
Ethical Reflection Must Always be Measured

Science, Technology, & Human Values
35(6) 839-864

© The Author(s) 2010

Reprints and permission:

sagepub.com/journalsPermissions.nav

DOI: 10.1177/0162243909357917

<http://sthv.sagepub.com>



Kathrin Braun¹, Svea Luise Herrmann²,
Sabine Könninger³, and Alfred Moore⁴

Abstract

The article analyses what we term governmental ethics regimes as forms of scientific governance. Drawing from empirical research on governmental ethics regimes in Germany, France and the UK since the early 1980s, it argues that these governmental ethics regimes grew out of the technical model of scientific governance, but have departed from it in crucial ways. It asks whether ethics regimes can be understood as new “technologies of humility” (Jasanoff) and answers the question with a “yes, but”. Yes, governmental ethics regimes have incorporated features that go beyond technologies of prediction and control, but the overcoming of the technical model also bears some ambivalence that needs to be understood. The article argues that governmental ethics regimes can be understood as a form of “reflexive government” (Dean) in that the commitment to techno-scientific innovation is stabilized not through an elitist, technocratic exclusion of non-scientific

¹ Leibniz University of Hanover

² Leibniz University of Hanover

³ Karlsruhe Institute of Technology

⁴ University of British Columbia

Corresponding Author:

Kathrin Braun, BIOS/Department of Sociology, London School of Economics and Political Science, Houghton Street, London WC2A 2AE, UK

Email: k.braun1@lse.ac.uk

actors and knowledges or a depreciation of normative and emotional dimensions, but through their inclusion, involvement and mobilization.

Keywords

public bioethics, governmental ethics regimes, reflexive government, politics of talk, scientific governance

The fundamental and manifold uncertainties brought about by science and technology have prompted calls for new forms of public justification of science and technology and new relations between political decision makers, experts, and citizens. Sheila Jasanoff, voicing a general concern in science and technology studies (STS), argues that such new forms of public justification should go beyond the prevalent technologies of prediction and control, such as risk assessment, which have proven unable to address unknowns, moral and scientific uncertainty, and ambivalence:

Today, there is a need for “technologies of humility” to complement the predictive approaches: to make apparent the possibility of unforeseen consequences; to make explicit the normative that lurks within the technical; and to acknowledge from the start the need for plural viewpoints and collective learning (Jasanoff 2003, 240).

Yet, in the issue area of medicine and red biotechnology, new bodies and technologies are already in place, which arguably deal with the public justification of science *and* go beyond technologies of prediction and control. “Public bioethics,” as Susan Kelly (2003) has termed it (in contrast to academic, clinical, or corporate bioethics) refers to the whole range of bodies and procedures such as national ethics councils, parliamentary ethics commissions, or public consultations on “ethical issues,” which are meant to inform and guide political decision making with respect to ethical considerations. Insofar, as these bodies and procedures are commissioned or sponsored by governments, we will speak of a governmental ethics regime.

Public bioethics is yet to be fully explored as a form of scientific governance,¹ and the literatures on bioethics and on science–society relations have evolved rather separately from each other. This article aims to more closely examine governmental ethics regimes as new forms of scientific governance. The concept of scientific governance here refers to the government of technoscientific development on one hand and to governing science–society relations on the other. Do contemporary governmental ethics regimes meet Jasanoff’s (2003) demand to develop “technologies of

humility”? And, if so, in which ways do they do this, and at what costs? This article will argue that the governmental ethics regime presents a new model of scientific governance, which grew out of the technical model of scientific governance but has departed from it in many ways and can best be understood as a form of what Mitchell Dean (1999, 129) has called “reflexive government.” Dean uses the term to capture a form of government that he sees emerging since the 1980s and 1990s. It denotes “the government of government” and is distinguished from a more direct form of governing that he calls “the government of processes,” referring to examples mostly from the economic sphere and industrial relations. While the concept of “reflexive government,” unlike the concept of “technologies of humility,” did not originally refer to science and technology, we argue that it can well be used as an analytic tool to explore contemporary forms of governing the issue area of science and technology. In the following, we draw on the results of our research on governmental ethics regimes in Germany, France, and the United Kingdom, which have developed since the early 1980s. The study is based on the analysis of constituting documents, reports, position papers, or proceedings of meetings, covering the whole period under study (early 1980s to 2005). In addition, we did participant observation of meetings and over thirty interviews with members of public bioethics bodies. Interviews and participant observation took place in 2005-2006.²

Ethics as Frame and Problematization

In the following, we will use the term “ethics” in a strictly nominalist sense, meaning that we will not enter a discussion about its sociological or philosophical meaning. We will deliberately bracket out the question of how ethics should properly be defined. Our intention is not to expose any distorted or narrowed uses of the concept of ethics or to point to any discrepancies between its “actual” idea and its sorry reality but to understand when and how problems became *framed* as ethical issues, when and how the language of ethics appeared as a technology of scientific governance, and what difference this makes. We maintain that by bracketing out the question of what ethics “actually is,” we get a clearer view of these new forms of government. Here, we follow Max Weber who, in the context of his *verstehende* sociology, only defines ethics in as much as he distinguishes it from the concept of law, yet refrains from any declaration of positive content:

Whether a belief in the validity of an order as such, which is current in a social group, is to be regarded as belonging to the realm of “ethics” [. . .], cannot

for sociological purposes, be decided in general terms. It must be treated as relative to the conception of what values are treated as “ethical” in the social group in question (Weber 1978, 36).

Weber encourages us to start from the meaning that social actors themselves give to “the realm of ‘ethics.’” What does or does not fall into this realm, then, is not to be determined by the social researcher, employing a fixed, preset concept of ethics and imposing it onto the material. The interesting question is not whether social actors apply the concept of “ethics” accurately or whether a certain belief, value, or question is “truly” ethical (according to the researcher’s understanding), but whether, when and how actors construct “the realm of ethics” as a means of ordering and understanding the social world. The methodological approach of frame analysis allows us to operationalize this question and to investigate the specific meaning ethics assumes in different contexts and for different actors. Frames bring out certain elements of reality and allow for particular ways of speaking and thinking about things while precluding others (Rein and Schön 1993, 146; Fischer 2003; Hajer 2003; Laws and Rein 2003). Since framing processes are unavoidable, above all in politics, the question is not *whether* but *which* framing processes occur and what the implications are. Hence, in the following, we will understand ethics *not* as a specific type of statement but as a frame. However, as the frame concept is somewhat restricted to the semantic-discursive dimension, to grasp the institutional and practical dimensions of the ethics regime, we will combine frame analysis with a Foucauldian analytics of government. Foucault (2003) understood government as the exercise of power which, rather than being based on domination, violence, or command, means conduct, steering, or management. To govern in this sense, means to “structure the possible field of action of others” (Foucault 2000, 341). Contemporary “advanced liberalism” is essentially based on mechanisms that allow the state to govern “from a distance” (Rose 1996, 54), linking techniques of conducting oneself with those of conducting others and conducting the state as a whole. This modern, Western form of government, Foucault argues, forms a continuation, transmission, and expansion of pastoral power as developed by the church. In modern pastoral power, the state and a broad range of professionals such as physicians and therapists have largely taken over the pastor’s task of looking after the life and soul of the individual and the community. A key element within pastoral power is the confession. It creates a link between the authority of the pastor, who spreads the truth to the flock, and the practice of individual self-inspection and, ideally, individual

