

The Politics of Life Itself

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Life is our life's work. (Mission statement of the pharmaceutical company Pfizer Inc.)

THE BIOLOGICAL existence of human beings has become political in novel ways. The object, target and stake of this new 'vital' politics are human life itself. How might we analyse it?¹ I would like to start from a well known remark by Michel Foucault, in the first volume of *The History of Sexuality*: 'For millennia man remained what he was for Aristotle: a living being with the additional capacity for political existence; modern man is an animal whose politics calls his existence as a living being into question' (Foucault, 1979: 188). Foucault's thesis, as is well known, was that, in Western societies at least, we lived in a 'biopolitical' age. Since the 18th century, political power has no longer been exercised through the stark choice of allowing life or giving death. Political authorities, in alliance with many others, have taken on the task of the management of life in the name of the well-being of the population as a vital order and of each of its living subjects. Politics now addresses the vital processes of human existence: the size and quality of the population; reproduction and human sexuality; conjugal, parental and familial relations; health and disease; birth and death. Biopolitics was inextricably bound up with the rise of the life sciences, the human sciences, clinical medicine. It has given birth to techniques, technologies, experts and apparatuses for the care and administration of the life of each and all, from town planning to health services. And it has given a kind of 'vitalist' character to the existence of individuals as political subjects.

What, then, of biopolitics today? In this article, I suggest that a new configuration of control has taken shape, and that contemporary biopolitics is *risk politics*. I argue that as the truth regimes of the life sciences have mutated, contemporary biopolitics has become *molecular politics*. And I

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think that developments in biomedicine have become deeply intertwined with prevailing technologies of the self, and that contemporary biopolitics is *ethopolitics*.²

Biopolitics as Risk Politics

In the light of the history of biological racism and eugenics in the 19th and 20th centuries, it is not surprising that many sociologists have expressed concerns about the contemporary resurgence of biological and genetic accounts of human capacities and incapacities.³ They have argued that, like previous appeals to biological nature, such developments will tend to generate a politics that *individualizes* human worth, *essentializes* variations in human capacities, *reduces* social phenomena to the aggregate of individual actions, and *discriminates against, constrains or excludes* those found biologically abnormal or defective. Thus they have warned of the dangers of a new determinism – ‘geneticism’ – based on a false but seductive mystique of the power of the genes, and entailing all sorts of discrimination on genetic grounds (Dreyfuss and Nelkin, 1992; Lippman, 1992; Nelkin, 1992; Nelkin and Lindee, 1995; Nelkin and Tancredi, 1994). Some have suggested that we face the real prospect of the rebirth of scientific racism grounded in the apparent objectivity of DNA sequences, and of a new eugenics fuelled not merely by the commercial interests of the biotech companies, but also by parental desires for a perfect child in an age of manipulated consumerism and reproductive choice (Duster, 1990; Hubbard and Wald, 1999; Rifkin, 1998). From such a perspective, the rhetoric that celebrates the potential of biomedicine and biotechnology to improve the health, welfare and quality of life of individuals obscures the threat that new biological practices of control will coerce, restrict and even eliminate those whose biological propensities are believed – by doctors, parents or perhaps even by political authorities – to be defective.

Some locate the wish to control the biological make-up of the population at the very heart of modernity. Thus for both Giorgio Agamben and Zygmunt Bauman the thanatopolitics of population purification is immanent within the very project of biopolitics: to manage the health of the ‘body politic’ inescapably requires the control and elimination of ‘foreign bodies’ (Agamben, 1998; Bauman, 1989). The National Socialism of the German Third Reich certainly exemplifies this link between the administration of life and the administration of death. For example, in a book of 1936 entitled *Rassenhygiene als Wissenschaft und Staatsaufgabe*, Ottmar von Verschuer asserts that politics should mean ‘giving form to the life of the people’ (von Verschuer, 1936: 8, quoted from Agamben, 1998: 148). Life itself, the vital reality of a people, must become the overriding responsibility and criterion that should guide the exercise of political authority. This requires a nationally organized and politically directed programme to improve the quality of the national stock and eliminate taints or weaknesses that might threaten it. Its tactics range from propaganda and education stressing the burden on the race imposed by those with defective constitutions, to eugenic legislation on

marriage, the assessment of reproductive worth by experts working on behalf of the state, the prevention of those who are members of defective or inferior sub-populations from reproducing through sterilization or extermination. Once each life has a value which may be calculated, and some lives have less value than others, such a politics has the obligation to exercise this judgement in the name of the race or the nation. All the eugenic projects of selective reproduction, sterilization and incarceration follow. Indeed, Agamben asserts that 'the camp' is the 'biopolitical paradigm of the modern': when the collective body of the people becomes the principal resource for politics, the purging of defective individuals becomes an essential part of the care of life (Agamben, 1998).

As Lene Koch has pointed out, references to eugenics in many contemporary evaluations of biomedicine have a characteristic rhetorical function.⁴ Some invoke eugenics to distinguish the present from the past: thus contemporary molecular geneticists usually argue that their discipline, in common with the rest of medicine, has decisively rejected eugenics in favour of individualized, voluntary, informed, ethical, preventive medicine organized around the pursuit of health. Others invoke eugenics to link the present with the past, suggesting that despite its differences, contemporary biomedicine, in combination with genetics, still judges human life and worth, in so far as it intervenes upon the chances of life in order to eliminate differences coded as defects. But Agamben and Bauman are undoubtedly correct in suggesting that, over the course of the 20th century, there was no such clear distinction between preventive medicine and eugenics, between the pursuit of health and the elimination of unfitness, between consent and compulsion.

At the start of the 20th century, two great state-sponsored biopolitical strategies were taking shape across the nation states of Europe and North America and in many of their colonies. The first sought to maximize the fitness of the population by adding an individualized attention to the habits of subjects to the earlier hygienic concern with securing the external conditions of health through town planning, sewage systems and the like. Taking its cue from the moralizing interventions into the habits of the poor that had proliferated in the second half of the 19th century, this 'neo-hygienist' programme sought to instil habits conducive to physical and moral health into each individual via the machinery of the domesticated home and the school, linked with such disciplinary and tutelary measures as medical inspection of schoolchildren, health visitors, clinics and so forth (Donzelot, 1979; Rose, 1985). Health here formed a kind of transactional zone between political concerns for the fitness of the nation and personal techniques for the care of self.

The second great biopolitical strategy also sought to maximize the fitness of the population, but it privileged one site – that of reproduction. Eugenics sought to improve the body politic and to relieve it of the economic and social burdens of disease and degeneracy in the future by acting upon the reproductive decisions and capacities of individuals in the present (of

the many general accounts of eugenics, perhaps the best is Kevles, 1985). Eugenic programmes used a combination of incentives and compulsion to modulate the wish or ability of individuals in certain categories to procreate – those judged to have hereditary disease, to be deranged, feeble-minded or physically defective, those who were deemed habitually or incorrigibly immoral or anti-social, especially those guilty of sexual crimes and alcoholics. ‘Positive’ eugenic measures ranged from exhortation to family allowances. ‘Negative’ eugenic measures ranged from abortion, through segregation, more or less involuntary sterilization, to ‘euthanasia’.

