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Life, Science, and Biopower

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Abstract

This article critically engages with the influential theory of "molecularized biopower" and "politics of life" developed by Paul Rabinow and Nikolas Rose. Molecularization is assumed to signal the end of population-centred biopolitics and the disciplining of subjects as described by Foucault, and the rise of new forms of biosociality and biological citizenship. Drawing on empirical work in Science and Technology Studies (STS), we argue that this account is limited by a focus on novelty and assumptions about the transformative power of the genetic life sciences. We suggest that biopower consists of a more complex cluster of relationships between the molecular and the population. The biological existence of different human beings is politicized through different complementary and competing discourses around medical therapies, choices at the beginning and end of life, public health, environment, migration and border controls, implying a multiple rather than a singular politics of life.

Keywords

biopower, biopolitics, life sciences, politics of life, molecular politics

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1. Introduction: Foucault, STS and the Biological Sciences

In the history of Science and Technology Studies (STS), the legacy of Michel Foucault has been a mixed one. It is possible to find introductory textbooks to the field (David 2005; Yearley 2005) without any mention of his work, but is evident that many of his ideas have been very influential for STS scholars interested in exploring the complex connections between knowledge, power, and change, especially through the practices of ordering (Law 1994; Bowker and Star 1999) and the recovery of "subjugated knowledges" (Watson-Verran and Turnbull 1995; Epstein 1996). Beginning with the Human Genome Project in the 1990s, social scientists across a number of different disciplines have become interested in the biological sciences, and, in this context, Foucault's ideas on biopower and biopolitics have proved to be productive for sociologists, anthropologists, political scientists, psychologists, and some STS scholars interested in the consequences of changes in the biosciences, biomedicine, and biotechnology (Andree 2002; Bates 2005; Coors 2003; Flower and Heath 1993; Ganchoff 2004; Lemke 2004; Kaufman and Morgan 2005; Kent et al. 2006; Koch 2004; Krones et al. 2005; Petersen and Bunton 2002; Petersen and Lupton 1996; Polzer et al. 2002; Rabinow 1996, 1999; Rabinow and Rose 2006; Rock 2003; Rose 2001, 2006; Rose and Novas 2004; Shostak 2005; Skinner 2006; Waldby and Mitchell 2006).

Within this literature, the recent work of Paul Rabinow and Nikolas Rose (Rabinow 1996; Rose 2001, 2006; Rabinow and Rose 2003, 2006; Rose and Novas 2004) has become especially influential. One paper by Rose (2001), "The Politics of Life Itself," is widely cited, including in STS circles (Shostak 2005; Skinner 2006) to support the claim that we are living in an era where life, the life sciences, their institutions and practices, and indeed, politics itself are becoming increasingly "molecularized." Understood as the impact of genetic science on institutions, societies, and individuals, molecularization is taken to signal the rise of key changes in the configuration of biopolitics and biopower from that analyzed by Foucault, in particular, the supplanting of interventions from "above" by those from "below." In this article, we draw on our own and other empirical work in STS and related fields to critically interrogate the account of a new molecular biopower advanced in Rabinow and Rose's body of work.

Our central aim is to explore the following question: how should social scientists conceptualize biopower today? Does the rise of the genetic life sciences mean that biopower has taken on a correspondingly distinctive

form that, as Rabinow and Rose suggest, departs from its previous association with population-centred techniques and disciplining of subjects? What does this account omit both in terms of how we understand the scope of biopower and empirically investigate developments in the life sciences? We begin our discussion with a review of Foucault's writings on biopower followed by a summary of Rabinow and Rose's account of molecularized biopower. Drawing on a range of empirical examples, we then focus on some of the limitations of their account, in particular, their interpretation of the transformative role of the life sciences. The article concludes by outlining some key issues that need to be investigated if we are to better understand the cluster of multiple relationships that make up contemporary biopower.

2. Foucault on Biopower

In the *History of Sexuality*, Foucault argued that a new form of power emerged at the threshold of modernity. He contrasted this "biopower" with the classical form of sovereign power in this famous quote "one might say that the ancient right to *take* life or *let* live was replaced by a power to *foster* life or *disallow* it to the point of death" (Foucault 1978, 138, italics original). Biopower was thus concerned with power over the unfolding and administration of life rather than with decisions about the subject's right to live. Foucault elaborated on it as follows:

> This power over life evolved in two basic forms; these forms were not antithetical, however; they constituted rather two poles of development linked together by a whole intermediary cluster of relations. One of these poles—the first to be formed, it seems—centred on the body as machine: its disciplining, the optimization of its capabilities, the extortion of its forces, the parallel increase of its usefulness and its docility, its integration into systems of efficient and economic controls, all this was ensured by the procedures of power that characterised the *disciplines*: an *anatomo-politics of the human body*. The second, formed somewhat later, focused on the species body, the body imbued with the mechanics of life and serving as the basis of the biological processes: propagation, births and mortality, the level of health, life expectancy and longevity [. . .] Their supervision was effected through an entire series of interventions and *regulatory controls*: a *bio-politics of the population*. (Foucault 1978, 139, italics original)