self-conduct. Governing souls implies that “the pastor must not simply teach the truth. He must direct the conscience” (Foucault 2007, 181)—which can only succeed when the individual actively participates in the process, exploring and speaking about his or her conscience. It is through this process of speech and self-inspection, guided by some sort of pastor, that ideally the individual soul finds salvation.

Self-government and self-inspection, governmentality scholars argue, are critical in liberalism, due to an essential tension in liberal political rationality between the demand for (more) freedom (of the individual, the market, and research) and thus an implicit demand for the reduction of government, on one hand, and the idea of the state as the pastor who looks after the life and welfare of the community and its members, on the other. The latter might involve protecting the community against potentially damaging effects resulting from the exercise of those freedoms. From this tension, new forms of government emerged, mobilizing subjectivity and individual freedom as instruments of government, or, as Mitchell Dean put it, government in liberal societies “is an activity that [...] in a sense, attempts to shape freedom” (Dean 1999, 13).

A further Foucauldian concept we articulate in our study is the concept of problematization, understood as “a calling into question of how we shape or direct our own and other’s conduct” (Dean 1999, 27). Problematizations emerge when existing forms of government come under scrutiny or come to be seen as insufficient or inadequate. In governmentality studies, this concept refers most prominently to the questioning of the interventionist welfare state since the 1980s and the demand for stronger market- and competition-oriented forms of government. In our view, the development of the ethics regime since the early 1980s can also be seen as the manifestation and result of a problematization of government insofar as the existing forms of science and technology governance had at that time been criticized by many as insufficient or inadequate. In the next section, we will argue that the question of whether certain scientific and technological developments require political intervention, regulation, or steering, began to be framed as an ethical issue, that is *in terms of* ethics, in the early 1980s in the context of controversies on recombinant DNA, nuclear energy, and *in vitro* fertilization (IVF).³ In this context, two major forms of scientific governance came under political scrutiny, namely the self-regulation of medicine and science on one hand and traditional morality on the other. In the language of Foucault and governmentality studies, these two forms of governance were problematized and it is in the context of these problematizations that government bodies, such as advisory commissions, presidents

of state, or ministers of research started to frame the question of how to govern new scientific and technological developments *in terms of ethics* or, as Weber put it, as belonging to “the realm of ‘ethics.’”

Problematization of Scientific Self-Regulation and Morality

One of the outposts of the language of ethics in the realm of scientific governance was the concept of responsibility, which emerged in the context of the two international conferences held in Asilomar in 1973 and 1975, at which scientific professionals gathered to discuss the risks of recombinant DNA technology. At that time, arguments around potentially undesirable or dangerous consequences of technoscientific developments were still primarily framed in terms of risks, which in turn were conceived in terms of health and safety (Krimsky 1982; Wright 1994). The language of risks stabilized the demands of science for self-regulation and noninterference in that it framed the assessment and containment of risks as a technical matter (Evans 2002). Yet, the governmental ethics regime grew out of the Asilomar process and the risk discourse. Asilomar prompted the establishment of a series of new bodies such as the Genetic Manipulation Advisory Group in the United Kingdom, dealing with the question as to how to reconcile technological progress with “social values of the community at large” (Ashby 1975, 3), and the first ethics committee in France, set up by the Délégation Générale à la Recherche Scientifique et Technique (Alias 1992, 123).

In Germany, the rise of a language of ethics was linked to a problematization of the risk-frame as such. Here, the Asilomar process was celebrated by the then minister of research as an example of a science that regulated itself responsibly (EK DB 1986, vol. VI, 2305), in contrast with the politicized, antagonistic debate on nuclear energy in Germany at the time. The nuclear debate was strongly focused on a *politicized* concept of risk and fundamentally concerned about *whether* to deploy this technology at all. The government was keen to avoid this type of debate spilling over to the issue of genetic technology. Instead of *whether or not*, it wanted the debate to focus on *how* to go ahead with the new technology (a member of the Enquête Commission “Chances and Risks of Genetic Technology,” Int. G I) and introduced the notion of ethics and an “ethical–philosophical” debate, performed among experts, as a counterframe to the highly politicized public debate on risks (BMFT 1984, 98).

Another strand in the early formation of ethics regimes is the problematization of morality as a frame of reference for statutory regulation. In

France, already in 1978, the President of State, Giscard d'Estaing, had commissioned a report on the social consequences of modern biology, which, in a subsection titled "morality and social practices," problematized the effects of these developments on family structure, gender relations, the demographic development of France and "traditional forms of behaviour in the area of reproduction and sexuality" (Gros, Jacob, and Royer 1979, 265). It discussed potential problems of medicine and scientific development as problems that should *not* be delegated either to individual decision making or to scientific self-government but rather require political intervention and it recommended the establishment of a permanent body of reflection as well as a dialogue between science and society. These institutional innovations were devised to ensure that the perceived ethical and social problems would not block scientific development (Gros, Jacob, and Royer 1979, 283). The government eventually implemented these recommendations when it established the French national ethics committee in 1983. Hence, we find that the ethics regime resulted from contradictory imperatives: on one hand to protect the social order and its sexual-moral foundations from a perceived threat and to protect the autonomy and further development of science on the other. The way to accommodate these contradictory imperatives was to processualize them and to establish an ongoing process of reflection and dialogue in the form of the ethics regime.

