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**Cloning Sensations:
Mass Mediated Articulation of Social Responses
to Genetic Research**

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Abstract: *The 1998 announcement by American researcher, Richard Seed, that he intended to clone a human person for reproductive reasons created a large amount of media attention and controversy in Danish mass media. Within a theoretical framework inspired by Bruno Latour the paper analyses this controversy as a productive process, where news is created by inscribing the announcement in different networks of articulation. An inductive analysis of scripts employed by the media demonstrate how different interpretations of human cloning are associated with general notions of genetic research and social organisation. Three main scripts focusing on technical, regulatory and wider societal aspects are identified. All scripts generally reject the idea of human cloning, but four distinctively different forms of response are identified corresponding to the classification of different cultural dialogues on risk.*

1. Introduction

Biotechnology and genetic research has been surrounded by controversy in different publics during the last decades. With issues ranging from genetically engineered microorganisms, plants and livestock over reproductive technologies and research on embryos and stem cells to gene therapy, cloning of humans and genetically enhanced normality; controversies over this techno-scientific development have proliferated. As a major area of conflict in contemporary society, these controversies have simultaneously been a topic for analysis within various scientific disciplines. Researchers have employed a broad range of methods in order to explore the nature of these controversies and their connection to broader social and cultural developments.¹

The object of analysis has varied in these different studies. Accounts like those of Nelkin & Lindee, Van Dijck and Condit have focused primarily on popular images of biotechnology and genetic research on the basis of a hypothesis that representations have a major influence in shaping public perception and understanding. Other studies like those of Mulkey and Priest have primarily tried to understand the controversies as expressions of cultural conflict that shape the development of technologies. Most studies, however, seem to imply a mutual relation of influence in the development of technology and controversies. Technological development brings new challenges to societies, but technological development is at the same time socially shaped. This reciprocity has been formulated by Bauer & Gaskell in relation to the study of the development of European controversies on biotechnology: “(I)n 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.”²

The present paper adopts this notion of mutuality, as controversies are not seen as instances of badly conducted diffusions of technology. Instead they are perceived as points of condensation in a shaping process where both technologies and perceptions of these technologies are continuously negotiated in a particular cultural and social setting.³

Furthermore the paper adheres to the view of many of the above-mentioned studies, that mass mediated representations form an important empirical site for the study of controversies⁴. Although mass media is not equivalent to the public sphere, it must be viewed as a major arena for public debate about biotechnology. Studying mass media further has the

advantage, that it is possible to understand dynamics of controversies both with a view to time and different cultural contexts.⁵ In Denmark, which forms the particular cultural setting for the present study, this is especially important since conflict and confrontation is central to the mass mediated coverage of biotechnology.⁶

It is commonplace that mass media often portray biotechnology as a revolutionary technology with extraordinary consequences for both individuals and society. In this paper, however, the mediated representations is analysed on the basis of a fundamental assumption that technologies in themselves are not necessarily controversial or newsworthy. In order to receive media coverage biotechnological occurrences has to be presented as controversial, revolutionary or in other ways interpreted in a framework, which presents them as newsworthy stories. Accordingly, the study of mass media interpretations in this paper serves as a way of analysing the dynamics of biotechnological controversies in a particular social and cultural context such as the Danish.

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 analyses⁷. It is argued that this occurrence transposed the notion of human cloning from the realm of science fiction into the real world while at the same time revealing this notion to be a particularly explosive issue⁸. Looking at the Danish media coverage it is obvious that human cloning has been articulated often and usually as controversial.⁹ Moreover, after Dolly became a familiar sheep in the Danish media, human cloning became a persistent topic of interest in the coverage of health care related gene technologies. In a study of the Danish mass mediated coverage of health care related biotechnology in a 4½ year period, human cloning was found to be the most frequently articulated among a number of different applications of health care related biotechnology. Furthermore, it was found to be one of the most controversial fields of application with a high focus on regulatory issues.

