

Genetic Borderlines: Cultivating German Reproduction

Bettina Bock von Wülfigen

Abstract

The new genetics open and involve international markets for technologies and products as diverse as genetic markers, specific proteins, gene test kits, sperm and egg cell banking, IVF, microsorting, PIGD, gene therapy or cloning. Central to the economic utility of these techniques is the access to human genetic material. This paper reports on results of an analysis of international discourses in German print media that advocate laboratory conception as a general standard and substitute for the conception 'at home'. In these discourses various local discourses of concern are addressed in the introduction of reproductive genetic techniques. The article focuses on expansion as a research category. It discusses specific discursive techniques in the capitalization of genetic data noticeable in the confrontation of these seemingly 'universal' arguments with the local barriers.

Debates about ethics and the policy of new genetic and reproductive technologies in STS are usually framed in terms of population policy and in terms of rather restrictive governmentality. Instead, this article claims that this approach overlooks the capitalization of genetic data as intrinsically linked to the new genetic 'reproductive system', bringing with it a growing interest for 'diversity' and 'abnormality'. Within the past years some scholars in science studies (mainly those working with research material from Anglo-Saxon countries) claim that genetics when applied to the human (e.g. in genetic testing in the post genomics) has to be discussed in less control-oriented understandings than is the case with the common understandings of 'eugenics'. This applies to the linking of genetics with reproduction as well. Clarke (1998) discussed the change from the idea of control in reproduction to the reshaping of physical processes in laboratories as 'new' in new reproductive technologies. She characterised it as a search for biochemical and economic niches. Rabinow and Rose (2006)

58 Bettina Bock von Wülffingen

decidedly call this type of biopolitics 'capitalism and liberalism' (ibid., 211) instead of control-oriented eugenics. Applying results from my thesis 'geneticization of conception—the notion of health and illness in biomedical discourses on technological procedures of conception', this article discusses how in the years 1995–2003 this turn from control to marketing of hope and chances or even from 'chance to choice' (Buchanan et al. 2000) in reproduction is introduced to the German public. The text focuses on the issue of expansion as part of the process of geneticization in its metaphorical and its geographic sense: My usage of the term geneticization is derived from 'molecularization' which refers to a certain epistemic as well as economic concept and implies the redundancy of thinking within supra-molecular or organismic limitations. But I also draw critically on 'medicalization', which for some scholars was the root for the term 'geneticization' and on the notion of expertise, linking both to the Foucauldian concept of subjectivation. This study follows the hypothesis that the expansion of market space explicitly deals with specific cultural hindrances. Strategies such as the 'silencing' of local stories and the use of 'globalizers' such as 'identity' and 'intimate love' are essential elements of the expansion of the geneticization of conception.

Local restrictions

Within the international markets, national boundaries and laws still constrain seemingly global research. Germany is considered as relatively restrictive concerning reproductive technologies and genetics. At the beginning of the third millennium pressure was high in German politics to develop a new legal framework in order to fundamentally change the possibilities for human biotechnology in the country. The Human Genome Project involved ambitious German scientists. Reproductive physicians pleaded for the legalization of pre-implantation genetic diagnosis and stem cell researchers aimed to work with embryonic material.

The results of the ambitious public debates, however, were quite unexpected. The Embryo Protection Act, passed in 1990, was reconfirmed. A long discussion process within the German parliament, the *Bundestag*,

produced a rising awareness with regard to the notion of cloning. This resulted in the postulation that since 'therapeutic' and 'reproductive cloning' were technologically and biologically indistinguishable from one another, the law should not treat them differently. Only the importation of stem cells was legalised. All other restrictions remain as stringent as ever, however, impeding egg donation and all handling of fertilised egg cells apart from their 're-implantation'.

The political process prior to these decisions had been accompanied by extensive media coverage in which experts were invited to explain their future visions of the usage of new genetic and reproductive technologies, offering rich material for my study.

Analysis of struggles for discursive space

This article explores these expert discourses in the German print media at the specific historic moment when a biopolitical change in Germany seemed to be possible at least to some German journalists. The selected period of time (1995–2003) followed the indication by Graumann (2002) that the ethics debate on human biotechnology in reproduction, especially on cloning, started in Germany around 1997 with the birth of the sheep Dolly.