In the United Kingdom, the birth of the first IVF baby in 1978 kindled public debate about the responsibilities of science toward society. Alongside emerging public concerns that this field of science was raising moral, ethical, and social questions, the economic potential of biotechnology generated enormous pressure on the government to create a stable and supportive research environment (Bud 1995; Bauer et al. 1998). In this context, the Thatcher government set up the Warnock Commission to report to the government on this issue, a committee that already showed certain patterns of the current ethics regime in the United Kingdom, such as the participation of lay members as a counterweight to scientific and medical interests, and the assumption that although new technologies raise ethical and moral questions it was not the job of the committee to give definitive answers to these questions. While the "moral right" (Yoxen 1990), including influential pro-life organizations emphasized the interconnection between morals and politics, Warnock declared that it was *not* the role of the commission to represent or adjudicate moral standpoints but rather to advise on policy (Warnock 1985). The relationship between morality and the law had become problematic: "'Common morality' is a myth," the report argued (Warnock 1985, xi) and could not be translated into statutory law. Warnock

recommended rather a specifically liberal form of conflict management: IVF was to be a matter of personal conscience and not the law.

The Warnock Report, in rejecting not only the self-regulation of science but also “common morality” as a reference point for scientific governance, came up against the fundamental dilemma of liberalism: how to secure (scientific and individual) freedom without endangering the foundations of social order, and how to protect the foundations of social order without illegitimately curtailing scientific and individual freedom? Warnock declared that a society without “inhibiting limits, especially in the areas with which we have been concerned,” would be a society “without moral scruples,” (Warnock 1985, 2). The solution she offered was pragmatic, pluralistic, and decidedly liberal: “What is common [. . .] is that people generally want *some principles or other* to govern the development and use of the new techniques” (Warnock 1985, 2, *our emphasis*). Hence “some principles or other,” apparently interchangeable and without specified content, form the boundaries of freedom. The ethics regime in the United Kingdom later continued this path, trying to provide for the *existence* of *some* normative principles without going to war about their content. This—necessarily problematic—role is managed primarily through the creation of spaces and processes in which to speak in a structured way about the problems that are to be regulated, as we will explain in the following.

Evolutionary, Precarious, and Reversible

Since the 1980s, ethics bodies and procedures have proliferated vastly in scientific governance. What, if anything, is new and particular to them as a form of scientific governance? The question cannot be answered by referring to the ethical quality of the issues, for this would simply push back the question to what constitutes an ethical issue, and the answer to that question is not at all evident, not least for the actors themselves. When we asked what ethics meant, our interview partners gave different and often vague answers. A member of the French Comité Consultatif National d'Éthique pour les sciences de la vie et de la santé (CCNE) declared: “As far as the concept ethics pertains to the ethics committee: I think, few people give much thought to the word” (Int. F IX). While ethics for one British interview partner was equivalent to the protection of the embryo “[. . .] and everything in a way flows from that fundamental principle” (Int. UK VI), for a German member of the Enquête Commission “Chances and Risks of Genetic Technology” the ethical quality of a problem was defined by it affecting society as a whole and not being a matter to be left to individuals alone (Int. G I). Yet, a member of the French CCNE

argued the opposite view, similar to Warnock, that ethics was—in contradistinction to morality—precisely an individual matter:

Morality, that's grey hairs, the old generation, reactionaries, who want to prescribe for us the things that they take as good. Ethics means, I make my own rules of living, independently (Int. F IX).

At best, there was a consensus on a negative distinction of ethics from profit-orientated considerations (Int. F IX; Int. UK I; Int. UK VII).

Yet, ethical considerations were also negatively distinguished from the category of truth. Ethics, it was repeatedly emphasized, is not synonymous with the production of truth. One member of the French CCNE declared:

[. . .] one must say, that we do not see our position statements as the truth. If you like, our position statements are precarious, because we discuss at a specific point in time a state of knowledge that is evolving, and a moment of social acceptability, which is also *evolutionary*. Our position statements are thus *precarious* and *reversible*. Perhaps in the year 2007 they are no longer warranted (Int. F IV, our emphasis).

Along with claims to truth, claims to provide clear-cut advice are also rejected. One member of the German national ethics council (NER) emphasized:

From the beginning, we have understood ourselves as an authority that encourages discussion, that in some circumstances sets off the discussion, but in no way claims to give definitive answers (Int. G II).

In this, he is supported by a member of the British Nuffield Council, who, in relation to the recommendations of the council, declared:

[. . .] this is not prescriptive, this is just telling you what issues you have to *address* when you're setting up research, you've got to think about them (Int. UK III, our emphasis).

The ethics regimes here face the same paradoxical task that we encountered in the Warnock report: To identify principles, which, if necessary, may set limits to scientific and technological development, without being too precise about *which* principles these should be and *why* they are *right*. The result is an inbuilt temporalization of the ensuing limits; they are provisional, changeable, and apply only until new preliminary limits are

adopted—they are “evolutionary, reversible, and precarious.” In short, the self-understanding of the ethics regime’s commissions and their members is far removed from the idea of the scientific experts as “speaking truth to power” (Wildavsky 1979).

We argue that what we see here is a model of scientific governance that on multiple counts differs from what we call “technical models,” and others have termed “technocratic regulatory paradigms” (Abraham and Davis 2007), scientized risk assessment (Levidow, Murphy, and Carr 2007), or “technocratic” modes of policy making. This family of terms speaks to a tradition within STS that is concerned with the political, legal, and policy contexts of science and technology and has been represented most influentially by Jasanoff (1994, 2003), Wynne (1995, 1996), and Irwin (2006; Irwin and Michael 2003; Irwin and Wynne 2003). This tradition shares a critical orientation to the assumption that scientific expertise is a neutral or value-free instrument of government and that “technical input to policy problems has to be developed independently of political influences” (Jasanoff 2003, 225) so that it can “speak truth to power.” The claim in this STS tradition is that the neutrality on which the technical model depends is an illusion that serves to insulate the pervasive and inescapable politics of expertise from public scrutiny and democratic steering. Ostensibly, neutral knowledge is inevitably conditioned by prescientific framing commitments concerning the topics to be addressed and the kinds of knowledge to be considered, and it reserves for scientific experts a special authority over “appropriate simplification” (Hilgartner 1990) both for policy makers and the wider public. The claim, then, is that the technical model gives scientific experts a special status in the policy process that in fact undercuts their strictly neutral, technical function. This critique was voiced in early STS work by Plough and Krinsky (1987), Fiorino (1989), and developed by Jasanoff in her (1994) account of the scientific advisory network as a “fifth branch” of government. This tradition aims to provide better descriptions of the practices of policy making, showing that expert government is always politicized, subject to subtle processes of bargaining, negotiation, and boundary drawing. It also shares a normative agenda. The technocratic model of science policy is regarded as unable to address unknowns as well as moral or scientific uncertainties and ambivalences (cf. Jasanoff 1994). Thus, the normative part of this tradition is concerned with overcoming technocratic models and identifying possible alternatives—such as Jasanoff’s “technologies of humility” (2003)—that are sensitive to such moral and scientific uncertainties.