The interest in cloning has been particularly fuelled by the occasional statements by researchers Richard Seed and Severino Antinori, that they had actual plans for human reproductive cloning. Especially the 1998 announcement by Seed that he intended to commence with reproductive cloning in order to help childless couples reproduce received much attention in the Danish media. This claim was presented as highly controversial and its announcement received more attention (measured in number of articles) than other biotechnological

occurrences in the 4½ year period after August 1997, including, notably, the announcement that the human genome mapping project had been concluded in June 2000.¹⁰

This observation is particularly interesting, since several articles about this announcement explicitly question whether the enormous amount of media attention given to it 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.¹¹ The issue of sensationalism, however, installs an ontological distinction among occurrences, which is not a fruitful trajectory for the perspective adopted in this article. 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?

Against this background the analysis inquires into the way Danish news media construct this occurrence as a newsworthy event in public discussions about biotechnology. The study is thus rooted in a long tradition, which refers to the journalistic product as a socially constructed phenomenon.¹² The central point is that news is a product of a social process in which a phenomenon or an occurrence, such as an announcement on human cloning, is shaped into a newsworthy story. As indicated above this constructive view does not imply, however, that journalists can construct news in any way they see fit. As Schudson has put it, saying that journalists make the news is not the same as saying that they fake them.¹³ Journalists do not write fiction, but has 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 meaning can be constructed.

The following section will outline a conceptual framework for this particular case study. By introducing the concept of *inscription* in networks of articulation it becomes possible to study the translation of occurrences into newsworthy events. With this background three main inscriptions of human cloning in the Danish media are identified. Subsequently the differences between these inscriptions are discussed with a special focus on the way they construct the possible societal response to the idea of human cloning. The conclusion emphasise

how the controversies about human cloning can be viewed as controversies over possible ways of regulating research in modern society.

2. Conceptual background to the study

The adopted view of news as social constructions bears much resemblance to the studies of the construction of scientific facts as carried out within the field of "science studies". Facts are gradually established in a productive process of transformation, which turns phenomena in laboratory experiments into text in scientific journals.¹⁴ With Bruno Latour we can use the term *translation* to cover this process of transformation in which a displacement of a phenomenon from one context to another is taking place.¹⁵ 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.

In this perspective, it can be argued, that news can also be viewed as the tangible result of a series of translations.¹⁶ A news item is a result of a process that has linked a concrete occurrence or a phenomenon to a specific journalist who, in the concrete situation, has been able to obtain access to a given amount of information and to bring a specific number of sources to give a statement. The question of how occurrences are transformed into newsworthy stories, therefore, becomes a question of viewing translation processes as the establishment of productive connections. The translation of Seed's announcement at a conference in United States in December 1997 into news accounts in Danish media in January 1998 has taken a great deal of productive work.

Furthermore, this perspective reflects the ambition to treat each news product as an, in principle, un-determined outcome. This does not mean that it is impossible to look for some sort of pattern in news. This pattern, however, is an outcome of a retrospective analysis, not an underlying structure that was there all along controlling the work of the journalist and just waiting for the analyst to excavate it.¹⁷ The ambition in the following is precisely to look at the news of Seed's announcement as the result of a series of productive translations, and to search for patterns in the way the particular occurrence is constructed as newsworthy.

To analyse patterns in news construction is interesting because it is not only a question of a profession exercising its skills or a particular ideological or economic interest trying to influence the audience in an opportunistic way. Journalists do construct the news, but they do not do so without relations to the rest of the world. Journalists or the media (dependent on whether we focus on professions or institutions) are operating within a given social and natural context, and they are therefore in one or the other way connected to cultural and/or political conflicts or interpretative struggles of this context. We can use another Latourian term for this kind of connectedness: *association*. Whereas translation signifies the process of transformation, the concept of association signifies the connections created in this process.¹⁸ When a source is commenting on an occurrence in a journalist's article, a connection is made between the occurrence, the source and the journalist. In this way we can speak of the journalistic work as a question of creating networks or as Latour puts it: "exploring the collective. Any entity is such an exploration, such a series of events, such an experiment, such a proposition of what holds with what, of who holds with whom, of who holds with what, of what holds with whom".¹⁹

The central point is that the productive translation process does not take place in a vacuum. The journalist cannot simply write anything but has to negotiate possibilities. Which sources will give a statement on human cloning? Which interpretative frame produces meaning in which way, etc.? Not everything can be associated. The productive process, in fact, is precisely a question of testing possible connections and the result is the creation of news, understood as an interpretation of the occurrence, which is socially viable in the particular context.