This Foucauldian discourse analysis (Foucault 1972) was first triggered by the finding that a new discourse appeared in the German media. Experts from reproductive sciences and genetics publicly embraced homosexuals and singles for laboratory reproduction. Since this happened for the first time in Germany at the end of the 1990s, one major research question was how experts hit on this new idea, which had seemed unthinkable beforehand due to evolutionist concepts of reproductive health. I analysed the largest-selling national magazines and high-quality newspapers (which were also read by politicians and media professionals themselves): *Frankfurter Rundschau*, *Frankfurter Allgemeine Zeitung*, *Stern*, *Die Zeit* as well as *Süddeutsche Zeitung*, *Focus*, and *Der Spiegel* (Informationsgemeinschaft zur Verbreitung von Werbeträgern, 2000). Additionally, I included the best-selling national popular science magazines *Geo* and *Spektrum der Wissenschaften* as well as some singular findings in the feminist journal *EMMA*

60 Bettina Bock von Wülfigen

or the philosophy journal *Ethica*. The study involved a macroanalysis of about 1000 media articles from 1995–2003, which included all articles matching keywords such as cloning, laboratory reproduction, in-vitro fertilization and pre-implantation genetic diagnosis. This first overview study mainly contained reports on stem cell policies and cloning debates and often took on a critical stance. From these, the articles arguing *in favour* of a relaxation of the German regulation of new reproductive and genetic technologies were selected (interviews and guest essays of more than 500 words). Thus finally some dozens of articles were subjected to a microanalysis, which involved figuring out networks of discursive lines, applying an ‘archaeology’ of discursive objects and their positioning towards one another, de-contextualizing them in the microanalysis and re-contextualizing them using additional material from the macroanalysis. The study also included governmental reports, reports by different national and regional ethics bodies, popular scientific books authored by researchers the media had coded as experts. Additionally the microanalysis included a metaphor analysis following the broad notion of metaphor by Harald Weinrich (1980). This allowed for a synchronical and diachronical analysis of overlaps in the pictorial frames (findings from the metaphor analysis will be published elsewhere).

A first overview of the material found that not only same-sex couples were the focus of attention. Rather, a discursive stream emerged according to which everybody should draw on laboratory expertise for conceiving, thus disconnecting in-vitro conception as ‘treatment’ from any diagnosis of ‘infertility’. Thus the analysis aimed at finding which discursive objects and streams were newly combined in order to open up an imaginative space that enabled this idea of general laboratory conception. Departing from the broader question of the dissertation study in public health, which focused on the notion of health and illness, this article explores how these ideas were explained in the specific German context. It focuses explicitly on those contributions which promote new genetic and reproductive technologies. It turned out that all the articles taking this special position towards combined genetic and reproductive technologies were marked as expert statements by the newspaper and magazine editors. This appears to be plausible in the German context since both domestic journalists in prestigious papers and

the German scientists themselves were obviously bound by their local professional ethics. Guests marked as foreign experts, however, appeared to be authorised to break with these local rules.

This article therefore assesses experts' discourses in the light of the friction between restriction and expansion. The latter refers to the expansion of markets, to the expansion of access to human biological material and to the crucial extension of experts' competence as a tool to broaden access to biological material and markets. 'Medicalization' is a widely used concept in Gender in Public Health, Feminist Science Studies and Social Studies of Reproductive Medicine to get a grip on the broadening of medical influence on the human biological process. We could thus believe 'medicalization' to be a suitable framework for the understanding of the expansion discussed in this article. However, after critical social and historical studies introduced the term with regard to the installation of academic medicine from the 1970s on (see e.g. Goubert 1982) in competition with the traditional health sector, such as midwifery for instance, it is often understood as victimising addressees of the medical system and viewing medical personnel as taking control over patients' bodies (e.g. Illich 1990). Experts are thus seen as thereby extending their competence, field of influence and field of work (Ettorre 1999; compare Canguilhem 1978). Generally, the analysis of medicalization provides an understanding of how feeling healthy and being of good health started to diverge and experts' definition of a person's health became substantial instead of the judgement by people themselves. Gender in Public Health Studies successfully used this concept to describe the ever growing clinical treatment of human life spans or abilities such as puberty, fertility or infertility, pregnancy, birth or menopause (Kolip 2000a).

This article will make use of the concept of medicalization while critically integrating it into a Foucauldian take on medical or genetic 'subjectivation' (Foucault 2004). This is to acknowledge advantages of the medicalizing processes for the addressee of the medical system within a medicalized world: experts and patients are thereby entangled in the same power field together with the state and other actors. All of these might have different interests in medicalization or in being medicalized, which e.g. might give people a certain identity with which they had become able to address the state when fighting for their rights.

