as irresponsible 'black sheep' who should be dealt with internally. In the hierarchical order of the institution of science, this kind of un-behaving scientists should be made to behave responsible by enforcing internal discipline and rule-following behaviour. External regulation, on the other hand, might destroy the order of the hierarchy, and should therefore be avoided.

Summarising the scripts of scientific information, comportment and self-discipline, they all seem to subscribe to a general notion of an ordered whole, in which the decisive issue is for every individual to play their prescribed roles with predefined privileges and obligations. Researchers should behave according to the scientific code of conduct, patients should accept their situation and subject themselves to the rules of the system and the general public should re-

spect the general authority of scientific rationality. Knowing about one's prescribed role and acting accordingly seems to be the key issue in terms of solving problems in all these scripts.

Competitive individualism

In contrast to this focus on roles and rules, competitive individualism (market) is characterised by individual autonomy and strongly competitive conditions. Consequently the exchange mechanism of the market is the means of co-ordinating activities, rather than a central authority prescribing the right course of action. In this social context the individual is not constrained by any external boundary or by any essential status or formal rules connected to particular roles. This does not mean, that there is no classification or stratification, but just that all 'the existing classifications are only provisional negotiable boundaries' (Douglas 1978:21).

This mode of articulating the collective tends to be sceptical of master plans and grand theories from which 'right' decisions should be deduced. Instead, it claims that decisions about preferences should be an individual matter. This, however, does not mean that nothing is sacred in competitive individualism. The autonomy of the individual is a staunchly defended notion in this articulated collective, since it is an essential condition of negotiation and bargaining:

> In such an environment [the individual entrepreneur] cannot claim autonomy for himself without setting it up as universally valuable, a right of his fellow citizens, too. He will claim for everyone the rights freely to contract and freely to withdraw from contractual obligations, so long as the procedures for contracting and withdrawing are publicly accepted. For his kind of society, by definition, refuses to give some individuals a hereditary or other right to exact privileges or to turn the free market into monopoly. (Douglas & Wildavsky 1983:95)

The system of exchange is also held sacred as the general principle of co-ordination, which must be protected for social order to be sustained. Following this, a basic faith in quantification is important, since this constitutes the machinery of choice, the medium in which one decides among several options. The more allies an individual is able to muster in comparison with competitors, the merrier. Consequently, competitive individualism is characterised by a prag-

matic style of reasoning. Douglas and Wildavsky state that utilitarianism is exactly the theory to explain the behaviour of individuals operating in an entirely individualist society: 'the ideas of human rationality conform to the classic assumptions of utility theory – to rank objectives, choose the one with the highest value, and go for it' (Douglas & Wildavsky 1983:97). Stability, on the other hand, is not important in this mode of articulating the collective. Decisions are negotiated in order to maximise utility, but they can always be changed if new possibilities emerge or hitherto unknown aspects can be claimed significant. Contrary to the authoritative hierarchy, the time-span incorporated in these decisions seems to be extremely short.

Uncertainty and risk are not seen as unfortunate circumstances to be regretted or ignored, but on the contrary as opportunities to be exploited. The world is changing constantly; uncertainty is just another word for the hope of a better tomorrow. If allowed to operate freely, the exchange mechanism of the market will make sure that all resources are put to their best uses. 'With his evolutionary faith that the market will select the best and reject the worst, the individualist feels confident that his activities will leave the future better off. In a sense, he is future oriented; he places his bets on guessing right' (Douglas & Wildavsky 1983:99). Whereas the authoritative hierarchy is oriented towards the future as a continuation of the past, competitive individualism sees the future as the result of the pursuit of individual interests in the present.

Like hierarchy, in which power is exercised in order to protect the authoritative order, the exercise of power via the market is seen as a common good, since it fulfils the utilitarian dictum. On the whole and in the long run we will be better off if decisions are left to the market. Contrary to hierarchy, however, the individual's struggle for power positions is acknowledged as an important part of the process. It is precisely because every individual actor tries to pursue his own interests and strengthen his individual power-base that the common good is obtained.[106] This is obviously built on a different pre-conception of the individual. Rather than fulfilling a role with predefined obligations and privileges as in an authoritative hierarchy, actors working under conditions of competitive individualism are defined as individuals by their interests and resources.

[106] Just as authoritative hierarchy is in line with notions of weberian bureaucracy, this notion of power is completely in line with the way power is exercised through the invisible hand of classical economical theory.

In the script of *pragmatic regulation*, identified in Chapter 3, the key issue is to generate an evaluation of different kinds of regulation with respect to their benefits and drawbacks. The aim of creating the most effective regulation of cloning, which would prohibit cloning, but permit beneficial, 'good' research, makes this script very similar to competitive individualism. Central here is the pragmatic evaluation of pros and cons and the image of science as a beneficial activity, which is expected to lead to positive outcomes, but where the boundaries have to be negotiated with the rest of society.

In the scripts of *patient rights*, *great expectations* and *consumer protection*, which were presented in Chapter 4, the notion of science as a beneficial activity in need of external regulation is also articulated. Central in this super-script of external regulation is that, if it is left to pursue its own goals, medical science can be expected to produce effective cures of disease, but this pursuit makes science and scientists blind to the interests of other actors. In this way, Seed and Lindkær Jensen are seen as villains, but villains who are only behaving as we could have expected, because it is in the nature of scientists in pursuit of the goal of knowledge to try to reach it with any available means. As an external mediator it is therefore necessary for politics to define the borders of what is acceptable behaviour within medical science. And as the weaker parties, patients have to be protected against undue exploitation, that destroys their status as independent actors. On this account patients are not constituted as objects subject to an authoritative hierarchy of medical science, but as consumers with rights that have to be respected in their relation to the health care system. As is the case with competitive individualism, actors are articulated as autonomous, pursuing their own interests in negotiations with other autonomous actors. This is expected to lead to positive outcomes at a general level, but in order to mediate between what may be enormously asymmetrical positions of power it can be necessary to impose external regulation.

Summarising these scripts, medical progress is seen as beneficial, but it has to be conducted with respect of the autonomy of other actors – for instance patients. What is essential is the establishment of actors as independent individuals with a personal make up of resources, preferences and interests. And it is the pursuit of these preferences and interests that will result in the most prosperous use of resources and the attainment of a utilitarian common good, although some

regulations might be necessary in order to foster and maintain free negotiations between actors.

Some remarks on the relation between authoritative hierarchy and competitive individualism are in order at this point. I have earlier quoted a recent statement by Douglas of these positions as the two ways of exercising power. It should now be clearer what is meant by this claim. Despite their differences, they are both concerned with upholding the present social system as it is. Neither is envisaging a future that differs substantially from an extension of the present (and past). Douglas and Wildavsky write that both 'have imperialist tendencies, since both can solve their organizational problems by expanding the field of operations – bigger markets, larger collectives' (Douglas & Wildavsky 1983:97). They both enforce universalistic rules, but where the hierarchist prefers rules of instruction, the competitive individualist prefers rules of fair play that do not stipulate what is to be done. We can say that while hierarchical rules ideally prescribe the right thing to do, the rules of competitive individualism should be procedural, prescribing how autonomous individuals can reach a pragmatic decision in a concrete situation.

Sectarian egality

The two other modes of articulating the collective, sectarian egality and fatalistic isolation are, by contrast to the foregoing, ways of opposing rather than of exercising power. In these modes it is not possible to articulate the exercise of power as being in the interest of the common good of society. Rather power is in all cases seen as oppression that has to be opposed. But it is only in the mode of sectarian egality that this opposition is made explicit. Whereas fatalistic isolation involves withdrawal, as I will demonstrate in the following, sectarian egality is explicit in its dissociation from present social order. The critique is formulated around an expected disaster in the surrounding world and the imminent need to try to avoid it:

> [The sect] is not confident that the disaster can be averted. There may be no time left. But it knows how the disaster has been caused: corrupt worldliness, that is, ambition for big organization has endangered mankind and new technology represents all that is most reprehensible – social distinctions, the division of labor, materialist values, unfeelingness for individual suffering. Its mode of articulating the collective is characterized by dichotomized

> values: good and bad are severely contrasted, compromise is bad, purity is good. Paradoxically, given the alert detection of betrayers in their ranks, the sectarians supplement their mistrust in human organization with trust in the goodness of human individuals. (Douglas & Wildavsky 1983:127).

The identification of sectarian egality is modelled on small voluntary groups organised around a common interest in the protection of public goods. Douglas claims that these groups are characterised by their efforts to solve the fundamental problem of keeping the group together, since the absence of formal hierarchy makes it difficult to sustain solidarity in the group. Membership in the group is voluntary, and with no system of incentives, members will tend to evade obligations. Furthermore, the lack of formal regulation with regard to reward and punishment (as available in the hierarchy) is leaving the group without adequate instruments for solving conflicts. Only the drastic sanction of withdrawing the privilege of membership or the dissolution of the group can be effectively applied. This will produce two tendencies. First, in order to strengthen group solidarity and avoid defection or dissolution, the boundary around the group will be strongly demarcated and the difference between the good of *inside* and the bad of *outside* will be emphasised. Second, without the ability to take recourse to coercion or overt leadership, due to the lack of formal regulation, there will be a strong tendency towards factions, and mutual allegations of treason or corruption will be common, as these are the only available sanctions in the organisation. The issue of risk is perfect for satisfying this need:

> The first difference between the border [sect and isolate] and center [hierarchy and market] views is about what the future will be like. The center takes it to be an extension of the present. Sectarians expect discontinuity. They expect a different future and they expect it will be bad. Established society is incorrigibly evil, being both coercive and hierarchical. It must not be imitated and it cannot continue. They have a vested interest in bad news that shows the society outside is polluted and also shows that the sect inside is pure. (Douglas & Wildavsky 1983:121-22)

The expectation of future life to undergo radical changes for the worse is a means of keeping the group together. The argument in *Risk and Culture* is therefore a basically materialist one when they state that it ‘is not smallness that is first loved nor a passion for equality that brings the fraternal sect to pursue its

characteristic ends but the reverse. A losing battle against the difficulties for voluntary organization presses its members into rejecting increase of scale, preferring egalitarian rulings, and attempting closure against the rest of the world' (Douglas & Wildavsky 1983:121). On this account sectarian egality has three positive commitments: human goodness, equality, and purity of heart and mind. It is worldliness, i.e. power and money, which has lead humans astray and corrupted their innate goodness. If only equality could be enforced, and heart and mind purified then the good life could be restored. Unfortunately there are conspiracies lurking everywhere, corruption is the normal state of affairs and the world, essentially a good world, has thus been polluted by the evils of money and power. [107]

Douglas later seems to have untied the connection to the problems of voluntary organisation in a group and begins to articulate this cultural form more generally as a social tendency (Douglas 2001). It is in this way that she can identify a political discourse in which radical critics, who have emancipation and radical political change as their program, find the context of risk a convenient arena for showing, that 'dangers have been concealed and the public misled' (Douglas 1997). For the present purpose it is interesting to note that this enlargement keeps the perspective of a kind of 'reverse causality' in which the focus on any public danger is guided by a general need to find an issue which serves to reinforce a basic view of power as oppression, and systems and institutions of society as corrupted.

On this background I found close affinities between the script of absolute resistance, identified in Chapter 3, and the articulation of sectarian egality. The notion of a maverick science and an immediate need to impose limitations in the form of absolute regulations and restrictions bore much resemblance to the identification of the sectarian resistance towards pollution in America. Both portray the world as an endangered place, and the need for reformist action to be extreme. And both portray the dangers of corruption by the worldliness of money and power – in the Danish case it is the pure search for knowledge that has been

[107] As it might be evident, Douglas and Wildavsky draw heavily on different analyses of religious sects in the characterisation, and they explicitly compare environmental interest groups with religious sects. 'Either God will punish or nature will punish; the jeremiad is the same and the sins are the same: Worldly ambition, lust after material things, large organization' (Douglas & Wildavsky 1983:122-23).

corrupted by the wish to become master of reproduction. Cloning is articulated as a major threat in a society described as a battlefield where science is one of the systems of power that threatens to corrupt the community, because it follows its own systemic rationality. Furthermore the crucial distinction in connection to the definition of actors is whether they belong to the corrupt systems or the enclaves of resistance.[108]

Fatalistic isolation

The fourth mode of articulating the collective is dominated by insulation in the form of an experience of minimal autonomy and no sense of group belonging. The inhabitants of this kind of articulated collective are articulated as heavily restricted by the classifications of the social system, but since they are not members of any groups there is no reward for accepting this slot as in the hierarchy, where the role comes with privileges as well as obligations (Douglas 1978). Fatalistic isolation was left out of the analysis in *Risk and Culture* and several of the later analyses of risk debate, probably because it is not an explicitly formulated position, but more of a residual category. Withdrawal, which is central to the description of this mode, is a refusal to engage in a normative debate about the condition of the social order, and therefore it does not produce a coherent pattern of views on risk or other overtly politicised issues. Later in an essay on the 'Prospects for Asceticism', Douglas deliberates on this cultural form:

> By definition the fourth type is politically mute: it is a social environment, which separates individuals, cuts down their communication with one another, and limits their options. Such a social environment with a high degree of regimentation and no clear group affiliation is quite common in complex societies. On the fringe of markets are individuals who have little scope for trading; on the fringe of hierarchies are other individuals who are very weakly enfranchised. They may indeed speculate, but it is hardly realistic for such individuals, whose autonomy is severely

[108] In contrast to chapter 3, I have not found any of the scripts in chapter 4 as fitting with this mode of articulating the collective, although I did identify one single article that seemed to present the gene therapeutic experiment in this context, see note 33 in chapter 6. In general, however, I have found the scripts of anti-scientific information and heroic action to be more closely aligned with the fatalistic mode of articulating the collective, as it will appear shortly. They criticise science, but they do not present it as a corrupt system that should be fought. Rather fatalism with respect to the general trends of society seems to be prevailing.

> limited, to be conducting a normative debate about how their society should be constituted. (Douglas 1996b:45)

Douglas states that just like all the other positions, isolation is a matter of degree, where the decisive question is the experience of restriction of choice.[109] In the present context I will abstain from talking about isolates as a group of clearly defined individuals. Rather we should view withdrawal as the second way of resisting the exercise of power. Withdrawing is to refuse to take part in the positive exercise of power through hierarchy or market. This is the silent resistance, but whether it is adopted by choice or forced upon individuals is not the issue in this context – analytically both positions exist.

On this account, it is by means of the structural analysis that Douglas can claim any coherence in the mode of articulating the collective of isolation. As a matter of fact she takes this lack of coherence as the decisive point in the identification of the mode of articulating the collective and claims that, individually, isolates must be expected to think idiosyncratically (Douglas 1996b:186). The heavier the isolation, the more eccentricity can bloom. The mode of articulating the collective of isolation is thus as likely to include witchcraft, vampires or UFO's as modern science and medicine, global warming and carcinogenics:

> Their far-out eclecticism has become a protective barrier against pressure. Uncommited to persuading anyone to do anything, they are not trying to persuade or organize. If they once did such things, they have learnt the uselessness of it in their present position. Along with being accommodated to isolation comes relief that no one expects very much from them. Another experience which they all may have, though it would be going too far to call it a shared experience, is the sense of pressure lifted. There is less scope for disappointment. As to hopes, a dose of fatalism is a good adaptation: then there will be no bad surprises. It is not surprising

[109] The most obvious inhabitants of this corner are the social outcasts, beggars, tramps, poor and so on, but also people in the other end of the welfare scale can be said to inhabit this corner if they do not combine high restriction of choice with a sense of group belonging. She even suggests that some 'choose this cultural niche for personal preference, and live there happily, with or without a sufficiency of means. Though others may see their presence as proof of victimage, it is not obvious that the inhabitants of the isolates' quadrant are all there unwillingly.' (Douglas 1996b:184)

> that the long-term inhabitants of the isolates' corner have in common a tendency to apathy. (Douglas 1996b:187)

This idiosyncrasy is not a result of a failure of education or deficient intellectual abilities. Rather it is a result of the social constraints of the isolation. The mode of articulating the collective of fatalistic isolation is the mode of articulating the collective of the marginalized. It is voiced from an un-accountable position in the political struggle over social order. It tends to emerge in sociological accounts as the unpredictable element, and is often articulated as alienated or indifferent. In discussions on environmental risks, accounts subscribing to this mode of articulating the collective are often characterised as 'apathetic' or 'passive' (Douglas 1996b:184). Since these are all de-legitimising terms for this particular cultural bias, it tends to become confirmed in its marginalized bias. Douglas therefore warns us, that trying to evaporate this mode of articulating the collective with rational information or incentive systems constructed on values from the other articulated collectives would probably have very little effect. As response to the perceived lack of autonomy, the mode of articulating the collective is basically fatalistic about the nature of the universe and its future: 'True isolates live in a state of eclectic openness where anything might be expected to happen. Their main freedom is one that other people fight for: freedom to believe what they like, whenever they like.' (Douglas 1996b:187)

The second form of opposing the exercise of power must therefore be expected to be rather silent. It is the withdrawal from official rationalities – both in terms of bureaucratic systems and bartering exchange relations. Fatalism and withdrawal is the response to the perception of a situation with no possibility of control or deliberate change for the better. Accepting Douglas' argument, that isolates will hardly engage in a normative debate about the social order of the good society, I found it particularly interesting, that a kind of fatalist stance is easily detected in the inscriptions of the concrete cases in Chapters 3 and 4. The fatalistic irony deployed in the cloning story has its counterpoint in the articulation of chance and heroic action in connection with gene therapy. These inscriptions do not formulate a stringent, universal way of doing things right. Rather they articulate society and universal institutions like science as completely outside of control.

In the script of *fatalistic irony* nothing can be done about Seed. Although cloning is articulated as deeply reprehensible, the only possible action is to laugh at him. Science and scientists are mad and perceived as completely beyond control. The same can be said of the script of *heroic action* and *anti-scientific information* in chapter 4, where science is completely disregarded as the way towards a cure for cancer. In the super-script of *chance* every individual is left to try to fend for himself in an unpredictable world, where he might be lucky and be cured of cancer or other deadly diseases. But this will in no case be due to the workings of the system, rather, it will be owed to a lonely hero acting on his own accord to try to rescue concrete patients.

Summarising these scripts they articulate society as an anarchic chaos with no overarching rules and no mechanism that secures order or justice. Rather, fatalism prevails and every person is left to try to fend for himself, but outcomes are basically determined by chance. Furthermore there is no regularity in the definition of actors, one day's hero can be the next day's villain, although there seems to be a preference for heroic action, and there is definitely a rejection of the rationality of systems and authorities defined by systems such as hierarchies and markets.

Controversies as cultural dialogue

Cultural analysis derives its strength from placing controversies at the centre of cultural dialogue, which in this theory is equivalent to competing notions of articulated collectives. Citing Schwarz and Thompson, Douglas notes that 'the motto for cultural survival is "divided we stand". Culture thrives on opposition. This is such a vital insight for the way that culture generates political debate, and so relevant to the environmental issues, that it needs emphasis' (Douglas 1996b:175). The fruitful perspective in Douglas' cultural theory is that it emphasises that the dialogue on culture in any given society is inherently adversarial. Controversy is part of the normal way of things, and the assignment of blame is a central means for culture to express its own logical structure:

> Casting blame is one of the quotidian tests of cultural affiliation. It follows from the adversarial nature of cultural definition that each type of culture has its distinctive pattern of blaming. Who gets blamed, and for what? Hierarchy lays blame on weak definition of responsibilities, that is, on inadequate organization. Individualists blame hierarchists for blocking freedom of action and enclavists

> [sectarians] for attacking their profits. Dissenting groups are essentially organized for moral criticism, their blame tends to be cast against the whole system and the badness of people's hearts." (Douglas 1996b:177)

It is important to remember that in my translation of this approach the articulated collectives are not mysteriously imposed upon individuals from the outside. A collective is produced to the extent that articulations keep subscribing to it in actual practice. It is a notion about how the world works and it emerges from the particular practices of the members of society. Following this line of argument, the number of sustainable collectives cannot be determined in advance. It should rather be regarded as an empirical question.

The typology constructed in this dissertation, however, can be seen as four distinct ways of constructing arguments in the controversies about biotechnology. As mentioned in the introduction to the dissertation, the establishment of a relation between problems and solutions in an argument can be seen as the application of a general notion of how to restore order and reach closure and this in turn is the same as articulating the collective in a particular way. After the previous presentation of the typology of articulated collectives, I can now be much more precise in the identification of these possible ways of creating arguments by invoking a particular ideal of restoring the collective order. The idea is that arguments can be classified according to the way they articulate the possibility of reaching closure, that is, of solving problems and restoring order, as presented in the following list. It should in this context be noticed that although the two ways of opposing power are not as oriented towards re-storing order as the first two, they still have a distinct way of discussing how problems ideally should be solved:

- In *hierarchy* order is restored by recognising the ordering principle for the hierarchy, for instance the knowledge hierarchy of scientific truths or the stratified power-positions of a bureaucracy. If a hierarchical order is presented with a problem it can ideally invoke a general principle from which a 'right' solution can be deduced, which will close the controversy. Generally this solution should focus on respect of the hierarchical order and the obligation of actors in the hierarchy to assume their prescribed role with individual privileges and obligations.

- In *competitive individualism*, reaching closure is equivalent to co-ordinating different interests and preferences, and this is done through the market. The 'right' solution will be the one that gains the highest amount of backing, for instance as citations, alliances, or even votes, through the exchange taking place in the market.
- In *sectarian egality* problems are equivalent to corruption or pollution, and are ideally solved by identifying the cause and subsequently purifying the community by expulsion of this cause. If, for example, scientific truths have been taken hostage by worldly considerations, it is important to purify and expel the corrupting influence, in order to restore the scientific ideal of pure knowledge in the interest of the community and the good of the people.
- Finally *fatalistic isolation* is special because it makes arbitrary or ad-hoc connections between problem identifications and ways of solving problems. Problems occur from somewhere else, as does fortune. Since there is no way to change that, the only option is withdrawal. Science might produce evils, but we might also be lucky: in any case, it is uncontrollable by general regulation.

Each mode of articulating the collective defines the social order in a particular way. Integrated in this articulation is a distinct way of reaching closure and restoring order. And it is also evident that reaching closure is a fundamentally different concept in each of the four modes. What counts as legitimate closure under competitive individualism – the majority decision – is not accepted as legitimate in hierarchy, where there is normally only one 'right' solution that should be deduced from the hierarchical order. The central feature in political controversies, as they are defined in this context, is precisely this kind of disagreement about solving problems and reaching closure and it is fundamental in the analytical discrimination between the four modes of articulating the collective.

It should be emphasised that the analyses are not efforts to show that the controversies are a mere extension of an underlying structure of conflicting articulated collectives. They exist, because they are invoked in articulations – not the other way around. Therefore I could not say, that these four modes are the only possible ways of producing or imagining social order, just as I am not able to claim that there could not be different scripts implying different articulated collectives.