In the following I will employ a third Latourian concept, *inscription*, about the interpretative aspect of the translation process. Inscription refers to the types of transformations through which an entity becomes materialized into a sign or a trace.²⁰ When meaning is ascribed to an occurrence like the announcement of cloning it is because it is associated with other occurrences and sources in a particular way. Sources are assigned different roles (as researchers, politicians, citizens) just as non-human actors are aligned in order for the news story to make sense. This process of making sense by assigning roles I will term inscription and the interpretative framework thus created can be termed script. Again it should be made clear, that scripts are not structural features that determine the translation of an occurrence into a newsworthy event. Rather, a script is the outcome of productive processes.

Summarising, we can say that a script is what frames the occurrence into a newsworthy event by association. And it is analysed by looking for patterns in the way human cloning is constructed as a particular phenomena by being associated to other events. 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.²¹ Furthermore, since it is analysed as example of the proliferating controversies over biotechnology, I have looked particularly for the way cloning is constructed as a problem as well as for the kinds of solutions suggested in the mediated coverage. 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, with particular respect to the way cloning is constructed as a problem. 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 in newspaper articles alone. In the following sections I will present these inscriptions after an introduction about the way Seed's announcement was introduced as breaking news.

3. "Danes shocked at plans to clone baby"²²

On 7 January 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.²³ The news evoked a response in most Danish media in the course of the following days.

Below I present an analysis of the entire corpus of articles, which address human cloning in four national newspapers in a three-week period from 7 January 1998 – a total of 54 articles. The four sampled newspapers have been chosen because they represent a broad spectrum of national newspapers.²⁴ The analysis includes both journalistic articles, letters to the editor and other debate contributions, since the purpose is to investigate the whole spectrum of inscriptions of Seed's announcement as a newsworthy event.

Breaking news

On 8 and 9 January, 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 controlled by the moral and economic interest of the individual researcher alone. This development²⁵ must be curbed.²⁶

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 cloning²⁷

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 implied reader to sleep peacefully, order now having been restored. 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 to the problem of cloning²⁸. 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 a 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 it seems that the inscription of cloning focus on either technical, regulatory and wider societal aspects. This division does not imply any essential difference, but just that the primary focus in a given inscription has been found to be on one of these three aspects, and it has therefore structured the analysis.

Technical aspects

Many of the inscriptions primarily articulate 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 great. (...) - In order to make Dolly we used 277 fertilized eggs, which required 430 un-fertilized eggs. Every donating woman in Seed's 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.²⁹

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 scien-

tific 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."³⁰

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 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.³¹

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.³²

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 a proper scientist, and it is "bad" science to clone a human, since the procedure has not yet been perfected on animals, and therefore it must be expected to create many unwanted side effects. These inscriptions 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.

Regulatory aspects

A second type of inscription 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 inscriptions 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.³³

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 implication seems 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."³⁴ 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, a 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.

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".³⁵ 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 ques-

tion 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 too 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.³⁶

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"³⁷ 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.³⁸

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?"³⁹ 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"⁴⁰. 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."⁴¹ So it seems that although there is unanimous 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.

Wider societal aspects

A third kind of inscription 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 inscriptions 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.⁴²

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 quotes in the previous sections, 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 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.⁴³

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?’⁴⁴.

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 inscriptions presented in the two previous sections, 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 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.⁴⁵

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 previous sections on technical and regulatory aspects, 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 articulation of technical aspects, it seems probable that human cloning will happen and that it will have widespread dystopian consequences. And as opposed to the articulation of regulatory aspects, 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 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."⁴⁶

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'"⁴⁷. 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."⁴⁸

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."⁴⁹ Fatalism thus seems to be the obvious response to a trend that is basically reprehensible, but at the same time beyond our control.

As a summary it is fair to say that the first few days' coverage of the story as a sensational story on risks and perils evolves into inscriptions of cloning in three different ways, by focusing on technical, regulatory and wider societal aspects respectively. It should be noted that the different types of inscription are not equivalent to the newspaper articles on a one to one basis. In stead, several articles employ more than one type of inscription in the mediated narrative. 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. Inscriptions focusing on technical and regulatory aspects often dominate the news accounts whereas inscriptions about the symbolic aspects often function as a counter-perspective in the news article or as the main script in debate contributions.