Biopolitics was therefore associated with particular strategies to govern populations, and, in the process, was differentiated from strategies for

disciplining individual bodies (i.e., anatomo-politics), though both were held to coexist by the eighteenth century. What they had in common was an emerging power over life. Why, though, should this development be of anything other than historical interest? A clue for contemporary analysts is found in Foucault's characterization of biopolitics as "the endeavor, begun in the eighteenth century, to rationalise problems presented to governmental practice by the phenomena characteristic of a group of living human beings constituted as a population" (Foucault 2003a, 202). As Mitchell Dean (1999) elaborates:

> It is concerned with matters of life and death, with birth and propagation, with health and illness, both physical and mental, and with the processes that sustain or retard the optimisation of the life of the population. Bio-politics must then also concern the social, cultural, environmental, economic and geographical conditions under which humans live, procreate, become ill, maintain health or become healthy, and die. From this perspective bio-politics is concerned with the family, living conditions, with what we call 'lifestyle', with public health issues, patterns of migration, levels of economic growth and the standards of living. It is concerned with the biosphere in which humans dwell. (Dean 1999, 99)

These statements enjoin us to look anew at concepts (e.g., of a population) and state activities (e.g., governing of health) that now appear mundane and largely uncontroversial. How did the biological become a legitimate matter for government intervention and political action, and what have been the consequences? Biopolitics acquires its legitimacy, we learn, in conjunction with the development of new forms of knowledge or regimes of truth (demography, epidemiology, statistics) built on visualizing living, working social beings as a collective ("population") with certain distinctive traits (such as mortality and morbidity) that are deemed to be knowable. This allows fundamental experiences of life and death, health and suffering, and individual and collective identity to become linked to the exercise of power by the state (Dean 1999). However, biopolitical interventions are not just centred in the state as they work in conjunction with a range of specialized agencies and, crucially, through modes of subjectification. Members of a population are no longer held to be merely territorially bound participants obliged to submit to their sovereign ruler, but vital beings with *their own* habits, norms, and everyday practices. This means they are capable of working on themselves in their self interest to improve and optimize their lives and life chances, and in turn, enable biopolitical interventions by various authorities to work.

In sum, in Foucault's account, biopower refers to the conjunction of strategies adopted by the state and a diverse range of institutions and agencies to constitute and govern the population, made possible by forms of specialized knowledge and self-governing participants. The great Victorian public health strategies for controlling the spread of infection represent one of the classic examples of biopolitics in the nineteenth and early twentieth centuries. In these campaigns for urban sanitation systems and public hygiene, people became enrolled in practices of governance as new habits (the now routinized norm of handwashing) were established on the grounds of self-interest as much as the interest of institutional authorities. However, these urban environmental interventions also became part of the basis for building the modern state (Porter 1999), and contributed to the rethinking of the early dichotomy in Foucault's writing between sovereign power and biopower. Although the quote from *The History of Sexuality* at the start of this article clearly states that biopower had come to *replace* sovereign power, Foucault went on to outline a more complicated relationship between these different forms of power. In *Society must be Defended* (2003b), Foucault clarifies:

> I wouldn't say exactly that sovereignty's old right—to take life or let live—was replaced, but it came to be complemented by a new right which does not erase the old right but which does penetrate it, permeate it (Foucault 2003b, 241).

By looking at the interpellation of sovereign and bio power, Foucault was able to offer an answer to an apparent paradox produced by the rise of biopolitics. In his lecture on the "Birth of Biopolitics" given in 1979, Foucault posed a key question: how could this government of populations be accounted for when liberalism was also beginning to emerge as the dominant practice of political rule? If liberalism seeks to promote individual autonomy and free enterprise, and to limit the exercise of government, how could the administration of the population be justified and effected? Does not the focus on the collective lead to a situation of governing "too much" (the bete noire of liberalism) rather than "too little"?

While Foucault did not elaborate on this in detail, subsequent authors (e.g., Dean 1999, 107-8) have built on his work to argue that the new notion of the population—and expert knowledge generated about it—actually made a distinctively liberal mode of government possible that permitted the periodic exercise of sovereign power. While biopolitical government largely works through self-governing participants (a governmentality which "solves" the liberal challenge), it also permits the illiberal management of

unruly individuals or groups by appealing to the notion of a "society" that is internally complex and that may periodically require intervention by the state for its maintenance and security. In sum, "biopolitics" signifies from the start a conceptual complexity that is in keeping with real tensions between the simultaneous promotion of individual freedom and the justification of coercive strategies in liberal societies.

3. Biopower and the Life Sciences

When social scientists began to examine the possible implications of the Human Genome Project (HGP) in the early 1990s, Foucault's writings on biopower became a significant reference point. For example, Flower and Heath (1993) suggested that the new genetic technologies emerging out of the HGP would form a new disciplinary power, imposing and inducing particular behaviors on individual bodies through surveillance regimes of genetic screening, testing, and research, albeit within a dispersed and differentiated structure of power relations. This would therefore mark a new development in the exercise of biopower whereby the twin poles of anatomo-politics and biopolitics would be conjoined into a new "macromolecular politics" signifying power/knowledge of both the individual and the human species. Another much more influential approach to Foucault's writings on biopower has come from the work of Paul Rabinow and Nikolas Rose. In contrast to Flower and Heath's emphasis on the HGP and its role in extending the disciplining of bodies and surveillance of societies, Rabinow and Rose invoke a more pastoral picture in which individuals begin to draw on science to articulate their own judgments and political claims and the state enables them to take greater responsibility for their own vitality.