The ethics regime has departed from this model in almost every crucial respect, as we will lay out in the following. It does not focus on quantitative,

scientific methods, it is not made up by experts only (although experts still do play a decisive role), it strongly focuses on processes and nearly ignores outcomes, it raises no claims to the universality and objectivity of its representations, it does not seriously expect policy makers to follow the experts' advice, and it does not emphasize the values of efficiency and rationality only.

Alan Irwin (2006), in reference to the controversy over genetically modified organisms in the United Kingdom, coined the term "politics of talk," which runs alongside the old forms of scientific governance, yet at the same time is connected with old assumptions of deficit models of the public's understanding of science and scientific governance. The new politics of talk, as he sees it, is characterized by an emphasis on openness, transparency, and public participation. We can discern these features also, as we will show below, in the structure and mode of operation of the ethics regime.

Exemplary Moderation

If we look at the composition of the different ethics commissions and processes, for instance, we find that while medicine and science are still guaranteed a certain influence, there is almost always a counterweight, albeit differently constructed in the three countries we studied. Most institutions prescribe the participation of nonscientific and nonmedical members: The British bodies, the Human Fertilisation and Embryology Authority (HFEA), the Human Genetics Commission (HGC), and the Nuffield Council on Bioethics (NCB), provide for a minimum of fifty percent membership of so-called lay members who are not medical or scientific practitioners and not decision makers, sponsors, or researchers in the field of biomedicine (STC 2005, 87). In the French CCNE, the five most important "spiritual families" (Catholic, Protestant, Jewish, Muslim, and Atheist) must be represented, in order to represent the "diversity of French opinion" (Int. F V). In Germany, the idea of lay participation or the representation of a plurality of worldviews is not codified, and the commissions are predominantly occupied by experts from medicine, science, and law (Fuchs 2005). In practice, however, the constitution of bodies such as the NER or the Enquête Commission on Law and Ethics of Modern Medicine also reflect the idea that different academic disciplines and at least the Catholic and the Protestant Church should be represented. The newest commission, the Central Ethics Commission for Stem Cell Research, forms an exception, in that the participation of ethicists and theologians

is prescribed to provide a counterweight to medicine and science. On grounds of which competencies are the nonscientific members of ethics bodies recruited? They are officially appointed neither as interest representatives (Bogner, Menz, and Schumm 2008) nor as representatives of a political position. Political behavior, in the sense of taking an antagonistic stance, that is, fighting for one's political views or interests and asserting them when necessary against others, is precisely what is not wanted within the ethics regime.

Interestingly, however, nonscientific members are rarely appointed on the grounds of their professional ethical competence. Professionally trained ethicists are in fact thin on the ground.⁴ Instead, the decisive competency that a member of an ethics body must have, as many interview partners said, is an aptitude for moderate communication. In this way, according to two members of the French CCNE, the committee can be understood primarily as a national "pre-reflection committee" (Int. F V) that provides a public model of reasonable, moderate conflict resolution and accommodation (Int. F IX). The German National Ethics Council demands a moderate debate too:

In the view of the National Ethics Council, the first and most important prerequisite for a political solution is a culture of mutual respect, in the spirit of which due regard is paid to divergent opinions and all arguments are objectively examined. Each side must be given an opportunity of seriously defending its position (German National Ethics Council 2001, 11).

For this mode of accommodation, it is important to maintain a moderate attitude. As one member of the French CCNE put it, referring to the CCNE:

"[...] ethical reflection [...] must always be measured—[...], nobody here asserts a claim to truth [...]" (Int. F IV).

Rather than making a "claim to truth," which would imply the *falsity* of opposing positions, actors of the ethics regime are committed to moderate accommodation of coexistent and equally valid positions (see also Memmi 1996). This pluralistic, liberal outlook is also central for the ethics regime in the United Kingdom. Rather than even aspiring to universal truth or definitive normative judgments, ethics bodies and their members aspire to pluralism and openness, insisting that the different social groups can bring in their perspectives. This pluralism, however, has intrinsic limits, in that those who do not follow this outlook and further contend that certain conduct is *wrong*

and is to be fought against, stand outside this frame. The former chair of the HFEA explained on this ground that members of pro-life organizations could not be members of the HFEA:

I think that you must subscribe to the acceptability of IVF and the acceptability of embryo research. I do not think that you could sit on the Authority and exercise the kind of decision-making that we have to do if you were fundamentally opposed to the activities that we regulate (STC 2005, 91; Q 1259).

Those who take up a rigorous normative position lack the decisive competence that a good member of the ethics regime must bring: the disposition to consider all positions as discussable. A good member is reflective, disinterested, capable, and willing to take part in discussion, able also to represent controversial viewpoints in such a way as to not offend the sensibilities of others. In short, a good member has “clubbability,” as one interview partner put it (Int. UK XI).

The Politics of Proper Talk

Hence, it is less a specific professional competence through which a person is qualified as a member of an ethics organization than a certain attitude or habitus. However, the required openness is at the same time a mechanism of closure: Whoever is not prepared to compromise on certain questions, whoever maintains that certain practices are not discussable, and whoever holds fast to the unchallengeable validity of fundamental norms, does not fulfill these qualifications and can be excluded from participation. The open and flexible attitude corresponds to the open and flexible, temporalized character of the recommendations and regulations that emerge from these discussions: Participation in ethics regimes requires accepting that these outcomes are “evolutionary, reversible, and precarious.”

A further way in which the ethics regime differs from the classical technocratic model of scientific governance is its active reference to the public. Although we see this to some extent in all three countries under study, the need for public involvement is most strongly emphasized in the United Kingdom. The British HFEA has, sometimes in cooperation with the HGC, carried out seventeen public consultations on biomedical and biotechnological topics between 1994 and 2007. Typically in these consultations, the public is invited to comment on a position paper they have set up. In addition, the HGC has also applied other, more experimental formats such as open meetings, focus groups,

a series of over 1,000 personal interviews with citizens, a youth conference with 200 students, and an advisory consultative panel comprising persons directly affected by certain genetic conditions. These exercises have various purposes, including the enhancement of scientific literacy and public trust in science and its regulation. However, this interaction with the public is also about engaging each and every individual with the new possibilities of biomedicine. The German NER describes the purpose of public dialogue as follows:

Everyone must be able to form an impression of the prospects and risks of the new technologies, as a basis for arriving at his or her own judgement on the associated ethical issues. To this end, the Ethics Council will seek to facilitate understanding of the presuppositions and consequences of current problems (German National Ethics Council 2001, 7).