4. Discussion

The different types of inscription have been inductively identified with respect to what aspect of cloning was problematised in order to present it as a newsworthy event among other events. The patterns in these inscriptions can be termed scripts and they can be seen to reflect different ways of making sense of Seed's claim. Hereby, however, they also demonstrate that scripts imply different readers. By inscribing cloning in different networks the reader is beckoned to evaluate the risk of human cloning in different ways as I will try to outline in the following.

The pattern identified in the inscriptions focused on technical problems can be termed *the script of scientific information*. This script 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 scientists 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 technical details also ought to prevent researchers like Seed from engaging in these kinds of experiments.

The inscriptions focusing on regulatory aspects 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 for granted that it is a viable technology. The important question in the inscriptions focusing on regulatory aspects is therefore a pragmatic question - of finding the best way of regulating biotechnology, 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 fore-

most 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.

The third kind of inscriptions analysed focus on the wider societal aspects of the announcement immediate human cloning. 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 a general rejection of the logic of science and research.

As illustrated earlier, these inscriptions present two different solutions or possible societal responses to the situation occasioned by Seed’s announcement. Since this difference seems to be fundamental, I have chosen to treat these inscriptions as two different scripts and 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 a reader, who holds some measure of power to affect the course of events. Accordingly it 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 seen as 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.

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 articulate Seed and his announcement in different ways constructing problems and solutions differently.

Script	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 regula-

			tion
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 and hereby questions about creating life and designing babies, which is generally articulated as very controversial⁵⁰. Along these lines it has been 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.⁵¹ 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 development 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 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 Mulkey in the analysis of the English debate about embryonic research, a similarity, which is also pinpointed by Einsiedel in relation to the issue of cloning.⁵² 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 Mulkey'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 articulate 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.

Presented in this way the four forms of social response bears some resemblance to the four-fold typology of the culture theory described by Mary Douglas and collaborators.⁵³ According to Douglas four kinds of competing dialogues about risk can be identified in the 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 influence 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."⁵⁴

In this context, the scripts of *scientific education* and *pragmatic regulation* can be equated to the centre positions of hierarchy and market, whereas the scripts of *absolute resistance* and *fatalistic irony* can be compared to the peripheral positions of the critical activist and the isolate. Along these lines it can be argued, that *scientific education* takes place within a hierarchical system of knowledge claims. The problem of cloning can be solved by adhering to the rules laid out in the scientific hierarchy – Richard Seed should follow his peers and the public should believe in the scientifically established knowledge of right and wrong. *Pragmatic regulation* on the other hand, takes place within an exchange system (the market), where different knowledge claims has to be weighed against each other in order to select the most beneficial solution. Actors like Richard Seed, other genetic researchers, politicians and citizens can all be constructed as individuals with their own incentives and interests and the logic of the exchange system is to try to reach a solution, which most individuals can

accept. In contrast to this, *fatalistic irony* and detachment is the obvious social response of isolates, constructed as having no influence on their societal situation. And finally, with clear parallels to the analysis of environmental organisations by Douglas & Wildawsky, *absolute resistance* takes place within a sect of critical activists, where the chosen few have seen the light and therefore are constructed as the opposition to mainstream society.⁵⁵

The comparison with Douglas' cultural forms is interesting because it illustrates how the different inscriptions of cloning and their resulting social responses are linked to notions of society, social order and forms of social organisation. Consequently it is possible to argue, that responses to cloning and biotechnology should be understood in connection with general patterns of opinions or ways of thinking. Controversies about biotechnology are not just disagreements about biotechnology, but should be seen as general ideological conflicts about the preferred order of society. Further analysis of the connection between views on society and responses to biotechnology is outside the scope of this paper. Still, one last point should be made about the comparison with the structurally defined thought styles of Mary Douglas, since it naturally implies questions about the materiality of the four forms of social response. It is necessary to stress, that the scripted forms of response have been located on a discursive level. They are standard formulations of the appropriate social response in the different scripts, but they are not identified as attitudes in human beings. Furthermore this analysis has no intention of claiming any structural necessity in the four-fold schemata. The four forms in this paper have been inductively defined, and other kinds of empirical material on cloning might reveal other than these four forms.