Instead, I view the cultural typology as a conceptual toolbox that I have applied because the inductively identified scripts showed significant similarities with the four-fold typology.[110]

At this point I would like to return to the introductory remarks about the problematisation of *science, ethics* and *public debate.* At that point I dismissed using a particular definition of these concept and the relation between them, since the very definitions of these phenomena were seen as integrated parts of the controversies about biotechnology. Now I am able to present this proposition in a much more articulated way. In so far as arguments articulate the collective differently they also articulate the phenomena of science, ethics and public debate differently. Analysing the arguments in the controversies it should be possible to identify patterns in the way these phenomena are defined by following the subscriptions to the articulated collectives. This is what I intend to do in the following chapter. Instead of letting the inscription of events guide the analysis, I now want to follow the patterns of articulation of arguments according to their subscription to articulated collectives.

[110] Rather than taking this as any form of proof that I have access to an underlying structure that guides the actions of actors engaged in controversies, I take this as a result of constraints on social analysis. I had to follow the line of least resistance. Cultural theory provided a short cut.

Chapter 6
Regulation of biotechnological research
- Articulations of science, ethics and public debate

In order to understand what follows it may be useful to summarise some of what has gone before. Any newspaper article can be read as both a description of events—a story—and as a prescription for action—an argument[111]. Many articles explicitly exhibit one of these aspects, while the other must be considered implicit in them. On my analysis, telling a story is the inscription of an event in the articulation of a script, and making an argument is the subscription of an action to the articulation of a collective. (One should perhaps qualify the terms 'event' and 'action', with the words 'purported' and 'proposed', in order to indicate that we are dealing in all cases with mediated representations of realities that are not themselves determined by this inquiry.) The term *script* here designates the particular application of those more general cosmologies, which I call *collectives*. Read as a story, a newspaper article articulates a script, while when we read it as an argument, it will come to articulate a collective (or several different collectives). So far, I have been analysing primarily how events are inscribed in newspaper articles as stories. I will now turn to the question of how arguments subscribe to collectives in their articulation.

The analytical direction of the previous three chapters has been one of reduction. There, I went from the inscription of events in newspaper articles, through the scripts they articulate, to a typology of articulated collectives, which is to say, I reduced the multiplicity of differences between the articles to the four fields of the typology. In this chapter, I want to change the direction of the analysis and use the typology as a structured perspective, one which has been structured precisely by the stories told in the newspaper articles, in order to look for patterns in the way the same articles articulate science, ethics and public debate in the mediation of arguments for action. These phenomena are central to the identification of the discursive possibilities for the regulation of biotechnological research. In order to make this move the status of the typology is changed.

[111] It is of course natural to map this distinction between the descriptive and prescriptive aspects of newspaper articles onto the empirical/normative distinction. It should be kept in mind, however, that the standards of journalism offer little guidance in the way of *justifying* empirical claims (as in science) or of *legitimating* normative ones (as in politics).

Whereas it emerged as the result of my investigations in the previous chapters, it will here be employed as a point of departure in the form of a structured perspective classifying mediated arguments. I am going to propose that such arguments subscribe to particular modes of articulating the collectives, and that this subscription can be usefully classified according to the typology that has been produced in the previous chapters.

The objective of this analytical change of direction is to explore how the phenomena of science, ethics and public debate are articulated differently in different arguments about the regulation of biotechnological research, not how events are articulated as stories. It should be mentioned that I have chosen to look at regulation of biotechnological research, because this term signifies the intersection of science and biotechnology. The objective, moreover, is *not* to try to prove the typology of the four forms of articulating the collective right. Since I am going to use it as a structured perspective, I will find it in some form or another. But its ontological status, or, more precisely, the ontological status of the events and actions articulated, and the structure of the conditions of *their* possibility, is not the issue in this chapter. Rather than aiming at producing proof that the typology is right I am going to use it as an analytical tool for classifying arguments in order to explore the discursive possibilities of regulation. It is not the possibility of the actions and events themselves, but the possibility of their articulation that interests us in this dissertation. And in this chapter the focus shifts from purported events to proposed actions, from the telling of stories to the making of arguments. From this chapter and onward I am restricted to the typology as it is constructed in the previous chapters. This is not, however, because the inscription of events is somehow *prior* to the subscription of actions. One has to begin somewhere; but it is important to keep in mind that whatever accounts for the commonalities between scripts and collectives is necessarily produced *simultaneously* in the process of mediating the news—the mediation of current events and imminent actions.

With regard to the present analysis, the typology of articulated collectives can be summarised in the following way, particularly emphasising the specific way actors are articulated, which is to say, the collectives to which each action must subscribe in order to attain articulation:

- **Authoritative hierarchy:** The collective is organised in hierarchical relations where every individual person or system has a defined role with responsibilities, privileges and obligations. Actors are defined according to their role or position in the hierarchical order of the whole.
- **Competitive individualism:** The collective is a market of bartering relations where every individual actor is free to negotiate exchange relations with all other actors. Actors are defined according to their individual resources, interests, and preferences.
- **Sectarian egality:** The collective is a battlefield where systems of power, including science, corrupt the community of people, because each system follows its own systemic rationality. Crucial in defining actors is whether they belong to the systems or to the enclaves of resistance.
- **Fatalistic isolation:** The collective is an anarchic chaos with no overarching rules and no mechanism that secures order or justice. There is no regularity in the definition of actors, although actors perceived as authorities or executives of power are rejected.

As mentioned I will now use this typology as a structured perspective, when I look for patterns in the arguments about regulation of research. In order to make this analysis as transparent as possible it is necessary with some introductory remarks about method. They are concerned with the analytical tool of structured perspective (how to see) and the identification of 'arguments about regulation of research' (what to look at). Using the typology to explore how the phenomena of science, ethics and public debate are articulated differently, means that the different modes of articulating the collective are employed as four perspectives that let the phenomena become visible in different ways. The typology is the set of analytical distinctions and each type is seen as a particular perspective that articulates the collective in a particular way. Making the typology operational is therefore done by treating each form as a perspective according to the definitions presented above. When I employ the perspective of hierarchy I look for arguments that subscribe to hierarchical notions of social and natural order. For instance I look for arguments where the definition of problems and solutions are deduced from an overarching rule, or arguments where the phenomena are presented as compartments in a larger hierarchy, one, which produces a particular set of privileges and obligations on each compartment.

This type of analysis can only be conducted on a relational level. Therefore I am not classifying arguments as intrinsically or universally hierarchical. Rather, I am classifying them as hierarchical *in relation* to other types of arguments. Furthermore it should be clearly stated that the classification is a matter of degree. Some arguments are clearly hierarchical, whereas other arguments are much more resistant to classification. This also means that the arguments cannot be reduced to the classification. Rather, the meaning of every single argument always exceeds what can be captured by this classification.

The sample of articles that has been selected for this analysis consists of 104 opinion pieces (including editorials, essays and letters) about the regulation of biotechnological research as described in Chapter 2. Each of these articles has been characterised according to the predominant mode of articulating the collective. Some fall in several categories as they employ different types of arguments. As a guide for classification I have formulated the following questions:

- What is it, in the social and natural order, i.e. 'the collective' that has to be protected?
- What should it be protected from?
- How are different entities framed as actors in that order?
- What are the justificatory arguments put forward on issues concerning regulation of biotechnological research.

The following table contains a quantitative description of the distribution of articles according to these guidelines. Although the figures appear to reveal clear differences between the papers, one should be hesitant about putting too much emphasis on this, since this categorisation was not conducted with this objective, but rather aimed at exploring qualitative differences between the arguments employed. I will, however, return to this issue in chapter 7.

Figure 6.1	Total	Authoritative Hierarchy	Competitive Individualism	Sectarian Egality	Fatalistic Isolation
Politiken	34 (15)	22 (13)	10 (5)	8 (1)	0
Jyllandsposten	31 (4)	12 (1)	13 (2)	8 (1)	0
Information	33 (12)	16 (6)	1 (0)	20 (9)	1
Ekstra Bladet	6 (3)	0	0	2 (1)	4 (2)

The figures in parenthesis show the number of editorials that has been included in the overall figure.

The provisional categorisation of articles according to their predominant type of argument, however, is not the main purpose of the analysis in this chapter – rather it has been a heuristic device to identify a group of arguments that should be further analysed when applying each perspective. What matters in this context, is the qualitative pattern in inscriptions of the phenomena. I have therefore *proposed* that arguments about the regulation of biotechnological research subscribe to different articulations of the collective, and I identify patterns in these arguments using the four modes of articulating the collective as analytical perspectives.

The following analysis is structured around each perspective. In an effort to enhance transparency I begin each section by illustrating how the particular mode of articulating the collective can be identified in concrete arguments. On this background I explore the inscription of the phenomena of science, ethics and public debate in three subsequent sections. I have included a number of exemplary quotes, which serves the purpose of illustrating and explicating the analyses, as well as making the presentation more vivid. I have, however, also included some quotes that pose problems for the distinctions between perspectives. The reason for this is primarily to enhance transparency of the relational analysis, but also to draw attention to its complexity.

Authoritative hierarchies

The arguments classified as subscribing to the hierarchical mode of articulating the collective all emphasise the need to establish or respect a social order of differentiation. In this context differentiation means that different actors have different rights and duties according to their societal role. A keyword is responsibility, which implies that the responsible actor is responsible according to a predefined set of rules and practices, to which the actor subscribes, and as result acts accordingly. Researchers have to behave properly with respect to the rules of conduct for researchers, just as politicians have to behave properly in following their prescribed role. In these arguments, regulation of biotechnological research has to be founded or based upon some sort of overarching principle or order. Once this order is identified or established it will prescribe a procedure for finding the 'right' answer to problems, also with regards to how genetic research should be conducted and regulated. The following quote is taken from a discussion of the ethical problems connected to the use of human embryos for stem cell research:

> Up until the 19. Century, Christian philosophers and theologians have followed the interpretation put forward by ancient philosopher Aristotle and the great theologian of the middle ages Thomas Aquinas, that there is a tight connection, a complementarity, between material and mental development. On this basis it was agreed that the foetus does not have a soul, and consequently is not a complete human being, until after 40-80 days of development. Foetal stem cells can therefore not in themselves be ascribed status and rights as a human being, and it would not be an atrocity towards another human being, if these cells were exclusively used for cloning and therapy as described above. If, on the other hand, the foetus were allowed to develop further beyond the first 14 days, where organs have also begun to take shape, it would be more alarming to use the foetus or its parts for instance as organ transplants.[112]

With reference to the theological tradition, an overarching principle – the complementarity between material and mental development – is invoked. From this principle an ethical stance towards the embryo can be deduced according to which, it is not 'an atrocity' to use foetal stem cells for research. The interesting thing about this quote is, of course, that Christian theology is often invoked with precisely the opposite result – the insistence that embryos should *not* be used for research since they constitute the start of a human life. This tension is very important. Although it is a general assumption in hierarchical arguments that some closures in terms of solutions are objectively better than others, there is no unanimous agreement about which basic principle, or which interpretation of such principles, should be employed to identify the right closure. The common feature of these arguments is the notion of a fundamental social and moral order, connected to the natural one that constructs the hierarchy and renders it possible to discriminate between solutions. The moral order organises social relations, but the content of this social and moral order and how it should be established is not generally agreed upon, as I will demonstrate in the following.

Many of the quotes present a tension between market forces and freedom of research. Often they do not reject the market forces as a principle for economic organisation in companies, but claim that the use of market exchanges should be

[112] Medical doctor in Information, 5 September 2000: "Embryos in reserve".

restricted to some areas of society. The regulation of biotechnological research especially should be kept outside economic considerations, as it is seen as improper to let economic considerations influence the realm of 'pure' science. Also knowledge in the form of genetic information about individuals is often articulated as something that should not be treated as a commodity:

> Within genetic research a current tightening of conditions which, if it is allowed to continue, will have paralysing effects on the successive exchange of preliminary results, which is commonly regarded a precondition for all serious research.
> Icelandic authorities have granted a company monopoly to the mapping of the population's genome. Considered in terms of the ethics of public records, it is a very worrying affair. But also in other respects the Icelanders are on the wrong track. A society ought not to treat information about the genome of its citizens as a commodity that can be sold to the highest bidder. Also it ought not to issue monopolies that push research further down the slippery slope towards secrecy and enclosure.[113]

The implied understanding of society is a system of discrete spheres working according to their own set of rules and the overarching objective of regulation must be to secure these internal systems of norms and regulations. Science (and the rights of humans) is placed outside the province of bargaining, since freedom of research (understood as an important rule of conduct within the scientific system) must not be infringed or contaminated by the market forces and their tendencies toward secrecy and closure. Instead science should be regarded as a system with an order of its own and specific rules of conduct. Thus we might speak of science as a social activity guided by a set of principles establishing an authoritative hierarchy.

[113] Editorial in Politiken, 26 July 1998: "The genetic road" (In Danish 'gen-vej' which also means shortcut). As a parenthesis the almost sacred status ascribed to knowledge about the human genome is an interesting feature in this quote. It is found in many articles and should be object of an analysis in itself. Rabinow argues that a similar feature in French controversies should be understood as a distinct cultural trait shaping policy formulations about access to genetic information (Rabinow 1999). Here it suffices to say that the sacred status of genetic knowledge (as product of genetic technoscience) can be viewed as an extra argument stressing the need to deal with genetic knowledge creation in a 'responsible way'.

Science as hierarchy

Freedom of research is defended in the article quoted above, because it serves a purpose of securing 'serious research'. It is articulated as a necessary precondition of a properly functioning scientific system. According to this argument the dangers that society has to deal with, are external influences on research and thus the independence of science has to be secured - if necessary through societal regulation that restrict market forces. Along these lines, several arguments stress the independent nature of the knowledge producing activity of research:

> The technological principles of cloning domestic animals are almost defined, even though the basic biology in a great many details are not yet illuminated or realised. There is still much research left to do! But what is the point of this long story? The importance of cloning should be viewed as both product and process. The product of the technique of cloning is the ability to create clones of animals, that is, genetically identical individuals. The process on the other side is constituted by the biological recognition, which spring from the exploration of the biology of cloning. (...)
> The research in cloning has opened the gate to biological cognition that will reach far into the next millennium. The exploration of the possibilities in this should not be curbed. But the application should be debated.[114]

Here we are presented with a clear-cut division between different domains – a principle is established according to which the scientific exploration of possibilities is a matter internal to research, whereas the decision about application is a matter of public discussion. As pure cognition, knowledge is articulated as an absolute goal in itself, subject only to the internal rules of conduct as prescribed by the scientific community. In general, it is not possible from the data in this analysis to be very precise about these *internal rules of conduct in the scientific system*. Several arguments hint at the need to respect this kind of rule, for instance in the above mentioned quote about freedom of research, but the rules themselves are usually not explicitly identified. I have found it useful to use the phrase *logic of scientific inquiry* as a proxy for an identification of these rules. While they are not very clearly stated, the occasional reference to rules of this

[114] Three clone researchers in Politiken, 25 March 1999: "Cloning – a new world".

kind could be interpreted as bearing much resemblance to the CUDOS norms as put forward by Merton (Kjørup 1987).

It should be noted, that the logic of the argument is dependent on the enforcement of the ideal of a social contract or arrangement, one that allows the scientific community freedom of research in order to produce true knowledge. In this connection, freedom of research does not imply complete societal independence of the scientific system. Science has a function to serve as the knowledge creating system of society. Within the limits of this societal role science can be said to enjoy the privilege of freedom, but only as far as the obligations connected to the privilege are respected. Science has an obligation to create true knowledge that can serve as the basis of 'right' decisions, and in order to fulfil this obligation it has the privilege of being free from external interference in the form of either money or power. By invoking this notion of a previous societal decision of freedom of research, the argument therefore becomes an argument of preserving the established order.

It should also be noted, that even though the rules of scientific inquiry seems to imply freedom of the researcher, it is a very restrained freedom placed within a hierarchy. The logic of scientific inquiry can be seen to operate with a distinct notion of the better argument. The lesson of various forms of epistemology is that in principle, it will always be possible to identify the better argument, and thus the most 'true' knowledge. Furthermore, viewed as a social practice, research is organised as a very hierarchical system with peer reviews and asymmetrical roles of responsibility. Therefore it should be noted that it is science, and the scientist as an occupational role, that enjoy the privileges of freedom, not the individual person occupying the role as scientist.

The argument in favour of the social arrangement that secures the freedom of research is often justified in a claim, that if the scientific logic of inquiry is distorted by external influences, science will not live up to its obligations. Only by following its own independent hierarchical rules of conduct will it create 'true' knowledge for the benefit of society. On the other hand, if society accepts this division of labour, problems might be solved by biotechnological research itself, as it generates better and better knowledge:

> The use of cloning to produce spare parts for humans raises many ethical challenges as previously described. My last point, however, is that continued research in the biology of cloning can render the use of egg cells and cloned human eggs superfluous. (...) Seen through the mist, the horizon research can render cloning as such superfluous in favour of the virtual clones; clones that only exist as cells and not as individuals. In this light, the use of egg cells and cloned human eggs will only be a passing phenomenon, which paves the way for the future.[115]

As this quote illustrates, a problem can be regarded as simply a lack of scientific knowledge, and the way to solve such a problem is to allow researchers to do their job according to the internal rules for scientific conduct. In this way, creation of scientific knowledge is central to the possibility of reaching closure, because it has the ability to eradicate moral dilemmas by creating new knowledge. Presented like this, science (as provider of scientific knowledge) is accordingly placed in a central position in the hierarchical order of society. Perhaps it is not strange that this particular articulation of science is often associated to researchers. By this observation I do not imply that researchers are trying to manipulate public opinion or acting in an inappropriately strategic manner. Researchers living in the world of knowledge hierarchies probably extend this social organisation to the rest of society, hereby enforcing an ideal of scientific knowledge as a general solution to problems. But this is not a necessary pattern, let alone a causal explanation. Other researchers or other conditions might lead to other patterns. In this context, however, no researchers argue explicitly against the use of scientific knowledge as an important part of reaching closure about questions posed by new gene technology.

Ethics as hierarchy

As I hinted in the beginning of this analysis, there is no unanimous agreement on which hierarchical order should be *the* organising principle. Next to science ethics seem to play a common role in establishing a moral order that will prescribe solutions to problems with biotechnological research.

> The biotechnological development has led to an increased need for judicial protection of the human body. The question is what kind of human beings we want to be and whether we use biotechnology for

[115] Cloning researcher in Jyllandsposten, 25 April 2000: ”The clones are coming”.

> the benefit of society. It is important to avoid genetic manipulations, which driven by an utopian dream of creating improved human beings, lead to greater suffering because of the unintended consequences of biotechnological interventions. In this connection and as a scientific observer on a EU-financed research project about bioethics at the Centre for Ethics and Law, University of Copenhagen (1995-98), I have been involved in the development of a proposal of common ethical principles, which will encourage the use of biotechnology for the benefit of human kind. We have just published the book Basic Ethical Principles in European Bioethics and bio law, Vol I-II (2000) (Ed. Jacob Dahl Rendtorff & Peter Kemp), which argues for the principles of respect of human autonomy, dignity, integrity and vulnerability as basic values for a common European legislation of bioethics.[116]

The argument points to ethics as a means to reach agreement on the right kind of regulation of biotechnological research. It should be stressed at this point, that this analysis is not occupied with the ontological status of ethics. Rather, what is interesting is to focus on the way ethics is presented as an object in these arguments. It is perhaps not surprising that the previous quote is taken from an argument made by a person trained in ethics as an academic discipline. Taken at face value ethics is portrayed as a set of principles from which the morally right regulation can be deduced in this quote. This also seems to imply that clarification of ethical principles is a task best left to academics trained in the discipline. Identification of the relevant ethical principles and their interpretation thus seems to be a task for experts. In this way ethics becomes a hierarchical system of statements just as the system of scientific knowledge was presented earlier. Again we have a hierarchy, but instead of scientific knowledge claims at the top, we now have ethical principles. It should be emphasised that the previous quote is extraordinarily explicit in formulating this hierarchy. Most other arguments about ethics are less direct in their advocacy for the position that morally right regulation can be deduced from ethical principles, but many imply that ethics somehow holds the solution to the new challenges posed by gene technology:

> In the ethical debate the difference between good and bad is often attached to the concepts of natural and artificial. But when the boundary between natural and artificial grows diffuse, it becomes

[116] Social scientist in Jyllandsposten, 24 October 2000: ”Towards a European bio ethic”.

> difficult to differentiate between good and bad. On the surface it is technical progress in the form of gene therapy and cloning that sets the agenda, but internally it is just as much a question of new points of orientation to latch human existence onto. Ethics, therefore, ought to have a central place in public debate about technological progress, and we are very happy that The Council of Ethics has backed the project [an exhibition at the Science Museum on the Future Body] in every possible way, because the council, if anybody, has worked to put ethics and technology on the agenda.[117]

This way of understanding the function of ethics is apparently less hierarchical. Since ethics should play a part in public debate there are apparently issues to debate, but the argumentation is rather vague on this point, as many of the arguments about ethics are. Ethics seems to be taken for granted as a means to solve problems in many arguments. But whether it can be viewed as a set of principles that can prescribe a clear moral order, or whether it is a set of procedural rules that prescribe a particular type of considerations or reflections, is often unclear. I will argue, however, that both types can be viewed as hierarchical modes of articulating the collective. In the first instance it is obviously a hierarchical order that prescribe solutions to problems. In the second instance it is not treated as an order that is defined *a priori* but as a reflexive procedure. The key assumption seems to be that through ethical deliberation it will be possible to identify the 'right' way to act and regulate biotechnological research. In so far as this type of argument seems to imply that, although the 'right' choices cannot be deduced from pre-existing principles, it is still possible to identify a universally 'right' way to act, I have classified it as a hierarchical mode of articulating the collective. In the next quote, this is exemplified with the articulation of ethics as universal, not just an aggregation of individual preferences on morals:

> The ethical challenge has come to stay. We will therefore experience that the ethical questioning of progress and rosy pictures will continue. The fact that something that is ethically contestable is initiated evidently does not mean that the contestation will cease. Of course, there is always a tendency for human beings to get used to the existence of something, even though they strongly opposed its introduction. But, on the other

[117] External editor in Jyllandsposten, 25 March 2000: "Future Body"

> hand, although little resistance towards current legislation on abortion can be noticed in the population, the ethical problems associated with abortion have not been dispelled – one might even say: far from it. (...) Even if the colour turns black, when it should have been white, there is no reason to call black 'white'? There is a reason to stick to ethics, because otherwise one will end up losing both one's senses of direction and of colour. As it is known, taking an ethical stand is not an unambiguous phenomenon. Everybody will probably agree that not everything, which is possible, should also be done. But there is no unanimity about where the specific limit between ought and ought-not should be put in the concrete context. Still everybody ought to agree that a limit has to be set somewhere – unless, as mentioned, ethics should be abandoned completely.[118]

Although the quote presents some tensions in terms of whether or not the specific line can be drawn between black and white, the general implication of this argument is that ethics is a guide that can prevent white from turning into black. Without ethics, society is left with no means of securing a morally 'right' regulation of biotechnological research. Ethics can thus be viewed as a defence against the threat of immorality. If 'we' as a society do not act ethically responsibly, that is, acknowledge black as black and white as white, we will lose direction and the ability to distinguish between good and bad, right and wrong.