Rabinow and Rose suggest that from Foucault we should learn "a movement of thought that invents, makes use of, and modifies conceptual tools as they are set into a relation with specific practices and problems that they themselves help us form in new ways. When they have done this work, without regret, they can be recycled or even discarded" (Rabinow and Rose 2003, xv). In this article, we scrutinize their work to see how they have modified, recycled, and discarded some elements from Foucault to provide a certain account of biopower that, as we suggest, has some insights but also some major shortcomings. We focus on an interconnected body of work that Rabinow and Rose have published together (Rabinow and Rose 2003, 2006), individually (Rabinow 1996; Rose 2001, 2006), and with other authors (Rose and Novas 2004).[1] After highlighting their key claims, we develop a critique of their work, drawing on studies from STS and related

fields that we believe challenge their accounts of contemporary biopower and biopolitics.

Responding to Foucauldian ideas employed in recent political theory (Agamben 1998; Hardt and Negri 2001), Rabinow and Rose (2006) argue that the concept of biopower has come to be used in such a totalizing fashion that it has lost the analytical specificity intended by Foucault. First, they point out that although Foucault initially examined biopower in terms of administrative activities of the state, he eventually moved on to a wider appreciation of the diffuse networks and modes of organizational and individual conduct—not all of these can be tied back to a coherent set of objectives embedded in the state or other forms of authority. Thinking of biopower as a paramount force regulating life from the interior, as Hardt and Negri (2001) do, is therefore misleading. If biopower is everywhere, it is nowhere. Rabinow and Rose therefore suggest that we need to have a clear, analytical definition of what it constitutes. They propose that biopower operates through the following elements: truth discourses about the vital character of living human beings articulated by a number of competent authorities (which do not necessarily have to be from within the discipline of biology); strategies for interventions into the collective existence of whole populations or subgroups in the name of health and life; and, the modes of subjectification by which individuals work upon themselves in relation to the above. The precise nature of these elements may, however, vary over time. Hence, we cannot assume that biopower today is the same as the form it took in the eighteenth century or, as Agamben (1998) suggests, in the Nazi concentration camps that, in the view of Rabinow and Rose, constitute an *exceptional* moment rather than one that typifies biopower.

The writings on biopower by Rabinow and Rose seem to imply that, today, the "truth discourses" about the vital character of human beings are those associated with the genetic life sciences. These scientific discourses do not take the population as their object of knowledge or as the basis on which truth claims are made about human life and vitality. Instead, as Rose recounts, over the course of the twentieth century, a molecular vision of life has emerged (cf. Kay 1993) so that today "life is now understood, and acted upon, at the molecular level" (Rose 2006, 12). The molecule has therefore come to replace the population in contemporary biopower.

This is reflected in the way that Rabinow and Rose discuss biopolitics. They offer one general definition that biopolitics refers to: "all the specific strategies and contestations over problematizations of *collective* human vitality, morbidity and mortality; over forms of knowledge, regimes of authority and practices of interventions that are desirable, legitimate and

efficacious" (Rabinow and Rose 2006, 197, our emphasis). This has strong echoes of Foucault's own language and could encompass activities in a range of fields from social statistics to public health. However, they appear to claim that today biopolitics has a more specific site of action, becoming:

> A matter of the meticulous work of the laboratory in its attempts to create new phenomena, the massive computing power of the apparatus that seeks to link medical histories and family genealogies with genomic sequences, the marketing powers of the pharmaceutical companies, the regulatory strategies of research ethics, drug licensing bodies, committees and bioethics commissions, and, of course, the search for profits and shareholder value that truth here promises. (Rabinow and Rose 2003, xxxi)

Therefore, in the conduct, regulation, governance, and marketing of research in the life sciences, we find contemporary strategies and contestations of collective human vitality that have taken on a very different character—according to Rabinow and Rose—to the biopolitics of the nineteenth century. As Rose (2001) recounts, in the past, the state sponsored two biopolitical strategies aimed at improving the population. The first was concerned with what Rose calls the hygiene of the population, focusing both on fostering individual behavior that was becoming of good physical and moral health and improvements to urban environments to combat infectious disease. The second was concerned with the reproduction of the population—in other words the eugenic interventions that persuaded some to reproduce more and dissuaded and coerced others not to do so. Today, such biopolitical interventions are at an end. Now states do not "claim—or are given—the right, the power, or the obligation to make such judgements in the name of the quality of the population or the health of the gene pool" (Rose 2006, 254). Now, each individual citizen is encouraged to take responsibility of their own health, to manage their own lifestyle in a way that will optimize their health. The state is "no longer expected to resolve society's need for health" (Rose 2001, 6).