There were many disputes between those allied with the eugenic movement and those who argued for preventive medicine and public health education. But the operational relations between these strategies were more complex: eugenic themes were present in much politics of public health, and public health and preventive medicine seemed to many to be compatible with eugenic thought. Infused with a more or less virulent racism, eugenic policies of forced or coerced sterilization of those considered threats to the quality of the population – notably inhabitants of mental hospitals, the ‘feeble-minded’ and those deemed incorrigibly immoral or anti-social – spread across the United States and Europe and reached their bloody apotheosis in Germany.⁵ In the 1920s and 1930s, such sterilization laws were passed in many states in the United States, in Switzerland, Denmark, Finland, Germany, Norway, Estonia, Iceland, Mexico (Vera Cruz), Cuba, Czechoslovakia, Yugoslavia, Lithuania, Latvia, Hungary and Turkey. But coercion was only one element in these strategies, which also sought to modify public attitudes and individual judgements by education and counselling. Even under Nazi eugenics, at least as far as mental pathologies were concerned, sterilization and euthanasia were not merely a noxious imposition from above. In the context of the eugenic domination of the medical and scientific literature, many German doctors took their own decisions on eugenic grounds; in the context of a widespread campaign of propaganda and public education, parents often requested eugenic measures for their own children (Burleigh, 1994).

Thus it is not surprising that sterilization on eugenic grounds continued into the post-war period in a number of democratic nations.⁶ Many scientists and policy-makers saw nationally planned and state-directed eugenic practices as quite compatible with rationalities of welfare. Sweden is the exemplar.⁷ Here, from 1935 up until 1975, a kind of pastoral eugenics was practised, within the context of a developing paternalistic welfare state. It was modelled on the responsibilities of a good shepherd – who must, of course, be prepared to take sometimes harsh decisions in order to reduce the burden that weak or sickly sheep would otherwise place upon the flock as a whole (cf. Foucault, 2001). Eugenic arguments, informed by a wish to improve the quality, fitness and health of the national population, also underpinned pro-natalist policies such as family allowances and prenuptial examinations in France, and the key actors saw no contradiction between eugenic and hygienic strategies to combat ‘social evils’ (Carol, 1995;

Drouard, 1999). And, at least up until the 1950s in Britain and the United States, eugenic considerations infused reproductive advice to prospective parents in the new profession of genetic counselling: such advice was considered especially important for those subjects with a family history of inherited defects or disease who lacked the moral capacity to appreciate the implications and hence control their reproduction.⁸

State-organized or state-supported tactics for modification of reproductive decisions and capacities in the name of the health of the population thus played a part in the medical and biological politics of many liberal democratic societies across the 20th century in the name of preventive medicine and public health. However great the moral and political distance between the euthanasia, compulsory sterilization and genetic counselling, we cannot simply counterpose positive to negative policies, voluntary to compulsory measures, coercion and persuasion. How, then, might one begin to mark out the specificity of our contemporary biopolitics? The biopolitics of the first half of the 20th century, both in its neo-hygienist and in its eugenic form, involved more than the idea that, other things being equal, healthy individuals were more desirable than those who were unhealthy. Health was understood as fitness, and the problem was framed in terms of the political importance attached to the fitness of the national population considered *en masse*, as it competed with other national populations. Population fitness was liable to threats from within and without, and national governments had the obligation to guard against these threats and to take measures to enhance that fitness through policies that were formulated by, and enacted through, the apparatus of the state. But, unlike Agamben and Bauman, I think that contemporary biopolitics differs in crucial respects. As many have pointed out, the political rationalities of our present are no longer inspired by the dream of the taking in charge of the lives of each in the name of the destiny of all (see Rose, 1999). The ideal of an omniscient social state that would shape, coordinate and manage the affairs of all sectors of society has fallen into disrepute. The idea of ‘society’ as a single, if heterogeneous, domain with a national culture, a national population, a national destiny, co-extensive with a national territory and the powers of a national political government has entered a crisis. The idea of a ‘national culture’ has given way to that of ‘cultures’, national identity to a complex array of identity politics, ‘community’ to communities. In this new configuration, the political meaning and salience of health and disease have changed.

Of course, programmes of preventive medicine, of health promotion and health education still take, as their object, ‘the nation’s health’. Today, however, the rationale for political interest in the health of the population is no longer framed in terms of the consequences of unfitness of the population as an organic whole for the struggle between nations. Instead it is posed in economic terms – the costs of ill-health in terms of days lost from work or rising insurance contributions – or moral terms – the imperative to reduce inequalities in health. While international comparisons are undoubtedly still

significant, their contemporary political function is no longer that of marking the potential vulnerability of a polity in geo-political rivalry; rather, they serve as public indices of the extent to which nations have instituted successful policies for the governance of health. National health indicators, here, do not measure the fitness of a population as a whole; they function as aggregates of the health status of individual citizens and families. Further, in fostering health, the ideal relation of state to people is no longer that aspired to in the 'social' state. The contemporary state does not 'nationalize' the corporeality of its subjects into a body politic on which it works *en masse*, in relation to the body politics of other states competing in similar terms. The state is no longer expected to resolve society's needs for health. The vitality of the species – the nation, the population, the race – is rarely the rationale and legitimation for compulsory interventions into the individual lives of these who are only its constituent elements. In this domain as in so many others, the images now are of the enabling state, the facilitating state, the state as animator. On the one hand, the state retains the responsibility that it acquired in the 18th or 19th century – the precise timing varying across national contexts – to secure the general conditions for health: regulating the sale of foodstuffs, organizing pure water and sewage disposal, sometimes mandating the addition of health-promoting elements into the diet – vitamins, fluoride in water and the like. On the other hand, within such a health-promoting habitat, the state tries to free itself of some of the responsibilities that it acquired across the 20th century for securing individuals against the consequences of illness and accident. Thus we have seen an intensification and generalization of the health-promotion strategies developed in the 20th century, coupled with the rise of a private health insurance industry, enhancing the obligations that individuals and families have for monitoring and managing their own health. Every citizen must now become an active partner in the drive for health, accepting their responsibility for securing their own well-being. Organizations and communities are also urged to take an active role in securing the health and well-being of their employees and members. This new 'will to health' is increasingly capitalized by enterprises ranging from the pharmaceutical companies to food retailers. And a whole range of pressure groups, campaigning organizations, self-help groups have come to occupy the space of desires, anxieties, disappointments and ailments between the will to health and the experience of its absence. Within this complex network of forces and images, the health-related aspirations and conduct of individuals is governed 'at a distance', by shaping the ways they understand and enact their own freedom.

Perhaps Agamben and Bauman are right in suggesting that the link between individual and collective in the first half of the 20th century – both neo-hygienic and eugenic – took a characteristically 'modern' form. If so, I would argue that within the political rationalities that I have termed 'advanced liberal' the contemporary relation between the biological life of the individual and the well-being of the collective is posed somewhat differently (Rose, 1996). It is no longer a question of seeking to classify, identify,

and eliminate or constrain those individuals bearing a defective constitution, or to promote the reproduction of those whose biological characteristics are most desirable, in the name of the overall fitness of the population, nation or race. Rather, it consists in a variety of strategies that try to identify, treat, manage or administer those individuals, groups or localities where risk is seen to be high. The binary distinctions of normal and pathological, which were central to earlier biopolitical analyses, are now organized within these strategies for the government of risk. Such strategies are organized at a number of levels. There are actuarial or epidemiological strategies that seek to reduce aggregate levels of risk across a population. There are strategies for the management of high-risk groups. And, increasingly, there are strategies based on identification of, and preventive intervention for, risky individuals.