Public dialogue thus addresses the individual and actively encourages her to personally relate to the new technologies and to become an active “biomedical citizen” (Rose and Novas 2005).

In France, public dialogue has taken above all the form of the annual public events “Journées annuelles d’éthique” in which the CCNE presents its positions and recommendations to the public and invites ethical discussion. As a member of the CCNE explained, a particularly cherished target group here is school students, because:

In this way naïve questions, lay questions can be put, which provoke the reflection of the ethics council. These days are an asset to the CCNE [. . .] (Int. F II).

The young people are seen as future citizens who are asked to cultivate bioethical reflection (Int. F IV) and give their own presentations on bioethical themes such as, for example, euthanasia for newborns in comparison to euthanasia for the elderly or refusal of treatment on cultural grounds.⁵ The process counts as a success when the students understand that ethics means “examining the frame of reference” and that in ethics one can never come to definitive answers.⁶ It is therefore not simply a matter of communicating scientific knowledge or ethical viewpoints but rather one of stimulating participants to deliberate, discuss, weigh up arguments, and form their own opinions, specifically on themes that until then did not seem important to them. Above all, they should understand that there are no stable, correct answers, rather everything is very difficult and differentiated, which is why the discourse must in principle remain inconclusive: “They have understood the difficulties and the problems”.⁷ The “naïveté” (Int. F II) of the

young people is considered a specific resource for the committee, as they provide ideas and views that can help to further develop and refine the stimulation of future debates. Furthermore, public dialogue has an educational function as it provides an opportunity for participants, under the guidance of experts, to acquire the capacity for proper bioethical reflection. Due to their naïveté, the young people are (still) particularly amenable to such education. At the same time, they function as “multipliers,” who spread the art of proper ethical reflection among their families (Int. F IV).

A model emerges here that we can also see in Germany and the United Kingdom (Herrmann and Könninger 2008; NER 2006): The experts take on a dialogical function rather than the function of imparting knowledge. They are expected to incite and mediate discourse and to refrain from providing the “right” answers. This is not just a “one-way transmission of informative packages” (Wynne 1991, 114), because the experts also absorb something from the public, namely ideas for the future stimulation of discussion. It is important in this model to make the participants speak themselves and to actively involve them to elicit ideas for taking discourse further. In addition, these discourses have an educational dimension in that they offer an opportunity for participants to practice the right style of ethical reflection—“right” referring not to the quality of substantive judgments but to the style of thinking and speaking about the issues. Proper talk, as we term it (where “talk” is understood as referring to the interactive practices of speech), is moderate and perpetual, it avoids antagonistic constellations and substantive commitments. Through public dialogue, proper talk, initially developed and performed in an exemplary fashion by public ethics bodies, is funneled into the public.

The idea of addressing multipliers who will spread proper talk among the population was also incorporated into the funding strategy of the German Federal Research Ministry. In May 2006, they published a call for proposals for discourse projects “on ethical, legal and social questions in the modern life sciences” (BMBF 2006). The background and general purpose of the call were outlined as follows: “Advances in the modern life sciences, [. . .] open new possibilities of great promise in medical diagnostics and therapy,” yet they also bring up “grave ethical, legal and social questions,” which cannot be left to experts alone, but rather must be “collaboratively shaped and supported by a well informed public” (BMBF 2006). The program aims at the integration of “young people into the discursive process” and at the development of new formats for discourse projects. Such projects have to address problems that “contribute to the objective and unbiased information of the respective target groups” and “assist them in forming educated opinions through an engaged

and publicly visible discourse” (BMBF 2006). The target groups are to be students, apprentices, young professionals or their teachers, and social workers. The projects should “contribute to the professional development of bioethical discourse processes on a permanent basis” (BMBF 2006).

Such processualization of ethical discourse and its proliferation among different groups of the populace should, however, be guided by experts, more specifically by experts who know how to conduct discourse: “Applicants must demonstrate appropriate scientific expertise *and* practical experience in the implementation of discursive events” (BMBF 2006, our emphasis). Thus, the program specifically addresses discourse experts. Their deliveries would consist not of innovative products in the form of statements or recommendations but of processes such as “innovative project forms, which place a particular methodological emphasis on the improvement of discursive processes” (BMBF 2006). Such improved discursive processes would support “*educated* opinion-formation” and contribute to “*educated* development and perpetuation of bioethical discursive processes” (BMBF 2006, our emphasis). Hence, in one respect, the program does not seek to impose specific scientific or normative truths on the young people. It seems to be indifferent toward the *content* of the educated opinions to be generated. Nonetheless, a certain truth claim *is* made and applicants must subscribe to in order to acquire funding. This claim is laid down in the very first premise of the call:

Advancements in the modern life sciences, [. . .] *inaugurate* new, *promising* possibilities in medical diagnostics and therapy (BMBF 2006, our emphasis).

That advancement in the biosciences proceeds and will continue to proceed and that this is positive in principle is fixed as a premise. To hold this as a truth forms the precondition of participating in the program. Hence, the discursive processes the program seeks to promote may be nondirective, yet they must not dispute scientific progress as being given and being a good. The educated, moderate, and perpetual discourse that is to be rehearsed is a discourse that accepts and does not challenge continuous technoscientific innovation.

Reflexive Government

Why and in which sense does this account of the specificities of the ethics regime show that it can be understood as a form of reflexive government, as we have suggested? As laid out above, the governmental ethics regime

emerges in the late 1970s and early 1980s, at a time when both public trust in science's ability to responsibly govern itself and the idea of a common binding morality as a frame of reference for political regulation have become problematic. In other words, the mechanisms of governing science and technology themselves become subject to problematization, scrutiny, and reformation. Policy makers are confronted with opposing imperatives to both foster the development of science and technology and set limits to it to protect society. This is the classical dilemma of liberalism: to support freedom, namely the freedom of the individual and the freedom of science, and at the same time take seriously the concerns of the public and safeguard society against potential threats that could accrue from the exercise of those freedoms. The ethics regime provides a form to deal with these contradictory demands that, to borrow from Marx's account of the commodity form, "does not sweep away these inconsistencies, but develops a *modus vivendi*, a form in which they can exist side by side" (Marx 1996, 113). As such, it does not operate like a classical liberal instrument of state intervention by means of which the state bears directly on the processes of scientific and technological development. Rather, it can be understood as a set of political technologies by means of which *talk about* the problems concerning these processes can be framed and guided. To put it another way: the governmental ethics regime is not a means of governing science and technology directly, but rather of governing the terms, frames, and manners in which the development and government of science can be argued about and societal struggles over the proper relationship between politics, science, and society are organized. In this view, it operates much like what Mitchell Dean has termed "reflexive government" or "government of government." The point of reflexive government, as Dean portrays it, is to permanently reform both institutional and individual conduct and to activate and mobilize the energies and capacities of institutions, organizations, companies, social groups, and individuals "in the face of processes that are deemed beyond governmental control" (Dean 1999, 179). Reflexive government actively invites individuals to develop and use the skills of responsible and prudent self-government, since such self-government is seen as the most adequate strategy of adapting to the potentially threatening but inescapable dynamics of globalization. However, reflexive government is not limited to the economic sphere and we hold that technoscientific innovation can be regarded a further dynamic beyond governmental control—or deemed to be beyond governmental control. Governments may consider themselves capable of regulating technoscientific development to some extent but a point that regularly recurs in both academic and political discussions on

contentious technoscientific developments is “you cannot stop it” or “if we don’t do it, someone else will.” The idea that technoscientific progress is our fate rather than an assumption that could be politically challenged seems to form the general presupposition of contemporary science governance discourse.