With this decline in the role of the state, Rabinow and Rose (2006) highlight the appearance of patient groups or disease advocacy organizations organized with utilizing new biomedical knowledge about genetic predispositions and disease to aid people with certain conditions. These groups are celebrated as examples of how people are indeed taking responsibility for their own health, informing themselves of their conditions, taking appropriate action where possible, petitioning for recognition and resources, and forging collaborations with scientists to find cures. For Rabinow and Rose, the

analysis of biopolitics needs to examine these self-organizing groups as increasingly significant actors because they represent new forms of (bio)sociality (Rabinow 1996), and reflect broader transformations in people's understanding of themselves as "somatic" individuals or as "biological" citizens (Rose and Novas 2004).

A striking aspect of Rabinow and Rose's account of these new biological self-understandings is the dissociation from the disciplinary character typically emphasized in Foucault's and other Foucauldian accounts. As we noted earlier, Foucault's notion of biopower was distinctive in emphasizing the role of subjectification in the production of power. Even a classic figure of the state's power to discipline and control, the panopticon, is seen to work through self-governance. Other less obviously coercive strategies that comprised what he called anatomo-politics also worked through disciplining the body. However, we get a sense in these relational accounts of power that subjectification works in tandem with institutional authorities and helps maintain what appears as power centred in these spaces. By contrast, Rabinow and Rose's account of biopower dispenses with any references to anatomopolitics or the disciplinary nature of individual action; indeed, Rabinow (1996) observes that biosocieties are now postdisciplinary. So, while they suggest that individuals "work upon themselves" in relation to new molecular knowledge and collective strategies and contestations about life itself, these modes of subjectification reflect what Rose calls "ethopolitics."

Ethopolitics is defined as the "self-techniques by which human beings should judge themselves and act upon themselves to make themselves better than they are," and contrasted with disciplinary power which "individualizes and normalizes" and biopower which "collectivizes and socializes" (Rose 2001, 18). Ethopolitics, Rose argues, has coalesced around life itself as a certain contested political and ethical value as witnessed by debates about abortion, stem cell research, and euthanasia. With the state "no longer expected to resolve society's need for health," individuals are now governing themselves, taking responsibility for their own health, making decisions about reproduction, genetic testing, participation in clinical trials, or biobanks free from state coercion but in alliance with a plethora of "experts of life." In this context, the knowledge claims of the sciences no longer signify old-fashioned biological determinism or its capacity for legitimizing illiberal interventions. Far from being seen in fatalistic or deterministic terms, biology is now to be worked on, to be changed as part of an "economy of hope" (Rose and Novas 2004).

In summary, our reading of the work of Rabinow and Rose reveals an account of biopower which seems to be constituted by two intersecting

elements—biopolitics and ethopolitics. Biopolitics is no longer defined as it was in Foucault's account by the state (understood to include a range of administrative agencies and expert bodies rather than the formally designated state alone) and the object of inquiry and intervention, the population. Today, there is a biopolitics "from below" of biosocial groups making claims to recognition and forging partnerships with scientists and other experts in ways that are no longer linked to the maintenance of state biopolitical strategies. Therefore, this biopolitics is not characterized by coercive power relations; it does not create, legitimate, or reinforce social inequalities unlike, say, the "racial science" of the nineteenth and twentieth centuries, nor is it preoccupied with eugenic considerations about miscegenation or pollution of the population. Central to these changes has been a number of key developments in the life sciences whereby a molecular understanding of life has emerged and taken hold. Therefore, for Rabinow and Rose, "molecular biopolitics" defines a series of intersecting elements of a molecular vision of life, the rise of new forms of biosociality and biological citizenship, and a new, flexible nondeterministic biologism. In the next part of the article, we discuss our criticisms of their account of biopower.

4. Problems with the "New" Biopower

In what follows, we address a number of key problems arising from the account of biopower that emerges from the body of work authored by Rabinow and Rose. Our aim is to highlight some of the limitations of Rabinow and Rose's account of biopower with reference to evidence produced by empirical studies in STS and related fields and to consider some of the conceptual implications of our critique. We also draw on recent critiques of Rose's work on the "politics of life itself" (Kerr 2003; Braun 2007) and of Rose and Novas' work on biological citizenship (Plows and Boddington 2006). We organize our comments in relation to their claims about the "truth discourses" of life, biopolitics, and ethopolitics.

Our first concern is that in effect the account of Rabinow and Rose conceptualizes biopower in terms of the discourses of actors who inhabit the scientific commercial, clinical, social, and ethical spaces associated with the life sciences. Therefore, they seem to equate the "truth discourses" about human life, vitality, health, and illness today with those that focus on the level of the molecular. In turn, they seem to presume that such molecular discourses are necessarily opposed to discourses of the population.

However, the molecular, the population, and the life sciences are linked in more complicated ways as we outline below.