In his analysis of *professional* boundaries and of the function they assume in the introduction of technology, Gieryn (1999) stresses that it was not so much scientists' objective methods which created their credibility but the way their ideas and results left the laboratory and became part of public knowledge and the legitimation of cultural practices. Within this framework, the differentiation between laypersons and experts equipped with special knowledge, who vow to conduct their scientific work according to the rules of their respective disciplines (Kuhn 1962), is one of the productive foundations of modern science and medicine.¹ As specialists, the experts are in a governmental sense (Foucault 1991) 'educators, surveillors and story tellers, whose role is to reinforce and legitimate a genetic order, required for the common good' (Ettorre 1999, 555). In the health systems of risk societies they exert the task of translating risk knowledge into reproductive choices for families and society (Ettorre 1999, 555; Samerski 2002). While dealing with clients, experts accomplish the quest for normality and rituals (Kolip 2000b).

Lippman is said to have coined the term 'geneticization' as an offshoot of the medicocritical notion of medicalization (for an overview of this connection see Hedgecoe 1998). Given the governmental take on medicalization as described above, my understanding of the geneticization of conception differs from this concept, despite the fact that it might profit from medicalized societies. She calls geneticization 'the tendency to distinguish people one from another on the basis of genetics; to define most disorders, behaviours, and physiological variations as wholly or in part genetic in origin' (Lippman 1998, 64). Although this might apply to the first and second issue of expansion discussed in the next section, I applied the term geneticization in a relatively epistemic sense. When I first used the term I derived it from 'molecularization' as used i.a. by Gilbert (1996). He referred to the transition from a cellular biologist towards a molecular biologist take within life sciences, meaning the techniques, research questions addressed, perceptions and representations as well as the economic system behind this research, which equally concentrates on the molecule. According to my further study (e.g. Bock v. Wülfigen 2005), molecularization led to the productive neglect of individual lives and thus to the ability to 'see' and describe never ending

molecular 'life cycles' and to the conceptual transgression of cellular or organismic boundaries from the 1970s on. Since according to this idea, geneticization is conceptually disinterested in the non-biochemical supra-molecular or at least in the supraindividual, it is much more flexible than any geneticization derived from medicalization would suggest. It is my assertion that this *epistemic* and economic stance, which is interested in the diversification of molecules and not in any restricting concept of how 'healthy' molecular constellations should look like, allows for the rather liberal consumerist, thus less control-oriented approach discernible in the quotes discussed in the next section.

In the following, I will discuss the analysed texts as part of an introduction of technology into a (due to the restrictive legal situation) new (or hitherto hostile) market. I will elaborate on three key ideas for market expansion in these texts which are, first, the broadening of the consumer profile with regard to the parents of the projected child (i.e. the future parents' access to reproductive and genetic technologies), and second, the broadening of the qualities of the future child to be addressed by genetic and reproductive technologies. The expansion of the borders of the market is the third topic. These different types of expansion are linked with one another through the issue of access to the cellular and genetic material. Metaphorical and literal space thus unfolds as an increase in biomaterial and genetic information to access and work with.

Opening access for more 'users'

Many of these experts' texts promote new genetic and reproductive technologies and consider the conventional conception at home outdated. They favour conception in the laboratory for everybody: 'Young men and women can build reproductive banks of sperm and egg cells. When they want to have a child they can withdraw what they need from their account. From the very moment that they own such an account they can undergo sterilization. Sex would only take place for lust and love, while the reproduction was transferred to the microscope' (Djerassi 1998, 184). Other texts promote reproductive genetic technologies for singles,

64 Bettina Bock von Wülfigen

'late mothers' and same-sex couples. Some also refer to cloning as a reproductive technique: 'Through cloning both of the women can each deliver a clone of her partner' (Green 1999, 64).

This is no longer about individuals who suffer from organic infertility. Instead sterilization, banking of biomaterial, IVF and ICSI, as well as cloning are discursively combined; pre-implantation genetic diagnosis would be standard. Sterility thereby is normalized and 'random fertility' pathologized, calling the 'conception at home' (or do-it-yourself conception, my term) 'genetic roulette' which is 'unfair' (Silver 2000, 147), or an unreasonable 'stochastic conception', just as 'throwing the dice' (Reich 2000, 206).