It should be noted that the quote is taken from an opinion piece by the chairman of the Council of Ethics. I do not, however, mean to suggest anything about intrinsic motives. Still, explicating the connection between the position as chairman and the argument can stress an important part of my understanding of the articulated collectives. When the chairman is arguing in favour of ethics as a guiding principle it can be viewed as a general statement about the *ought* of society as a whole, but it could also be read as a defence of the function of the council. In this connection I want to make the same argument as with researchers and the interests of biotechnological research. The fact that the chairman of the Council of Ethics is arguing in favour of ethical reflections in society should not necessarily be interpreted as an argument designed to serve a particular interest. In fact, if we take the perspective of hierarchy seriously, the causal expla-

[118] Chairman of The Ethical Council in Politiken, 30 December 2000: "The spread of the ethics of resigning".

nation would be the other way. It is because 'we' believe in ethics as a guiding principle of moral order, that it makes sense to have a council of ethics employing ethical principles. As I will show in the section about the perspective of competitive individualism, talking about interests is part of a different articulation of the collective. Therefore, if *we* as readers of the chairman's argument talk about interests we are no longer accepting *his* articulation of the collective as a hierarchy where The Council of Ethics play a role as mediator of ethical principles.[119]

Public debate as vehicle for enlightenment

In arguments articulating the collective as a hierarchy it is very common to present 'society' as a 'we'. It is 'us' who have to face the new challenges posed by biotechnology and act accordingly. Whether the social order is based on science or ethics, the realisation of this order is important for the ability to reach closure in controversies, since it is possible to deduce 'right' answers from the unifying order. For instance, as demonstrated in the section about science as hierarchy, closure can be obtained in the form of a solution that initiates[120] a search for 'true' knowledge according to the rules of conduct for scientific research. Correspondingly, when ethics is articulated as the guiding order, answers will be provided if 'we' follow prescribed rules of conduct for ethical deliberation as illustrated in the previous quotes.

In its full consequence this means that no problems are unsolvable. If they appear as such, it is because the fundamental guiding order or principle is not clear to, or acknowledged by, all members of society. Thus, the fundamental tension in a hierarchical order would not be clashes of interests as in the market, but rather a question of whether all the parts of the whole are familiar with, and accept the precedence granted to the whole and the guiding principle that sustains the social order. From the hierarchical perspective dissent must be understood as a lack of recognition of the fundamental guiding order. In situations of controversy, therefore, the individual elements should be made to see, understand

[119] Although as we will see, The Ethical Council can also be articulated as an important mediator between interests.

[120] This is an important qualification. Ethical issues are 'closed' not by *solving* the original ethical problem, but by getting that research underway which will eventually render it obsolete.

and/or accept this order because this will make them able to recognise the decisions or answers deduced from this order as universally 'right'.

> Can we say that the new knowledge of genetics is a bad knowledge?
> Of course not. Genetic knowledge will influence our everyday life, our economy, and our culture to same degree as the electronic knowledge has done in the last twenty years. We might as well realise this. Whether we like it or not; by virtue of genetics we will have the possibility of being endowed with a whole new dimension of knowledge about life, about our bodies and the risks that might threaten it from the inside.
> Society has to take a stand on which kind of knowledge is good and which is not from case to case. The individual citizen cannot decide on this alone, since genetic knowledge affects just a single individual only in extreme cases, and normally also the family of the individual. Solely for that reason we must evolve ethical norms about the access to knowledge on a societal level. (...) It is an important task for experts within the health care sector to pose – and possibly answer – the questions, which will make all of us wiser. FDB [an association of cooperative grocery stores] will initiate general meetings on genetically engineered food. The health care authorities have a gigantic responsibility to guide and inform the people about the significance of this new knowledge.[121]

As this quote signifies, social order is not built solely on the aggregation of individual preferences, but on a general principle. Decisions on regulation of biotechnology cannot be left to individuals since they will have an influence on more than the individual. Decisions on genetic knowledge affect the whole, not just the parts, and therefore societal institutions like ethical norms should regulate the use, rather than leaving it to individual preferences. In this case the demand of 'facing the challenge' seems to lead to closure in the form of a combination of expert knowledge and public information. The problem is to a large degree constructed as a lack of information and the solution is found in the dissemination of expert knowledge, with responsibility for this dissemination process assigned to the authorities.

[121] Editorial in Politiken, 2 October 1999: "Genetically seen".

This quote hereby subscribes to a highly hierarchical notion of science communication, with 'knowledge' or experts at the top and ignorance at the bottom. The necessity of accepting this hierarchical order is stressed by the insistence, that we cannot escape this new knowledge. Thus being a responsible citizen requires understanding and knowledge of genetics as well as awareness of knowledge hierarchies. And correspondingly: developing proper regulation of biotechnological research is primarily a question of following expert advice. According to this quote the dangers that society has to deal with is predominantly ignorance. Biotechnological research has the capacity of transforming society, and as experts and citizens we must take part in a general process of science communication in order to fight ignorance. Not being part of this enlightening communication, either as sender or receiver, is irresponsible, since it might lead to in-correct and therefore 'wrong' perceptions of genetics. As it is put in another editorial in Politiken that warns against genetic determinism: 'If we are not very careful, the genetic discourse will install itself where myth and fairy tales hang out'[122]. In this way genetic knowledge is not something to take lightly. It is serious business and has to be handled with care.

Public debate is seen as a central mechanism for this process of information that is expected to lead to closure in the controversies about biotechnology. It is through communication in a public sphere that the members of society can be generally educated and cultured as particular elements in the social order and hereby become aware of the connection between their particular role and the unity of social order. Rather than using force to enforce the hierarchical order, it seems that the hierarchical order is supposed to be persuasive by nature. If individuals are just made aware of the reigning order they will accept it and behave accordingly. Consequently, neglect of this order is presented as a result of ignorance. Problems arise because people do not have sufficient knowledge about the hierarchical order, whether in the form of science or ethics. Therefore enlightenment seems to hold the key to reach closure in controversies. If 'we' (inside the hierarchical order) just inform and communicate the hierarchical principle clearly enough then 'they' will understand and accept the 'right' answers as deduced from this principle.

[122] Editorial in Politiken, 27 June 2000: "Book of Life".

In this way enlightenment, as a process of 'bildung' or general education (sometimes also translated as 'edification'), is to ensure that individuals in society can and will conduct themselves in a *proper* way, just like experts and individuals occupying other hierarchical positions should behave properly. Public debate is thus a means of diffusing knowledge about the hierarchical order with the purpose of shaping the individuals as virtuous members of society, so that controversies can be solved in an amicable fashion. On this background it is possible to construct the following scheme for the inscription of science, ethics and public debate.

Figure 6.2	Science	Ethics	Public debate
Hierarchical Authority	Institution *prescribing a logic of scientific inquiry* for establishing true answers	Institution of ethical principles or procedural rules for *identifying morally 'right' answers*	Vehicle for *informing and enlightening* the public about the hierarchical order

Competitive individualism

The change of perspective from hierarchy to competitive individualism makes other patterns in the analysed arguments come to the fore. The crucial feature for classifying arguments as subscribing to the competitive perspective is that they articulate the collective as an exchange mechanism where closure is reached by mediating between the preferences of the individual actors. Actors do not occupy roles as they do in the hierarchical perspective, rather they are seen as autonomous individuals characterised by a unique set of interests, preferences and resources. As a mechanism of co-ordination, it is the market that makes the individual actors negotiate with each other in order to pursue their own interests for mutual benefit. All actors are free to negotiate or withdraw, so the shared agreement has to hold more benefits than risks. This evaluation, however, is changing all the time depending on the immediate identification of risks and benefits, as demonstrated in the following quote taken from an editorial about the birth of five cloned pigs:

> In the wake of Dolly, all the bio-ethical committees of the world were mobilised, EU considered if grounds existed for an overall legislative reform on cloning, and German opinion, loaded as it was with the memory of the nazi's eugenics, was horrified. The commotion was understandable and inevitable, but three years and

> so many words later, more sober considerations in the debate on cloning, are required. The immediate prospects of this week's pig clones is not airy, but very tangible, as it was instantly experienced by the company behind the clones in the form of pronounced stock increase. The company hopes to be able to introduce genetically modified organs of pigs designed for human beings within just four years. Everywhere in the world there is a shortage of human organs for transplants. This shortage could be remedied if organs can be 'grown' in pigs. The prospect is frightening for most people, but difficult to argue rationally against, if the alternative to the transplant of pig's organs is to let people in need of organs die.[123]

Several aspects seem important in this quote. As a starting point it is interesting to note the ease with which the economic aspects for the company involved are presented. In contrast to the arguments subscribing to the hierarchical perspective, this argument treats it as a 'normal' and perfectly acceptable strategy of a private company to pursue this technology. The main justification is the hope of producing a useful and working solution to the problem of organ transplants. In this way research is defined as a way of creating solutions to problems just as we have seen in the previous section. Here, however, there is no mention of specific rules that has to be observed if science is to bear fruit, as it was the case with the logic of scientific inquiry identified in the hierarchical mode or articulating the collective. Quite on the contrary the fact that research is taking place within a private setting, does not seem to make any difference to the outcome. The only thing that seems to matter in the end is whether or not a solution to the shortage of organs is provided. Secondly it is interesting to notice, how resistance to cloning is presented as an initial 'commotion', which is now to be superseded as we 'sober up' and see the real possibilities. It is not because it is 'right' in any universal way to use the organs of pigs for transplantation, but because it is useful. Thus, fear must be succeeded by a utilitarian contemplation of the great prospects in the technology.

[123] Editorial in Politiken, 20. March 2000: "Five small pigs". Reading through this quote, the references to the German public should be noticed, since it is not more than a couple of chapters ago that I showed how the editorials in Politiken also explored the connections between eugenics and the prospect of human cloning brought about by Dolly. The fact that the same newspaper articulates several contradictory statements is, however, not a central issue in this dissertation, but could be interesting to pursue in further research.

Central in this perspective is that it is not universal norms or hierarchical orders that have to be protected through regulation of biotechnological research. Rather it is the autonomy of the individual that has to be protected from attacks, but since the autonomy of some, however, can infringe the autonomy of others, some regulation can be necessary. This is exemplified in many calls for prohibition of reproductive human cloning as a result of the public announcement made by Antinori and his team of researchers of their efforts to clone humans for reproductive reasons:

> An uncomfortable consequence of the mad scientists' misanthropic experiments with human individuals can be that politicians overreact and also prohibit therapeutic cloning, which will cure illnesses and ease suffering. There is an urgent need for political systems all over the world to manifest the inviolability of the human individual without putting unjust obstacles in the way of responsible research, which in spite of everything, is by far the most all-encompassing. The boundary runs between individual and non-individual.[124]

This quote is characteristic because it seems to incorporate some of the elements from the hierarchical mode as illustrated in the previous section. Talking about responsible research and about making the inviolability of the human individual manifest seems to imply a hierarchical order of an absolute limit, from which a moral can be deduced. I have, however, classified this as subscribing to a perspective of competitive individualism because of the pragmatism it also articulates. Reproductive cloning is articulated as wrong because it has no benefits (but poses many risks such as disabilities and abortions), whereas therapeutic cloning is seen as beneficial and therefore should be permitted. In addition it is explicitly stated that it is important not to 'overreact', hereby prohibiting a potentially beneficial type of research, just because some villains take 'unjust' advantage of the individual right to pursue private goals.

In this connection, two things must be considered. First of all, even though the prohibition of human cloning is often discussed as a major manifestation of a limit, it can be viewed as mere gesture from a utilitarian point of view, since it is not an actual impediment to any established kind of research in Europe. It is not that the prohibition actually restrains any Danish researchers from following

[124] Editorial in Jyllandsposten, 10 August 2001: "Crazy research".

their research interests. Actually, the unquestioned positive assessment of therapeutic cloning also put forward in this quote underlines this point. Only a couple of years earlier the same newspaper gave editorial space to arguments against human cloning as such. In the meantime, however, it seems that therapeutic cloning has crossed the line of estimated benefits, and is now unquestionably valued as a technology holding great prospects for the future. Seen in this light, the prohibition could be understood as a case of prohibiting what no one really wants anyway, hereby leaving another door open for the pursuit of therapeutic cloning.[125]

Secondly the marking of the 'individual' as setting a limit should be noticed. As discussed in Chapter 3 human cloning can be seen as touching upon some central values of individuality in the western world. In line with the presentation in the previous chapter, it is possible to argue that the notion of individuality has a special function in arguments articulating the collective as competitive individualism. Markets presuppose individual preferences, interests, resources, and actors that are able to negotiate freely with each other. On this basis it is not just an empty gesture for arguments subscribing to this mode of articulating the collective to hold individuality sacred. It has a much more central position in this perspective, than in the hierarchical mode of articulating the collective, where roles seem to be more important than the actors occupying them.

The invisible hand of scientific progress

During the analysis I have found it difficult to establish clear-cut distinctions between the way science is inscribed in the competitive mode versus the hierarchical mode of articulating the collective. I will return to the similarities later, but in this section I have employed a distinction between actor and institution as discriminator, and I have used very distinct definitions of the two. In the hierarchical mode science is an institution of rules and norms of behaviour. In the competitive mode science is constituted as an actor with interests and preferences, able to mature and provide solutions to problems:

> Gene technology is maturing within two important areas – health care and food. In just a few years it will be possible to treat

[125] Priest makes same kind of argument when she argues that cloning gets so much attention because it is less important for influential actors and that media coverage tends to follow the path of least resistance (Priest 2001c). Ascribing this tendency to particular intentional subjects, however, cannot be sustained in this dissertation.

> diseases and make diagnoses in a completely new way. (...) This will also contribute to the creation of an impression that everything is possible – that anything can be done. These technologies will be the 'iron horse' of the future just like the steam locomotives at the turn of the last century were the symbol of progress and new times. These technologies will be part of sustaining the idea that the world can change for the better. We will recover a belief in the future for two reasons. First of all because it is a very long time since we last believed in the future, and secondly because the new technological possibilities make us able to believe in progress and a better future.[126]

Here it is very clear that the hope for the future is based on a un-problematised expectation that biotechnological research will provide solutions to problems. Science is a resource in the creation of the 'better world of the future' and therefore it is an important part of society. But it should be noted that it is not a defence of the institution of science as a knowledge hierarchy. Science is not important as a system in itself, but as a means, a resource, it is a central activity in society. Another version of this future optimism is found in the following quote, where the author is arguing in favour of a concept of trans-humanism as a successor of traditional humanism:

> Many traditional humanists feel that human dignity is threatened by these new possibilities because if our DNA is as easy to change as that of a banana fly, and if our personality can be changed by Prozac, what is it that separates us from animals and dead objects? But they overlook that human dignity does not have to be based on an argument that humans are better than other things. It can instead be based on our unique ability to choose what we will become. We do not get our dignity because we accept our limitations but because we evolve. That, which impedes our progress, is the real threat to human dignity. Many people fear the future, because it is unknown and insecure. Many feel an urge to stop and control progress. One would rather say no thanks to new possibilities in order to avoid new threats or new moral problems. (...) [But] in the perspective of trans-humanism it is only now that human beings have the possibility of really becoming free. We can free ourselves from the limitations put on us by evolution, and become what we

[126] Future researcher in Jyllandsposten, 3 January 1999: "The novel times and the novel time-spirit".

> really want. It is not easy, and there will always be risks. But we can use our rational senses to find good solutions, both individually and in common. It is better to be tolerant and let people be at liberty to try different methods, than to try to force everybody to do the same; partly because we are individuals with different goals and partly because it could easily have disastrous results to force a bad solution on everybody.[127]

In this quote hope for the future is explicitly connected to a view of society as consisting of individuals pursuing different goals with different means. It is worth noticing how the common good is reached by letting people follow their own individual interests, rather than seeking a common principle or rule according to which everybody should act. In this way the development of biotechnology is articulated as following a similar logic to the invisible hand of the market. If we all pursue our individual goals unhindered, the result in terms of new solutions will be most beneficial to all. The quote explicitly argues against hierarchies of knowledge claims by claiming that the real impediment to human dignity is restraints of all kinds. In making this argument, a general notion of progress is invoked, one in which progress is defined in terms of human ambition to break free of unspecified constraints imposed by nature or origin. Evolution rather than confinement is the central feature of human dignity and evolution equals progress in this context.

This goes directly against the claims made in the previous section where human dignity had to be protected by rules or principles. In competitive individualism, the social order is not constructed around a norm prescribing the 'right way' to act. Rather than establishing a set of roles with corresponding privileges and obligations, this notion of social order depicts a lot of individual actors (which can also be research groups, organisations and so on) pursuing their own interest. What is central is that this pursuit of individual interests is seen as resulting in the general prosperity of society as such. Thus freedom of research can also be defended in this type of argument. It is, however, not a rule of conduct but a question of autonomy based upon the notion of an invisible hand of scientific progress. In this perspective science (or a group of researchers) is constructed as a social actor with particular interests and characterised by its potential as a knowledge producing resource.

[127] Scientist in Jyllandsposten, 5 December 2000: "Human kind 2.0".

Ethics and the regulation of market imperfections

In the quote above it seems to be a consequence of this perception of society that regulation should be minimised or even abandoned completely in order to let all actors pursue their individual preferences for the common good. As mentioned above, however, most of the arguments articulating the collective as composed of actors with interests and preferences that need to be co-ordinated through some kind of market, do not explicitly argue in favour of no regulation at all. It seems that in order to let individuals pursue their own interests, it is necessary to have some general regulation that will sustain or secure freedom of the individual. In the following quote the call for regulation is put forward by a chairman of the association of laboratory technicians arguing for the right of technicians to refuse work that transgresses a personal ethical limit:

> We all have our individual ethical politics of limitation, and for most of us it becomes particularly clear when it pertains to the beginning and end of human life. (...) Some – probably many – welcome the new technologies and seek jobs within avant-garde areas like fertility and gene technology. For others the almost surprising pace of scientific progress implies that they feel pressured into a dilemma of "quit" or "transgress your limits". I do not consider this a fair choice. Although an employer always should be able to presuppose a certain professional flexibility of an employee, it must be possible to draw a line between what is just a new, different, and perhaps unpleasant, professional method, and a technique which touches upon our most fundamental perceptions of creation, life, and death. (...) The limit ought to be drawn once and for all in parliament with a legislation, that protects health care personnel against the pressure to participate in those parts of modern research and treatment, that it is against their personal ethics, especially on the subjects of life and death.[128]

In this argument ethics has become an individual question of personal limits, and regulation is necessary to secure this right to choose. Everybody is entitled to his or her own personal ethic, but in order for this right to be safeguarded, the collective should protect it through legislation. In juridical terms one could speak of a negative right – the right to be free to choose for your self. It is interesting how this argument, which is advanced by a union leader in favour of the

[128] Chairman of laboratory technicians in Jyllandsposten, 19 September 1997: "But mice are squashed".

protection of union members, in this way becomes very similar to traditional liberal perceptions of personal freedom.

In this way, a positive association between a pragmatic evaluation of risks and benefits, and regulation in order to protect individual freedom can be identified. I will argue that this association is constructed around the particular articulation of science as an actor constituted by its resources and interests. As discussed above it is central to let all actors utilise their resources and follow their interests, since on a collective level, this is seen as leading to prosperity. Thus a key issue proves to be the protection of the individual freedom of different actors that might have conflicting interests. Science should pursue its own interests in terms of the search for true knowledge, but this pursuit should not impede the freedom of other actors to pursue their interests. Legitimate closure, is therefore a pragmatic regulation that can balance interests for the common benefit of all parties in society. Private interests can thus become a problem if they go directly against public interests or interests of other parties. This can be compared to the way the state can be seen to regulate market imperfections in the capitalist economy. Throughout the history of political theory it has often been argued that in the capitalist state it is necessary to regulate in order for the market mechanism to function in the most rational way, as well as prohibit stronger parties (or villains) from taking unjust advantage of the honest and/or weaker parties.

Another example of this protection of the weaker parties is found in the following quote. It is taken from an argument about the possible legalisation of research in stem cells, where the ethical question put forward is the status of the foetus:

> What is a human being really? Should a lump of cells be allocated human worth, merely because it contains human DNA or does it take more than that?
> Personally I would like to set the limit at the ability to perceive pain. The precondition of the perception of pain is a primitive, but organised central nervous system. A newly fertilised egg is not able to perceive pain. The foetus is probably not able to feel pain until the twentieth week of pregnancy.[129]

[129] Medical doctor in Politiken, 22 April 2000: ”What is human life”.

Following this line of argument it is the foetus as individual that should be protected, not the universal idea of the fertilised egg as the beginning of human life. A foetus able to feel pain should be protected because individuals should not purposely be subjected to pain. But the foetus does not represent a general principle of life that should be protected as such. The quote illustrates ethics as a concrete consideration protecting the weaker parties, which again, can be compared to the state protecting the weaker parties in the capitalist economy. Concerning the stem cells, however, the argument leads to the following presentation of the ethical problem: 'Should blind life in the form of stem cells be allocated worth in such a way so this "human worth" prohibits cultivation of stem cells, which could save lives and prevent severe suffering?'[130] Put in this way the argument is strictly utilitarian, as the way to reach closure is to find a way of exploiting biotechnology, so that it brings the largest amount of benefit at the smallest amount of costs or risks. In this context it becomes difficult to distinguish between perspectives, because if utilitarianism becomes an overarching ethical principle, then it turns out as a hierarchical system of rules for producing the 'right choices' like in the following quote:

> In short, it is a consideration of the quality of human life that calls for correction, the prevention of disease, the manipulation of genes. But this consideration also speaks in favour of gene manipulation for enhancement. It is of course true that we never with certainty will know if a given genetic measure will actually advance the quality of life of future generations. In short, there are risks connected to the use of gene technology on humans. Naturally, this is not something special pertaining to the use of gene technology. Any new technology implies risk. So when we ask ourselves whether it is morally defensible to introduce a new technology we ought to weigh estimated positive consequences against estimated negative consequences. (...) To prohibit gene manipulation seems to be the same irrational reaction as that of the absolute monarch when he orders the killing of the messenger of bad news. None of the described arguments against enhancing eugenics seems valid. Most of us have a certain emotional dissociation to eugenics. Since this dissociation cannot be backed by arguments, we ought to free ourselves from it.[131]

[130] Medical doctor in Politiken, 22 April 2000: "What is human life"
[131] Assistant professor in Philosophy in Jyllandsposten, 10 October 2000: "Future Body: Would it be bad, if we were improved?"