First, it can be seen that visions of the population strongly influence the epistemic frameworks and design of molecular research, the enrolment of publics in research activities, and promises of their impact on clinical practice and health care. Arguably, the population is intrinsic to investigations into the causes of complex human diseases and into variation in drug response—the very areas of research about which there are great expectations for the life sciences to deliver new therapies and diagnostics (Nightingale and Martin 2004). Investment during the last decade in creating biobanks and other kinds of biorepositories has tended to rely on population-based strategies to produce the statistically robust datasets that are deemed necessary to determine the complex interplay of genetic and environmental factors in disease etiology. Moreover, many of these have been organized at the level of the nation–state and have appealed to imagined national communities and traditional notions of social welfare in seeking to enrol research participants and establish public legitimacy (Busby and Martin 2006).[2]

For instance, in the study of infectious diseases and infection control, public health science continues to be heavily influenced by a population perspective. Indeed, in the case of the recent "scare" over the MMR (Measles, Mumps and Rubella) vaccine in the United Kingdom, the dominant population-based epidemiological techniques of risk estimation were largely unquestioned in scientific studies and government assurances about vaccine safety. Some campaign groups did challenge this population-centred style of science by calling for clinical research that would consider individual biological pathways of potential links to bowel disease and autism (Hobson-West 2005; Leach 2005). Indeed, a few argued for the development of tests that might detect the genetic basis of fragility to vaccines, but these arguments were marginalized in the debate over vaccine safety (Hobson-West 2007).

Moreover, by focusing solely on the life sciences (as represented by molecular biology, genomics, or biotechnology), Rabinow and Rose seem to discount practices and forms of knowledge that Foucault and Foucauldian scholars (including Rose in his previous work) have identified as characteristic of biopower—the production of social statistics on matters ranging from population growth, patterns of migration, levels of economic growth, standards of living, and public health. Governments through various statistical agencies still produce statistics concerning the condition of the national population at regular intervals, and use specialized instruments

such as epidemiology and demography to investigate trends in health disparities, employment patterns, mortality and morbidity, and the like. We suggest that this form of knowledge about populations remains highly relevant to an analysis of contemporary biopower.

There is evidence, for example, that population categories produced in the arena of social statistics impact on research design in the life sciences through state regulation. As Steve Epstein (2007) documents, the 1993 Health Revitalisation Act mandated the US National Institutes of Health (NIH) to ensure that investigators included women and minority groups in their research and studied their potential differences. To meet this policy objective, the NIH adopted the racial and ethnic categories produced by the Office of Management and Budget (OMB) for the US census and other social statistical surveys to monitor the inclusion of population groups in studies (Friedman et al. 2000). This is despite the view of the OMB that these categories should not be considered as anthropological or scientific in nature but as "socio-political" constructs. Nonetheless, there is evidence that these self-identified sociopolitical categories are becoming a part of biomedical knowledge production, justified on both scientific and public policy grounds (Risch et al. 2002; Smart et al. 2008).[3]

Therefore, if contemporary truth discourses about life contain a hybrid of molecular and population categories, it is no surprise that biopolitical interventions developed on this basis are then too complex to support the claim that the old biopolitics from above has given way to a new biopolitics from below. While we accept that the "great biopolitical strategy" of coercive eugenics is no longer a part of state intervention, there are still normalized and more mundane population-based interventions, led or coordinated by governments, that represent important aspects of what we might call "state biopolitics." Through the work of agencies such as the Health Protection Agency in the UK and the Centers for Disease Control (CDC) in the United States, public health remains a key area of government action encompassing strategies for infection control (through childhood vaccination or surveillance of pathogens, humans, and animals in hospitals, workplaces, and the community), and the monitoring of chemical and radiation hazards. Although Rose and Novas (2004) recognize the endurance of infection control, they seem to assume that it is no longer a part of current struggles over the scope of biopolitical interventions. This makes it possible to claim as Rose (2001) has done elsewhere that the state largely plays a pastoral or enabling role in the new politics of life. Yet, practices to contain infection combine a set of individual obligations with mechanisms of top-down control rather than one or the other. For example, in the United Kingdom, (the

lack of) handwashing has become politically salient, putting technologies of the professional self under public scrutiny, while a review of UK public health law (Department of Health 2007) sparked concerns about the potential extension of coercive powers and the criminalization of HIV-positive individuals.[4]

Molecular discourses around microbiology and immunology are also being enrolled in the construction of population-based interventions by nation–states and transnational organizations of governance. Nicholas King (2002) has argued that new truth claims around emerging infectious diseases in the West are shaped by underlying paradigms of national security and global commerce. With renewed importance to migration and border controls, states have invested in systems of surveillance and information management, some of which take precisely the individual variation of human bodies as its object of identification in the form of biometric databases (Amoore 2006). In relation to developments around the fear of global epidemics, Braun (2007) argues that biopolitics appears to be converging with *geopolitics*, in ways that extend coercive power and enable the multiplication of surveillance networks. Here, molecular science helps frame a fearful discourse of a body politic embedded in an unpredictable and chaotic world (Braun 2007, 14) rather than the hopeful discourse emphasized by Rose and Novas. Microbiological truth claims support interventions undertaken in the name of national biosecurity, as seen, for example, in a recent amendment of UK port health law requiring prospective migrants from designated high-risk countries to certify that they do not carry the bacterium associated with tuberculosis. While such population discourses are periodically challenged on the basis of individual rights or their questionable evidence base (Coker 2004), it is difficult to support the claim that population biopolitics have been entirely displaced by individual judgment, or that potentially authoritarian interventions no longer appeal to the truth discourse of bioscience as Rabinow and Rose (2003, xxix) seem to suggest.