This is what I would call the expansion—or extension—of the user profile, which goes hand in hand with emancipatory struggles led by advocacy groups alongside pregiven medicalized concepts. In May 2006, for example, the Danish Parliament decided that public clinics should be obliged to offer in-vitro fertilization even to singles, with the full costs to be covered by health insurance. The expansion of the user profile additionally extends to the qualities of the child in three steps from healing to prevention to wellbeing and finally to the free choice of genes. While previously infertility treatment was considered only if one or both parents had a 'genetic illness', now prevention is promoted. It is suggested, for example, that genetic conditions against malaria (Reich 1999), cancer or HIV (Silver 2000, 146) should be added. From about 1998 to 2000, there was a second shift from prevention to the 'wellbeing' of the child in terms similar to the notion of wellbeing as defined by the WHO. However, wellbeing from now on means that their *genetic conditions* would promote their 'happiness and success' (Silver 2000, 147), and thereby their 'life chances' (Silver 1998, 144). The next step around 2000 was the free choice of genes, since 'people should be free to choose which features they wish to have for their children' (Baker 1999, 163). And of course these features should correspond to the identity of the parents, who might for instance want to choose to have either a boy or a girl, which 'is the private matter of the parents where the state should not intervene' (Comhaire 2002, 124). The call for a free choice of genes echoes the wish of parents to match the racialized features of their surrogate child with the parental environment (Beckera et al. 2005). In the analysed macro-discourse,

the publicly discussed search by an American deaf lesbian couple for a donor who would provide a 50 percent chance of generating an equally deaf second child, was commented upon by someone referred to as 'human geneticist (...) of the University of Halle' and thus designated as an expert with regard to the application of new reproductive and genetic technologies: 'The most important issue is that children receive love, a sense of security and support. (...) After all, everyone is selective regarding the partner with whom they want to create children' (Berndt 2002).

This meets the analysis by Carlos Novas and Nick Rose of the 'somatic individual' (2000): they describe the change in genetic counselling over the course of the past 30 years. Instead of only addressing 'genetic risk' as a threat to the health of the individual, genetic counselling became concerned with promoting the 'life chances' and 'quality of life' of the respective individual. While recent studies (Kerr 2003; Samerski 2002) do not confirm this and still find responsibility to be the major rationale in the governmentality of these technologies, the texts analysed here approve Novas' and Rose's analysis as applicable to *reproductive* counselling and to the care for the child-to-be as well. Moreover, these analysed texts not only refer to the enhancement of happiness and wellbeing of the child but also address the identity and creativity of the prospective parents as an issue of genetic intervention. The 'genetic self' thereby extends into the next generation.

Expanding market space

The third issue of expansion is the spatial expansion in its literal sense, the expansion of the market, which is in this case the German regulatory space. The broadening of technological influence is thereby explained as a motor intrinsic to technology itself, which unfolds as an unstoppable warrior, disrespecting national and human borders: 'progress runs us over at all fronts' (Stock 1998) and 'the powerful technologies take aim at us' (Stock 2000, 190). They also seem to enforce some kind of colonial war that demands sacrifices from us but also promises ideational and material profits: Several quotes see some states or institutes 'at the forefront of

medical research' (Green 2002, 24), since the development of new reproductive and genetic technologies is tantamount to the 'conquest of outer space' (Stock 1998); additionally 'the exploitation of the human genome promises several thousand new points of intervention for the development of medication' (Rosenthal 2001, 85). This, taken together with the strategy to broaden the user profile, exemplifies Adele Clarke's (1998) differentiation between control-oriented reproductive technologism versus flexible, diversifying and modifying reproductive genetics creating new niches.

Since they are also interested in national barriers, the analysed texts address issues they obviously see as specific to the German context. The authors explicitly deal with what Lassen and Jamison (2006) call 'discourses of concern' such as eugenics, cloning and equity in access. For example, my finding, analogous to Hauskeller's (2005), is that the differentiation between stem cell and reproductive cloning made in these texts is very specific to Germany. Unlike some other countries with different levels of regulation, the German Human Embryo Protection Act prohibits any treatment of the embryo from conception onward. It thus seems plausible to work toward some differentiation and niches in the regulation of this market.

Other scholars (Kerr 2003; Kirejczyk 1999; O'Mahony & Schäfer 2005) investigated major topics in stem cell and reproductive technology debates in other countries and yet nowhere was eugenics as prominent as in German media texts. My analysis of the experts' dealing with Germany reflects this. The authors offer various biological definitions of eugenics, explaining why the future visions do not fit the respective criteria of eugenics. Another way to deal with the historical experience of eugenics is to simply discard it. In these texts we often find the metaphor of the 'ghost of eugenics' (e.g. Stock 2000, 192), a kind of irrational fantasy which 'darkens bright prospects' (Green 1999, 65).