Risk here denotes a family of ways of thinking and acting, involving calculations about probable futures in the present followed by interventions into the present in order to control that potential future.⁹ Mortality and morbidity were key sites for the development of conceptions of the future as calculable, predictable, and as dependent upon identifiable factors some of which were manageable (on the rise of risk thinking, see Hacking, 1990). The politics of health in the 19th century was underpinned by the collection and tabulation of numerical information on populations, and its analysis in terms of frequencies, probabilities. This was the rationale for hygienic strategies that tried to identify, manage and reduce aggregate levels of morbidity and mortality by modifying the factors within a geographical area, a habitat or a portion of the life course that were statistically associated with increased levels of morbidity or mortality. Thus, in England, Edwin Chadwick used statistical and probabilistic reasoning in his arguments for the reform of sewage systems, and William Farr compiled evidence on the geographical distribution of morbidity and mortality to inculcate water supplies in the spread of cholera (Osborne, 1996). In the first half of the 20th century, such ideas about the regularity and predictability of illness, accidents and other misfortunes within a population were central to the birth of the very idea of society, and to the emergence, in different countries, of social insurance strategies for the spreading of the risks entailed in the very activity of living across an insured national population (Ewald, 1986, 1991). Over the second half of the 20th century, biopolitical concerns with the minimization of risks to health – control of environmental pollution, reduction of accidents, maintenance of bodily health, nurturing of children – became intrinsic not just to the organization of health and social services, but to expert decisions about town planning, building design, educational practice, the management of organizations, the marketing of food, the design of automobiles and much more. That is to say, for over 150 years, risk thinking has been central to biopolitics.

Demands for collective measures of biopolitical risk management, far from reducing, are proliferating and globalizing.¹⁰ And strategies aimed at the reduction of the probability of untoward events across a population –

targeting risky practices and locales rather than risky or at risk individuals – are spreading to the government of many other kinds of unwanted events – notably crime control (cf. Feeley and Simon, 1992, 1994). However, again starting in the 19th century, a second set of strategies has also operated in terms of a type of risk thinking. These attempted to find factors that would enable the identification of high-risk groups and hence permit authorities to intervene upon those falling within such groups in a preventive or prophylactic manner. The use of risk profiling to demarcate risk pools has a very long history, going back to the very beginnings of the insurance industry. Risk profiling, rather than acting ‘actuarially’ or insurantly upon the population at large, uses probabilistic and epidemiological knowledge to identify factors associated with higher risks of particular forms of ill-health, reproductive problems or other forms of pathology, and then allocates individuals to risk pools using an algorithm made up of these factors. In the field of health, as risk profiling developed from the mid-20th century, it was used to develop risk profiles, scales and indices, which were used to identify those who fell within groups with a significantly higher than average risk, and intervene preventively upon them.

Most readers will be personally familiar with such procedures for the allocation of individuals to risk groups, on a genealogical basis, in terms of a family history of illness or pathology, and/or on a factorial basis, in terms of combinations of factors statistically linked to a condition. Men presenting to their doctors with high blood pressure are risk profiled in terms of age, weight, family history, smoking and so forth, are allocated to a risk group using a scale based on epidemiological and clinical research, and, if at high risk, may be advised to make changes to behaviour, diet or lifestyle, or pre-emptively placed on a drug regime intended to reduce the risk of the occurrence of such disorders. Pregnant women are risk profiled by their doctor or midwife, and, if allocated to a high risk group for miscarriage, premature birth or associated difficulties, are subject to enhanced surveillance by midwives and gynaecologists (Weir, 1996). The earliest reproductive advice based on genetics also operated in terms of the identification of those who were members of high-risk groups on the basis of epidemiological factors, family history and probabilities. So did the eugenic programmes of sterilization of ‘the feeble minded’, psychiatric patients and sexual offenders in the early 20th century that I have already discussed. In addition, from the early 20th century, in many countries, a number of individuals and organizations began to give reproductive advice, focusing on prospective marital partners or would-be parents who had a family history of certain types of disease or disability thought to be ‘hereditary’. They were given advice concerning the risks and probabilities of their children carrying the condition and advised not to marry, or not to have children, offered a termination of pregnancy, even in jurisdictions where abortion was illegal on other grounds. Genetic advising in the first half of the 20th century was an explicitly eugenic tool (cf. Kevles, 1985). In the years after the end of the Second World War, when a large number of heredity clinics were

established in many countries, their major goal was to prevent birth defects, and help couples make ‘eugenic’ rather than ‘dysgenic’ decisions’ (Fine, 1993: 103). And in the closing decades of the 20th century, antenatal screening, for example, testing samples of maternal serum for raised levels of proteins associated with certain genetic abnormalities, became widespread for pregnant women whose age or family history placed them in high-risk groups, coupled with the option of termination (Rapp, 1999).

A few doctors and geneticists still argue that any responsible citizen who believes that they carry genetic defects should try to reduce the risk of transmission to future generations (Glass, 1971; Robertson, 1983); such statements lead some critics to diagnose an implicit eugenics in the very idea of genetic counselling.¹¹ But I think it is necessary to be more specific about the make-up of such contemporary logics of control.¹² Decision-making in the biomedical context takes place within a set of power relations that we could term ‘pastoral’. I have referred to Swedish eugenics as pastoral, in a sense close to that developed by Foucault – a form of collectivizing and individualizing power concerned with the welfare of the ‘flock’ as a whole. But this contemporary pastoral power is not organized or administered by ‘the state’ – even if we use this term to encompass the whole complex of legislative provision, state-funded research organizations and national committees of enquiry into the medical and ethical aspects of the new biomedicine. It takes place in a plural and contested field traversed by the codes pronounced by ethics committees and professional associations, by the empirical findings generated by researchers, the attitudes and criteria used by employers and insurers, the tests developed and promoted by psychologists and biotech companies, the advice offered by self-help organizations, and even, one might add, the critical perspectives contributed by religious organizations and sociological critics. Crucially, this pastoral power does not concern itself with the flock as a whole. For at least three decades, professionals involved in this work have explicitly rejected the view that they are, or should be, seeking to limit the reproductive capacities of those at risk of passing an inherited condition or disability to their offspring, let alone the suggestion that they are, or should be, concerned with the contribution of individual biological characteristics to future population quality, or even the future cost to the nation of caring for children with disabilities.¹³ But this pastoralism does not simply entail a priest-like shepherd knowing and mastering the soul of the individual troubled sheep. Perhaps one might best describe this form of pastoral power as *relational*. It works through the relation between the affects and ethics of the guider – the genetic counsellors and allied experts of reproduction who operate as gatekeepers to tests and medical procedures – and the affects and ethics of the guided – the actual or potential parents who are making their reproductive decisions, and upon their networks of responsibility and obligation.