Looking in more detail at the formation of disease advocacy, organizations and other patient support groups, which Rabinow and Rose (2006) and Rose and Novas (2004) see as evidence of the new biopolitics "from below," we can see that their accounts are problematic. As Plows and Boddington (2006) suggest, the focus seems to be on the experiences of a select group of actors in a particular time and space, which sidelines groups that are critical of the promises of biomedicine and biotechnology or that oppose the market structures that shape research priorities. Since biopolitics is assumed to revolve around claims about "life itself," alternative or "subjugated" discourses that aim to step out of this dominant framing are

ignored. For example, critical opposition to California's Proposition 71 that sought to provide state funding for embryonic stem cell research did not only involve pro-life arguments about the status of the embryo. Some feminists argued that they were pro-choice on abortion, yet concerned about the prospective creation of a biological marketplace and state subsidy of biotechnology companies at a time when millions lacked basic health care.[5] It is also the case that while Rose and Novas (2004) briefly acknowledge critiques of medicalization and geneticization, they treat them as representative of an old guard that no longer characterizes the field of contemporary biopolitics. However, the work of Weiner (2006) shows that disease advocacy groups do not always conceptualize conditions in genetic or molecular terms even where such discourses are well established in the scientific domain. In addition, there is also the possibility of tensions *within* new biosocial groups—as Epstein (1996) has shown in his study of the role of AIDS movements in restructuring clinical trials for new drugs, the focus on access to treatment created considerable fissures and ambivalence within the movements and a growing divide between "lay lay" activists and "lay expert" activists schooled in the language of science and articulating political claims on its basis.

We are also concerned with questions of exclusion and marginalization in relation to the notion of "ethopolitics". As Braun (2007) asks, who has the resources and opportunities to be the kinds of ethopolitical participants envisaged by Rose? Where do migrants, the poor or marginalized populations in the underground economy feature in this account? Are such groups equally well able to make the kinds of choices about their vitality as others? When they successfully organize to articulate their claims, are they able to exert similar influence to others? And how should we relate the claims to new, ethopolitical identities to existing, entrenched identities or structures of social exclusion? In the context of global trade and production, it is valid to ask in what ways is the pursuit of "vitality" by some *interdependent* with the decline in vitality of others? In this respect, the work of Scheper-Hughes (2004) is instructive in revealing the global economic relationships of organ transplantation that shape the capacity of some select minorities to extend their lives.

Of course Rose is not blind to the question of global inequalities: he recognizes that the story of the "politics of life itself" that he recounts is not the *only* politics of life—there is another, characterized by the stubborn, global patterns of inequality in health and wealth that mean a large part of the world's population do not have access to basic medicines or clean running water (Rose 2006). But this other politics of life does indeed seem to be

"othered" when it is an intimately related part of contemporary biopower that needs to be at the centre of social theory rather than at its margins.

With the notion of ethopolitics, Rose appears to reject the concerns of some social scientists writing in the early days of the Human Genome Project (Flower and Heath 1993) about the potential for new disciplinary technologies of power. While the Human Genome Project has not led to centralized disciplinary institutions, it is also fair to say that decisions about life made by ordinary people everyday are made in the context of the pastoral power exercised by professionals including not only those in the public health care sector but increasingly commercial organizations as well. Therefore, social scientists have attended to how, even with the strong rhetorical commitment to individual choice, people encounter genetic knowledge in conditions shaped by clinical practices, the availability of knowledge, and broader social and cultural contexts (Shakespeare 1998; Hallowell 1999; Polzer, Mercer, and Goel 2002; Kerr 2003).

Indeed, if as Rose and Novas (2004) have noted, individuals are now *obliged* to be responsible in the ways specified within a biomedical regime, does this not suggest that disciplinary power remains relevant to our analysis of the bioscientific politics of life? As Hobson-West (2005) has argued, while in the United Kingdom, dissenters to vaccination are no longer subject to the kind of state sanction they faced in the nineteenth century, the absence of legal compulsion to vaccinate should not be seen as the absence of power relations or the complete withdrawal of the state. Rather, the promotion of vaccination by experts and policymakers, and the existence of cultural norms in the health care system between "good" and "bad" parents combine to create an "imperative of vaccination." Therefore, we find that as Kerr (2003) has argued, the stark contrast drawn between the past and the new, individual-centred ethopolitics of the present shows the danger of drawing inferences simply from different rhetorics and ignoring the possibility of potential continuities.