Historical analyses and especially the analysis of the role of the book in 'the invention of nations' by Anderson (1991) describe the expansion of techniques and ideas and the growing concern for identity, i.e. in that case 'national identity', as intrinsically bound together in the project of early modernity. Just as the analysed texts do with the genome, Anderson assigns emancipatory as well as imperialist qualities to the book, describing

its egalitarian but also universalizing role in the building of the nation-state and in the economic expansion into the new world, the colonies. Crucial to this process—he argues—was the silencing of local languages and traditions, which are reminders of former rules of governance as well as the memories of resistance or related experiences of conflict.

Some authors even suggest that the public health and welfare system that Germany was well known for should give everyone access to genetic technologies in reproduction (Silver 2000, 147). Through all these shifts, the texts move from ideologically difficult concepts such as illness as a societal burden, risk and responsibility to positive notions such as identity, quality of life and even love. Quote: ‘Laboratory babies are always wanted and loved babies. They are better loved than those conceived naturally’ (Djerassi 2002, 77). Thus love was made the link between the different discursive streams and a major argument in favour of a change of the restrictive German legislation at the turn of the millennium. This is connected to the fact that these texts often addressed emancipatory issues such as the wish of women to have both a reproductive and a working life. They offer the possibility that women first pursue their career and then become ‘late mothers’ above the age of 40 or 50 (Djerassi 1998; 1999). Others relate to homosexual emancipation, since the only problem that women who love women have is ‘that they can’t conceive a child with their beloved partner’ (Dahl 1999, 312; similarly i.a. Djerassi 1999; Green 1999; Hamer 2002).

Space for love and identities

Thus the analysed discursive streams no longer relate the desire for reproduction to the category of health as derived from a universal human nature, but to a different object that is independent of physical functions: love. Where hitherto healing-orientated reproductive technology was legitimated by such categories as risk and responsibility, love now justifies all deviations from the conventional concept of health and disease grounded in physiology and evolution. The new architecture of the objects love, responsibility and entitlement is constructed in a way

that it inevitably results in the application of new reproductive and genetic technologies (see above the discursive stream on the beloved child). The category of love desexualises the partner constellation of the couple and provides imaginary space (see Foucault 1972) since 'every couple has the right to decide when and how they want to have a child' (Katzorke 2003, 149), and thus care has to be taken that legal restrictions of relevant technologies do not 'curtail the right to biological offspring' (Silver 1998, 142). In this way, the categories love, equal rights (to access to new reproductive and genetic technologies) and identity are interwoven, integrating those bodies and identities into the discourse that were previously excluded by a physiological and evolutionary understanding of 'healthy reproduction'. In contrast to the conventional concept of a genetically determined desire for having a child, which could only be imagined as an expression of physiologically and evolutionary healthy (thus also heterosexual) bodies, the parental bodies now become irrelevant. The emphasis instead lies on the genetic condition of the projected child, which, however, does not need to conform to 'universal' ideas of health. It can be created according to diverse parental demands and match their identity, even if those contradict such former values for natural human health.² As Novas and Rose (2000) put it, new reproductive technologies 'split apart categories that were previously coterminous—birth mother, psychological mother, familial father, sperm donor, egg donor and so forth—thus transforming the relation that used to play such a fundamental role in (...) identity formation'. The analysed texts reveal a specific transformation that lies in a change of the former biological bond in relations between individuals from 'blood relations' to mere 'genetic relations' with love as the reason for this transformation (or rather of the geneticization of 'blood relations') and as the new glue in the niche-seeking flexible reprogenetic discourse. This platonic bond, love, however needs to be materialised in the form of geneticized identities in the genetic bond, which replaces the 'blood relations' without which reproductive technologies might not be required at all.