In this quote utilitarianism, in terms of the weighing of positive and negative consequences, is articulated as a general principle that can provide a universal answer to questions of right and wrong, and in this way it must be classified as hierarchical. On this basis, it can be argued that utilitarianism in its pure form should not be classified as competitive individualism, because it gives precedence to a hierarchical norm from which 'right' answers can be deduced. In the actual classification of arguments, however, this ambiguity has been treated as a question of the context of the argument. Is the point to argue for the existence of utilitarianism as a general argument or is it to use the utilitarian notion as basis for a pragmatic evaluation of pros and cons? In competitive individualism the essential characteristics are pragmatism, the concrete, contextualisation in time and space, and the evaluation of risks and benefits by individual and autonomous actors operating to pursue their own interests. When regulation is necessary it is in order to remedy concrete imperfections, not in order to protect a universal norm.

Public debate as a market of opinions

A second insight clarified by the previous quote is the way in which the aggregation of preferences seems to be the means to reach closure in the controversies and to attain co-ordination in society. A reason for considering the previous quote as basically hierarchical is that within the perspective of competitive individualism it cannot be claimed, that 'most of us have an emotional opinion, which is incorrect'. In classifying an argument as subscribing to competitive individualism, it is precisely a central element that there is no extrinsic norm, to which actors can refer in order to deduce determinate answers. Rather, actors are stuck with all the other actors with special preferences and interests, when trying to reach co-ordination in society and legitimate closure on questions of regulating biotechnological research.

On this basis public debate takes on a different function than in the hierarchy. There it was a means to diffuse knowledge of hierarchical order. In the competitive mode of articulating the collective, public debate becomes a vehicle for negotiation or mediation between different interests and preferences. Arguments can be voiced and mediated with each other, but how this mediation precisely is to result in closure and co-ordination is a matter of less clarity:

> The Council of Ethics has now expressed its opinion on therapeutic cloning, and a majority of its members endorse the idea that it should be allowed to clone cells from the early human embryo in order to produce stem cells, which – in theory – can be used in the treatment of a number of diseases. (...) We are – after careful consideration – in almost total agreement with the majority of the Council of Ethics. We open the door to organ fabrication – but we do not have to let human cloning be the consequence. A vibrant debate should be the basis of clear international regulation in the field, so that we do not end up with industrial technology, without having consulted the public.[132]

The implications of the last sentence in the quote are that it is justifiable to go ahead with industrial implementation *if* the public agrees. In this context, the public and the presence of 'vibrant debate' become the ultimate criteria of acceptability of the technology, not an overarching principle, or rule. It should be noted that the phrasing 'vibrant debate' ('levende debat') rests upon the particular Danish tradition in discussions on theories of democracy mentioned in the introduction to this thesis. The Danish theologian Grundtvig used the expression of 'the living word' ('det levende ord') as a phrase designating continuous general education within the 'people'. Later, another theologian, Hal Koch, elaborated this notion further to a particular definition of 'democracy as dialogue'. In this ideal of democracy, closure is ideally created as consensus through mediation of arguments. At length the quote can thus be seen to invoke an ideal of the public sphere as a means to reach some kind of negotiated settlement, or even full consensus, on the regulation of biotechnological research.

Consensus, however, is not a necessity in the present definition of the perspective of competitive individualism. In principle, closure can be reached through voting or other quantitative methods of aggregating individual preferences. Rather, the central feature of public debate is the possibility of mediating between interests and preferences. Co-ordination consists of taking as many things as possible into account, and then trying to reach a compromise from these diverse considerations:

> My wish will be, that you [the youth] will not let yourself be directed by misguided despondency that the trend cannot be

[132] Editorial in Politiken, 1 March 2001: "The limit".

> curbed, but that you will be part of setting the agenda for the path that progress should take – therefore, have courage. That you may not let yourself be directed by economic considerations alone, but that you will also let ethics, environment etc. play a decisive role – therefore, take responsibility. That you will question the everlasting demand for rapid decisions since your choice touches upon fundamental values, including what has been termed the wealth of nature and the nature and dignity of human beings – therefore, demonstrate humility and caution.[133]

In this quote the mediation between considerations should be guided by courage, responsibility, humility and caution, but it is essential that the process of mediation be presented as 'choices'. In this way social order cannot be deduced from a universal, absolute or hierarchical norm, but has to be determined by choice. And this is how I have differentiated it from the notion of enlightenment in the previous section as means of achieving closure. Whereas arguments subscribing to hierarchy conceived of public debate as means to identify the basic principle that should be the foundation for closure, arguments subscribing to competitive individualism inscribe public debate as a vehicle for continuous negotiation and mediation in which closure is always contextual. On this background the inscription of science, ethics and public debate in arguments subscribing to an individualistic mode of articulating the collective can be summarised in the following scheme:

Figure 6.3	Science	Ethics	Public debate
Competitive Individualism	Resource in society producing solutions to present problems according to the *invisible hand of scientific progress*	Ethical choices are *sum of individual preferences*, sometimes pointing to necessity of regulating market imperfections	Vehicle for pragmatic and contextual *mediation* between different interests and preferences

Sectarian egality

As mentioned previously, authoritative hierarchy and competitive individualism are the two basic ways of exercising power. In the present analysis, no assump-

[133] Chairman for the Council of Ethics in Jyllandsposten, 1 January 2000: "The genetic cocktail".

tions are made about the executive power of subjects. Still, it is possible to say that the two perspectives seem to subscribe to an ontology that includes something like beneficial positions of power, since they articulate society as a manageable entity where commonly beneficial closure can be the outcome of controversies. Whether legitimate closure emerges through a universal norm guiding hierarchical order, or through the co-ordination of interests and preferences in the market, exercises of power can be based on a commonly accepted order to the benefit of the collective.

When we shift the perspective to see the collective in terms of sectarian egality and fatalistic isolation, this notion of legitimate closure and exercise of power for the common good disappears. These ways of articulating the collective represent perspectives of counter-power and protest, where society is not articulated as a positively ordered entity. Rather, the prevailing social order is articulated as the problem, either because it is problematic in itself or because it is non-existing. The two ways of problematising social order points to two different ways of opposing the exercise of power. Whereas opposition in the sectarian perspective is shaped as radical activism, the perspective of isolation results in fatalism and withdrawal. It should be remembered that this is an analysis of arguments, not of individuals or power structures. I look at the articulation of social order in the arguments, but I do not thereby claim that the subjects presenting these arguments have some kind of essence as critical activists or isolates. The reason for using the somewhat uncommon vocabulary of modes of articulating the collective is precisely to keep the status of these types as articulated collectives not as real-types of individuals firmly and continuously in view.

In the sectarian mode of articulating the collective, society is a battlefield, where systems of power corrupt the community of people. When the collective is articulated in this mode, the notion of invisible corruption or disguise is central. Although science looks like progress the 'real' consequences are hidden and hideous:

> And we have seen them as highlights in the history of civilisation: "Edison, Ford, Niels Bohr – only long after their glorious time have we realised the unintended consequences: the cities, the cars, the bombs. It is actually not until recent years more people start to realise that there can be a reason to call it quits. (...)

> We are saying no, to the trend as it looks today – we fools. Because the brave new world is not our world, not the world we wish for the future. Think about the whole world ruled by a handful of resourceful brains sitting at a round table. Buried in curves and calculations. With all the recent stock prices and data on the screens around them. With only one criterion for the decisions they are going to make: What will they gain in terms of money.
> And where do you think you would be in this scenario? Probably scrapped with all the other underprivileged. Like Jeppe. And then Klods-Hans comes riding his goat – with mud in his pocket. I wish for a world with humour. With life and with humanity. I want birds around me. Mates, who thrive. Forests. Meadows. Pure water. Fertile land. Solidarity with people of other countries. Buddhists. Bushmen. Bolivians.[134]

Several things should be noticed in this quote. Of interest is first of all, the way the scientists and their innovations are articulated as apparent high points of civilization, but lead to a terrible form of capitalist oligarchy. The conspiratorial form of this argument unambiguously place science in cahoots with the enemy, around the same table, which in this case organises a mixture of capitalism, unification, industrialisation and exploitation.

Secondly the implied difference between surface and 'reality' should be noticed. It is only on the surface that science looks like progress, and that opposition looks foolish. Just like it is at the surface that the rivals of Klods-Hans look smarter than him. But when reality is unveiled it becomes obvious that the pleasant looking surface is mere appearance, disguising a radically different and hideous reality. Biotechnological research does not bring real progress, but rather domination. Fools are not idiots, but rather freedom fighters and so on. In this line of argument the crucial issue is to become aware of this discrepancy between surface and reality. To realise, that even if a technology presents itself as progress, it is not necessarily so. On a general level it can be noticed, that this

[134] Member of an NGO in Information, 24 February 1998: "Genes are not Lego blocks". Jeppe is a famous Danish literary figure, a drunk who is treated as baron for a day and then thrown back on the dunghill to the amusement of the baron and his friends. Klods-Hans is taken from the fairy tales of H.C.Andersen and can in this context be seen as exemplifying the ordinary person with no respect of hierarchies or people of larger resources, who wins the princess and half the kingdom on this account.

line of argumentation rests upon an emphasis of uncertainty as justifying precaution. Because the scientific progress has also included negative consequences in the past, this should lead to more precaution in the future. In this way the criticism of progress rests upon the establishment of an ideal of progress as something that ought to be unconditionally good.

Science on the slippery slope of corruption

Sectarian modes of articulating the collective can be seen to have high expectations of what science hypothetically is able to provide. As mentioned above, 'real' scientific progress is supposed to provide benefits without drawbacks in terms of risks and side effects. In this way they often present an ideal about 'true' scientific knowledge that will be beneficial to everybody in society and support the common life of people in an entirely positive fashion. This, however, is the ideal of science, whereas the articulation of the tangible scientific activity is presented as an ambiguous phenomenon. In the following quote the present stage of biotechnological development is articulated as a dilemma that can be solved only by realising that there is a discrepancy between surface and reality. Even though scientific growth looks like progress we have to realise that it really is degradation:

> For many years now, the ethical debates that follow any new biomedical initiative has been in a dilemma. Techniques have been developed, which on one hand sound like good aids, for example in fulfilling adults dream of the enrichment in life that children are, but on the other hand these techniques are an expression of the degradation of the human being. (...) Every time a new method is introduced as a step towards the future land of milk and honey, it is a dilemma to say no. We are stuck on a slippery slope where every medical conquest is only a small step. It is tough to have to say no, because then you are a bad person, who does not grant other people the quality of life that you have yourself![135]

The slippery slope is a commonly used metaphor in the arguments classified as sectarian in this analysis. It covers the idea that doing the thing A might be innocent, but the natural continuation of A is B or even C, which might be appalling. So even if A is not a problem in itself, it should be shunned because it will unavoidably lead to B and C. The argument about a slippery slope thus portrays

[135] Two priests in Jyllandsposten, 31 May 1998: "The biomedical slippery slope".

change as a kind of unidirectional motion leading from A directly to disaster. In this way it is parallel to the notion of *the invisible hand of scientific progress*, only with the reverse direction. Whereas the invisible hand of scientific progress automatically leads to utopia, the slippery slope automatically leads to dystopia. Sometimes the notion of slippery slope is articulated as an invisible or imperceptible phenomenon. The implications seems to be that one day, society will have become inhuman or in other ways estranged, without having realised the danger from the scientific development in time:

> The question is whether we will be able to control the continued trend if we cross this qualitative limit – even if it is only a tiny step. The slippery slope is right ahead with all its medical temptations to take just another little step, again and again. Until a strange humanity eventually stands out, struck by oblivion and unable to weigh dignity against personal utility.[136]

One reason to fear the slippery slope, it appears, is the element of temptation that leads to perdition. Society will loose the ability to distinguish between right and wrong, if it lets itself be tempted by the progress of biotechnological research. These arguments bear some familiarity with the hierarchical mode of articulating the collective, in that they seem to imply a need to find an overarching principle that can serve to ward off this trend. The many references to temptation, perdition, oblivion, however, indicate a different line of reasoning. Whereas the temporal perspective in the hierarchy seems to focus on the past (we have to follow traditionally established social order) or the present (we have to identify the immanent principle of order), the sectarian articulations focus on the future. It is the threat towards the future that is the key issue. There is no stable hierarchical principle of order that serves as basis for the argument, but rather a threat is identified. This threat on the other hand constitutes the present as fragile – as humans, we are in danger of loosing our true selves. Biotechnological research is threatening to corrupt core values of society, but it seems that this threat is not yet properly realised. Therefore a main task for these arguments seems to be a call for attention to or publicity for this threat. Society is endangered by science and has to become aware of the seriousness of this situation. Although technical change looks like an improvement, it has to be realised as a fundamental change, which touches upon the essence of humanity:

[136] Editorial in Jyllandsposten, 9 April 2000: ”Lord of the creature”

> Technology has characterised the last 100 years and since then our immediate world and conditions of life have been strikingly improved, why stop now and break with the trend? The problem is that today the changes are far more fundamental and extensive, and they will change our lives so strikingly that we inevitably will have to define new values. The problem is that in these years the changes do not just alter the way we live, but the conditions for life itself. And the oddity is that the smaller the changes, the more basic they become. Science will soon reach into the core of the human being. When we are in there, no more limits will be left.[137]

The air of inexorable destiny, or at least exceptional importance of protecting the present social order in this quote is noticeable. The implications of biotechnological research are articulated as vast, and therefore the actions of the present seem to be extremely important. When the core of the human being is at stake, it is of vital importance to realise the potential threats and act accordingly. The sectarian perspective thus seems to imply a fragility and importance of the contemporary, as noted in chapter 3. If the slippery slope is not resisted, perdition is lurking at the end. And since the first step down the slippery slope might be decisive, contemporary actions are crucial. Furthermore, members of society might not even be aware of this change. They might be corrupted by the slippery slope of scientific progress without even noticing the corruption it implies and then they are forever doomed: 'when we are at the core of the human being, no more limits will be left'. On this background it seems to be important to sound the general alarm against this all-encompassing threat from science.[138]

The sense of fragility and fear of corruption supports the articulation of the scientific trend as a universal threat to the current social situation in this perspective. Although this content is never really specified it is still articulated as in

[137] Opinion piece in Politiken, 23 October 1999: "The day ethics died".

[138] Before I move on to a discussion of the way this 'resistance' is articulated, however, a little clarification is necessary. In the analysis I have made references to a rather religious vocabulary. In the way I have defined these four perspectives, however, there are no reason to view the sectarian form as in any way 'closer' to religion than the other forms of articulating the collective. Rather, I will argue that it is a core feature of the sectarian way of articulating the collective to see the world as a system where the chosen few form an enclave of insight in a society on the road to perdition. Consequently, when I describe how the articulations focus on corruption and perdition, it is not a result, but origin. It is not an outcome of the analysis, but the distinction I have used to identify the arguments.

need of protection. It is therefore possible to say that it is the threat of corruption that construes the current situation as worthy of protection. It is not because there are positive reasons to articulate present conditions of society and human life as glorious, but in light of what might come, it is essential to protect life-as-we-know-it. Thus, the argument has a similar structure to the future optimism sometimes presented within the competitive individualism, just in the reverse direction. There it is the notion of progress that makes the future seem to be a better place than the present. Here it is the notion of the slippery slope as a downward movement that makes current conditions seem to be worthy of protection. It is the notion of a threat that constitutes that, which has to be protected.

Ethical institutions as legitimating lackeys

A tension is thus presented between 'the good life' that has to be protected and the systems of power, which have to be resisted because they corrupt or extort this 'good life'. Arguments classified as subscribing to the sectarian mode of articulating the collective often employ words like 'humanity', dignity', 'variety', 'diversity', 'spirituality', 'independence', to cover the positive formulation of what should be protected. As shorthand for this list we might use words like life-world or civil society, because they signal opposition to the world of systems, like those of the market or bureaucracy.[139] On the other hand resistance should be directed towards 'reification', 'utilitarianism', 'unification', 'industrialisation', 'capitalism', 'scientism', 'exploitation', and so on. It is quite common, to view the combination of science and capitalism as the ultimate unification of evil forces in society. Especially in relation to the discussion about legislation on biotechnological patents[140], this connection between capitalism and science has been problematised as an unholy alliance:

[139] While I stress that these concepts serve only as shorthand for the particular articulations here investigated, and not as references to the strict theoretical concepts of Jürgen Habermas or other theoreticians, it is possible, as John Law (Law 1986) has also proposed, to read Habermasian concepts as a sectarian articulation of the collective, a proposition that is also sustained by many of the writings on public accountability and science in the public sphere, as mentioned in chapter 1.

[140] The controversy on patents concentrate on a European Directive on the legal protection of biotechnological inventions from 1998, which should be implemented in national legislation in year 2000 at the latest (http://europa.eu.int/smartapi/cgi/sga_doc?smartapi!celexplus!prod!CELEXnumdoc&lg=da&numdoc=398L0044). The European regulation of biotechnological patents has been object of discussion in Denmark throughout the 1990's, but particularly in the spring of 2000 – just before Danish legislation was confirmed, the discussions peaked.

> A lot of people are very concerned about whether this unholy alliance between the logic of profit and the uncontrollable urge to create new knowledge can lead to anything but misery. Will manipulation of genes lead to the infliction of irreversible damage on nature? Will our bodies, our children, and our genes, become a commodity like tables and chairs? How are we to interpret life, now that it can be patented? On this account it is only natural, although humorous, that in the wake of this newly rich discipline of science an abundance of sympathetic bio-ethicists have emerged. Many of them were gathered in governmental institutions such as the Council of Ethics. But where did they come from? Were there really this many dismissed priests and rabbis, former TV hosts, actors, retired sirens and county mayors? Nobody knows, but since they are there, one must think they were needed. Now, we can discuss, whether the objective of the bio-ethicists has been to intensify or direct attention to the brave new world of biotechnology and the contracting out of previously untouchable areas of life to private firms. Although it is not possible to directly accuse the Council of Ethics of being on the advertising budget of biotechnology, the repressive tolerance with which the public has been held at bay in the case of the EU patent legislation is worthy of a study in itself.[141]

Compared to the hierarchical perspective it is interesting to notice how the Council of Ethics and other ethical committees are not seen as defenders of ethics, but rather as belonging to the system of power. It is apparently not from this kind of institution that resistance, or even salvation, should be expected. Rather, the members of these institutions are presented as lackeys, much in the same way as assorted Marxists have spoken of the lackeys of capitalism. In contrast to these hired hands, the *public* is articulated as the locus of resistance, when it is argued, that it is the public, who has been held at bay. Thus, it is from the public that resistance to the unholy alliance of capitalism and science should be expected – not from an institutionalised board of ethics, which only serves the purpose of legitimising the corrupt systems of power.

It is important to notice that it is not necessarily ethics as general phenomenon, which is disregarded in these quotes. Rather it is institutionalised ethics, such as

[141] Editorial in Information, 31 March 2000: ”Life is a patent law”.

that of the Council of Ethics, whereas ethics in general are often presented in a very positive manner:[142]

> What is actually wrong in trying to cure disease and helping childless couple reproduce? Can such good causes be criminal? It is an old saying, that the road to hell is paved with good intentions. And this is precisely the case with the issue of cloning. The good intentions originated from researcher's imagination. It is alive and kicking when money and support for their projects has to be attracted. It is necessary for all researchers to develop this imagination when they are writing applications. Otherwise most of them would not receive any grants. (...)
> Human cloning is the dream of our time of a new form of slaves that some of us can have power over. And the perfection of the technique that leads to cloning, which is based on intervention in the reproductive process (for instance in so called therapeutic cloning) is already the beginning of the crime. No technology that interferes decisively in our social life can be neutral, and this is particularly true for a technique, which by manipulating reproduction is a step towards the surveillance society. A metaphysical idea of the uniqueness of every human being is not enough to damn human cloning in any form. It is also necessary to have an ethical critique of technology, which can warn us against those techniques that cannot be used without leading us closer to a new separation of humans into masters and slaves.[143]

In this quote, the slippery slope of biotechnology leads to a new form of the separation into masters and slaves and a society of surveillance. The means identified to warn us against this slippery slope is an ethical assessment of technology that can serve as the basis for resistance. In this way the quote illustrates how a diagnosis of the present as threatened by negative outcomes of the imagination of researchers can also lead to arguments in favour of some kind of hierarchical norm, from which order can be deduced. There is an implication of basic collective order and essential human qualities in the way genetic technolo-

[142] In order to make sense of this observation it is important to remember that ethics is an object of analysis, not a pre-defined concept. As such the definition of ethics changes with the different ways of articulating the collective. What is relevant then, is to identify the way ethics is articulated in this perspective.
[143] Professor of philosophy in Politiken, 18 March 2001: "Ethics: cloned humans are slaves".

gies are presented as entities that can be sifted through ethical assessments and be judged to be either acceptable or non-acceptable.

This quote hereby also highlights the difficulties in making these classifications discrete. Rather than trying to argue that this quote is only sectarian I have classified it as a combination. It can be viewed as sectarian in so far as it presents a society on the road to hell, lead by the corrupting forces of science, money and power. But it can also be classified as hierarchical when it argues that ethical technology assessment can save the world if employed as a universal norm of exercising power. The combination of a sectarian diagnosis of present conditions with a hierarchical search for solutions is not uncommon. Still, as shown earlier there are also many arguments in which the reference to ethics is more vague and seems to imply a kind of procedure for critique. The focus is then on ethics as a dialogical procedure as opposed to hierarchical rules or market forces.

Public debate as egalitarian resistance

In sectarian arguments, ethics is often used as a term to denote the possibility of using moral or ethical arguments in the resistance to technology. But it is in no way an institution of resistance with a particular essence or hierarchical order. Rather, it is usually democracy, the public or the 'we' of ordinary people that seems to be the central social condition for the possibility of voicing resistance towards the systems of power and the power elite, as in this quote on the gene therapy case covered in chapter 4:

> It is neither the first nor the last time that researchers and medical doctors take ethics as a hostage in their play for money and prestige. There ought not to be a moments doubt that, of all professionals, it is precisely doctors and biotechnological researchers who are permanently in a moral and legal grey area, which they constantly transgress, whereupon the legislature follows closely on its heels, almost always legalising what the transgressors have committed. (...) We should not let ethics and legislation is lead by the nose of doctors and researchers, who are positioned in a borderland, and have many times transgressed the limit, set by legislators. We should set the limits, because there ought not to be any doubt, that yours and my bike-mender, carpenter or dustman are just as good judges of ethics, as the doctors, lawyers, and priests that are usually asked about ethics and

> morals, and which always make up the ethical councils and committees that seem to have appointed themselves keepers of good morals. Not even the most cocksure professor can take responsibility for the possible consequences of the almost daily new gene technological initiatives. So there are weighty reasons for putting the brakes on those researchers who (...) fill their wallets every time they find a new gene therapeutic treatment.[144]

Again it is interesting to note, how the ethical institutions are placed in cahoots with the corrupt systems of the rest of society. Here a distinction is made between ethics as a procedure for finding limits, and ethical institutions as keepers of good moral. Whereas the first is seen as positive and should be in the hand of 'ordinary people' like craftsmen and garbage collectors, the ethical institutions are a sign that representatives of the system, like priests, lawyers, and doctors, have taken ethics hostage. In this way institutionalised ethics serves the purpose of the systems of power, and can thus be viewed as a mere legitimising function.