Finally, it is also worth reflecting on how ethopolitics is itself a contested proposition. While Rose writes that ethopolitics takes life as the object of adjudication and talks of contestations around life, its value and meaning, we might also say that ethopolitics as a space of action in which individuals "judge themselves and act upon themselves" (Rose 2001, 18) is also a matter of adjudication and contestation. Those debates about life itself to which Rose refers also impinge directly on who has the right to make judgements in the first place. For instance, the pro-life position on abortion does not only contest the status of the embryo but also the rights of individuals to make decisions that, it is claimed, involve a significant collective

dimension. Therefore, and this is especially vivid in the United States, there is a powerful tension between those who lobby for state intervention to deny people the right to abortion and those who claim to protect individual freedom in the ethopolitical arena described by Rose.

5. Conclusion: Toward a Framework for Exploring the Multiple "Politics of Life"

We began this article with the question of how social scientists should conceptualize biopower today. In particular, should we assume that the rise of the genetic life sciences necessarily signifies the end of population-centred biopolitics and disciplinary biopower and the rise of a distinctively "molecularized" form of biopolitics as suggested by Rabinow and Rose? In this paper, we have examined the limitations of the molecular thesis, arguing that Rabinow and Rose marginalize the significance of structures and practices of the *collective* body that endure from the "old" forms of biopower explored by Foucault. Our purpose, however, is not to call for a wholesale return to Foucault's original accounts of biopower or to deny the significance of social and technical changes of the last several decades. Equally, Flower and Heath's (1993) early vision of the Human Genome Project as the conscription of persons and knowledge in the service of institutionalized power—what they describe as "anatomo-politics" or the governance of bodies becoming conjoined with "biopolitics" or the control of populations—has a deterministic ring to it, threatening to sweep away the contradictions emerging around both the appropriation and the critique of genetics (Brodwin 2005). Rather than try to offer a general theory of biopower based on a few selective examples, we want to highlight new questions for investigation that are missed by the tendency to prejudge the political implications of the life sciences. In conclusion, we ask: how might an STS sensibility toward *contingency* contribute to framing and investigating the relationship between biopower and biological knowledge?

First, we should clarify a common misconception that arises from talking about "enduring structures." Both STS and Foucauldian perspectives reject structure-talk as it seems to imply that there are hidden structures existing in a central place "above" the practices that should be taken to *generate* power, and that these are permanent and static when instead they are contingent and, crucially, capable of transformation. Yet, this counterposition becomes unhelpful when contingency is reified and used to altogether define away the concerns expressed through an appeal to "macro" language. So, we can point to the endurance of the practice of collecting social

statistics—or, indeed, of the state system—while remaining open to changes in this practice or system. Troublesome terms such as "macro/micro" or power from "above or below" enable us to ask certain questions that would otherwise be rendered irrelevant or opaque. They act as sensitizing devices rather than as representing particular answers to these questions since these answers are inevitably contingent on empirical context. So, structure-talk does not mean that we take the world to be made of unchanging, centralized containers of power that impose their will on participants. Rather, it means we look for what is taken to be determinate (or contingent), when, and by whom; how determinancy is made possible and to what effect. Therefore, this approach makes us suspicious of narratives of paradigmatic shifts as implied in the thesis of molecularization. It forces us to examine the interpellation of old and new rather than assume a shift from population to molecular or sovereign to "bio"power.

We agree with Rabinow and Rose's use of "bipower" to refer to the combination of truth discourses about life, strategies for intervention into populations, and contestations around them ("biopolitics"), and modes of subjectification by which individuals work on themselves in relation to the above. However, rather than assume that each of these three elements now exist in distinctively molecular forms, we argue that social scientists need to investigate the structures and dynamics of a *multiple* politics around questions of life that are instantiated at different levels.

Contemporary truth discourses in the "politics of life" and the governmental interventions validated on their basis operate at different levels—from the molecular to the interface between bodies and environment to the collective body—whose coexistence may provoke discordance, generate new syncretic forms, or merely remain unremarkable. For example, the very production of genetic knowledge in national biobanks is shaped by population categories and data. Some public health policies such as childhood vaccination are largely justified in terms of population-centred epidemiology with molecular discourse being largely the domain of a handful of resisters. In others such as policies emerging around national biosecurity, genetic and epidemiological sciences are working in conjunction to identify and monitor new infectious agents. In all, activities originally identified by Foucault as biopolitical remain highly relevant in the exercise of biopower today—social statistics, public health, infection controls—along with other policy interventions such as border controls made in the name of collective security, whether this is defined in terms of human health, quality of life, or protection from dangers emanating from outside the social body. Conceptualizing the domain of biological knowledge and practice this way

forces us to ask how precisely the molecular and the collective are intertwined rather than fetishizing the one at the expense of the other. It also allows us to consider where sovereign power may be extended and intertwined with biopower as Foucault came to suggest in his later work.