Looking at the most recent and sophisticated developments in the ethics regime’s engagement in public dialogue in the United Kingdom, we can suggest, on the basis of early and anecdotal signs, the emergence of a specific new type of reflexive government: one that essentially uses interpretation, communication, and emotions and thereby displays some of the key features of what Foucault termed pastoral power, albeit taking place in public and not in the enclosed settings of psychotherapy or confession. While in past decades, proper ethical discourse has often been presented as a rational discourse that is meant to replace a fundamentalist or emotional one, usually with the help of scientists, ethicists, or other experts, today a new understanding seems to supplement this notion. Whereas the older model is based on a decisively binary, modernist matrix, opposing rationality to irrationality, reason to emotions, science to fundamentalism, and so on, the new model is rather integrative and systemic, viewing emotions less as the enemy that has to be defeated but as a potential resource that can be exploited, although this process requires assessment, interpretation, and “editing.” In this view, ethics talk should not exclude but instead *elicit* the public’s attitudes and emotions. Shirley Harrison, the new chair of the HFEA, made this quite clear when she introduced a new public consultation titled *Should we allow the creation of animal/human embryos?* with the following comment:

It is important to remember that this is not a referendum with “votes” counted for or against particular types of research. Instead, we want to understand why people feel worried or enthusiastic about this research in order to help us make a judgement about the best way to proceed (HFEA 2007).

Hence, such consultations are not about quantitative data. Instead, the citizen’s views and attitudes constitute the raw data of qualitative analysis, which have to be assessed and interpreted by experts to find out whether they might point to some undiagnosed ills that need to be addressed.

We think that we can see a newly emerging role of the expert here, one that goes beyond that of a scientific expert giving policy advice or that of a moderator mediating public debate: he or she rather acts as a therapist helping the public to better understand itself. In this vein, one member of the

HFEA explained to us that the role of the expert is to look “under the surface of public attitudes”:

What I think is really difficult here, and just takes time, is finding what’s under the surface of public attitudes. The question is whether some expression of anxiety or hostility is merely an expression of ignorance or of prejudice, as we would think in the case of homosexuality, or whether there is something there which needs to be addressed. [...] It may be that it goes the way that the IVF arguments went, and the public come to see that there’s something worth doing here, which is not actually as awful as some people think it is. Or it may be that the objection to it gets crystallised into a rather tougher form of argument than I can at present formulate (Int. UK VII).

The experts’ task is to distinguish the “real” ethical considerations from simple prejudice. Much like a psychotherapist they elicit material that hints at the “true” emotional states of the client, in this case the public, scrutinize, review, and interpret these materials and, through publication of the results, offer “feedback” to the “client.” The idea seems to be that the clients/citizens talk about their emotional state while the therapists/experts offer their interpretation and channel it back into the public. Through this practice, the clients are enabled to better understand and manage the “truth” of their own feelings.

This understanding is even more explicitly articulated by the former chair of the HFEA, Dame Suzi Leather. Feelings, Leather said at a conference, were an important dimension of public ethical debate and were not to be ignored, for “[...] if you ignore feelings they don’t go away.” In the subsequent discussion, Leather explained: “When people do not speak about their emotions they are like unfinished prisoners.”⁸ In this understanding, it is important that the ethics regime creates settings where people speak about their feelings, and, with the guidance of experts, learn to understand the truth about themselves and thereby attain freedom—be freed from the “*prison*” of their own emotions. Talk, in the right setting, liberates and relieves. In this understanding the ethics discourse, or more precisely, public participation in ethics discourse organized by public ethics bodies, is analogous to mass therapy and displays some critical features of the modern pastor–flock relationship described by Foucault. Feelings such as concern and anxiety here are not something that has to be excluded or repressed to generate a “rational discourse” but rather something that has to be integrated in a multifaceted, bidirectional process of communication and reworking between experts and the public.

Conclusion

In this article, we have argued that the governmental ethics regime can be understood as a new form of scientific governance, one that has gone a long way from Daniel Fiorino's "technical model" in which specialized experts favor system stability over participation, focussing on technological variables only, using quantitative methods and emphasizing the values of rationality, efficiency, and expertise. In contrast to the technical model of expert advice, the ethics regime does not raise claims to objectivity and truth concerning the representations and recommendations it generates. Indeed it *does* provide a framework to discuss other values than merely efficiency, such as individual autonomy, human dignity, the welfare of the child, public dialogue, and so on, it *does* provide space to express public concerns and not just elites' conclusions, it *does* refer to values and not "facts" only, and in part it *does* include emotions and subjectivity rather than excluding them in pursuit of reason and objectivity, and it *does*, at least to some extent and in some way, operate on the basis of bidirectional communication between experts and the public, providing some opportunities for talk *with* the public rather than just *to* the public. Thus, to some extent, we can recognize basic features of the "technologies of humility" Jasanoff has called for: the specific practices and settings that characterize the ethics regime do not just concern themselves with prediction and control, efficiency and rationality. Nor are they based on the assumption that the technical is free from the normative. Rather, the values aspired to are pluralism, openness, moderation, reflexion, and also participation, albeit to varying degrees. Insofar, as these values refer to the way in which scientific governance is organized, rather than to the government of scientific and technological development directly, it is a set of values referring to the "government of government" rather than to the "government of processes" in the sense of Dean.