Secondly, it is worth noticing, that the references to 'we' in the quote are not a general 'we' of society, as in the hierarchical or market modes of articulating the collective. Rather, in this context, 'we' denotes ordinary people – the ones who do not belong to the systems of power – at least not the medical profession or the ethical (including the legal) institutions. In this argument there can be said to be a distinct notion of egalitarianism. It is not only the chosen few, who are the freedom fighters. All the bike-menders and garbage collectors of the world, who do not accept the rule of the system, should be involved in a regulatory process with the aim of setting limits for the systems of power. It is the ordinary people in the general public, who should decide on regulation and closure of controversies, and not the elite in any form. In this way, the argument also bears some resemblance to the Marxist' discourse, where the proletariat should revolt against the power structures of capitalism. Here, however, it is not capitalism alone that is the main villain, but the general combination of power structures of science, capitalism, state and hierarchical positions.

[144] Opinion piece in Jyllandsposten, 20 July 1999: "Doctors take ethics hostage". It should be observed that this is the only article that articulates the Århus experiment with gene therapy with a focus on wider social aspects and can be said to employ the script of absolute resistance.

> The dis-interested, self-effacing, and service minded sciences have entered an intimate alliance with political interests of power and economic interests of the market. Examples of this cannot only be drawn from the military industry, but also in the pharmaceutical industry's interest in medical experiments on patients, and – more covertly – in the interest of maintaining sick lives in unhealthy environments.
> At last, the blind ideology of growth has groped its way far into natural science, with climate distortion and exploitation of natural resources as (un)foreseen consequences in the service of the mastery of nature. A narrow caste of powerful experts, the technocratic elite, is apparently determining the development of society – which means maintaining the prevailing madness – and defence of the free play of power forces is conducted publicly as a fight against all external critique. In this lies the objective reason for pessimism – and for criticism: Evading public supervision and democratic considerations, this many-headed monster pursues its own scientific, power-political, economic goals with dauntless, Machiavellian, consistency.[145]

The connection between pessimism and criticism is interesting because it sustains the interpretation made earlier of the threat as constituting the order in society. The world is divided into two opposing sides – the systems of power, lead by the narrow caste of the technocratic elite, and the rest. But it is important that this 'rest' is constituted as the negation of the power structures. It is because of the identification of the power structures as corrupt that a critique can find a *raison d'être*. There is, however, one positive determination of the possibility of resistance in the quote. Public supervision and democratic control is construed as the means to fight the prevailing madness determined by the systems of power. Herein lies the possibility of resistance and of counter-power. Still, there is no elaboration of what it is, that has to be protected. Instead the general public has to fight systems of power exactly because they are systems of power. By their definition as such, they are immanently threatening to corrupt or colonize everything – just as natural science has been corrupted by the blind ideology of growth.

[145] Opinion piece in Information, 14 September 1998: "A many-headed monster".

In this way it can be argued that reaching closure is not the important objective in the sectarian mode of articulating the collective. Rather, what is important is to keep the controversies manifest by resistance and the exercise of counter-power. Since legitimate closure is primarily perceived as the revolutionary creation of an ideal community, the possible actual closures are likely to be interpreted as illegitimate oppression by power exercised within systems of control. On the background of this section, the sectarian modes of inscription can be summarised as follows:

Figure 6.4	Science	Ethics	Public debate
Sectarian Egality	Ideal about 'true' knowledge, but as social activity, science is caught on the *slippery slope of corruption* by money and power	As vague ideal ethics can *pinpoint the fragility of contemporary conditions*, but if institutionalised it becomes a lackey of the system	Possibility of *warning* and *resistance* and for ordinary people to engage in *egalitarian democratic dialogue*

Fatalistic isolation

The fourth perspective in the employed typology is that of fatalistic isolation, where the collective is articulated as an anarchic chaos with no overarching rules securing order and justice. Fatalism is an obvious response to this perception of society as there are no stable connections between input and output and thus it is not possible to act with the purpose of managing society as such. There is no systematic way in which it is possible to reach legitimate closure and regulate or influence the actions of other parts of society in order to bring about a particular kind of social order, and there is no such order to invoke in one's arguments. This negative perception of the possibility of order must be said to be in stark contrast to any ambition of regulating biotechnological research in order to influence its evolution in a particular way. On this account it is not strange that almost no articles where placed in this category when I imposed the relative classification of the long opinion pieces and editorials as described in Chapter 2 and at the beginning of this chapter. If the dominant outlook on society is that it is an anarchic chaos with no possibility of securing order, it is apparently not of much use to discuss how biotechnological research should be regulated as a social activity. Still, conducting the classification I did identify a couple of argu-

ments, where fatalism seems to be the prevailing answer to an irrevocable development:

> It would be most convenient, if it was possible to take a stand on every single problem separately – and determine the speed accordingly. But so far the transition from problem to problem has been gradual. Our culture is less and less prepared to accept pain and privation, debilitation, suffering, and death itself as conditions of life. Then rather gradually get used to a technique that interferes in genesis of our life and paves the way for a new kind of humans, which makes use of that which was earlier considered holy and inviolable as means to repair and copy themselves. Treatment of infertility is already considered an almost inviolable right. And who will seriously fight therapeutic cloning if it can lead to a cure for otherwise incurable diseases and rejuvenate aging tissue of the body – even if it is at the expense of seeds of life in embryos? Most people shrink from human cloning. But is it possible to stop those, who are determined to do it anyway? There must be limits to madness, but where is the limit between pity, arrogance, and crime against human dignity?[146]

Since this quote stresses that there ought to be limits and order, it would seem appropriate to classify it as hierarchical. It could also be classified as sectarian because of the references to the loss of human dignity and interference in holy and inviolable spheres of life. The most consistent feature however, is a distinct notion of fatalism in the way scientific change is presented as determined and as leading inevitably to new ways of exploitation. In so far as this quote seems to lament the impossibility of order, it invokes hierarchical order as utopia, but there is apparently nothing to do in order to re-establish this order. Order is lost and fatalism seems to be the only option left, as a kind of opposition.

Science as elitist monster of authority

Anti-authoritarianism plays a prominent role in the fatalistic mode of articulating the collective. The authorities of science, capital, state and so forth, are seen as using power structures to act in their own interest. Thus, science for instance is not an institution, or an actor, creating knowledge for the benefit of all, but a

[146] Editorial in Information, 11 August 2001: ”A matter of life and death”.

monster of authoritarianism intertwined with all the other monsters of society – living a life of its own and only looking after its own interest:

> The holy science does not dream of stopping in the face of in vitro fertilisation, human cloning, eugenics or any other possibility. The tree of knowledge tastes sweetly of power and money. Science has expropriated the workshop of God. And the Christian church. What has become of it? (...) Faith or science. It is always about money and power over souls. In theory, politicians are the ones who, when faced with all of this, should maintain public sense and set the limits. But we cannot count on them. They have bureaucratised ethics to some administrative councils, with private letterhead, office administration and private interests.[147]

In this way the fatalistic perspective can seem to subscribe to an articulation of the collective, where actors are seen to pursue their own interests as is the case under competitive individualism. The reason for classifying this argument as fatalistic, however, is the impression of anarchic chaos with no overarching way of regulating or resisting change. The only thing we can be sure of, is that we can't count on anybody. Although the quote articulates the scientific developments as horrific, it does not seem like a sectarian argument, as the threat from corruption is not presented as important. The collective is not in danger of being corrupted – it *is* corrupt. Evil is the normal order of the day. There is no fragility to speak of, nor is any importance attributed to actions in the present, as it is in the sectarian perspective. Rather the social (non)order is quite robust. It is wrong, to be sure, but robust nonetheless. Therefore detachment in the form of fatalism and satire seems to be a relevant response.

Ethics and public debate as high gloss legitimation

As it was shown in chapters 3 and 4 fatalism is a common feature of the coverage in Ekstra Bladet. Here it is often presented in an ironic or even satirical way and therefore it seems to be a different kind of fatalism, than that of the disappointed hierarchist. In Ekstra Bladet it seems far more cynical and detached from the other perspectives on social order. There is no lament of the loss of order or the utopia of a good society. Rather science, ethics and public debate are treated as phenomena that are all somehow incorporated in the project of elites or systems that are out of reach. Science is an elitist monster of authority follow-

[147] Editorial in Ekstra Bladet, 25 January 1998: "The white-coated and the black-gowned.

ing its own internal logic and preferences, and both ethics and public debate are seen as high gloss, manipulative efforts to legitimate this by the elite. The difference between this perspective and that of sectarian egality is the lack of fragility, threats or importance in revolting against this project in order to create a better society. Where sectarian egality presents a vision of the community of people and a road away from perdition, the cynical fatalist detaches via satire, but has no vision of utopia. The following quote is taken from a column written as a kind of reportage from a conference organised by the Council of Ethics:

> She says it herself: We should neither be the clergy of fear nor happy, babbling optimists. Who is she? And why is she talking like this? Nielsen, Linda. Professor, dr.jur., University of Copenhagen. And chairman of the state's Council of Ethics.
> The remark about the clergy of fear or the babbling optimists applies to the Council of Ethics as such, and yesterday's highly academic day of debate about Man-made Man, which was went off according to plan in a well-behaved gathering of learned initiates of the present academic clergy. A state financed seminar for intellectual opinion makers, who daily camp on each other's doorsteps at hospitals and colleges. Yesterday it took place at the Radisson SAS-hotel, where they could confirm each other in the proper code, and with the particular verbal ground rules that is the means by which the elite distinguishes itself from the mob. (...)
> And how far should we go? Towards cloning people, for instance. No. Nobody wants to do that anyway. Besides, law prohibits it. But it could have been refreshing, if just a single person had had that opinion. What is wrong with producing a couple of hundred clones of Wolfgang Amadeus Mozart? Immediately the bogey of Hitler comes up. But he and all the other bastards through the course of history could precisely just be prohibited. We have the technology to do it. We could use it as a lock on the scoundrels and open the floodgates for good, creative, musical geniuses. That would look bloody nice![148]

These quotes represent some of the only arguments identified in the longer contributions to the mediated debate on biotechnology where the fatalistic view is expressed as the main mode of articulating the collective. As argued it is not strange that it is difficult to find this perspective in articles that have been se-

[148] Journalistic commentary in Ekstra Bladet, 26 March 1999: "The clergy of fear".

lected as a sample of general arguments about the regulation of research. When arguing in favour of some kind of regulation it is no doubt by far the most common to have some sort of vision of a way to create a better society in mind. Whether this vision is the reinforcement of a hierarchical order, the free exchange between individuals or a kind of utopian community of civil society they all seem to imply that it is possible to imagine a 'better' world and that regulation of research should somehow have effects of advancing this vision. In contrast, the perspective of fatalistic isolation is not focused on a positive description of (future) social order, but rather on ironic comments or rejection of present power structures. They detach from society without presenting arguments about a coherent beneficial regulation. Thus the inscriptions can be summarised as follows:

Figure 6.5	Science	Ethics	Public debate
Fatalistic Isolation	*Monster* of authority	High gloss *legitimation* by monsters of authority	Sphere for *manipulation* by monsters of authority

Whereas there were only a few articulations subscribe to the fatalistic mode of articulating the collective in connection with specific arguments on regulation of biotechnological research, it should be observed that this perspective was more common in the context of concrete cases of biotechnology. In chapters 3 and 4, the perspective of fatalistic isolation was identified as implicit in the scripts of fatalistic irony, heroic action and anti-scientific information in connection with the coverage of reproductive human cloning and gene therapy. With regard to the first, fatalism was shaped in an ironic tone of 'exotic news of scientific excesses'. The announcement made by Seed was interesting because it was a sensationalist story about science out of our control. The implicit argument seemed to be: 'look what the researchers are doing – now it is proven again that they are completely out of control, as we have argued all along'. In the second case of the story about gene therapy, the scripts of heroic action and anti-scientific information also portrayed a world out of control, but with the chances of positive side effects of medical experiments. In this context it should be remembered that any shared experience between isolates is by nature only visible as an analytical construct. I will argue that these positions can easily be contained within a general articulation of the collective as an anarchic chaos, with no overall cause-effect relationship. You win or you loose, there is no way to tell in advance. And there is no overall logic to which you can subscribe in order to regulate research

or society in general. The outlook on regulation thus seems to be rather opportunistic.

Regulating biotechnological research

On the basis of these analyses it is possible to sketch discursive possibilities and conditions for the regulation of biotechnological research within each of these four modes of articulating the collective. In this section I will present the understanding of the use of regulation by summarising them. Subsequently, this presentation will function as the basis for a concluding discussion in the last chapter by pointing to the main similarities and associations as well as the differences between these four modes of articulating the collective.

Hierarchical Authority

The mass mediated arguments on the regulation of biotechnological research, which subscribe to a hierarchical perspective, reveals an inscription of the phenomena of science and ethics as two parallel, but different, hierarchical orders that prescribe solutions in terms of '*the right answer'* in order to reach closure in controversies. One is the logic of scientific inquiry connected to the *institution of science.* In this hierarchical order scientific research should not be regulated externally, since this is seen as problematic interference in a system that should follow its own internal set of rules of behaviour. The second is the *institution of ethics,* in which ethics is inscribed as a hierarchical system of norms and rules that make it possible to deduce the morally 'right' solution.

What is important is that society is, or should be, organised according to some basic principles that provide the means to distinguish between good and bad, between right and wrong. Reaching closure becomes equivalent to identifying a universal principle according to which 'the right answer' or 'the proper decision' can be deduced as solution. Consequently, regulating biotechnological research becomes a question of designing regulation according to these rules in order to make sure that social norms are not violated. There is, however, quite a span of variance with regard to how these rules are identified. Within the articles analysed it is possible to speak of a continuum from conservative to reflexive forms of hierarchies.

In the most conservative or traditionalist hierarchical form of articulating the collective the rules or principles are given, for instance, by God, or Science, and the task of contemporary societies is to deduct proper regulations from these rules. In this form, public debate is a means of *enlightenment* and edification, a way of disseminating familiarity with the rules, whether they are founded on the authority of science or ethics. The communication process is seen as a one-way dissemination with recipients being informed by higher levels in the hierarchy. Whether guided by science or ethics, ordinary citizens are placed in a hierarchy where it is their duty as citizens to let themselves be informed by the elite.

In reflexive forms of hierarchical modes of articulating the collective, the rules are not so obvious or evident. Instead it seems that they have to be identified first in order to serve as a basis of proper regulation. The reflexive form of hierarchy presents the possibility of reaching closure through public debate rather similar to the perspective of competitive individualism. In so far as arguments articulate the possibility of identifying or localising an absolute rule or principle according to which proper regulation can be designed, I will speak of a hierarchical mode of articulating the collective. It is not necessary that the principle can be identified. The important thing is the assumption that there *is* a principle, which, in principle, can be identified.

Competitive Individualism

In arguments classified within the perspective of competitive individualism, actors are constituted by their individual interests, preferences and resources. Accordingly, science is articulated as an actor, with an interest of its own, namely the goal of creating knowledge, and with preferences in terms of freedom of research and so forth. Other actors in society do not have to share this interest in order to allow the freedom of research. It is enough that they recognise that it is beneficial to society as a whole if science is able to pursue its goal in the most unhindered way, because it is expected to create solutions to common problems. Although this constitution is different than it is within the authoritative hierarchy, it also implies a social arrangement, or contract, in which science can be left to pursue its own goals in return for the production of scientific knowledge.

The key issue in reaching closure and designing regulation is to secure the most beneficial conditions for biotechnological research, without impeding other actors in society. Many of the arguments subscribing to competitive individualism

are found to promote great expectations for science, almost deterministically expecting far-reaching solutions to problems of disease and suffering just round the corner. I have used the expression *the invisible hand of progress* about this way of portraying science, as a resource that unquestionably will lead to a better world. Central to this, is the notion that if actors (including science) are left to pursue their own interests, e.g. a search for knowledge, this will lead to greater prosperity in society as such. There are, however, several arguments, that point to possible unfortunate consequences of this pursuit and a wish to prevent them. Just like the capitalist state can be seen to regulate against market imperfections, it is articulated as necessary to regulate against unfavourable spin-offs of the scientific enterprise. Regulation is thus a question of striking a pragmatic balance between different interests in order to ensure that the autonomy of individual actors is respected as much as possible without violating the autonomy of other actors. This mode of articulating the collective thus seems to imply two different notions of regulation, in which the first seems to be arguing in favour of leaving biotechnological research with as few restrictions as possible, and the second to imply the need for regulation.

In contrast to the hierarchical perspective, where ethics could be seen as an institution along the same lines as science, it is not possible here to identify ethics as an actor in the same way as science. Rather it seems that ethics is primarily an individual matter – a question about personal preferences – and the protection of individual autonomy therefore seems to be the major task. I employed the image of *regulating market imperfections* about the need to secure rationality in the knowledge market as well as protecting the weaker parties of society against 'unjust' exploitation (where the meaning of the word 'unjust' is founded on more or less explicit utilitarian considerations). Following this, ethics can generally be viewed as one among several inputs in the negotiation of closure in the form of a pragmatic design of regulation. Ethical considerations thus have to be weighed against all the other considerations put forward in the pragmatic process of reaching closure on the question of legitimate regulation.

Compared to the hierarchical mode of articulating the collective, the question of reaching closure hereby takes on a different form. The search for a universal norm, from which 'right answers' can be deduced, has been replaced by a necessity to co-ordinate and balance different interests. The questions of right and wrong, and of proper behaviour in general, have been substituted with a mecha-

nism of exchange and negotiation between autonomous actors. There is, however, a rather large amount of vagueness about this mechanism for co-ordination. I have found several different inscriptions that can suitably be characterised as a continuum stretching from aggregating anonymous preferences to complex processes of negotiation.

In the classical model of a market, the aggregation of individual preferences is the way of co-ordinating actions. When exported from economics to the field of politics or regulation, co-ordination in the form of closure of controversies becomes a question of counting heads in favour of political preferences as described in many liberal theories of democracy and public opinion. At this end of the continuum, public debate is thus a possibility for voicing interests, and closure is reached by majority decisions – ultimately in the form of voting. From the arguments classified as competitive, however, it seems that closure can also be envisaged as a result of processes of negotiation, where mediation between interests and preferences somehow replaces the quantitative aggregation of individual preferences. The reason for viewing these processes of negotiation as belonging to the perspective of competitive individualism is that they articulate actors as individual utility-maximising agents. Processes of negotiation can thus be seen as one way of safeguarding interests. At this end of the continuum, public debate becomes a field where these mediations and negotiations to take place.

Sectarian egality

Sectarian modes of articulating the collective perceive society as a battlefield, where the chosen few are fighting against corrupt systems of power. In these articulations dualistic oppositions come to the fore: The deceptive surface of progress versus the 'true' depth showing corruption. The systems of power run by an elite versus democratic resistance against their rule of corruption. As a social institution or actor, science is depicted as belonging to the system of power, although utopian glimpses of a different notion of science, in the 'service of mankind', are established now and then. It is not the search for knowledge in itself that is wicked, but the unholy alliance between the institution of science and the forces of power and capitalism. Since science has been corrupted by this alliance it no longer creates knowledge to the common benefit of all, but only in the service of particular interests. On this account it is necessary to sound the alarm and enforce severe external regulation on biotechnological research: this

in order to protect human dignity, diversity, life as we know it, etc. from being colonised and corrupted by the growth of scientific knowledge.

The notion of disguise plays a conspicuous part, as it is common to articulate the apparently *invisible hand of progress* as concealing the opposite motion: *the slippery slope of corruption*. The idea is connected to a sense of fragility, where it becomes of paramount importance what course of action is followed in present times. If the 'we' of the general public of ordinary people fails to see the danger and regulate biotechnological research accordingly, we will somehow be lost or corrupted as well. In this context some of the arguments are tinted in a slightly religious or otherworldly way, when the slippery slope is seen as leading to oblivion or perdition. If we do not react to the threat of corruption, we will be forever doomed. In this way it is possible to speak of a 'purgatorial space' (Rabinow 1999), where the resistance towards biotechnological research becomes a trial, in an almost biblical sense, of our ability to withstand temptation. What is at stake, in this argument, are thus our own souls – we could loose our humanity and human identity, if we do not resist temptation.[149] In this context, ethics, if this word is taken as a vague term for a set of considerations about basic values, is presented positively. It should be observed, however, that the warning against immediate doom or corruption is seldom followed by concrete proposals of action in terms of concrete regulation. Rather, instructions are vague, as it seems that the central issue is the call for attention to the threats.

In the sectarian mode of articulating the collective there is, however, also a more this-worldly or secular type of argumentation. In this mode it is not our humanity or human identity, which is at risk, but the freedom from corrupting systems of power. What we have to fight in this connection is the colonialization of humanity, ordinary life, diversity, dignity, independence, etc. – in short, the life world. In these arguments, an egalitarian public debate seems to be the central means to resist the corruption of the elites and their systems of power. The public has to set limits on research in order to preserve areas of freedom, where the corrupt influence of the systems of power can be kept out.

[149] When the argumentation follows this path, it comes close to the hierarchical notion of an ethical order instigated by God. It is worth noticing, however, that the Christian comprehension of social order can be articulated both in a mode of hierarchy and a mode of sect. The difference is whether the focus is on a stable society instigated by God or on an imminent threat of doom or corruption.

Consequently it might be possible to speak of some kind of variation between threats toward the human identity and threats towards the life-world of civil society. But the central issue in both these arguments, however, is that it is the identification of a threat of corruption that seems to be central. Whether it is humanity or the life-world that is threatened by corruption, it is the threat itself, which seems to constitute that which has to be preserved. It is the fact that the slippery slope points downward that constitutes the current situation as being the upper point

Fatalistic isolation

In the articulations subscribing to the fatalistic mode of articulating the collective, science in general, is presented as un-controllable and out of reach. Therefore it is of no use to be committed to any stable opinion on regulation. When it comes to concrete applications, however, individuals might be so lucky as to be cured or have a baby. This, however, is not presented as the product of science, but rather as (un)luck in life and the labour of particular people. Science and ethics in general are just some of the monsters of authority, about which we as ordinary people know nothing except that we don't trust them and they don't count on us. Furthermore public debate is no useful mechanism of resistance or co-ordination since it is just another platform for the authorities to manipulate public opinions. On this account the scarce arguments on regulation can be seen to be ironic comments that emphasise that it is of no use to regulate science and technology and at the same time as the openly reject of authorities and elites.