5. Conclusion

As a tool for analysing the dynamics of controversies in a particular social and cultural setting Latour's notion of translation by association has proven useful in the development of a framework for understanding news production as inscription of occurrences in networks of articulation. With the use of this conceptual framework four scripts of scientific education, pragmatic regulation, absolute resistance and fatalistic irony have been identified as patterns in the way Danish media have inscribed the announcement of reproductive cloning. As scripts they interpret the occurrence of Seed's claim into a coherent news story by associating it to other occurrences and actors in particular ways. Hence, these scripts look like a structure, but theoretically it is stressed with the concept of translation that these scripts only exist as such

in retrospect. They organise the news event, but they do not exist outside the actual practice of organising, and they should not be seen as fixed entities determining the work of the news journalists. Rather, they come into existence as productive patterns in the actual news production.

The purpose of the analysis has not been to try to differentiate between these different inscriptions in order to deem some of them more serious and other more sensationalist. Quite on the contrary, it has been the intention to show how different scripts imply different social responses to cloning and that they are all linked to fundamental notions of social order and the role of genetic research in society. Viewed as conflicting inscriptions of biotechnology, the controversies are not just controversies on singular aspects of biotech, but also ideological conflicts about the "right" way of organising society. In this way it is hoped, that the present analysis will inspire future studies of public understanding of science and technology, where neither the public nor technology are perceived as the determining cause of controversy. Rather, the development of both should be understood as a mutual shaping process in a particular social and cultural context, where disagreement is not just about technology, but about the general order of the world.

¹ As examples of inspiration it is appropriate to mention Martin Bauer and George Gaskell, eds., *Biotechnology. The making of a Global Controversy* (Cambridge: Cambridge University Press, 2002), Susanna H. Priest, *A Grain of Truth. The Media, the public, and Biotechnology* (Landham: Rowman & Littlefield Publishers, 2001), Celeste M. Condit, *The meanings of the gene* (Madison, University of Wisconsin Press, 1999), José van Dijck, *Imagination. Popular images of genetics* (London: MacMillan Press Ltd, 1998), Michael Mulkay, *The embryo research debate* (Cambridge: Cambridge University Press, 1997), Theresa Marteau and Martin Richards, eds., *The troubled helix. Social and psychological implications of the new human genetics.* (Cambridge: Cambridge University Press, 1996) and Dorothy Nelkin and M. Susan Lindee, *The DNA Mystique. The Gene as a Cultural Icon.* (New York: W.H. Freeman and Company, 1995).

² Bauer & Gaskell, *Biotechnology* (2002) p. 5.

³ Previous studies of scientific controversies have also used controversies as a condensed or exemplary empirical site for the study of the relation between science and society, see H. Tristram Engelhardt and Arthur L. Caplan, eds., *Scientific Controversies* (Cambridge University Press, 1987).

⁴ For similar arguments see Jane Gregory and Steve Miller, *Science in Public: Communication, Culture and Credibility* (New York, Plenum, 1998), Sharon M. Friedman et al., eds., *Communicating Uncertainty. Media*

Coverage of New and Controversial Science (New Jersey: Lawrence Erlbaum Associates, 1999) and Stuart Allan, *Media, risk and science* (Buckingham: Open University Press, 2002).

⁵ Especially if the selection of media is inclusive so that it covers a variety of public discourse.

⁶ In the comparative study of European countries Gutteling et al. argues that the mass mediated coverage in Denmark is the most negative in Europe. Jan M. Gutteling et al., "Media coverage 1973-1996: trends and dynamics." In *Biotechnology. The Making of a Global Controversy*, ed. Martin Bauer & George Gaskell (Cambridge: Cambridge University Press, 2002).