Anderson's (1991) concept of the universalist—dominatory as well as emancipatory—qualities of literacy, language and the book links imaginative spaces (opened up in the analysed articles by the 'globalizers' love

and identity) with space in its geographic sense. He uses the example of the book and its standardising and universalizing effects which promoted the extension of markets in early modern times. He claims that language differences and orally transmitted local memories (of local heroes, resistance or victims) had to be levelled before larger nations could be built. His analysis is surprisingly similar to Foucault's description of the sovereign power (in 'Society must be defended', 2004). He describes it via the example of British history, where one reign followed the next on the same terrain, always rendering ancestors' stories of the conquered society inadequate, substituting the defeated language by the language of the conqueror, and the old monetary system by coins bearing the portrait of the new king. Sovereign politics is thereby based on open conflict in contrast to the post-enlightenment state of self governance and identification with national biopolitics. In this light, the expansion of geneticized conception shows frictions at its borders with local stories as notorious barriers. These frictions can also be understood as a clash between the use of 'sovereign' universal expansionist strategies in a world of 'glocalized' biopolitics.

Conclusions

In its description of historical processes as well as of current re-conceptualizations of bodily phenomena, medicalization draws on the social individual and on the idea of healing as derived from physiology. Physiology knows evolutionary goals of the human species and defines physical normalities according to these. Respective deviations need to be corrected. Ideas of geneticization derived from this understanding will reveal difficulties in describing the departure from the focus on the biologically 'normal' towards a diversification of desired 'genetic' traits. A tendency to explain the physics of human beings and their behaviour in genetically determinist ways may well be a necessary basis for the expansionist offer to geneticize conception—but this determinist genetic explanation of the human was already possible in the age of the chromosome. The molecularization of genetics in contrast—here again called geneticization—explains the lack of interest in the normal. It provides an understanding of the possibility to

discursively expand the user profile beyond normative issues of health and illness. Even more so, it addresses the user groups that are most diverse and distinguished locally or in terms of identity.

Neither the description of the geneticization by social science scholars nor reproductive genetic presentations in public papers, however, seem to be aware of this fundamental change. The discursive and geographic expansion in an anachronistic universalistic stance described here seems to overlook the validity of 'local' concerns. This resembles the mismatch between the humanistic goals addressed by some protagonists in the Human Genome Diversity Project in the 1990s with the actual ignorance in dealing with the scepticism which is based on diverse historically specific experience (Reardon 2004). Before it even started, this project, which aimed at a genetic database of 'isolated indigenous populations' was accused of inventing a new form of colonialism. The term of the colony in this critique referred to the historical power relations between colonial states with their overseas colonies and its individuals, where profitable goods were exploited.

It would be inaccurate to transfer this power relation, which sharply distinguishes between different nations and respective human bodies, from the enlightenment to today's geneticization. The roots of the latter lie rather in governmental and molecularizing processes: an interest in the individual might only exist in Dawkin's sense (1982) of the individual as simply the transporting shell of the DNA. However, colony once meant something else too: a futile piece of land, too dry or too wet to be cropped, like the north European moors, which was transformed into fertile soil. This metaphor of a colony, which refers to the genetic string as soil itself, does not contain the idea of national boundaries and sovereign interest. In the case of reproductive genetics, neither the individual nor special populations seem to be addressed. Rather it is those molecules which we do not know yet and which could be walked around by the boy next door. The trek to the Wild West, greening the desert or stepping on the Moon are projects the analysed texts dwell upon literally and with verve as precursors of the current endeavour of reclaiming the DNA, of rendering profitable a hitherto unprofitable molecular structure.

Notes

- ¹ Certainly laypersons can be seen as experts, too (Calnan 1987; Davison et al. 1991). However, the focus in this article lies on the expert role in the sense of the scientific expert within society.
- ² For an overview see also the diagrams of the previous and the present concept of the desire to have a child in Bock v. Wülfigen (2007).