As a summary it is possible to construct the following scheme (figure 6.6). The next chapter offers a concluding discussion of the differences between these four modes as well as the alliances between them in order to identify the discursive conditions of possibility for regulating biotechnological research. It appears from the scheme that the first three forms can all associate positively to the phenomena of science, ethics and public debate, although sectarian egality only associates positively to ideals, whereas the concrete observable phenomena are primarily disregarded as corrupted forms of the positive ideal. Only the forth mode does not associate positively to these phenomena and it also does not subscribe to a notion of the possibility of regulating biotechnological research in order to influence social order in a particular way.

Figure 6.6	Science	Ethics	Public debate	Regulation
Hierarchical Authority	Institution *prescribing a logic of scientific inquiry* for establishing true answers	Institution of ethical principles or procedural rules for *identifying morally 'right' answers*	Vehicle for *informing and enlightening* the public about the hierarchical order	Closure in terms of solution identifying a universal norm *guiding proper behaviour*
Competitive Individualism	Resource in society producing solutions to present problems according to the *invisible hand of scientific progress*	Ethical choices are *sum of individual preferences*, sometimes pointing to necessity of regulating market imperfections	Vehicle for pragmatic and contextual *mediation* between different interests and preferences	Closure in terms of coordination of preferences in order to reach *pragmatic regulation*
Sectarian Egality	Ideal about 'true' knowledge, but as social activity, science is captured on the *slippery slope of corruption* by money and power	As vague ideal ethics can *pinpoint the fragility of contemporary conditions*, but if institutionalised it becomes a lackey of the system	Possibility of *warning* and *resistance* and for ordinary people to engage in *egalitarian democratic dialogue*	Closure in terms of revolution and *absolute limitations* of science in order to protect humanity and life-world
Fatalistic Isolation	*Monster* of authority	Glossy *legitimation* by monster of authority	Sphere for *manipulation* by monsters of authority	No closure possible apart from acts of destiny

Concluding remarks

This chapter has been an effort to use the analytical typology as a structured perspective in order to analyse how the four different perspectives articulate the phenomena of science, ethics and public debate. As it has been obvious in several connections, however, the analytical typology only works at a particular level of analysis. As for instance in the case of ethics, where it is possible to find different kinds of articulation. Some present ethics as a hierarchical norm. Others present ethics as a way of balancing considerations in a public market of opinions, and others again present it as a procedure to resist corruption. If the arguments are extended, however, towards a search for a basic warrant of the

argumentation, it becomes more or less obvious that the perspectives can be fused into each other. Pragmatic evaluation of utility becomes a hierarchical norm if taken to its full logical consequences, and so does sectarian resistance in terms of ethical technology assessment. On the other hand hierarchical orders can be seen to be in the interest of privileged positions and thus a way of constructing better positions of negotiation on the market, just as hierarchical arguments can turn fatalistic if the implications of development are seen to be that the utopian order is inevitably dissolved. This makes it clear that the typology for classifying arguments only works at a certain analytical level. As soon as we begin to look at the contextual dynamics of actual controversies, rather than artificially isolated arguments, the relative classifications again appears to be in flux. Therefore the analysis in this chapter should be understood as artificially static.

Secondly, it has become clear that there are *more than four* articulated collectives. Each of these four modes presents us with several competing articulations of the collective. The hierarchy can be articulated with a scientific or an ethical (and possibly also a religious) authority as the general principle from which order and legitimate closure to controversies can be deduced. And these principles can be identified very differently, ranging from conservative, where it is a 'given' from the tradition, to reflexive, where it has to be identified in present context. In competitive individualism it makes a big difference for the actual possibility of closure, whether actors are seen as autonomous per se, or whether this status has to be actively established through regulation protecting the weaker parties. Furthermore, the exchange mechanism can also be articulated as either anonymous aggregation or as complex processes of negotiation. Similarly in the articulation of sectarian egality, in which there are competing threats. Some warnings focus on the risk of loosing our humanity, whereas others are more concerned with the risk of systems colonising the life-world of the community. The four modes of articulating the collective should therefore precisely be seen as *modes*, which can be filled with content in different ways. They are not a final or ultimate analysis of the core or content of the controversies about biotechnological research as such. Rather, they are a heuristic tool in the exploration of the thesis that articulating the collective is part of arguments in the controversies—the part I have been calling *subscription*.

Thirdly, the analytical strategy of searching for differences between classes of arguments, suspends chronology and connections, hereby presenting the arguments classified as subscribing to each of these modes as a discrete and separate network of articulation. But this was a result of the method employed, not an empirical result. The groups of arguments subscribing to each of these modes of articulating the collective are only as coherent and discrete as they are articulated to be. This is true both with regards to internal diversification, as there are many more articulated collectives than the four modes, and with regards to mutual detachment between the four; when we look for differences between these four modes, we will find them.

The final chapter will bring chronology and association back to the centre of the analysis. Whereas the former chapters focused on differences, I will shift the focus back to associations in the concluding discussions. The shift has been prepared by the attention given to similarities, affinities and connections in the previous analysis. When we shift the focus to associations, the arguments subscribing to different modes of articulating the collective do not seem completely detached. Instead, the groups of arguments can be viewed as clusters or areas of condensation that are partly overlapping, partly connected, partly sharing relations. Following this line of thought the modes of articulating the collective can be understood as analytical condensations of networks of articulation; as summing up particular densities in the constant flow of articulation. As argued, these condensations or densities are distinct from each other, but only as long as they are constructed analytically. When we look at the public controversies, the feature of distinctiveness has to be constructed by explicitly ignoring most of the features that pointed towards connections and relations. When the connections and associations are taken into account, it seems that the networks of articulation cannot be identified as discrete entities, but rather as clusters in the same medium.

All arguments are connected in one way or another. Taken in its full consequences, the networks of articulation can be seen as one large network, with some clusters of density and other spaces of scarcity in relations. This is equivalent to the ontological definition of public debate as put forward in chapter 1. Nevertheless, in this chapter I do not want to collapse all distinctions into one network. Rather I want to keep the notion of network*s* in the plural form; but instead of designating discrete entities, they designate clusters of density or con-

densations of associations in the constant flow of articulation as illustrated in figure 6.7.

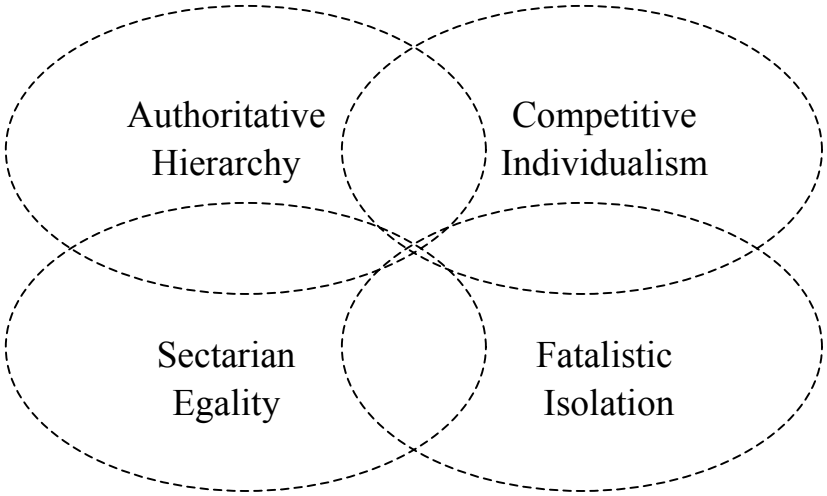

Figure 6.7

Chapter 7
Controversies as conflicts and alliances in cultural dialogue
- a concluding discussion

Throughout the previous chapters I have analysed controversies about biotechnology as political controversies by emphasising that any argument in the controversies imply a particular articulated collective. Each contribution to the debate is a productive articulation not just of biotechnology and technoscience (or the world that technoscience knows and masters) but also about nature and society, and not just about the local social and natural facts about biotechnology, but also about general features of the natural and social order of the collective. We cannot articulate stories and arguments about biotechnology without inscribing stories in scripts and subscribing arguments to collectives. On this background I have analysed the mass mediated articulations of biotechnology in order to identify the discursive possibilities for regulating biotechnology in Denmark.

In Chapter 1 the work of the dissertation was situated in the context of 'Public Understanding of Science' and 'Science Communication' as relevant academic traditions. Through a review of the theoretical literature, three models for the communicative relationship between science and public were identified. In the *diffusion model* information is transmitted from science to the public in order to improve instrumental decision-making. In the *deliberative model* dialogue is supposed to lead to consensus on how to regulate science, thereby granting legitimacy to scientific exploration. And finally, in the network model communication is construed as continuous negotiation about the development of technoscience as well as about the very definitions of science and publics with the aim of reaching interim closure. The chapter ended with a subscription to the last model that has served as the foundation for the analyses in the dissertation.

In Chapter 2 a general framework for a *relational ontology* was outlined, in which newspaper articles can be analysed both as stories and arguments about biotechnology. As stories they can be seen as inscriptions of phenomena in particular ways that articulate one of several scripts, that is, a framing network of

relations to other phenomena. As arguments they construct particular relations between problems and solutions and hereby they subscribe to articulated collectives, that is, general notions of social and natural (dis)order and how to maintain, restore or change this order with the aim of reaching closure. In the controversies about biotechnology, adversarial arguments were defined as subscribing to different collectives (just as divergent stories inscribe phenomena in different scripts). Furthermore, the connection between arguments and articulated collectives were presented as mutually constitutive. On the one hand the collectives exist because they are being continuously articulated, that is, because arguments in the controversies about biotechnology subscribe to these general conceptions of the social and natural order. On the other hand these conceptions of order work as the frame for inscription of problems and solutions in particular ways, hereby enabling particular arguments to be articulated.

In Chapters 3 and 4 two empirical cases were investigated. Chapter 3 focused on an announcement of efforts to begin trials with reproductive cloning. It was argued that this announcement constituted an exemplary case for the study of fears associated with biotechnology. In Chapter 4 the object of analysis was a set of mediated accounts of a suspended experiment with gene therapy. In contrast to cloning, it constituted an exemplary case for the study of the high hopes associated with biotechnology. These analyses were designed as inductive identification of scripts as patterns in the inscription of stories through a focus on the association of occurrences to other occurrences and phenomena. These analyses led to the identification of four scripts in the articulation of human cloning and three meta-scripts in the articulation of an experiment with gene therapy.

In Chapter 5 these different scripts were translated into a typology of four modes of articulating the collective. In the mode of *authoritative hierarchy* the collective is articulated as a hierarchical order of predefined roles with rules prescribing the obligations and privileges of each of the positions in the hierarchy. In the mode of *competitive individualism* the collective is articulated as a market of exchange relations between autonomous actors defined by their individual profiles of interests, preferences and resources. In the mode of *sectarian egality* the collective is articulated as a battlefield where systems of power are trying to corrupt humanity as well as the community of people and actors are therefore basically defined by their belonging to either the systems of power or the enclaves of resistance. In the mode of *fatalistic isolation* the collective is articulated as an

arbitrary chaos with no overarching principles securing order or justice and no regularity in the definition of actors.

Chapter 6 used this typology to categorise different arguments. The aim was to search for patterns in the way various arguments articulate *science*, *ethics* and *public debate*. This made it possible to identify different objectives of the regulation of biotechnological research in arguments subscribing to different modes of articulating the collective. In this analysis, however, it became clear that there are more than four articulated collectives. Hierarchies were seen to be based on either science or ethics. Competitive individualism was found to come in both an un-regulated and a regulated form. Sectarian egality was seen to be concerned with threats towards humanity and human souls, or towards the systems colonising the community of people. By explicating the distinct objectives in each of the different modes of articulating the collective it was possible to characterise the discursive conditions for the possibility of regulating biotechnology on a generic level, according to figure 6.6 towards the end of Chapter 6.

In order to carry out these analyses, however, some analytical restrictions had to be accepted so that arguments were disconnected from their context in order to search for patterns. In this final discussion I will move the focus back to the dynamics of controversies seen in a dialectical perspective. The chapter is structured in three parts drawing conclusions about the *theoretical, empirical* and *practical* aspects of the knowledge produced in this dissertation, respectively. The discussion of theoretical implications is a reflection on the combination of the theoretical frameworks proposed by Bruno Latour and Mary Douglas. It furthermore considers the ontological status of the articulated collectives as well as the question of discursive power. The empirical discussion examines the controversies as networks of conflicts and alliances, and considers the challenges and limitations of the use of the typology in future analyses of biotechnological controversies. The final discussion of practical implications focuses on the possibilities of reaching closure in the controversies and particularly on the use of public debate as a means to this.

Articulated collectives as structure and agency

In Chapter 2 I argued that the dissolution, as advanced by Latour, of the actor-structure divide should rather be seen as a construction of two dialectical perspectives. They mutually constitute each other as possible ways of observing phenomena, and at the same time exclude each other, since it is impossible to adopt them both in the same observation. On this account I found it necessary to combine two theoretical perspectives that made it possible to oscillate between the observation of actor and structure. The combination of the frameworks of Douglas and Latour were found to satisfy this need, since they can both be seen to incorporate notions of actor and structure, although they differ on the primary point of observation. Whereas Latour makes it possible to observe actors and lets structure be a derived function, Douglas facilitates the observation of structures but leaves room for individual action as the agent of change in the structure.

Translating these two theoretical frameworks into the context of the present dissertation, *inscription* designates the process in which a phenomenon is framed in a network, whereas *subscription* designates the summing up of the locally framed phenomena in terms of a total structure, which is obtained in the same movement, namely the articulation, or, more specifically, the newspaper article. Although these processes are mutually constitutive it is not possible to make both of them the object of observation at the same time. I have therefore developed two different analytical strategies. Whereas, the framework provided by Latour was the primary source of inspiration for the study of inscription in Chapters 3 and 4, Douglas' cultural theory was incorporated in order to study subscription in Chapter 6.

The combination of these theoretical frameworks, however, was not possible without making some adjustments to the two theoretical perspectives. By including the cultural theory in the relational ontology, I closed off any possibility of following the processual dynamics of network construction. As soon as the typology is constructed, heterogeneity is stifled. With regard to the cultural theory, on the other hand, I had to disregard the structural matrix and the establishment of four clear-cut ideal types. These sacrifices were necessary in order to combine the two theories, but I have not thereby conflated the two theories into one. Rather, as dialectical perspectives, each of them reinforces the other.

The Latourian framework provided the basis for my relational ontology – the basic assumptions behind the construction of my analytical *strategy*. Douglas, on the other hand, provided the framework for the construction of the analytical *scheme* that made me able to observe a particularly defined set of differences rather than an immense production of complexity. Latour displays how the chains of translation and association in a medium of infinite possibilities produce black boxes and he teaches us how to open them. The black boxes I have opened in this dissertation are the mediated articulations of 'science', 'ethics' and 'public debate'[150]. Not in order to demonstrate that black boxes can be opened – that is already given by the ontological foundation – but to analyse how they are closed in particular ways that produce a structure. To be able to do this, I had to open them from a schematic typology guiding which kinds of difference to focus on and to this end Douglas provided the concepts. If a general conclusion should be drawn from this analytical experience it could be that deconstructivist analytical strategies, like that of the actor-network theory, need the supplement of other kinds of theories and analyses in order to know what to deconstruct.

The dualism between structure and actor also pertains to the outcome of the present analyses in that it is an important question how the ontological status of the articulated collectives should be understood. Following the relational ontology, phenomena can only be identified according to a particular network of relations, and I will argue that this also goes for the phenomenon produced in this dissertation: the 'articulated collectives'. Similar to my understanding of Latour's notion of institution, which was presented in Chapter 2, I will propose that articulated collectives can be seen both as structures and as actants, depending on the angle of observation. We can perceive it as structure if we acknowledge that structure only exist as long as actors keep repeating it. We can perceive them as actants as long as we admit that actors routinely subscribe to networks that offer automated actions, by summing up complexity in suitably black boxes.

In this way articulated collectives can be seen as institutions when observed as stable entities – whereas they become actants in concrete chains of translation.

[150] I emphasise that no anthropological 'fieldwork' in the fields of science or media has been involved in my research. I have not 'followed scientists around society', nor ethicists, nor the shapers of public opinion. I have only looked at the *articulations* of their work as this appears in the printed media of four major Danish newspapers.

In the concrete production of public articulation of biotechnology they constitute only part of the network. Together with a long list of other actants they constitute the discursive possibilities of articulation. In order to make an argument it is necessary to imply some general notion of (dis)order as a logic of argumentation in the construction of a relation between problems and solutions, and for this, the four modes of articulating the collective present themselves as options. This conception of actor and structure, however, means that structure can only be described in hindsight – as a pattern in actual processes. It is therefore not possible to claim universality in the typology of articulated collectives identified in this dissertation. Other modes might be identified in other contexts. Consequently, it is not possible to conclude that we can only articulate the collective in these four modes. But if we do not choose to open these black boxes, they mark the discursive conditions of possibility for the regulation of biotechnology.

The discursive conditions for regulating biotechnology

In chapter 2 the formation of public opinion was defined as an on-going process of mediation and articulation. The analysis in chapter 6 pinpoints the fact, that not everything is equally well connected to everything. The important objective in studies of actual controversies or processes of public opinion formation is therefore to map the networks of articulation and indicate stronger and weaker relations in the form of alliances and adversaries. It is in the production of longer and stronger networks with higher density that can be said to identify more stable constructions of public opinion.

On this account it becomes possible to speak of *power* in the process of public opinion formation, albeit in a manner that defines power as the outcome of a process, not as a determining input. Power is equivalent to longer and stronger networks. In accordance with the Latourian framework,[151] I employ the notion of 'power' as a convenient way to *summarise* the consequence of collective action. It is shorthand for the description of a strategic situation, which is the outcome of a process, not a cause or effect that originally set the process in motion (Latour 1986:265). If we claim that an argument can be seen as powerful in the controversies about biotechnology, it is a way of saying that in the course of the controversies it has extended its network. It takes more of an actor to be able to

[151] And also in accordance with the Foucauldian notion of power as presented in The will to Knowledge, (Foucault 1976).

refute the argument, since increasing numbers of allies also has to be fought. Powerful arguments are a function of associations, alliances, and all the positive connections that make it more difficult to disregard the argument.

Consequently, the relative strength of arguments varies according to the number of other arguments that can be aligned. Powerful arguments have more associations at the cost of fewer substitutions and disconnections than less powerful arguments. The outcome of a study of actual processes of public opinion formation is therefore a general proposition about discursive power. We can say, that *discursive power is to public opinion formation, what reality is to fabrication of scientific facts*. It is the outcome of controversies – what was produced in the course of action. Claiming that an argument is (or has become) powerful, is merely an abbreviated way to describe the outcome of controversies, but in order to be able to speak of this outcome relations in the form of associations and inscriptions have to be studied.

What is important is that power in the controversies is not the ability to squash one's opponents' arguments, but rather to enter into dialogue and association with other arguments. Power is exercised in alliances. It is by translating the sacred notions in each of the four modes into *a common ground,* which can be associated to other ways of articulating the collective, that power is exercised. It should be emphasised that this common ground is not another term for consensus or Habermasian communicative action (Habermas 1987b). I use the term 'common ground' as term for a mediating space, where it is perfectly likely that all actions are strategic, but it allows for translations in order to connect arguments in some form or another. A powerful argument is therefore not an argument where the concrete solution to a problem only makes sense if subscribing to a single form of articulating the collective. Rather, the powerful arguments suggest solutions that can be inscribed as sensible in more than one way of articulating the collective.

It is obvious that this presentation of articulated collectives and discursive power raises the question of strategic subjects. Who is doing the inscription and subscription in the controversies about biotechnology? In the context of this dissertation the only possible answer is a Foucauldian one: It is the network of articulation that is the strategic subject itself. This answer is a result of choosing the analytical strategy of searching for patterns in articulations, rather than follow-

ing the productive chains of translation creating the articulations. In the future, however, it would be extremely interesting to follow this second analytical strategy, for instance by analysing the production of mass mediated news stories by following the negotiations between journalists, sources, occurrences, articulated collectives and so on. On the basis of the present dissertation, it would also be interesting to expand on the difference between the articulations in the four newspapers as identified in Chapters 3 and 6. Are these differences so stable that it will make sense to characterise them as organised segments in the public discourse? Future research, however, will have to investigate these questions, as it has been outside the scope of this dissertation to pursue them any further.

The combination of the conceptual frameworks of Latour and Douglas produced a way of understanding public opinion formation as a constant process of articulation in conflicting alliances, where both determinism and voluntarism is rejected. Closure is only rarely a final solution to controversies, but can be seen as temporary settlements in discursive power struggles, where the outcome of processes is not determined.

Development of controversies about biotechnology

In order to strengthen the argument made about discursive power it is illuminating to summarise the controversies over cloning, gene therapy and regulation of research as empirically analysed in the previous chapters. As mentioned above I will focus on the dynamic aspects in this concluding discussion, that is, the alliances between arguments as the change over time in each of these cases. Overall, it is of interest that the case of cloning seems to display a situation in which unanimous rejection gradually evolves into a more pliable form of resistance, as articulations of the benefits of therapeutic cloning seem to form a stronger network. In contrast, the case of gene therapy displays the opposite tendency where scepticism seems to be adopted in a much broader spectrum of arguments during the years analysed.

Cloning: From unanimous rejection to a softening of resistance

As indicated in Chapter 3, it is possible to argue that immediately after Dolly was born and at the time of Seed's announcement all inscriptions rejected human cloning and thus cultural unanimity could be stressed. As several analysts

have pointed out, human cloning in most western cultures is depicted as a fundamental threat to notions of individuality and uniqueness (Einsiedel et al. 2002; Priest 2001b; Hopkins 1998). In Chapters 3 and 6, however, it became clear, that this perceived threat is based on different articulations of the collective. Furthermore, as the controversies on human cloning develop and the distinction between reproductive and therapeutic cloning is introduced, the differences in arguments become more visible. Stressing cultural unanimity is therefore not wrong, but it rests on a particular association in a particular context, where arguments subscribing to all the modes of articulating the collective associated positively with a rejection of human cloning as such. I will briefly summarise the main points in the arguments subscribing to each of the four modes to make it clear, how this alliance is composed and how it is challenged again by the introduction of therapeutic cloning. In the following, I have chosen to simplify the language and speak of, for instance, hierarchical arguments rather than 'arguments subscribing to a hierarchical mode of articulating the collective', although the latter is more precise.