⁷ Edna Einsiedel et al., "Brave new sheep – the clone named Dolly." In *Biotechnology. The making of a Global Controversy*, ed. Martin Bauer and George Gaskell (Cambridge: Cambridge University Press, 2002), Matthew C. Nisbet and Bruce V. Lewenstein, "Biotechnology and the American Media," *Science Communication*, **23**, no. 4 (2002): 359-391, Susanna H. Priest, "Cloning: a study in news production," *Public Understanding of Science*, **10** (2001): 59-69 and Federico Neresini, "And man descended from the sheep: the public debate on cloning in the Italian press," *Public Understanding of Science*, **9** (2000): 359-382.

⁸ Einsiedel et al. (2002) p. 340.

⁹ Maja Horst, *The Landscape of Mass Mediated Articulations of Biotechnology* (Copenhagen, CBS, MPP working paper 2003-22, 2003). 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: *Ethiske sider af gensplejnings-, ægtransplantations-, fosterundersøgelses- og inseminationsteknikken*, og Indenrigsministeriet, 1984: *Fremskridtets Pris*. Human cloning has been prohibited by law in Denmark since 1987.

¹⁰ Horst (2003).

¹¹ The critique is common from scientists, but also some social scientists seem to share the view, see for instance Dorothy Nelkin, *Selling science - How the press covers science and technology* (New York: W. H. Freeman and Company, 1995). In connection with the mediated coverage of cloning the critique of sensationalism is discussed in Barrie Gunther et al., "The Media and Public Understanding of Biotechnology. A Survey of Scientists and Journalists," *Science Communication*, **20**, no. 4 (1999): 373-394. On a general level Stocking has tried to nuance this critique, see S. Holly Stocking, "How Journalists Deal With Scientific Uncertainty". In *Communicating Uncertainty. Media Coverage of New and Controversial Science*, ed. Sharon M. Friedman et al. (New Jersey: Lawrence Erlbaum Associates, 1999).

¹² For an international overview see Dan Berkowitz, ed., *Social meanings of news*. (Sage Publications, 1997).

¹³ Michael Schudson, "The sociology of news production." In *Social Meanings of news*, ed. Daniel Berkowitz (Sage Publications, 1997)

¹⁴ The following is particularly inspired by the following two books: Bruno Latour, *Science in action* (Massachusetts, Harvard University Press, 1987) and Bruno Latour, *Pandora's hope* (London: Harvard University Press, 1999).

¹⁵ Latour (1987) p. 108 and Latour (1999) p. 178.

¹⁶ Neresini has also argued in favour of seeing news creation as part of the translation process in F. Neresini (2000).

¹⁷ The ambition of the analysis is in this respect very close to that of discourse analysis as outlined by Michel Foucault in *The archaeology of knowledge* (Bristol: Routledge, 1972).

¹⁸ Latour (1999) p. 158-162.

¹⁹ Latour (1999) p. 162.

²⁰ Latour (1999) p. 306.

²¹ As it may be noted, the use of script thus bears some resemblance to the notion of frames in news coverage. As example frames are used as analytical tool in Bauer & Gaskell (2002). The use is also discussed in Matthias Kohring and Jörg Matthes, "The face(t)s of biotech in the nineties: how the German press framed modern biotechnology," *Public Understanding of Science* 11 (2002):143-145. Frames, however, are usually used in deductive ways as a predetermined framework for the analysis of news interpretations. Since the objective of this analysis is to study inscriptions inductively the notion of frames have not been adopted.

²² Headline in the daily paper *Politiken*, 8 January 1998.

²³ Nisbet & Lewenstein, 2002.

²⁴ Two of the newspapers are large national broad sheets, the social-liberal *Politiken* and the conservative-liberal *Jyllandsposten*, whereas the third is an intellectual and critical niche paper (*Information*) and the fourth is a tabloid (*Ekstra Bladet*). As could be expected a comparison shows a great deal of difference in the way the four media have edited their coverage of the story. Generally, the two big national papers, *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 time period (*Information* 8 articles and *Ekstra Bladet* 5 articles). Moreover, *Ekstra Bladet* and *Jyllandsposten* have the majority of letters to the editor and other debate articles (approximately half of the articles are debate contributions) whereas the other two only have half as many.

²⁵ The translation of the Danish term 'udvikling' (progress/development) is tricky throughout the paper 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.

²⁶ "Danes shocked at plans to clone baby," *Politiken*, 8 January 1998.