These new pastors of the soma espouse the ethical principles of informed consent, autonomy, voluntary action and choice, and non-directiveness.¹⁴ But in the practices of this pastoral power, such ethical

principles must be translated into a range of micro-technologies for the management of communication and information. These blur the boundaries of coercion and consent. They transform the subjectivities of those who are to give consent or refuse it, through discursive techniques that teach new ways of rendering aspects of oneself into thought and language, new ways of making oneself and one's actions amenable to judgement. And they reshape the telos of these encounters in specific ways, for example in terms of psychological notions of mental health, or in terms of the recent, but currently ubiquitous idea of 'quality of life' – each now defined within, and measured by, any number of rating scales. Nonetheless, this pastoral power differs from Christian pastorship, where the vectors of power flowed one way, requiring the submission of the sheep to the will of the shepherd, and the internalization of that absolute will in the form of self-examination and self-mastery. These counselling encounters entail intense bi-directional affective entanglements between all the parties to the encounter, and indeed generate multiple 'virtual' entanglements with parties not present – distant relatives, absent siblings, potential offspring. In these entanglements, the ethical relations of all the subjects to themselves and to one another are at stake – including the experts themselves. The consultation acts as an intensifier of ethicality. It mobilizes affects of shame and guilt, and of the respective claims, scope and limits of freedoms for the self and obligations to others. It activates the conflicts within the counsellors between the ethics of care and the ethics of guidance. It requires the counsellors to fold into themselves, in a way that is by no means trivial or transient, some of those anxious and fateful undecidabilities that possess those whom they counsel.

It is true that – whatever the explicit agenda of non-directive genetic counselling – evidence suggests that those who were counselled about their membership of risk groups before the availability of the kinds of predictive genetic testing I discuss below, were less likely to have children (Carter et al., 1971). But the perils of the contemporary biopolitics of group risk are not a repetition of the past. Rather than a wholesale politics of population management, these are more mundane yet no less hazardous. There are technical problems, for example the validity and appropriateness of the factors used to calculate the risk profiles through which individuals are allocated to risk groups, their generalizability to others given national and cultural variations, the effects of changes since the time when the scales were constructed and so forth. There are the problems of false positives and false negatives that are built into the very project of applying probabilistic reasoning to determine the treatment of individuals – these have become infamous in decision-making practices concerning compulsory treatment or detention of 'risky' psychiatric patients, and those arising from advice to women with a family history of breast cancer who may be contemplating prophylactic mastectomy. There are the problems that flow from the fact that, once known to fall within a risk group, the individual may be treated – by others and by themselves – as if they were, now or in the future, certain to be affected in the severest fashion. These problems have been much

discussed in relation to discrimination in insurance and employment (Gostin, 1991; Hubbard and Wald, 1999; Nelkin and Tancredi, 1994). They also arise when risk assessments are linked to preventive interventions. We can see this where individuals allocated to a high-risk group for cancer or heart disease, despite being healthy, must nonetheless conduct their lives under the shadow of medical authority if they are to be ‘responsible’. We can see it in the area of behavioural risk, in the projects for preventive screening and intervention into the lives of young people in the inner cities at risk of violent, aggressive or offending behaviour, which tend to justify preventive intervention into the lives of ‘the usual suspects’, that may itself be the first step in the moral career of spoiled identity (Rose, 2000b). In addition, there are the ethical problems that arise in the relation between experts and their clients when trust in numbers replaces other forms of trust – that is to say, when decisions as to action seem to arise automatically from judgements ‘black boxed’ within an ‘objective’ calculating device – whose authors are not available for debate and contestation (cf. Porter, 1996; I discuss some of these in relation to psychiatry in Rose, 1999). And, as innumerable accounts of ‘the risk society’ have pointed out, risk registers and databases have the potential for an expansion and refinement of strategies of control based upon surveillance (Lyon, 1994).

It is not surprising, then, that there is much professional optimism about the impact of recent advances in genomics, which seem to have the potential to shift the focus of regulatory strategies from group risk to *individual susceptibility*. Diagnoses of susceptibility attempt to move beyond the allocation of individuals to a risk group on the basis of factors and probabilities, to a precise identification of those particular individuals who are vulnerable to specific conditions or behavioural problems.¹⁵ Thus, while epidemiological evidence may show that individuals in certain groups carry an elevated risk for specific conditions – as for example in sickle cell anaemia – the aim is not simply to act upon that group *en masse*: group membership is merely the first step towards identifying and treating susceptible individuals. Amniocentesis was first used to detect major abnormalities in the number of chromosomes or their shape in the foetus – as in trisomies such as Down’s syndrome or abnormalities in the number of X and Y chromosomes. But samples of amniotic fluid, and now chorionic villus sampling, can be used to detect abnormalities in the DNA itself, or the presence of the specific sequences or markers that are associated with either an increased probability of developing a disorder, or in some cases (for example Huntington’s disease) the certainty. Genetic tests are available for a growing number of diseases thought to arise from ‘single genes’: Huntington’s, fragile X, sickle cell, cystic fibrosis and phenylketonuria. And, increasingly, tests are being developed which look for the presence of specific base sequences – markers or polymorphisms or SNPs (single nucleotide polymorphisms) – that significantly increase the likelihood of developing a particular condition: Alzheimer’s disease, some forms of breast cancer, certain types of heart disease. Since it is now routine for doctors as

well as geneticists to consider that any individual's vulnerability to any disease has a genetic component, consisting mostly of multiple genes and their interactions amongst themselves and with other environmental and biographical factors, the gaze of susceptibility is potentially unlimited.

In its new form of susceptibility, biomedical risk thinking has become individualizing and clinical. It penetrates behind and beneath even those who live their lives 'in the silence of the organs' (to adapt Canguilhem's use of Leriche – Canguilhem, 1978: 46) to discover within them the signs, seeds, portents, predispositions of pathology to come. While in the moment of eugenics it was the population that was 'at risk' from the risks posed by the reproduction of specific groups or sub-populations, what is created here is what Ian Hacking (1992, 1995) might term a new and 'interactive' 'human kind': the individual biologically – increasing genetically – risky or at risk.¹⁶ Now it seems that 'smart' programmes of pre-emptive intervention can be devised that target only those individuals predisposed to a particular condition. This thinking underpins the types of genetic counselling that have become routine since the 1970s: the screening of pregnant women in 'high-risk' groups; the widespread use of amniocentesis to detect fetuses with genetic abnormalities; the offer of therapeutic abortion for fetuses who test positive; and the increasing resort of 'high-risk' parents to IVF coupled with pre-implantation diagnosis in such situations.

But the promise of certainty is illusory. In almost all conditions, including those that are implacable such as Huntington's, genetic diagnosis of individual susceptibilities is still, inescapably, probabilistic. In many cases it is simply that the risk of developing a disease is increased by the presence of certain alleles, sequences or markers. Even when a gene sequence is identified that makes it certain that an individual will develop a disease, there is no certainty as to when it will manifest itself, or with what severity. Thus these new practices for the identification of susceptibilities open a space of uncertainty. This is the expanding realm of the asymptotically or presymptomatically ill – those individuals carrying the markers or polymorphisms of susceptibility who are neither phenomenologically or experientially 'sick' or 'abnormal'. While the calculation of risk often seems to promise a technical way of resolving ethical questions, these new kinds of susceptibility offer no clear-cut algorithm for the decisions of doctors or their actual or potential patients. In this space, biopolitics becomes ethopolitics.