References

- Anderson, Benedict (1991), *Imagined Communities: Reflections on the Origin and Spread of Nationalism*, London: Verso.
- Baker, Robin (1999), 'Der Mensch wird seine Reproduktion bald voll steuern', *Focus* 22: 163.
- Beckera, Gay, Anneliese Butler, and Robert D. Nachtigall (2005), 'Resemblance talk: A challenge for parents whose children were conceived with donor gametes in the US', *Social Science & Medicine* 61: 1300–1309.
- Berndt, Christina (2002), 'Der Wunsch nach dem fehlenden Sinn', *Süddeutsche Zeitung* 93.
- Bock v. Wülfigen, Bettina (2005): 'Fruchtbares Virus, infizierendes Spermium. Wie das Molekül das Selbst verlässt', in Engel, Gisela and Nicole C. Karafyllis (Eds.), *Reproduktionen*, Berlin: trafo, 115–129.
- Bock v. Wülfigen, Bettina (2007), *Genetisierung der Zeugung. Eine Diskurs- und Metaphernanalyse reproduktionsgenetischer Zukünfte*, Bielefeld: transcript.
- Buchanan, Allen, Dan W. Brock, Norman Daniels, and Daniel Wikler (2000), *From Chance to Choice: Genetics and Justice*, Cambridge: Cambridge University Press.
- Calnan, Michael (1987), *Health and Illness: The Lay Perspective*, London: Tavistock.
- Canguilhem, Georges (1978), *On the Normal and the Pathological*, Dordrecht: Reidal.
- Clarke, Adele (1998), *Disciplining Reproduction. Modernity, American Life Sciences, and 'the Problems of Sex'*, Berkeley: University of California Press.
- Comhaire, Frank (2002), "'Ich verstehe, wenn man ein Ungleichgewicht korrigieren will". Ein Arzt in Belgien lässt Paare das Geschlecht ihres Kindes wählen', *Focus* 38: 124 (Interview mit Frank Comhaire).
- Dahl, Edgar (1999), 'Sollten lesbische Paare Zugang zur künstlichen Befruchtung haben?', *Ethica* 7: 307–313.
- Davison, Charly, George Davey Smith, and Steven Frankel (1991), 'Lay epidemiology and the prevention paradox: The implications of coronary candidacy for health education', *Sociology of Health and Illness* 13: 1–19.

72 Bettina Bock von Wülfigen

- Dawkins, Richard (1982), *The Extended Genotype*, Oxford: Oxford University Press.
- Djerassi, Carl (1998), in Neffe, Jürgen, 'Ich will meine Gefühle pur', *Spiegel* 24: 182–184.
- Djerassi, Carl (1999), 'Der entmachtete Mann', *Die Zeit* 27.
- Djerassi, Carl (2002), in Blech, Jörg, and Gerald Traufetter, 'Laborbabys werden mehr geliebt', *Spiegel* 4: 76–77.
- Ettorre, Elisabeth (1999), 'Experts as "storytellers" in reproductive genetics: Exploring key issues', *Sociology of Health and Illness* 21 (5): 539–559.
- Foucault, Michel (1972), *The Archaeology of Knowledge and the Discourse on Language*, New York: Pantheon.
- Foucault, Michel (1991), 'Governmentality', in Burchell, Graham, Colin Gordon, and Peter Miller (Eds.), *The Foucault Effect: Studies in Governmentality*, Hemel Hempstead: Harvester Wheatsheaf, 87–104.
- Foucault, Michel (2004), *Society Must be Defended: Lectures at the College De France, 1975–1976*, London: Penguin.
- Gieryn, Thomas F. (1999), *Cultural Boundaries of Science: Credibility on the Line*, Chicago: University of Chicago Press.
- Gilbert, F. Scott (1996), 'Enzymatic adaptation and the entrance of molecular biology into embryology', in Sarker, Sahotra (Ed.), *The Philosophy and History of Molecular Biology*, Dordrecht: Kluwer.
- Goubert, Jean Pierre (Ed.) (1982), *La médicalisation de la société française, 1770–1830*, Waterloo, Ontario: Historical Reflections Press.
- Graumann, Siegrid (2002), 'Die Rolle der Medien in der Debatte um die Biomedizin', in Schicktanz, Silke, Christof Tannert, and Peter M. Wiedemann (Eds.), *Kulturelle Aspekte der Biomedizin. Bioethik, Religionen und Alltagsperspektive*, Frankfurt am Main: Campus, 212–243.
- Green, Ronald M. (1999), 'Mein Kind ist mein Zwilling', *Spektrum Spezial* 4: 62–65.
- Green, Ronald M. (2002), 'Die Ethik des Klonens', *Spektrum der Wissenschaft* 1: 17–24.
- Hamer, Dean (2002), 'Das Wunschkind aus dem Genbaukasten', *Spektrum der Wissenschaft*, Dossier: Gene, Klone, Fortpflanzung 4: 24–29.
- Hauskeller, Christine (2005), 'The Language of stem cell science', in Bender, Wolfgang, Christine Hauskeller, and Alexandra Manzei (Eds.), *Crossing Borders. Grenzüberschreitungen. Ethische, politische und religiöse Kontexte der Stammzellforschung*, Münster: Agenda, 39–60.
- Hedgcoe, Adam M. (1998), 'Geneticization, medicalization and polemics', *Medicine, Healthcare and Philosophy* 1 (3): 235–243.