Yet, these new inclusions and openings come at a price; they "structure the possible field of action" as Foucault put it, in a specific way. The price of proper talk, talk committed to openness and temporariness with regard to themes, opinions and regulations, is indeed that power relations and economic interests are not addressed, and there is no space for antagonistic political positions, long-term limits to certain technologies, or the question of whether certain technologies should be pursued and made available at all. Proper ethics talk does not question the basic assumption of ongoing technoscientific innovation and its identification with the welfare of society and it provides no framework for questioning it. Thereby, proper ethics talk

accepts and reinforces the requirement to not seriously impede scientific-technological developments. The task of ethics bodies is primarily to exemplify and propagate this model of proper talk. What is truly new is that within the framework of the ethics regime, the commitment to technoscientific innovation and its identification with social progress are stabilized not through an elitist, technocratic exclusion of nonscientific actors and knowledges, or the depreciation of normative and emotional dimensions of conflicts, but rather through their *inclusion*, involvement, and mobilization. In this sense, participation and system stability might not necessarily operate as opposing values but system stability could be pursued through using participation, provided the latter remains within the framework of proper talk.

Notes

1. See, however, Kelly (2003), Leinhos (2005), or Salter and Salter (2007).
2. For the purpose of this article, we translated the quotes from German and French interviews and documents into English.
3. Earlier events such as the Nuremberg trials of Nazi doctors and the Helsinki and Tokyo declarations on the ethics of human subject research had led to the development of *clinical* ethics regime that was applied to clinical trials. It was not until the early 1980s though that ethics bodies were established on the level of policy advice or policy making.
4. In July 2007, the Human Genetics Commission (HGC) had two formally trained moral philosophers (from nineteen members), the Human Fertilisation and Embryology Authority (HFEA) two (from nineteen), the Nuffield Council on Bioethics (NCB) four (from eighteen). Brian Salter and Mavis Jones (2005) confirm this finding for a different area of bioethical activity, the area of national biobanks. They found that of a total membership of eighty-eight of the bioethics committees of national biobanks, only eleven describe themselves as medical ethicists, philosophers, or theologians.
5. Participant observation at *Journées annuelles d'éthique*, November 16-17, 2004, Université Paris V René Descartes, Paris.
6. Participant observation at *Journées annuelles d'éthique*, November 16-17, 2004, Université Paris V René Descartes, Paris.
7. The facilitator at *Journées annuelles d'éthique*, November 16-17, 2004, Université Paris V René Descartes, Paris.
8. Notes taken from Dame Suzi Leather's presentation and the ensuing discussion at the conference on The New Governance of Life: Challenges. Transformations. Innovations, Vienna, June 11-12, 2007.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

Funding

We thank the German Federal Ministry for Education and Research for having funded the research for this article (reference 07SP31). We also wish to thank the other authors of this special issue for their valuable critique and comments. Barbara Duden, Isabella Jordan, Helen Kohlen, and Susanne Schultz have considerably contributed to this paper by providing a long-standing source of ideas, comments and support.

References

- Abraham, J., and C. Davis 2007. Deficits, expectations and paradigms in British and American drug safety assessments: Prising open the black box of regulatory science. *Science, Technology & Human Values* 32:399-431.
- Alias, F. 1992. Le comité consultatif national d'éthique et l'institutionnalisation d'un débat public relatif à l'éthique biomédicale. Approche critique. Ph.D. diss., Université Toulouse- Le Mirail, Toulouse.
- Ashby, L. 1975. *Report of the working party on the experimental manipulation of the genetic composition of micro-organisms*. London, UK: HMSO (Cmnd 5880).
- Bauer, M. W., J. Durant, G. Gaskell, M. Liakopoulos, and E. Bridgman. 1998. United Kingdom. In *Biotechnology in the public sphere: A European source-book*, ed. John Durant, Martin W. Bauer, and Georg Gaskell, 162-176. London, UK: Science Museum.
- BMBF. 2006. Bundesministerium für Bildung und Forschung. Richtlinien zur Förderung von Diskursprojekten zu ethischen, rechtlichen und sozialen Fragen in den modernen Lebenswissenschaften [database online]. <http://www.bmbf.de/foerderungen/6156.php> (accessed December 18, 2006).
- BMFT. 1984. Der Bundesminister für Forschung und Technologie. *Ethische und rechtliche Problem der Anwendung zellbiologischer und genetischer Methoden am Menschen. Dokumentation des Fachgesprächs im Bundesministerium für Forschung und Technologie*. München, Germany: J. Schweitzer Verlag.
- Bogner, A., W. Menz, and W. Schumm. 2008. Ethikexpertise in Wertkonflikten. Zur Produktion und politischen Verwendung von Kommissionsethik in Deutschland und Österreich. In *Wissensproduktion und Wissenstransfer. Wissen im Spannungsfeld von Wissenschaft, Politik und Öffentlichkeit*, ed. Renate Mayntz, Friedhelm Neidhardt, Peter Weingart, and Ulrich Wengenroth, 243-268. Bielefeld, Germany: transcript.

- Bud, R. 1995. In the engine of industry: Regulators of biotechnology, 1970-86. In *Resistance to new technology: Nuclear power, information technology and biotechnology*, ed. Martin W. Bauer, 293-310. Cambridge: Cambridge University Press.
- Dean, M. 1999. *Governmentality. Power and rule in modern society*. London, UK: SAGE.
- EK DB. 1986. *Materialienband I-VI zum Kommissionsbericht der Enquête-Kommission 'Chancen und Risiken der Gentechnik' BT DR 10/6775*. Bonn, Germany: Enquête Kommission des Deutschen Bundestages.
- Evans, J. H. 2002. *Playing God: Human genetic engineering and the rationalization of the public bioethical debate*. Chicago: University of Chicago Press.
- Fiorino, D. J. 1989. Technical and democratic values in risk analysis. *Risk Analysis* 9:293-9.
- Fischer, F. 2003. *Reframing public policy. Discursive politics and deliberative practices*. Oxford, UK: Oxford University Press.
- Foucault, M. 2000. The subject and power. In *Power. Essential works of Foucault 1954 - 1984*, vol. 3, ed. James D. Faubion, 326-48. New York: The New Press.
- Foucault, M. 2003. *Society must be defended. Lectures at the Collège de France 1975-1976*. New York: Picador.
- Foucault, M. 2007. *Security, territory, population. Lectures at the Collège de France, 1977-78*. New York: Palgrave Macmillan.
- Fuchs, M. 2005. *National ethics councils. Their background, functions and modes of operation compared*. Berlin, Germany: German National Ethics Council.
- German National Ethics Council. 2001. *The import of human embryonic stem cells. Opinion*. Berlin, Germany: German National Ethics Council.
- Gros, F., F. Jacob, and P. Royer. 1979. *Sciences de la vie et société. Rapport présenté à M. le Président de la République*. Paris, France: La Documentation française.
- Hajer, M. 2003. A frame in the fields: Policymaking and the reinvention of politics. In *Deliberative policy analysis. Understanding governance in the network society*, ed. Maarten Hajer and Henk Wagenaar, 88-110. Cambridge: Cambridge University Press.
- Herrmann, S., and S. Könniger. 2008. '... but you can not influence the direction of your thinking.' Guiding Self-Government in Bioethics Policy Discourse. In *Bioethical issues: Sociological perspectives*, ed. Barbara Katz Rothman, Elizabeth M. Armstrong, and Rebecca Tiger, 205-23. Oxford, UK: Elsevier.
- HFEA. 2007. Human fertilisation and embryology authority: *Should we allow the creation of human/animal embryos?* [database online]. Press release, 26 April 2007. <http://www.hfea.gov.uk/en/1518.html> (accessed October 16, 2007).