Biopolitics as Molecular Politics

Eugenics was grounded in the truth discourse of the biology of the first four decades of the 20th century, not just in Germany, but also in Britain, France, the Nordic countries and the United States. But that truth has been transformed. In the aftermath of the Second World War, much intellectual and political work went into disconnecting the links between concerns about genetic health of individuals and concerns about the quality of the population *en masse*. Genetics was to transform itself into a liberal discipline.

Geneticists reflected upon their own past, and reshaped the problem space of genetics in terms of the search for the roots of disease. The norm of individual health replaced that of the quality of the population. Genetics itself would cease to think in terms of broad social categories. It would try to penetrate beneath the misleading appearances of pathology and normality to the underlying determinants, the genes and their modes of functioning at a molecular level (Paul, 1998a, 1998b).

This new genetics was bound up with a mutation in the very image that we have of life. The body that 20th-century medicine inherited from the 19th century was visualized via a clinical gaze, as it appeared in the hospital, on the dissection table and was inscribed in the anatomical atlas. The body was a vital living system, or a system of systems. The skin enclosed a 'natural' volume of functionally interconnected organs, tissues, functions, controls, feedbacks, reflexes, rhythms, circulations and so forth. This unified clinical body was located within a social body made up of extra-corporeal systems – of environment, of culture – also conceptualized in terms of large scale-flows – of air, water, sewage, germs, contagion, familial influences, moral climates and the like. Eugenic strategies took their character from this way of linking the individual and the social body. The genetic body differs on all counts from this eugenic body. Most notably, it is conceived on a different scale. In the 1930s, biology came to visualize life phenomena at the submicroscopic region – between 10^{-6} and 10^{-7} cm (Kay, 1993: 5). Life, that is to say, was molecularized (see the articles collected in de Chadarevian and Kammaing, 1998). This molecularization was not merely a matter of the framing of explanations at the molecular level. Nor was it simply a matter of the use of artefacts fabricated at the molecular level. It was a reorganization of the gaze of the life sciences, their institutions, procedures, instruments, spaces of operation and forms of capitalization.

By the 1960s, as Georges Canguilhem put it, 'The science of life no longer resembles a portrait of life, as it could when it consisted in the description and classification of species; and it no longer resembles architecture or mechanics, as it would when it was simply anatomy and macroscopic physiology' (1994: 317). In changing the scale on which the characteristic phenomena of life are studied, contemporary biology had adopted a new language:

It has dropped the vocabulary and concepts of classical mechanics, physics and chemistry, all more or less directly based on geometric models, in favour of the vocabulary of linguistics and communications theory. Messages, information, programmes, codes, instructions, decoding: these are the new concepts of the life sciences. (Canguilhem, 1994: 316)

The history is actually more complicated: other possibilities, in terms of topography or function, had to be defeated for this informatic paradigm to become dominant and to take the form of a DNA-based code for protein synthesis (Fox Keller, 2000). But nonetheless, in the genomic discourse that

took shape over the closing decades of the 20th century, life was imagined as sub-cellular processes and events, controlled by a genome which is neither diagram nor blueprint but a digital code written on the molecular structure of the chromosome (Kay, 2000). This is 'the language of life' that contains 'the digital instructions' that make us what we are. Historians of this period like to quote the dream of Nobel Prize winner Walter Gilbert: 'one will be able to pull a CD out of one's pocket and say: "Here is a human being: it's me!"' (Gilbert, 1992: 96; cf. Kay, 1995). And, as the Human Genome Project progressed, it seemed that the 3 billion base pairs were organized into 100,000 genes – a 1 gigabyte 'parts list' that would just about fit onto one standard compact disc.

The first map of the Human Genome, when published on 11 February 2001, dealt a severe, perhaps fatal blow to this image. Rather than the 100,000 or so genes that had been confidently predicted, there seem to be only around 31,000 sequences coding for chains of amino acids – which compares with 6,000 for a yeast cell, 13,000 for a fruit fly and 20,000 for a nematode worm. This did not seem to be a parts list to make a human – even a modern aeroplane contains more than 200,000 unique parts. There did not seem to be enough genes to 'code' for each 'part' – to account for the complexity of human anatomy and physiology, let alone the neuronal basis of the vast behavioural repertoire of humans, consciousness, learning and memory. The brute reductionism of much of the genomics of the closing decades of the 20th century already seems old-fashioned, as molecular genetics re-groups around functional genomics and proteomics. The very idea of 'the gene' is complexifying and fragmenting. We are in the world of 'post-genomics', where the key processes are those of gene expression and their regulation, where the same genetic sequence can be cut, spliced and transcribed in different ways, depending on the cellular environment, which itself is shaped by a multitude of extra-cellular factors.

Nonetheless, the molecularization of biology has been an irreversible epistemological event. It has also been a significant technical event, for the new molecular models of life are as much technical as representational. Not that this itself is new: the symbiosis of knowing and transforming has long been woven into the very fabric of biology. In the biology of the second half of the 20th century, knowledge of life and the living body became intrinsically linked to interventions that transformed those living bodies (cf. Rabinow, 1998: 252; Rheinberger, 1995: 226). The elaboration of molecular models in the biology that has taken shape over the last three decades has similarly depended upon the technical re-engineering of life at this molecular scale. All those projects to transcribe 'the book of life', to decode 'the code of codes', to work out its 'normal' and its pathological lines, words, chapters, have been linked to endeavours that intervene upon life at this molecular level – not after the event but in the very process of discovery itself – as, for example, in the techniques of gene cutting and splicing, the polymerase chain reaction for creating multiple copies of precise segments of DNA outside living systems, the customized fabrication of DNA

sequences to order, the manufacture of organisms with or without specific gene sequences. In this process, theoretical concepts and experimental hypotheses rapidly mutated into entities that were provided ‘off the shelf’ by commercial companies.¹⁸

Thus it required no real shift of perspective to move that re-engineering out of the laboratory into the factory. Indeed the laboratory and the factory are already intrinsically interlinked – the pharmaceutical industry has been central to research on neurochemistry, the biotech industry to research on cloning, genotech firms to the sequencing of the human genome. It is not just that such companies seek to ‘apply’ or ‘market’ scientific discoveries, they shape the very direction, organization, problem space and solution effects of the biology itself. For life at the molecular level is only knowable through complex and expensive apparatus: electron microscopes, ultracentrifuges, electrophoresis, spectroscopy, x-ray diffraction, isotopes and scintillation counters and their links with the information-processing capacities of computers, and now, with the information dissemination capacities of the Internet. Hence, the politics of the life sciences – the politics of life itself – has been shaped by those who controlled the human, technical and financial resources necessary to fund such endeavours. In the post-war period, funds for the strategic development of the life sciences were provided by the newly established public research councils, together with private foundations such as Rockefeller with their own agendas. In the closing decades of the 20th century, these sources of funding were increasingly displaced by the capitalization of life science, by the pharmaceutical industry and, later, by biotech enterprises. Neither the production of truth nor even the production of health is now sufficient to move ‘the venture capitalists, patent offices, and science writers on whom [the life sciences] are increasingly dependent’: they must be legitimated by the logics of product development and market share (Rabinow, 1996c: 137; see also Rabinow, 1996a). Biopolitics becomes bioeconomics, driven by the search for what Catherine Waldby has termed ‘biovalue’: the production of a surplus out of vitality itself (Waldby, 2000: 19). But disputes over biopiracy, the patenting of genes and the trade in human tissue, show how molecular commodification is itself confounding our ideas of human life and the protections to be afforded to it (Pottage, 1998; Strathern, 1999). Are DNA fragments replicated, engineered and manipulated *in vitro* by recombinant techniques ‘life’ – let alone ‘human life’? Can doctors patent and profit from immortal cell lines that they have isolated from John Moore’s cancerous spleen (Hyde, 1997; Rabinow, 1996)? The classical distinction made in moral philosophy between that which is not human – ownable, tradeable, commodifiable – and that which is human – not legitimate material for such commodification – no longer seems so stable.