In *hierarchical* arguments the important thing is to identify the hierarchical principle according to which the right use of the cloning technique should be determined. In all the hierarchical arguments that I came across in Chapter 3 and 6, reproductive cloning is seen as a violation of a basic hierarchical order. It is against the logic of scientific inquiry because it does not rest on scientifically proven knowledge. It is also unethical in, for instance, reducing the individual human being to a means rather than an end. Whether based on science or ethics as the basic hierarchical set of norms for collective order, a ban on reproductive cloning is seen as an appropriate way of sustaining the guiding norms. But whether this ban should also cover therapeutic cloning is a matter of divergent articulation. It seems that arguments subscribing to scientific authority present research trials with therapeutic cloning as squarely within the scope of responsible science. It is seen as a 'natural' new area for responsible scientific exploration and therefore researchers should investigate this technology.[152] On the other hand, most arguments subscribing to the hierarchical institution of ethics seem to imply that regardless of whether a real baby is born or not, cloning the fertil-

[152] This difference can be taken to imply a tension between the need to stay within the limits of normal science and a need to go beyond these limits in order to create new discoveries, but I will not pursue this difference any further since a full account of this problem within 'the logic of scientific inquiry' is outside the scope of this project.

ised egg is anyhow a matter of transgressing a basic norm that should be held sacred precisely because it is a fundamental ethical norm.

In articulations subscribing to *competitive individualism*, reproductive cloning is also rejected. In this case, however, it is not primarily because it violates a rule of proper conduct deduced from a hierarchical order, but because it currently serves no purpose. Furthermore, it can be argued that it challenges the notion of individuality where every actor is free and autonomous, which is a prerogative for the exchange mechanism of the market to work. On this account a ban on reproductive cloning also makes sense in competitive arguments. Therapeutic cloning, on the other hand, is articulated as holding great promises for the future and therefore this technology should not be prohibited, but rather supported. Interestingly, the ban on reproductive cloning is seen as beneficial and supportive of the ability to explore the possibilities in therapeutic cloning. For instance, one of the quotes in Chapter 6 argues that it is important to prevent the 'anxiety' caused by resistance towards reproductive cloning from interfering negatively on the possibilities of therapeutic cloning. A prohibition of reproductive cloning can thus be seen as a necessary trade off. It will make the investigation of therapeutic cloning more acceptable, at the same time as no real sacrifices are made by prohibiting reproductive cloning, since it is seen to hold no current benefits. But it is also obvious that if substantial benefits were to appear in connection with reproductive cloning, arguments for the ban to be lifted would probably also appear since the most important value in this mode of articulating the collective is the pragmatic evaluation of benefits and risks.

In *sectarian* arguments, human cloning is articulated as a clear example of a general, problematic development of science, which should be resisted. Cloning is a natural extension of the growth of science so far. It is on the track of corruption, and will inevitably lead to the loss of any sense of humanity and the destruction of the community of people. Prohibiting cloning is thus one step in the resistance that should limit science and place it firmly under democratic control, in order for the current nature of the collective to be rescued from destruction and corruption. When the distinction between reproductive and therapeutic cloning later appears, the sectarian arguments reject the latter as acceptable. Rather they treat the efforts to promote this distinction as a sign that corruption is threatening again. It is argued that it clearly shows how the instrumental systems, like science and business, will not stop at anything. Rather than admitting

that cloning is reprehensible and realising that therapeutic cloning will probably lead to reproductive cloning, these systems will pursue this kind of research at any cost. Furthermore, sectarian arguments maintain that the claimed potential for revolutionary beneficial outcomes have not been sufficiently substantiated and are just put forward as bait in order for these systems to be allowed to continue with the hideous exploitation of human life.

Finally, *fatalistic* arguments seem to be the only articulations that do not unambiguously back the prohibition of human cloning. Not because they support the technology, but because they articulate a lack of trust in the effect of regulation. In so far as they articulate arguments about the regulation of research these amount to ironic comments suggesting that, no matter what kind of regulation the 'system', the 'authorities' or the 'actors in control' claim to be enforcing, it is impossible to stop scientific progress from having horrific consequences. On the other hand, this is treated with a kind of fatalism, in which the collective is presented as out of control. But, since this is a normal state of affairs, we have gotten used to it and expect no change. On this account I have not found the introduction of the distinction between reproductive and therapeutic cloning to have any consequences for fatalistic argumentation. Rather it seems that these arguments – of which there are not many when the issue is general regulation – seem to be treating the negotiations over acceptable regulation as a charade which does not have any real consequences.

The analysis of the articulations of cloning, therefore, indicates an initial alliance in favour of a general rejection of reproductive cloning. The fact that hierarchical, competitive and sectarian arguments can associate positively to a prohibition means that it would take a lot of effort to overcome this alliance and produce a viable alternative articulation if it is at all possible. The analysis also illustrates the dynamic and relative stability of this alliance as it shows how the initial agreement on the rejection of human cloning, as described in Chapter 3, is developed into new controversies, when the distinction between reproductive and therapeutic cloning is introduced, as described in Chapter 6. The alliance seems to be broken in two, when competitive and science-hierarchical arguments are in favour of research in therapeutic cloning, whereas most arguments subscribing to ethical hierarchy as well as sectarian egality are in opposition. In figure 7.1 I have depicted this situation graphically as two different alliances on the regulation of human cloning. It should be noticed that the fatalistic argu-

ments seem to be neither for nor against legislative prohibition of cloning, but they are definitely against human cloning and therefore they have been partly included in the sceptical alliance.

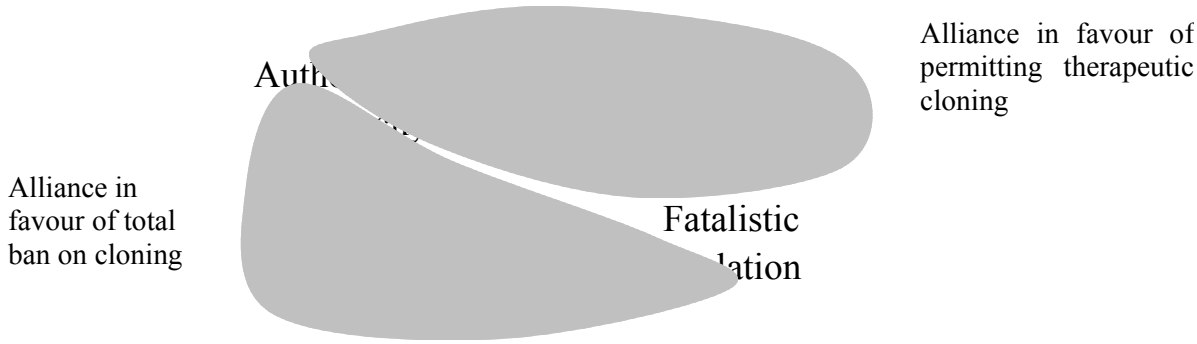

Figure 7.1. Alliances in the controversy about regulation of human cloning after the introduction of therapeutic cloning

The difference between these two alliances in the question of therapeutic cloning can be seen as equivalent to the difference identified by Michael Mulkay in the British debate over embryo research between the rhetorics of hope and fear (Mulkay 1997). The alliance in favour of permitting therapeutic cloning can be seen to follow the rhetoric of hope, in which scientific development is basically articulated as prosperous and beneficial. In contrast, arguments subscribing to ethical hierarchy as well as sectarian arguments employ the rhetoric of fear, in which scientific progress threatens to ruin the quality of life enjoyed by the community of people. It is interesting to note that these differences must be expected to continue although greater utility might be ascribed to reproductive cloning in the future, since expectations of utility are not likely to be of decisive importance in the rhetoric of fear.

On the other hand, although the arguments in this alliance against human cloning all employ the rhetoric of fear, it is still possible to identify an internal differentiation between these arguments. It is possible to recognize parallels to the distinction between a ‘green’ and a ‘blue’ resistance as identified by Hviid Nielsen and colleagues (Nielsen et al. 2002; Nielsen 1997). Most of the hierarchical

and fatalistic arguments seem very much in line with a 'blue', pre-modern resistance, in which biotechnology runs counter to tradition and national order, and is therefore just basically wrong. In contrast, most of the sectarian arguments articulate their warning against corruption in a setting of risks and benefits. Therapeutic cloning is a threat because it includes a risk of corruption, for instance by being a possible back door to reproductive cloning, without really having positive benefits. In this way it is possible to characterise this kind of argument as a 'green', post-industrial criticism, in which biotechnology is seen to be too risky, and should therefore be restricted.

The green resistance has been characterised as based on knowledge and scientifically informed evaluation of risks and benefits, and therefore more 'rational' than the blue. In the present dissertation, this judgement of more and less rationality cannot be sustained, since all the modes of articulating the collective are rational seen from their own perspective. Evaluating biotechnologies as beneficial or dangerous is not a question of evaluating the technical, ethical and social implications first, and then deciding upon which opinion to hold. Rather, the evaluation is an integrated part of a general notion of social and natural order that makes some evaluations appear sensible and others less sensible. On the other hand, the distinction between different kinds of rationalities highlights the internal differentiation in the resistance to biotechnology. Although the different types of argument agree on a rejection of biotechnology, the reasons for this rejection might be very diverse, as it is possible to demonstrate with the example of gene therapy.

Gene therapy: From sectarian criticism to broader scepticism

In contrast to the articulation of cloning in which a unanimous rejection was transformed into a split between opponents and proponents, so that the rejection in 2001 seems to be less comprehensive than the rejection of 1997, the development of the articulation of gene therapy has moved in the other direction towards broader resistance. Before the suspension of the experiment in Århus, only sectarian arguments seemed to be sceptical towards the general use of gene therapy. Although a common scepticism towards the use of gene therapy to enhance normality can be traced, hierarchical and competitive arguments were generally very optimistic about the future possibilities of curing serious diseases with gene therapy. In this way, gene therapeutic experiments are primarily in-

scribed in settings of great expectations, but this rhetoric of hope seems to have been rather dampened after the articulation of the experiment in Århus.

With regards to the criticism raised earlier by sectarian arguments, it is interesting to notice, that I have only found one articulation of the concrete experiment in Århus that can be said to be explicitly subscribing to the *sectarian* mode of articulating the collective. In this argument the experiment is articulated as an example of medical science run wild, threatening to corrupt humanity and the community of people.[153] Since it is difficult to present a sustainable analysis of missing phenomena, I will not pursue the question of why there are not more of these articulations. Yet, it should be noticed that sectarian arguments are common in general articulation of gene therapy. In these cases it is stressed that although gene therapy is expected to hold great promise of cures, it might prove to be very problematic since it holds many risks of both technical and moral kinds.

If we look at the other articulations of the experiment, it seems that *hierarchical* arguments primarily subscribe to scientific authority. They stress that experiments have to be conducted responsibly, but also that it is important to address patient treatment concretely, and separate from the scientific exploration of possible gene therapies. In order for gene therapies to be developed in a distant future, it is necessary for researchers to behave themselves with respect for the rules of scientific conduct and 'proper' research. Meanwhile, cancer patients should come to terms with their role as patients, suffering a deadly disease, and not go around expecting miracles. They should subject themselves to the scientific research as test cases, but they should do so because it is their duty is to assist in the scientific search for knowledge and cures of cancer, not because it is of benefit to themselves. These hierarchical arguments cannot be said to resist gene therapy as such, but they do formulate criticism of an undue, disrespectful, improper, and unrestricted utilization of biotechnology. The scientific exploration of the field of biotechnology will not bring positive effects if it is not treated with due caution.

In *competitive* arguments, it is possible to detect a division in arguments according to different articulations of the need for regulation. Some of the arguments treat the experiment in Århus as an unfortunate, but minor, episode, which does

[153] The quote is mentioned in Chapter 6 in the section about sectarian egality.

not have any consequences for the general expectations of scientific research in gene therapy to deliver revolutionary results in the future. In this kind of argument it seems that not much has changed on account of the experiment. The scientific enterprise is still viewed as an unlimited and unproblematic resource in society, expected to generate immense benefits in the future. On the other hand, many more of the competitive arguments articulate the experiment as pointing to a need to regulate biotechnological research, so that researchers will not take undue advantage of patients in their pursuit of scientific results. The implication in these arguments is that although the invisible hand of scientific progress is expected to generate many benefits it also produces problems in the form of a possible disregard of the autonomy of patients, since they are the weaker parties in the negotiable relation between patients and researchers. Biotechnological research should therefore not be allowed to suspend general notions of individual autonomy in the pursuit of effective solutions, and regulation has to enforce this.

On this account a powerful alliance between arguments subscribing to scientific hierarchy and a *regulated* competitive individualism seems to have formed. The core of this alliance is the description of biotechnological research as an activity that needs to be performed with respect to stated rules of behaviour. If these rules are respected, scientific research must be expected to produce positive results in the form of cures for deadly diseases. On the other hand, this alliance does not seem very stable, when it comes to discussing the actual formulation and enforcement of regulations. On the one hand, arguments subscribing to regulated competitive individualism articulate external regulation as the only kind of regulation that will prevent researchers from taking undue advantage of their powerful position in the negotiated relation. On the other hand, arguments subscribing to scientific authority present internal rules of science as both sufficient and more suitable than external regulation. External regulation is seen as an unsuitable and possibly harmful interference in a hierarchical order that should be self-regulating rather than controlled from the outside.

On this account arguments subscribing to a scientific authority then seem to form an alliance with arguments subscribing to an *un-regulated* competitive individualism about resistance towards external regulation of biotechnological research. In contrast, arguments subscribing to a regulated competitive individualism can be seen to associate positively with the previous sectarian arguments

calling for external regulation. So after the suspension of the experiment in Århus, the articulation of a need for external regulation controlling the exploration of biotechnology is formulated in a broader spectrum than before, now also including many arguments subscribing to a regulated competitive individualism.

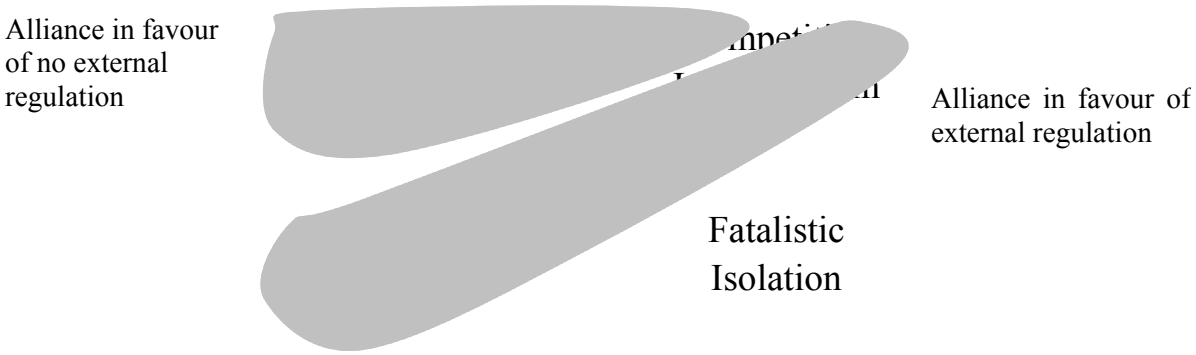

Figure 7.2. Alliances on regulation of biotechnological research on humans after the experiment in Århus

At the same time, however, another interesting trend may also be noted. Whereas fatalistic arguments articulated fierce criticism of biotechnological research in connection with cloning, this criticism seems to have vanished in connection with gene therapy, which is described as a working solution. In this context, however, it should be emphasised that it is not the scientific search for knowledge, which is praised in fatalistic arguments about the experiment in Århus. It is not science, which is seen as the solution, but rather the actions of single heroes. Similar to the articulation of cloning, the general activity of science and research is rejected and described as outside of control - following an inexorable if inchoate logic. But in the case of gene therapy it is evident that fatalistic arguments distinguish between concrete applications of biotechnology and the general search for true knowledge as an abstract, generalised ideal. And whereas the other three types of arguments all imply that the latter is a precondition to the first, fatalistic arguments do *not* present science as a precondition for biotechnological solutions to problems of disease. Solutions stem from actions, not from general ideals about science.

By this criticism of the general rationale behind science, the case of gene therapy hereby pinpoints a broad and fundamental alliance, composed of the arguments subscribing to authoritative hierarchy, competitive individualism and sectarian egality. The fatalistic opposition makes it clear that the other three all subscribe to the notion of systematic knowledge as a positive ideal and a precondition for effective technological solutions. And this also exemplifies the main difference between the sectarian and the fatalistic criticisms of biotechnology. Sectarian arguments subscribe to an ideal of scientific truth and the possibility of finding solutions through a scientific search for knowledge, but it distinguishes between this ideal and the social system of science – the actual organisations and practices of science – which is rejected as corrupt and dangerous. Fatalistic arguments do not subscribe to the system of science, but it does not subscribe to the ideal of scientific truths either. In accordance with the term fatalism, they reject the possibility of any systematic search for solutions to problems and this seems to be the core difference between the two oppositional logics.

As discussed previously, fatalistic modes of articulating the collective can be seen as a kind of 'blue' scepticism. It is critical of biotechnology as a general societal activity and this criticism is guided by a general opposition to systems of power and a disbelief in systematic ways of exercising control and generating knowledge. In this way, I will argue that this opposition should not primarily be interpreted as an instance of ignorance or lack of knowledge, but rather as the rejection of science as a possible way of creating systematic knowledge about science. The rejection of the possibility of creating a beneficial collective order naturally connects to a view, where technoscientific research is not considered a beneficial activity.

Furthermore, the example of gene therapy also points to an apparent contradiction in the fact that fatalistic arguments reject cloning but praise gene therapy as means of curing cancer. It is not uncommon between researchers of public opinion on biotechnology to explain differences like this in terms of 'immaturity' in opinion formation, see for example Midden et al. (2002). Hereby they express the view that apparent contradictions will disappear as the publics become more familiar with biotechnology in general. In the context of the present dissertation I have proposed that this difference between cloning and gene therapy is a matter of perceived benefits, where it is completely compatible with a fatalistic mode of articulating the collective that the chance of curing cancer is sufficient

reason to go ahead with genetic experiments, even if biotechnology in general is rejected. Fatalistic arguments might fiercely reject biotechnology on an abstract level, but this does not lead to a similar rejection of concrete genetic experiments if they are seen to have benefits for subjects who are perceived as worthy of help.

In figure 7.3, I present these main alliances. It demonstrates how a major alliance subscribing to an ideal of true scientific knowledge is visible in the light of an anti-science opposition articulated in the arguments subscribing to fatalistic isolation that refuses to accept this ideal. Although the three types of arguments in the former alliance do not agree on the way biotechnology should be regulated, they do all imply that regulation ideally should serve the purpose of supporting the creation of true knowledge for the benefit of society.

Figure 7.3. Alliances on the value of scientific research

From these two examples it is obvious that the lines of conflict in the controversies do not necessarily lie precisely between the two ways of exercising power at the top, and the two ways of opposing power at the bottom. Rather different alliances are possible. That the lines of conflict are not always primarily horizontal will indeed be even more obvious if we consider the issue of biotechnological patents, which has also been causing controversy in the time period considered in this dissertation. Although it has not been object of independent analyses, arguments concerning this issue were part of the analysis in Chapter 6 and on this basis it is possible to sketch the main alliances and conflicts. The conflict over biotechnological patents originated around the effort to implement a special

regulation of patents in relation to biotechnology. This issue raised questions about acceptability of economic gains, freedom of research, public vs. private research and the distribution of profits. From the analysis in Chapter 6, it seems that *competitive* arguments were most favourable towards the new rules stressing that it is of paramount importance that researchers and companies are able to take out patents on the valuable knowledge they create, since there will not be incentives to produce this kind of knowledge, if it is not possible to protect the commercial exploitation.

The *sectarian* arguments, on the other hand, describe the mixture of economic profit and knowledge creation as an extremely problematic combination, which demonstrates the corruption of science as well as the imminent need for regulation that will protect genetic knowledge from being infested with impurities stemming from economic exploitation. And most of the *hierarchical* arguments seem to share this view that scientific research should not be mixed with economic considerations since these extra-scientific considerations might undermine freedom of research as well as the collegial system of peer-review, which is described as a fundamental norm in the 'proper' conduct of research. On this account an alliance between sectarian and hierarchical arguments agrees on the importance of keeping the activity of science and the economic activity in the business market distinct and separated from each other. In contrast to this alliance we find the competitive arguments, which seem to be more worried about the possible harm to the invisible hand of scientific progress that is seen as a likely result of this separation, than a possible transgression of logics of different systems.

In this way it is obvious that both hierarchical and competitive arguments can be seen to defend the social activity of knowledge creation in technoscientific settings against harmful restraints and interference. But their definitions of the nature of technoscientific activity as well as the definition of harmful restraints vary. Whereas hierarchical arguments want to protect the institution of science against undue and improper interference from other institutions of society, for instance market forces, competitive arguments want to protect a market logic of scientific activity.[154]

[154] As mentioned previously this can be seen to illustrate a fundamental tension (or alliance, dependent on point of view) in the concepts of science within sociology and the theory of science, but a general explication of the difference between conceptualisations of the invisible

Discursive conditions for regulating biotechnology

As the examples of cloning, gene therapy and biotechnological patents show there are differences in alliances and lines of conflict between different controversial issues. This dissertation has mapped the controversies over two of the major issues in the period between 1997 and 2001, measured in media attention. But in order to understand conflicts about genetic determinism, genetic tests, stem cell research and so on, it is necessary to conduct in depth analyses of each separate case. The present analyses can therefore not deliver a full description of Danish controversies over health care related biotechnology in Denmark in the period 1997 to 2001, although it does provide a map of some of the more high profile controversies.

The most interesting conclusion from the examples is that the alliances formed in each case are different from each other. Cloning represents a situation in which hierarchical arguments are divided, so that some tend to be associated with competitive individualism (benefits in therapeutic cloning should be explored) and others with sectarian arguments (therapeutic cloning is just as bad as reproductive cloning). Gene therapy represents a situation in which competitive arguments are split between an alliance with hierarchy (science is best left to its own internal regulation) and sectarian egality (science needs to be regulated from the outside). And finally, the sketched example of patents represents a situation in which hierarchical and sectarian arguments form an alliance (it is wrong to mix economic exploitation with the scientific pursuit of true knowledge) with competitive arguments on the other side of the line of conflict (economic exploitation is necessary for scientific progress).

Although the present analyses do not result in a comprehensive description of all controversial issues regarding biotechnology in Denmark, they make it possible to outline the basic generic criteria for each of the four modes of articulating the collective to enter into alliance with each other about closure in the form of some kind of regulation of biotechnology.

In *hierarchical arguments* the vital concern is to respect the general hierarchical order from which it is possible to deduce a solution to problems. Therefore it is important to identify this order and inform all relevant actors of the rules and

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hand of scientific progress and the institution of science is outside the scope of this dissertation.

roles deducted from this order. In general, regulation of biotechnology can be regarded as positive, since it can be seen as a way of putting the hierarchical order into practice. But it is important that the regulation is based on the 'proper' order, since 'improper' orders, for instance external regulation of science, is wrong, because it mixes things that ought to be kept apart.