²⁷ "Europe against cloning," *Jyllandsposten*, 13 January 1998.

²⁸ Studies of scientific controversies have used the terms "closure" and "solution" to signify different ways to end a controversy. Solution denotes an ending, where all parties agree on how controversy should be settled, closure denotes an ending where some kind of force other than "the better argument" is used in order to settle the controversy, e.g. political decisions, see for example Engelhardt and Caplan (1987). 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.

²⁹ "Baby cloning is unlikely," *Politiken*, 18 January 1998.

³⁰ "The Lab is swarming with sheep," *Politiken*, 18 January 1998.

³¹ "New and better medicine," *Politiken*, 18 January 1998.

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- ³² "Danish doctors refuse cloning," *Jyllandsposten*, 12 January 1998.
- ³³ "Copy Humans," Editorial in *Jyllandsposten*, 11 January 1998.
- ³⁴ "Debate on Cloning brings great emotions to boil," *Jyllandsposten*, 12 January 1998.
- ³⁵ "The Dream of Cloning Humans," *Jyllandsposten*, 9 January 1998.
- ³⁶ "WHO: Cloning of humans is reprehensible," *Jyllandsposten*, 9 January 1998.
- ³⁷ "Clinton wants to ban cloning," *Politiken*, 2 February 1998.
- ³⁸ "The British leave the possibility of cloning open," *Jyllandsposten*, 12 January 1998.
- ³⁹ "Debate on Cloning brings great emotions to boil," *Jyllandsposten*, 12 January 1998.
- ⁴⁰ "Danish doctors reject cloning," *Jyllandsposten*, 12 January 1998.
- ⁴¹ "WHO: Cloning of humans is reprehensible," *Jyllandsposten*, 9 January 1998.
- ⁴² "Homunculus" Editorial in *Politiken*, 11 January 1998.
- ⁴³ "The sheep, the man and the bishop," Editorial in *Ekstra Bladet*, 9 January 1998.
- ⁴⁴ "Man of Seed," Editorial in *Information*, 9 January 1998.
- ⁴⁵ "Man of Seed," Editorial in *Information*, 9 January 1998.
- ⁴⁶ "Man in the machine," *Politiken*, 18 January 1998.
- ⁴⁷ "Europe against cloning," *Jyllandsposten*, 13 January 1998.
- ⁴⁸ "Frankensteins heir," *Ekstra Bladet*, 9 January 1998.
- ⁴⁹ "The sheep, man, and the bishop," Editorial in *Ekstra Bladet*, 9 January 1998.
- ⁵⁰ Jon Turney, *Frankenstein's Footsteps* (New Haven: Yale University Press, 1998).
- ⁵¹ Patrick D. Hopkins, "How popular Media Represent Cloning as an Ethical Problem" *Hastings Center Report*, **28** (1998): 6-14 and Susanna H. Priest, "Cloning: a study in news production" *Public Understanding of Science* **10** (2001): 59-69. Priest, however, also emphasize, that this issue proved to be titillating, yet harmless to industry and other influential actors. She argues that this is an explanation for its massive coverage since media tends to follow "paths of least resistance".
- ⁵² Michael Mulkay, "Rhetorics of hope and fear in the great embryo debate" *Social studies of science* **23** (1993): 721-742 and Edna F. Einsiedel, "Brave new sheep - the clone named Dolly". In *Biotechnology. The Making of a Global Controversy*, ed. Martin Bauer & George Gaskell (Cambridge: Cambridge University Press, 2002)
- ⁵³ See Mary Douglas and Aaron Wildavsky, *Risk and culture* (Berkeley, University of California Press, 1983), Michael Thompson, Richard J. Ellis, and Aaron Wildavsky, *Cultural Theory* (Westview Press, Boulder, 1990), Mary Douglas, *Risk and Blame. Essays in cultural theory* (London, Routledge, 1992), Mary Douglas, *Thought Styles*. (London, SAGE, 1996) and Mary Douglas "The depoliticization of risk." In *Culture Matters*, ed. Richard J. Ellis and Michael Thompson, 121-132 (Boulder, Westview Press, 1997).
- ⁵⁴ Douglas (1997) p. 129.
- ⁵⁵ Douglas & Wildavsky (1983).