Previously it seemed that life inhered in the inescapable natural workings of the vital processes themselves. All medicine was able to hope for was to arrest the abnormality, to re-establish the natural vital norm and the normativity of the body that sustained it. But these norms no longer seem

so inescapable, these normativities appear open to alteration. Once one has witnessed the effects of psychiatric drugs in reconfiguring the thresholds, norms, volatilities of the affects, of cognition, of the will, it no longer seems possible to imagine a self not open to modification in this way (Fraser, 2001; Kramer, 1994). Once one has seen the norms of female reproduction reshaped by assisted conception, the nature and limits of procreation, and the space of hopes and fears around it, are irrevocably changed (Edwards, 2000; Franklin, 1997). Once one has seen the norms of female ageing reshaped by hormone replacement therapy, or the norms of ageing male sexuality reshaped by Viagra, the 'normal' process of growing old seems only one possibility in a field of choice, at least for those in the wealthy West.

Of course, narcotics, stimulants and other drugs, licit and illicit, down the ages have transformed persons and their capacities by linking up their bodies with chemical actors. The body of the diabetic has been prosthetic since the invention of insulin treatment: calculated chemical artificiality here has sought to replace the missing or damaged normativity of the body's own vital processes. And, of course, the female body has long been more open to artificialization than the male. But an event is a matter of associations, linking up a number of disparate little changes such that a threshold is crossed. That which was previously exceptional, remarkable, becomes routinely thinkable, perhaps even expected. Now all life processes seem to consist in intelligible chains of events that can be 'reverse engineered' and then reconstructed in the lab, and modified so that they unfold in different ways. Consider, for example, four of the five most prescribed drugs in the United States in 1999: Premarin for the treatment of symptoms of the menopause – hormone replacement therapy; Synthroid for the treatment of thyroid deficiency – a condition characterized by general lethargy and lack of activity; Lipitor, for the treatment of hyperlipdemia – high levels of blood lipids thought to predispose to heart attack; and Prilosec for the treatment of peptic disorders and ulcers.¹⁹ The 'antidepressants' were close behind: Prozac was 10th, but its close cousin Zoloft was 11th and Paxil was 15th. Viagra only came in at 47th, but this was 1999. Existence is being lived according to new coordinates, a new game of life is now being played. For example, the very distinctions between mental illness and mental health are being transformed by the new molecular images of the mind generated by biological psychiatry, and the drugs that are specifically fabricated to target and modulate molecular events in the neurones and synapses: no wonder the diagnosis of depression is spiralling upwards, and our affective relations with the world are being reshaped, as all manner of malaise is recoded as depression (on depression, see Healy, 1997, for an enthusiast for the new psychiatry, see Andreasen, 2001; for the critics, see Newnes et al., 2001; cf. Luhrmann, 2001). Life now appears to be open to shaping and reshaping at the molecular level: by precisely calculated interventions that prevent something happening, alter the way something happens, make something new happen in the cellular processes themselves. As the distinction between treatment and enhancement, between the natural and the prosthetic

blurs, the management and maximization of life itself have become the life's work, not only of each individual, but of their doctors, together with the scientists, entrepreneurs and corporations who make the reworking of life the object of their knowledge, inventions and products (on enhancement, see Parens et al., 1998). Natural life can no longer serve as the ground or norm against which a politics of life may be judged. Dilemmas about what we are, what we are capable of, what we may hope for, now have a molecular form. Biopolitics now addresses human existence at the molecular level: it is waged about molecules, amongst molecules, and where the molecules themselves are at stake.

Biopolitics as Ethopolitics

The original biopolitical thesis implied a separation between those who calculated and exercised power and those who were its subjects, whose biological existence was to be shaped for the benefit of each and all. This does seem to characterize policies seeking to modify the breeding patterns of individuals in the name of the population; the bloody techniques of negative eugenics; medical experimentation on prisoners and psychiatric inmates; euthanasia of those whose lives are not worth living; even such benign strategies as medical inspection of schoolchildren. Here one might agree with Agamben that the sovereign has extended his powers over the living bodies of his subjects by entering an alliance with 'the jurist . . . the doctor, the scientist, the expert and the priest' (1998: 21). We should not forget that 1939 – the year that Hitler wrote his secret memo permitting certain doctors to grant a 'mercy death' to patients whose lives were deemed not worth living – was also the year that his government designated as the year of 'the duty to be healthy' (Proctor, 1988: 177).

But the huge extension of the political apparatus of health in liberal democratic polities in the 19th and 20th centuries would have been inconceivable if the newly shaped values of hygiene and health had not become entangled with the aspirations of 'the people' themselves – especially the poor, the disadvantaged, the working classes (cf. Baker, 1994). In this period, that is to say, biopolitics was democratized, and relays were formed between political and personal aspirations for health. In the neo-hygienist strategies of the first half of the 20th century, the duty to be well was to be built into the practices of education and routines of domesticity, and hence, it was hoped, into the obligations of mothers and children. In the second half of the 20th century, a new alliance formed between political aspirations for a healthy population and personal aspirations to be well: health was to be ensured by instrumentalizing anxiety and shaping the hopes and fears of individuals and families for their own biological destiny. The very idea of health was re-figured – the will to health would not merely seek the avoidance of sickness or premature death, but would encode an optimization of one's corporeality to embrace a kind of overall 'well-being' – beauty, success, happiness, sexuality and much more. It was this enlarged will to health that was amplified and instrumentalized by new strategies of

advertising and marketing in the rapidly developing consumer market for health – non-prescription medicines, health insurance, private health care, healthy food, vitamins and dietary supplements and the whole range of complementary, alternative and ‘self-health’ practices. By the start of the 21st century, hopes, fears, decisions and life-routines shaped in terms of the risks and possibilities in corporeal and biological existence had come to supplant almost all others as organizing principles of a life of prudence, responsibility and choice.

Selfhood has become intrinsically somatic – ethical practices increasingly take the body as a key site for work on the self. From official discourses of health promotion through narratives of the experience of disease and suffering in the mass media, to popular discourses on dieting and exercise, we see an increasing stress on personal reconstruction through acting on the body in the name of a fitness that is simultaneously corporeal and psychological. Exercise, diet, vitamins, tattoos, body piercing, drugs, cosmetic surgery, gender reassignment, organ transplantation – for ‘experimental individuals’ (Lury, 1998) the corporeal existence and vitality of the self have become the privileged site of experiments with subjectivity. I have termed this ‘somatic individuality’ (Novas and Rose, 2000). The new genomic and molecular vocabularies of ourselves – like earlier biomedical languages of intelligence, or depression, or ‘hormones’ – are being incorporated within these relations of the somatic self to itself. They render novel aspects of human vitality visible, reshaping ‘experience’, not only making sense of it in new ways, but actually reorganizing it a new way and according to new values about who we are, what we must do and what we can hope for.