- Illich, Ivan (1990), *Limits to Medicine. Medical Nemesis: The Exploration of Health*, London: Penguin.
- Informationsgemeinschaft zur Verbreitung von Werbeträgern (2000), *IVW Praxis*, Bonn: IVW.
- Jonson, Albert R. (1996), 'The impact of mapping the human genome on the patient-physician relationship', in Murray, Thomas H., Mark A. Rothstein, and Robert F. Murray (Eds.), *The Human Genome Project and the Future of Health Care*, Bloomington: Indiana University Press, 7–11.
- Katzorke, Thomas (2003), in Paetsch, Martin, 'Brauchen wir neue Gesetze für die Fortpflanzungs-Medizin?', *Geo* 8: 149.
- Kerr, Anne (2003), 'Rights and responsibilities in the new genetics era', *Critical Social Policy* 23 (2): 208–226.
- Kirejczyk, Marta (1999), 'Parliamentary cultures and human embryos: The Dutch and British debates compared', *Social Studies of Science* 29 (6): 889–912.
- Kolip, Petra (Ed.) (2000a), *Weiblichkeit ist keine Krankheit. Die Medikalisierung körperlicher Umbruchphasen im Leben von Frauen*, Weinheim / München: Juventa.
- Kolip, Petra (2000b), 'Frauenleben in Ärztehand. Die Medikalisierung weiblicher Umbruchphasen', in Kolip, Petra (Ed.), *Weiblichkeit ist keine Krankheit. Die Medikalisierung körperlicher Umbruchphasen im Leben von Frauen*, Weinheim / München: Juventa, 9–30.
- Kuhn, Thomas S. (1962 / 1973), *The Structure of Scientific Revolutions*, Chicago: University of Chicago Press.
- Lassen, Jesper, and Andrew Jamison (2006), 'Genetic technologies meet the public. The discourses of concern', *Science, Technology, & Human Values* 31 (1): 8–28.
- Lippman, Abby (1991), 'Prenatal genetic testing and screening: Constructing needs and reinforcing inequalities', *American Journal of Law and Medicine* 17 (1/2): 15–50.
- Lippman, Abby (1998), 'The politics of health: Geneticization versus health promotion', in Sherwin, Susan and the Feminist Health Care Ethics Research Network (Eds.), *The Politics of Women's Health: Exploring Agency and Autonomy*, Philadelphia: Temple University Press, 64–303.
- Novas, Carlos, and Nicolas Rose (2000), 'Genetic risk and the birth of the somatic individual', *Economy and Society* 29 (4): 485–513.
- O'Mahony, Patrick, and Mike Steffen Schäfer (2005), 'The "book of life" in the press: Comparing German and Irish media discourse on human genome research', *Social Studies of Science* 35 (1): 99–30.
- Rabinow, Paul, and Nicolas Rose (2006), 'Biopower today', *BioSocieties* 1 (2): 195–217.

74 Bettina Bock von Wülfigen

Reardon, Jenny (2004), *Race to the Finish: Identity and Governance in an Age of Genomics*, Princeton: Princeton University Press.

Reich, Jens (1999), 'Gentherapie gegen individuelles Leid', *Süddeutsche Zeitung* 212, V2 (7).

Reich, Jens (2000), 'Erotik in der Cyberwelt', *Spiegel* 48: 204–206.

Rosenthal, André (2001), 'Molekulare Medizin—Möglichkeiten und Grenzen', *Spektrum der Wissenschaft* 9: 84–93.

Samerski, Silja (2002), *Die verrechnete Hoffnung. Von der selbstbestimmten Entscheidung durch genetische Beratung*, Münster: Westfälisches Dampfboot.

Silver, Lee (1998), in Petermann, Jürgen, and Paul Rainer, 'Gefährlicher als die Bombe', *Spiegel* 29: 142–145.

Silver, Lee (2000), 'Eingriff in die Keimbahn', *Spiegel* 1: 146–147.

Stock, Gregory (1998), 'Klon der Angst. Der Segen der Gen-Technik', *Süddeutsche Zeitung*, 11.04.1998.

Stock, Gregory (2000), 'Der Geist aus der Flasche', *Spiegel* 15: 190–192.

Weinrich, Harald (1980), Artikel 'Metapher', in Ritter, Joachim (Ed.), *Historisches Wörterbuch der Philosophie*, Bd. 5. Darmstadt: Wissenschaftliche Buchgesellschaft, 1179–1186.