Second, experts, institutions, and wider social norms help frame the conditions in which individuals make "choices" about the use of scientific information or technology, or, indeed, discipline themselves as Foucault phrased it. It is misleading to assume that state biopolitics has simply given way to "ethopolitics" where individual judgment and reshaping of the self are paramount and where the state merely exerts pastoral power in the domain of life. By focusing on cases where biopolitical claims and counter-claims are framed in terms of individual choice, there is a danger of implying that individualism is the only discourse that is permitted in the political landscape today and that one must necessarily work within its confines even to challenge dominant practices. Even if we allow that the language of individual choice, rights, and freedom is clearly dominant, we need to examine how it is linked with or challenged by political discourses that appeal to some notion of the collective. In addition to mundane public health interventions by states, we have cited the example of pro-life thinking, which was ensconced in various US government activities. On the other side, we have pointed to examples of "subjugated knowledges" that attempt to challenge or reframe the assumptions of biomedical discourse, and reinscribe the significance of collective priorities for R&D investment and decision-making structures. For example, if we consider the politics of life around climate change, we see the potential for coalescence of individualizing "ethopolitics" and collectivizing "biopolitics" as people are asked to grapple with their personal carbon footprints in the context of moral claims about their impacts on the lives of other people in distant lands and on the biosphere.

This leads us to a third element, namely, the character and boundaries of contestation in contemporary biopower. Challenges to the conduct of the life sciences and the use of biomedical technology are not necessarily also framed by science and by a focus on individual rights to make choices about life. There is evidence that some might be aiming to step outside the language and contestations of "life itself," trying to rekindle debates about capitalism, markets, inequality, and the role of the state.[6] Social scientists studying the life sciences ought to at least recognize such interventions within the field of biopolitical struggles, if only to avoid contributing to their marginalization. Here too, we must consider the complex links between power-from-above and power-from-below. Again, in the case of

climate change, we see individuals challenging government decisions around investment in fossil fuel industries through such actions as climate camps or "sit-ins," which simultaneously confirm the power of the state (otherwise, there is nothing to challenge) and its weakness (otherwise, resistance would not be possible or make an impact).

Therefore, we advocate investigating the nature of the relationship between practices taking the population or the collective body as their target and those that now center on the individual body, as opposed to writing the former out of the picture altogether. Are these older structures and practices transformed, extended, reinforced, or otherwise interlinked with the rise of the genetic life sciences—or, do they perhaps coexist in a hybrid patchwork with new developments, and, if so, on what epistemic basis and to what political effect? The narrative of molecularized biopolitics does not seem to offer the conceptual space to investigate the first question and therefore provides an impoverished response to the second.

In conclusion, we are not denying the significance of new emergent scientific practices or forms of knowledge and their implications for changing discourses of identification, citizenship, or social action. Developments across the various life sciences are significant sites of study for STS and related fields. But we do wish to warn of the dangers of being blinded by the novel. Paying attention to continuities in the contemporary configuration of biopower will help us produce more nuanced accounts that make sense of current developments and link them to existing structures and practices that we argue are still pertinent today. Taking this perspective, we reject the idea of a molecularized form of biopower and instead suggest that actually biopower, to use Foucault's language, is characterized by the molecular and the population as "two poles of development linked together by a whole intermediary cluster of relations." The work that is required, therefore, for scholars in STS and related fields is the tracing and understanding of this cluster of relations.

So, when we talk of biopower, we need to remind ourselves that the "bio" relates not only to the discipline of biology as the account of Rabinow and Rose implies (which is to say with reference to the production of knowledge within the "life sciences"), but also to the broader question of how the biological existence of different human beings is brought into the political domain through a variety of complementary and competing discourses. These might include the discourses of disease, of medical therapies, of public health, of the environment and pollution, of migration and border controls, or of the choices at the beginning and end of life. The advantage of this approach is that it might help to register that there is not

a singular "politics of life" but a multiple politics with inequalities, opportunities, complexities, and dilemmas both individually and collectively, which require a more nuanced exploration.

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Notes

1. We recognize that both Rabinow and Rose have an impressive body of work, produced over two decades, which draws on and interprets the writings of Foucault and which has contributed greatly, in Rose's case for instance, to sociological understandings of subjectivity. However, in this article, we are concerned first and foremost with their more recent work on the life sciences.
2. Such analyses indicate that the rise of biosocial identities is a more contingent and even localized feature of contemporary biopolitics in which what are considered to be older and more traditional forms of identification remain potentially powerful.
3. While there is no similar regulatory requirement in the United Kingdom, recent evidence indicates that scientific investigators are turning to the use of social statistical categories produced by the Office of National Statistics (ONS), the UK counterpart to the OMB. This represents a particularly interesting "categorical alignment" (Epstein 2007) in practices across policy, administrative, and biomedical settings (Smart et al. 2008).
4. The UK Department of Health has issued several handwashing guidelines for doctors and nurses to control the spread of hospital-acquired infection. On the HIV case, see Weait (2007).
5. See report by Rebecca Veseley, "California's Prop 71 divides debate on Stem cells," Women's News, 26 October 2004. Available at http://www.womensenews.org/article.cfm/dyn/aid/2042. Accessed August 18, 2009.
6. Taking the example of Myraid Genetics' patent on BRCA1 and 2, Tutton, Kerr, and Cunningham-Burley (2005) show how debates about gene patents, for example, mobilize a range of complex issues and concerns for different public groups.

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Bios

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