Biopolitics, here, merges with what I have termed ‘ethopolitics’: the politics of life itself and how it should be lived (Rose, 1999). By ethopolitics I mean to characterize ways in which the ethos of human existence – the sentiments, moral nature or guiding beliefs of persons, groups, or institutions – have come to provide the ‘medium’ within which the self-government of the autonomous individual can be connected up with the imperatives of good government. In ethopolitics, life itself, as it is lived in its everyday manifestations, is the object of adjudication. If discipline individualizes and normalizes, and biopower collectivizes and socializes, ethopolitics concerns itself with the self-techniques by which human beings should judge themselves and act upon themselves to make themselves better than they are. While ethopolitical concerns range from those of lifestyle to those of community, they coalesce around a kind of vitalism: disputes over the value to be accorded to life itself: ‘quality of life’, ‘the right to life’ or ‘the right to choose’, euthanasia, gene therapy, human cloning and the like.

In this highly contested domain, somatic individuals themselves are key actors. Biological identity practices do not, as some critics have suggested, lead to passivity in the face of biological fate. Quite the reverse. In advanced liberal democracies, biological identity becomes bound up with more general norms of enterprising, self-actualizing, responsible personhood

(Novas and Rose, 2000). As knowledges and beliefs about one's biological and genetic complement become integrated into the complex choices that prudent individuals are obliged to make in their life strategies, biological identity generates biological responsibility (see Rapp, 1999 for a superb study of the enactment of such responsibility in amniocentesis). While many critics see the new biomedicine as individualizing, we can already see new forms of collectivization emerging. Choices about marriage, procreation, financial planning, inheritance, career and much more are made in a web of entanglements involving actual and potential kin, employers, partners and children. And 'at risk' individuals are joining into groups and organizations, not merely demanding public provision and rights, but making their own claims on the deployment of biomedical technologies and the direction of biomedical research – as, for example, in the case of families of those with muscular dystrophy, Huntington's disease or breast cancer (cf. Rabeharisoa and Callon, 1998). Paul Rabinow (1996b) has termed this 'biosociality'. Individuals who identify themselves and their community through their biology challenge the vectors that lead from biological imperfection or abnormality to stigmatization and exclusion. They use their individual and collective lives, the evidence of their own existence and their vital humanity, as antagonistic forces to any attempt to re-assemble strategies of negative eugenics within a new exclusionary biopolitics. They demand civil and human rights for those whose lives, previously, were deemed less worthy of life. They call for recognition, respect, resources, research, control over medical and technical expertise. As somatic individuals engage with vital politics, a new ethics of life itself is taking shape.

Within this new ethics, the human vital order has become so thoroughly imbued with artifice that even the natural has to be produced by a labour on the self – natural food, natural childbirth and the like. Even choosing not to intervene in living processes becomes a kind of intervention. This requires us to question the distinction, proposed most clearly by Georges Canguilhem, between vital norms and social norms. Canguilhem (1978) argued that vital norms arose from and manifested the normativity of life itself, of the organism as a living being, of its adaptability to its environment. Social norms, on the other hand, manifested only adaptation to a particular artificial order of society and its requirements for normativity, docility, productivity, harmony and the like. Some suggest that the new politics of life has once more mistaken social norms for vital ones, for example that the molecular politics of psychiatry, with its claims to be able to manipulate and transform personality and emotion, has incorporated the social into the vital, and has taken key features of vitality itself – for example sadness – as errors open to correction in the name of a social, not a vital, norm of health. But, at least as far as human life is concerned, the social and the vital have never been so distinct. Our very ideas of what it is to be a normal human being have been made possible by historically specific institutional and technical developments, not least by biopolitics itself. Thus, new norms of human capacities and longevity were born in the

sanitization and hygienization of urban existence in the 19th century; new norms of recovery and cure were born in the clinical hospitals; new ways of posing the relations between fate, life and health were born in the development of epidemiological knowledges of the distributions of disease and their social correlations. Our contemporary vital norms are no less, but no more, shaped by their conditions of formation than those of previous generations. On the one hand, our very personhood is increasingly being defined by others, and by ourselves, in terms of our contemporary understandings of the possibilities and limits of our corporeality. On the other hand, our somatic individuality has become opened up to choice, prudence and responsibility, to experimentation, to contestation – and so to a ‘vital politics’.

Life Itself

Michel Foucault pointed out long ago that, from at least the time of the birth of clinical medicine, ‘medical thought [has been] fully engaged in the philosophical status of man’ (Foucault, 1972: 198). Medical thought has also been fully engaged in the ethical question of how we should live – of what kinds of creatures we are, of the kinds of obligations that we have to ourselves and to others, of the techniques which we can and should use to improve ourselves, and the kinds of persons we should strive to be. I do not think that, today, the most far-reaching ethical innovations concerning our relations to ourselves are being made in the deliberations of the bioethicists and moral philosophers – they are being made within medical and biomedical thought and technique itself. Indeed, the individualized humanism of bioethicists and medical philosophers emerged alongside the 19th-century individualization of the living body within clinical medicine. But this humanism now encounters human life whose very meaning is being altered by biology, biomedicine and biotechnology. ‘The philosophical status’ – indeed the very ontology – of human beings is being reshaped through the decisions of entrepreneurs as to where to invest their capital and which lines of biomedical research and development to pursue. It is being shaped by geneticists taking all those small decisions about which family lineages to investigate, which markers to choose, which genes to hunt by which methods. It is being refined by clinicians working in alliance with their own patients to test out and explore the new potentials of gene therapy or reproductive technology. And it is being developed and contested by all those individuals and groups who are themselves active participants in the new ethics of normalcy – whether as subjects at risk of illness or early death, consumers governing ourselves through diets, selves reshaping ourselves by sculpting our bodies, potential parents deliberating over screening and genetic counselling, gay couples using artificial reproduction to have children.

I have argued that life, today, is not imagined as an unalterable fixed endowment, biology as destiny, where the reproduction of individuals with a defective constitution is to be administered by experts in the interests of

the future of the population. No longer are judgements organized in terms of a clear binary of normality and pathology. Of course, there are many practices where identification of high risk plus biological incorrigibility can switch the affected individual – or potential individual – onto the circuits of exclusion: whether that be via therapeutic abortion for a severely damaged foetus or preventive detention – or the death penalty in some states in the United States – for those thought to have a biological propensity to violence or sexual predation. But the dream – of doctors, geneticists, biotech companies and many ‘afflicted individuals’ and their families – is of that pre-symptomatic diagnosis followed by technical intervention at the biological level to repair or even improve the sub-optimal organism. For the political vocation of the life sciences today is tied to the belief that in most, maybe all cases, if not now then in the future, the biological risky or at risk individual, once identified and assessed, may be treated or transformed by medical intervention at the molecular level. In the process, the familiar distinction between illness and health has become problematic and contested. As claims are made to identify the genetic bases of ‘normal’ variability in aspects of vitality – from sexuality to longevity – the line of differentiation between interventions targeting susceptibility to illness or frailty on the one hand, and interventions aimed at the enhancement of capacities on the other, is beginning to blur.