In *competitive arguments* the important concern is to respect the basic freedom of actors to pursue individual preferences and negotiate freely with each other. Regulation is therefore only considered beneficial if it sustains the basic freedom of individuals. Regulation for the sake of a general hierarchical order is considered unacceptable. On the other hand, many of the competitive arguments articulate the need to regulate the rules for the exchange relations in the market forces in order to protect the some parties and their basic freedom. But in this case it is important that regulation is seen to benefit certain pragmatic aims, rather than protecting a general privilege or a role.

In *sectarian arguments* the important concern is to acknowledge that the trend is on the wrong track and to sound the alarm in order to raise awareness of the imminent disaster. On this account regulation in the form of restriction can be viewed positively as a possibility of demarcating an absolute limit. It can be seen as the turning point in which corruption will finally be taken seriously and a protective fence of prohibition will be erected. On the other hand, regulative measures are likely to be deemed insufficient as protection towards the lurking disaster. From the sectarian perspective, no restrictions are likely to be satisfactory.

In *fatalistic arguments* it seems that there is no general notion, which is described as sacred and worthy of protection. Rather this perspective is ironic and sceptical towards any articulation of a positive collective order. Benefits and problems are distributed on a random basis in this world and as individuals we might as well just accept this. On this account the systematic production of knowledge within science is not accepted as a means to a better world. Similarly regulation tends to be disregarded as a means of controlling society in any positive direction. This perspective seems to have a distinct negative bias towards any perceived system of power, whereas positive associations seem to be connected to romantically staged actors in the role of heroes and victims.

These outlines are of course highly simplistic, just as they disregard the fact that alliances as well as conflicts can also exist between arguments subscribing to the same mode of articulating the collective. On a generic level, however, these descriptions make it possible to characterise the similarities and differences between these four modes of articulating the collective. In this context, it should be noticed that I explicitly chose not to follow the four-field typology of Mary Douglas with the dimensions of grid and group as described in chapter 2 and 5. Rather I have treated the four modes as four different perspectives in the analysis. I will not repeat the discussion behind this choice, but it is obvious that figure 6.7 and the following figures in this chapter can be regarded as equivalent to the grid-group matrix, only stripped of lines separating each compartment. Especially when I will now point to generic possibilities of alliances it becomes obvious that the similarities and dissimilarities between these four perspectives can also be interpreted as dimensions in a four-field composed of these four modes. But to argue that these dimensions are underlying structures guiding the distinctions is not the view adopted here. Rather they are dimensions that point to differences as well as possibilities of alliances.

The most obvious generic difference separating two opposite alliances is the horizontal division between the two modes of articulating the collective at the top and the two modes at the bottom. These alliances are formed around a basic outlook on the existing natural and social order. The top positions view the collective order as positive and they also primarily articulate science as a basically beneficial activity. Arguments subscribing to an ethical hierarchy are sceptical towards science as uncontrolled activity, but they still imply that it is possible to control science in order to achieve favourable outcomes. The bottom positions on the other hand view the existing social and natural order as problematic or non-existing and they articulate science as system or authority as part of this problematic order. Whereas the top positions can agree on the need to regulate in order to preserve collective order, the bottom positions would be more positive towards regulation that is seen to change this order.

A different line of conflict deals with the position towards the need for coordinated collective action. Whereas the left positions in the figure both seem to argue for the need for all members of society to engage in collectively coordinated action – everybody should respect the hierarchical rules or be aware of the danger of corruption – the positions on the right side of the figure do not seem to

stress this necessity. In the positions on the right-hand side, collective order seems to be perceived as more robust and self-preserving. Although competitive arguments can be seen to argue in favour of regulation that protects some parties it does not seem to be necessary to actively seek to sustain the market of exchange relations. Order will basically come about by itself, if all actors are capable of pursuing their own goals. Similarly, the fatalistic perspective seems to favour the view that collective order is chaotic or at least only beneficial to 'the others', and that since this situation cannot be changed, it is of no use worrying about it.

As the example of gene therapy showed, alliances can also be formed on the diagonal. In that case, a possible alliance could be formed between sectarian and competitive arguments on the need to create external regulation of science to protect patients from being exploited unduly. The core in this alliance is resistance towards a hierarchical logic - in this case that of science - from disregarding the autonomy of the individual human being. Whereas individual freedom is important in competitive individualism, the need to protect the human being from exploitation by systems of power is important in sectarian egality. And since the sectarian notion of a basically good human nature can rather easily be made compatible with the competitive ideal of autonomous individuals an alliance between these two can be formed. In contrast to this diagonal, it is possible to identify a potential alliance between hierarchy and fatalism in a rejection of this focus on the individual person, but I have not come across this kind of argumentation in the present empirical material.

On a general level it can be concluded that there are probably a lot of insights to be gained from further exploration of this model of four modes of articulating the collective. It should be probable to use it as a heuristic model for exploration of concrete controversies, but it also holds the possibility of generating theses to be discussed and explored in empirical analysis. In the present context I will stress the conclusion that alliances can be imagined between all four modes of articulating the collective, just as it is also probable that arguments subscribing to the same mode present diverse arguments about a concrete topic. So controversies are not *just* a matter of different modes of articulating the collective being in opposition to each other. Rather, the typology catches some of the differences – especially with regard to the basic logic of argumentation in favour of

particular ways of reaching closure, but other differences will have to be identified by other analyses.

Public debate as a vehicle for political closure?

In order to discuss the practical conclusions that should be drawn from this dissertation, I want to return to the question of public debate as a vehicle for closure. As described in the problem statement, the Danish debate about biotechnology is characterised by broad subscription to this ideal. In Chapter 6 it became obvious that hierarchical, competitive and sectarian arguments all connect positively to an ideal of public debate as a mechanism for co-ordination and problem solving, although the argumentative logic in the support of this ideal was different in each case. Observing these different arguments, however, it also appears that they display some similarities with the three models of the communicative relationship between science and the public identified in Chapter 1. These similarities are important since they display how the model of four articulated collectives can be employed as a heuristic typology. But they also inspire to some reflexive conclusions on the practical outcome of this dissertation.

Under *authoritative hierarchy*, public debate is a means of educating and informing the public about the hierarchical order of society and the ascribed roles and rules. Controversies are seen as instances of lack of knowledge about the guiding principles and the order they produce in society. The key issue is therefore to remedy this lack of knowledge, and it is based on a general assumption that if people only know, they will automatically do the right thing. In this way this mode of articulating the collective can be said to guide the perspectives of traditional PUS discussed in Chapter 1, where the objective is to create scientifically literate citizens through an asymmetrical communicative process in which information is conveyed from the experts to the lay publics. When people are sceptical towards science it is because they do not have sufficient information. So if they are just presented with the right kind of information, controversy is expected to cease.

Under *sectarian egality* public debate is articulated as a possibility of sounding the alarm and for ordinary people to engage in egalitarian and democratic dialogue with the aim of restricting the system of science. The perspectives presented under the common heading of critical PUS can be said to have some af-

finities with this mode of articulating the collective, when they stress the ideal of deliberation in participatory methods and explain controversies as lack of democratic control over science. It is characteristic for this ideal that the lay public should express their criticism of science under the observation of strictly procedural rules of equality in order to arrive at legitimate regulation of technoscience. In accordance with sectarian egality, these accounts can be seen to have a tendency to romanticise the public and present lay knowledge as somehow more genuine than expert knowledge created within the realms of the system of science. It is, however, also important to notice that the similarities are not as straight forward as between traditional PUS and the authoritative hierarchy, since most of the authors cited under the heading of critical PUS do not seem to be as radical in the description of immediate danger of corruption threatening the community of people as the mass mediated arguments explored in this dissertation.

In *competitive individualism* public debate is a mechanism for pragmatic and contextual mediation between different interests and preferences, with the aim of reaching a pragmatic solution that can gain the most supporters, because it is seen as holding more benefits than risks. The third model identified in Chapter 1, the network model, in which communication between publics and science is seen as the mediation of rational arguments based on pragmatism and credibility with the aim of reaching interim closure in political negotiations can likewise be seen to be similar to the competitive mode of articulating the collective. Towards the end, I will return to this similarity between the network model and competitive individualism since it has been the basis for the entire analysis and therefore gives rise to some reflexive comments about the ontological perspective adopted in this dissertation.

Only arguments subscribing to *fatalistic isolation* do not associate positively to the ideal of public debate, but seem to view it as a sphere for manipulation by the systems of authority. As argued previously, in Chapter 6, it is awkward for arguments about the general constitution of society to subscribe to the fatalistic mode of articulating the collective. Therefore, it is not surprising that I did not identify a perspective within the academic tradition of public understanding of science to be similar to the mode of fatalistic isolation. Rather the arguments that I have identified within this perspective must be seen as the kind of arguments that both traditional and critical PUS want to eliminate. In these perspec-

tives ironic detachment and the rejection of scientific knowledge is perceived as a kind of argumentation that can be made obsolete by enlightenment in the form of either information or participation.

The reason for presenting these similarities between the typology of articulated collectives and the three models within PUS is not to portray one of them as ontologically more true or better than the other. Rather it serves to make it apparent that each of these models also subscribes to a particular way of representing society, science, public, in short, an articulated collective, just like all other arguments presented in the controversies. This is a consequence of the relational ontology adopted in this dissertation. There is *no* articulable place outside the network of articulation. No privileged place from which it is possible to observe the controversies without being guided by previous observations and associated allies.

In this dissertation I subscribed to the network model, but this model has strengths and limitations as well as the other models. The force of the network model, subscribing to a competitive mode of articulating the collective, is that it makes us able to see controversies about biotechnological research as political struggles over the social and political order – as a cultural conflict. In this way it can be seen to be a second order study of problematisations – an observation of how other actors observe a given phenomenon – in this case political regulation of biotechnology. The analytical strategy constructed on the basis of this model, however, is not able to shed much light on the effect of information, which is the main force of traditional PUS, or mechanisms of participation, which is the force of critical PUS. The present dissertation is therefore not able to provide conclusions as to what would be an effective way of communicating knowledge about biotechnology in order to enhance the public understanding of science. Neither is it possible to make explicit recommendations for improving participatory methods in order to enhance legitimacy of the technoscientific development. What this dissertation can do, is to provide some knowledge that ought to be of value in future analyses of the public understanding of science as well as concrete efforts to raise the information level and develop participatory methods, as I will sketch in the concluding section. And in this context, I will take the liberty of speaking about the modes of articulating the collective as actants that can be equipped with preferences, interests and resources.

Discursive conditions for regulating biotechnology

It is obvious that although the three modes authoritative hierarchy, competitive individualism and sectarian egality all associate positively to an ideal about public debate, the rhetoric behind these associations are very different. Consequently, they disagree about the objective of the process of public debate, and what it takes for this process to lead to a legitimate closure. Whereas hierarchy would like to see properly educated citizens behaving according to their prescribed role, competitive individualism would appreciate a mediation of preferences and sectarian egality would like members of the community to be aware of the danger of corruption and change behaviour. Nevertheless, it is an important point that they need not agree on the outcomes in order to agree on the necessity of public debate. In so far as they each do not see a fulfilment of their preferred objective, they can agree on the necessity for more public debate. On this account these demands for debate can be seen as a kind of lightning rod, that takes the heat off of the unfulfilled expectations. If public debate has not satisfied the objectives yet, we just need some more of it.

The alliance on the positive expectations towards public debate is important for the understanding of experiments with participatory methods. It seems that all modes, except fatalism, can agree on the positive values of these experiments. In itself this is ironic since it must be expected that fatalistic arguments are precisely the kind of arguments that the other three modes are most concerned with eliminating by participatory experiments. Precisely the rejection of the possibility of positive control of the collective, the rejection of science, ethics and public debate as means of reaching closure in controversies, are features that the other modes cannot associate positively to. Rather, from their perspectives, fatalism is seen as an arbitrary reaction due to lack of knowledge or participation that could be remedied by participation in a dialogue about biotechnology and the general social and natural constitution. In this way it is possible to claim that fatalistic isolation is the only mode of articulating the collective that does not buy into some notion of enlightenment through public communication. This notion of enlightenment can be seen as the basic reason for staging public debates – what I earlier referred to as the implied need for artificial life support in order to create public discussion. In this broad alliance around the notion of enlightenment, it makes sense to orchestrate public debate as initial top-down processes because it is expected that it will create bottom-up effects.

It should be noticed, however, that of these different objectives, the sectarian demand for an egalitarian, deliberative debate is the most difficult to satisfy. This, however, is not surprising since it is part of this mode of articulating the collective to be in opposition and to raise claims that are characterised precisely by idealism. The point of sectarian criticism is not to reach closure, but to keep existing as criticism. Taken in their full consequence, the objectives of hierarchy and competitive individualism is probably also impossible to satisfy completely, but since they are both in favour of sustaining and preserving present social order, it seems to be more acceptable to settle for partial satisfaction. It is not absolutely necessary for all members of society to be 'properly' informed and educated about hierarchical order as long as a majority is protecting this order. Similarly, it is not necessary for all preferences to be included in the mediating negotiations if only the most important ones are incorporated.

It is therefore important to stress that whereas hierarchy and competitive individualism will tend to be more positive towards actual experiments with participatory methods, sectarian egality is likely to be disappointed by the outcomes of these experiments. In the two systems-preserving modes it is probably positive in any case that participatory experiments were conducted, as they are expected to have conveyed at least *some* knowledge about the hierarchical order or have let *some* preferences be voiced. In these modes, therefore, each experiment with participatory methods can be seen as a step in the right direction. Contrary to this, sectarian arguments are much more devoted to a fundamental change. If this change is not brought about, the participatory experiments will just have been another step in the wrong direction, preserving the wrongful collective order as it is.

In this context it is also important that according to the present analyses, it is impossible to find a universal measure by which the effect or efficiency of participatory methods can be evaluated. This is partly because of conflicts between the different articulated collectives and partly because of practical impossibilities. From a hierarchical viewpoint participatory methods are expected to inform lay people. But whereas crude information levels can be measured it is difficult to establish causal relationships between the development of a controversy and these measures. From a competitive viewpoint participatory methods are expected to lead to negotiation of preferences, but only real time development will reveal whether a working compromise has been struck. And finally, from a sec-

tarian viewpoint participatory methods are supposed to awaken the lay public and result in behavioural change and democratic control over technoscience. But within this mode of articulating the collective it is impossible to decide whether corruption has been overcome or just adopted new forms of disguise. This lack of possibility for measurement of effect, however, does not seem to lead to a disregard for participatory methods. Rather, it seems that in the logic of most arguments, expectations in the positive outcomes of these methods are sufficient in order to associate positive to them.

Therefore, it could be tempting to conclude on the basis of this dissertation, that participatory methods as well as other efforts to enlighten citizens might not have great effects since they will only have intended effects on actors already sharing the basic assumptions about social and natural order implied in the different modes of articulating the collective. This however, is taking the conclusion far beyond what has been argued here, since it implies that actors inhabit these modes of articulating the collective on a stable basis. This is not the perspective of the present dissertation. As mentioned earlier in this chapter, they are available discursive positions for making arguments, but there is no necessary stability in the subscription to these modes. There is no determinism in adopting them, and human beings probably take on these positions in various patterns of change and stability. Furthermore, my analyses do not suggest that it is possible – let alone desirable – to eliminate either of these modes of articulating the collective, as I will argue in the last section.

Proposing that the staging of public debate can function as a lightning rod should not be understood to imply that the ideal of public debate is an inadequate or inappropriate substitute for a more genuine and effective vehicle for reaching closure. The differences in objectives connected to the notion of closure through debate means that public debate will probably never satisfy one of these modes of articulating the collective completely. But this is a matter of a fundamental condition in society. We do not live in a harmonious community of consensus, rather the dialogue is political as Douglas and Latour both will have us agreeing. Each day we engage in confrontations exploring what will hold with what – no matter whether it is local details or general discussions on the social and natural constitution, both of which are incorporated into each other as the notion of articulated collectives have pinpointed. Although public debate is unlikely to serve as a means to reach a final solution, so that controversies will

cease, it is not a function that modern society can dispense with. Rather it is a fundamental feature of society that exists in some form or another, and personally I will side with Douglas and Wildavsky in preferring a civilised version:

> Seen in their worst light, all three forms of cultural bias are contradictory and self-defeating. Each sees particular dangers and fails to see others of its own producing. When the argument about risks of technology is locked in stalemate, it is good to know the assumptions on which each debating position is grounded. A second marriage, Dr. Johnson said, reveals the triumph of hope over experience. At the heart of efforts to further the dialogue between border and center lies a contradiction between the desire for debate and the realization that discussion has proven unproductive. It is easy enough to say let there be dialogue, for a pluralistic society should work out the accommodation between initially rival and hostile views. But our analysis shows why the rival perspectives are polarized, each selecting facts to support pre-existing perceptions of risk. At least we know better now than to wish to see the erosion of the center or the suppression of the border. (Douglas & Wildavsky 1983:185)

The underlying argument in this quote is that culture thrives on opposition. Each of the four modes of articulating the collective should be seen as justified in their own right. In my view it is the combination of oppositional logics that will create the healthiest or most stable social climate for technoscientific creation of new knowledge and technology. Rather than viewing opposition as wrongful obstacles (no matter from which articulated collective one judges opposition), I will propose to view it as resource in the creation of long-term solutions. By making this argument, however, I have also pinpointed the cultural bias of the present dissertation: that legitimate closure is reached through mediation of interests and preferences.

Seen from the perspective of competitive individualism, the other perspectives must be doomed to fail in the efforts to create scientific literacy or egalitarian participation, but then again this is a choice of perspective. If viewed from the other perspectives the network model will err in its lack of prescription of better and worse collective action. If authoritative hierarchy and sectarian egality can agree on anything it is the need for action in order to ensure that the collective will not decay. Seen from their perspective competitive individualism presents a

dangerous consumerism that ultimately furthers functional explanations, which uphold the present system without offering anything in the way of normative judgements.

In the context of the relational ontology presented in Chapter 2, I will argue that a choice between these perspectives represent a choice of collective that each of us wants to live in. And since I am not sure that I prefer the world to be a collective shaped according to competitive individualism, the next step must be to discuss how it is possible to be normative within the perspective of the network model. Realising that powerful arguments are created in alliances between the four modes of articulating the collective is probably the first step in this exploration, but future research will have to take this further.

Danish Summary

Afhandlingen undersøger massemedierede kontroverser om bioteknologi som politiske uenigheder ved at analysere argumenters konstruktion af problemer og løsninger. Det hævdes at ethvert argument i kontroverserne altid implicit artikulerer en eller anden bestemt forestilling om den sociale (og naturlige) orden og om, hvordan denne orden opretholdes eller kritiseres. En sådan forestilling er afgørende for at argumentet kan fungere som argument, dvs. som en meningsfuld sammenkædning af et problem og en mulig problemløsning. Kontroverserne om bioteknologi handler derfor ikke kun om teknologi og forskning, men er grundlæggende uenigheder om, hvilken rolle forskningen skal spille i samfundet, og om social organisering i al almindelighed. En analyse af mønstre i disse argumenter kan derfor belyse de diskursive mulighedsbetingelser for regulering af bioteknologi i Danmark.

Afhandlingens teoretiske grundlag er en *relationel ontologi* formuleret på baggrund af den franske filosof og videnssociolog Bruno Latour, der giver anledning til at formulere en forståelse af offentlig meningsdannelse som en konstant produktion af italesættelse i netværk. For at kunne analysere denne strøm af italesættelse inddrager afhandlingen den britisk-amerikanske antropolog Mary Douglas' kulturteori som et analysestrategisk redskab. Det empiriske materiale udgøres af dagbladsartikler fra *Politiken*, *Jyllandsposten*, *Information* og *Ekstra Bladet*. På baggrund af en række søgeord er der udvalgt 1575 artikler i perioden 1. august 1997 – 31. december 2001, der omhandler sundhedsrelateret bioteknologi. En foreløbig indholdsanalyse af disse artikler er dokumenteret i et bilag til afhandlingen.

Afhandlingens kapitel 3 og 4 er empiriske case-analyser af italesættelsen af henholdsvis human kloning og genterapi. Det undersøges hvordan konkrete hændelser gøres til nyhedsværdige begivenheder ved inskription i forskellige 'scripts'. Ved hjælp af inspiration fra Douglas' kulturteori translateres disse scripts i kapitel 5 til en typologi over fire forskellige måder at artikulere kollektivet – fire forskellige forestillinger om den sociale og naturlige orden. På baggrund af denne typologi undersøges det i kapitel 6, hvordan forskellige typer af argumenter italesætter centrale fænomener som 'forskning', 'etik' og 'offentlig debat', og hermed identificeres de diskursive mulighedsbetingelser for reguleringen af bioteknologi.

I det *Autoritære hierarki* bliver kollektivet artikuleret som en hierarkisk orden af forudbestemte roller med regler, der foreskriver pligter og privilegier for hver position i hierarkiet. Kontroverser løses ved at deducere den bedste løsning fra det overordnede princip, og eventuel regulering skal være en gennemsættelse af dette princip. I den *Konkurrerende individualisme* bliver kollektivet artikuleret som et marked af udvekslingsrelationer mellem autonome aktører, der er defineret ved deres individuelle profil af interesser, ressourcer og præferencer. Kontroverser løses ved forhandling med henblik på at opnå midlertidige og pragmatiske kompromisser, og eventuel regulering skal derfor angive procedurelle regler for denne forhandling, herunder beskytte individets autonomi og frihed til at indgå i forhandlende relationer.

I den *Sekteriske lighedstænkning* bliver kollektivet artikuleret som en kampplads, hvor magtfulde systemer truer med at korrumpere humaniteten og det folkelige fællesskab, og hvor aktører derfor primært defineres ved, om de tilhører systemerne eller de kritiske enklaver, der yder modstand. Kontroverser er udtryk for modstand og løses kun ved, at truslen om korrumpering afværges ved en gennemgribende forandring af samfundet. Regulering er derfor positiv, hvis den bidrager hertil. Endelig bliver kollektivet i den *fatalistiske isolation* artikuleret som et tilfældigt kaos, hvor hverken handlinger eller resultater kan forudsiges, og hvor aktørerne derfor ikke har nogen mulighed for at styre udviklingen. Kontroverser kan derfor heller ikke løses, men de kan give anledning til ironiske kommentarer og en satirisk distance, og generelt er synet på regulering skeptisk.

På baggrund af denne typologi er det i kapitel 7 muligt generisk at beskrive de dis-kursive mulighedsbetingelser for reguleringen af bioteknologi ved at forstå diskursiv magt som evnen til at skabe alliancer mellem forskellige måder at artikulere kollektivet, og det konkluderes at de magtfulde argumenter er dem, der skaber flest positive alliancer. I Danmark kan der således iagttages en stærk alliance omkring forestillingen om 'offentlig debat' som et redskab til at løse kontroverserne. Men på baggrund af afhandlingens analyser fremgår det at forventningerne til dette redskab er meget forskellige, og dermed påpeges en mulig grænse for at bruge offentlig og politisk kommunikation som problemløsningsredskab.

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