- Hilgartner, St. 1990. The dominant view of popularisation: Conceptual problems, political uses. *Social Studies of Science* 20:519-39.
- Irwin, A. 2006. The politics of talk: Coming to terms with the 'new' scientific governance. *Social Studies of Science* 63:299-320.
- Irwin, A., and M. Michael. 2003. *Science, social theory and public knowledge*. Maidenhead, PA: Open University Press.
- Irwin, A., and B. Wynne. 2003. *Misunderstanding science? The public reconstruction of science and technology*. Cambridge: Cambridge University Press.
- Jasanoff, S. 1994. *The fifth branch. Science advisers as policymakers*. Cambridge: MA, Harvard University Press.
- Jasanoff, S. 2003. Technologies of humility: Citizen participation in governing science. *Minerva* 41:223-44.
- Kelly, S. E. 2003. Public bioethics and publics: Consensus, boundaries, and participation in biomedical science policy. *Science, Technology, & Human Values* 28:339-64.
- Krimsky, S. 1982. *Genetic alchemy: The social history of the recombinant DNA controversy*. Cambridge, MA: MIT Press.
- Laws, D., and M. Rein. 2003. Reframing practice. Deliberative policy analysis. In *Understanding governance in the network society*, ed. Maarten Hajer and Henk Wagenaar, 172-206. Cambridge: Cambridge University Press.
- Leinhos, M. 2005. The US National Bioethics Advisory Commission as a boundary organization. *Science and Public Policy* 32:423-33.
- Levidow, L., J. Murphy, and S. Carr 2007. Recasting "substantial equivalence:" Transatlantic governance of GM food. *Science, Technology & Human Values* 32:26-64.
- Marx, K. 1996. *Capital, vol. 1*. London, UK: Lawrence and Wishart.
- Memmi, D. 1996. *Les Gardiens du Corps. Dix Ans de Magistère Bio-éthique*. Paris, France: Editions de l'EHESS.
- NER. 2006. *Informationen und Nachrichten aus dem Nationalen Ethikrat*: VZK 64247, no. 11, August 2006 [database online] Nationaler Ethikrat. <http://www.ethikrat.org> (accessed September 1, 2006).
- Plough, A., and S. Krimsky. 1987. The emergence of risk communications studies: social and political context. *Science, Technology, and Human Values* 12:4-10.
- Rein, M., and D. A. Schön. 1993. Reframing policy discourse. In *The argumentative turn in policy analysis and planning*, ed. Frank Fischer and John Forester, 145-66. London, UK: UCL Press.
- Rose, N. 1996. Governing "advanced" liberal democracies. In *Foucault and political reason. Liberalism, neo-liberalism and rationalities of government*, ed. Andrew Barry, Thomas Osborne, and Nikolas Rose, 37-64. Bedford, UK: UCL Press.

- Rose, N., and C. Novas. 2005. Biological citizenship. In *Global assemblages: Technology, politics, and ethics as anthropological problems*, ed. Aihwa Ong and J. Stephen Collier, 439-63. Oxford, UK: Blackwell.
- Salter, B., and Ch. Salter. 2007. Bioethics and the global moral economy: The cultural politics of human embryonic stem cell science. *Science, Technology and Human Values* 32:554-81.
- Salter, B., and M. Jones. 2005. Biobanks and bioethics: The politics of legitimation. *Journal of European Public Policy* 12:710-32.
- STC. 2005. *House of Commons Science and Technology Select Committee: Human Reproductive Technologies and the Law*. London, UK: The Stationery Office.
- Warnock, M. 1985. *A question of life: The Warnock report on human fertilization and embryology*. Oxford, UK: Blackwell.
- Weber, M. 1978. *Economy and society. An outline of interpretative sociology*, ed. Guenther Roth and Claus Wittich. Berkeley, CA: University of California Press.
- Wildavsky, A. 1979. *Speaking truth to power. The art and craft of policy analysis*. Boston: Little, Brown.
- Wright, S. 1994. *Molecular politics: Developing American and British Regulatory Policy for genetic engineering, 1972-1982*. Chicago, IL: Chicago University Press.
- Wynne, B. 1991. Knowledges in context. *Science, Technology, and Human Values* 16:111-21.
- Wynne, B. 1995. Public understanding of science. In *Handbook of science and technology studies*, ed. Sheila Jasanoff, Gerald E. Markle, James C. Petersen, and Trevor Pinch, 361-88. London, UK: SAGE.
- Wynne, B. 1996. May the sheep safely graze? A reflexive view of the expert-lay knowledge divide. In *Risk, environment & modernity. Towards a new ecology*, ed. S. Lash, B. Szerszynski, and B. Wynne, 44-82. London, UK: SAGE.
- Yoxen, E. 1990. Conflicting concerns: The political context of recent embryo research policy in Britain. In *The new reproductive technologies*, ed. Maureen McNeil, Ian Varcoe, and Steven Yearley, 173-99. Houndmills, Basingstoke: Macmillan.

Bios

Kathrin Braun is a pl. professor and researcher at the Leibniz University of Hanover. Her research focuses on the challenges of developments in biomedicine for democratic governance and human rights and on the nexus of modernism, biopolitics and a technocratic style of governance.

Svea Luise Herrmann is a political scientist and research associate at the Leibniz University Hanover. She has done research on biopolitics, bioethics policy, and reprogenetics policy discourse in Germany and Great Britain. Currently she is working on eugenics and restorative justice.

Sabine Könniger is research assistant at the Karlsruhe Institute of Technology and PhD student in Political Sciences at the Leibniz University Hannover. Her research interests are the Politics of Ethics especially in the field of bio- and nanotechnology, public policy analysis and biopolitics.

Alfred Moore is a lecturer in political theory at University College Cork and visiting assistant professor at the University of British Columbia. His current research is on the relations between contemporary sociology of science and mainstream democratic theory.