I have suggested in this article that, in and through such developments, human beings in contemporary Western culture are increasingly coming to understand themselves in somatic terms – corporeality has become one of the most important sites for ethical judgements and techniques. Two modes of such a ‘biological ethics’ are particularly striking. On the one hand, human rights now have a biological dimension and, partly in consequence, have gained a new kind of ‘species universality’. Legal, political and social rights were first linked to the capacities and obligations of individuals who were elements of a political association. But now, it seems, each human being has such rights, simply by virtue of their existence as beings of this human kind. Individuals seem to have acquired a kind of biological citizenship – a universal human right to the protection, at least, of each human person’s bare life and the dignity of their living vital body. In the geopolitics of famine, drought, war and ethnic cleansing, in the vociferous anti-capitalist and anti-globalization movements, and in the local politics of health, it is now possible for human beings to demand the protection of the lives of themselves and others in no other name than that of their biological existence and the rights and claims it confers.

Such arguments suggest that biological ethics ascribes each human life equal worth. But our practices and techniques show us that, on the contrary, the biological lives of individual human beings are recurrently subject to judgements of worth. We do not have to look to the controversies over euthanasia or the rights to life of severely damaged neonates to see this – each session of genetic counselling, each act of amniocentesis, each prescription of an anti-depressant is predicated on the possibility, at least, of

such a judgement about the relative and comparative 'quality of life' of differently composed human beings and of different ways of being human. As biomedical technique has extended choice to the very fabric of vital existence, we are faced with the inescapable task of deliberating about the worth of different human lives – with controversies over such decisions, with conflicts over who should make such decisions and who cannot, and hence with a novel kind of politics of life itself. In this article, I have argued that this politics is not one in which authorities claim – or are given – the power to make such judgements in the name of the quality of the population or the health of the gene pool. On the one hand, in the new forms of pastoral power that are taking shape in and around our genetics and our biology, these questions about the value of life itself infuse the everyday judgements, vocabularies, techniques and actions of all those professionals of vitality: doctors, genetic counsellors, research scientists and drug companies among them, and entangle them all in ethics and ethopolitics. And, on the other hand, the politics of life itself poses these questions to each of us – in our own lives, in those of our families, and in the new associations that link us to others with whom we share aspects of our biological identity.

Of course, we should not overestimate the novelty of what is happening here. But nonetheless, to a greater extent and in different ways than before, we have become the kinds of people who think of our present and our future in terms of the quality of our individual biological lives and those with whom we identify. The melancholy refrain of those who condemn the arrogance of biomedicine for meddling in such areas, who convict all references to the biological of reductionism, individualism and determinism, or who predict a new eugenics are of little help to us in understanding the issues at stake here. For once our very biological life itself has entered the domain of decision and choice, these questions of judgement have become inescapable. We have entered the age of vital politics, of biological ethics and genetic responsibility.

Notes

1. This article was initially prepared for a seminar on Displacement of Politics held at Santa Margherita, Genoa, 24–6 June 1999 organized by Sakari Hanninen and Allesandro dal Lago, and a much earlier version was published in Italian translation in 2000 in *Aut Aut* 298: 35–62. Versions have also been given at the University of Bath, the University of Stockholm, Goldsmiths College, University of London, University of East London and at the conference on The Ethos of Welfare, University of Helsinki, September 2000. I would like to thank participants for their comments and criticisms. Special thanks to Carlos Novas for many discussions about these issues, and for lending me ideas and sources. In preparing the final version I have also benefited from reading Sarah Franklin's draft paper 'Life Itself' (Franklin, n.d.). My argument throughout is indebted to the work of Paul Rabinow.
2. I do not address the contemporary geopolitical dimension of biopolitics here, but hope to do so in a subsequent article.
3. The collection edited by Marteau and Richards (1996) contains a good and reasoned overview of the policy issues as they stood in the UK in the early 1990s.

4. In a conference paper as yet unpublished – see Koch (2000). For examples of this rhetoric at work, see Holtzman (1998), Wertz (1998) and many of the other papers in this special issue of *Science in Context*.
5. For Germany see Proctor (1988) and Burleigh (1994). For France see Carol (1995). For the United States, see Dowbiggin (1997), Larson (1995), Kevles (1985), Kühl (1994) and Robitscher (1973).
6. The Human Betterment Foundation reported that 50,707 Americans had been sterilized by 1 January 1950, and that the pace of sterilization had increased since 1944 after a lull during the early war years: see Dickinson and Gamble (1950). For details of the post-war eugenic programmes in the Nordic countries, see Broberg and Roll-Hansen (1996).
7. Under a nationally organized programme carried out by liberal and humanistic doctors, a total of 62,000 people – many who were merely thought to be anti-social or sexually promiscuous – were prevented from reproducing by sterilization, much of which was involuntary or coerced. While the initial targets had been informed by concerns about racial purity, the programme continued into the post-war years. Its targets were largely women who were thought to be anti-social, sexually active and without good judgement, and it was publicly rationalized on the basis that the size of families of those with a history of anti-social behaviour must be controlled. The research on this programme, by Maija Runcis, was publicized by articles in the leading Swedish newspaper *Dagens Nyheter* in August 1997 and widely reported in the English language newspapers; see *Guardian* (6 March 1999). For an account of eugenics in the Nordic countries see Broberg and Roll-Hansen (1996).
8. Sheldon Reed is usually credited with the invention of the term ‘genetic counseling’ in 1947, and discusses the changing relations with eugenic thought in Reed (1974). There is no recent single, general history of genetic counselling, but see Kenen (1984) and Fine (1993).
9. For two recent collections which elaborate on this way of approaching the issue of risk, see O’Malley (2000) and Baker and Simon (2001). I develop my own approach in more detail in relation to psychiatry in Rose (1998) and in relation to crime control in Rose (2000a).
10. However, as Ewald has argued, there are significant differences between the principles of risk spreading and indifference to fault that characterized prevention and compensation in 20th-century social insurance and health policies, and the kinds of contemporary risk thinking that underpin the ‘precautionary principle’ – where a demand for the total elimination of risk goes along with attempts to make someone bear responsibility for any untoward event, and where the almost incalculable uncertainty of the consequences of every new development is nonetheless linked to demands for assurances of total safety (Ewald, 2001).
11. Others have argued that eugenic considerations also underpin the quasi-voluntary practice of sterilization of women on welfare in some cities in the United States (Horsburgh, 1996).
12. Over the closing decades of the 20th century, such forms of group-based risk management spread to other fields – notably those concerning pathologies of conduct: families suspected of committing child abuse (Castel, 1991; Parton, 1991); the risk profiling of those convicted of certain types of sexual or violent offences (Pratt, 2000), and of psychiatric patients (Rose, 1998). In each case, a combination of demographic, biographical, lifestyle and other factors is used to identify those

thought to be 'high risk' who are then placed on risk registers, subject to surveillance and reporting by a whole range of authorities, and may be subject to other restrictive measures – have their children taken into care or be subject to preventive detention.

13. A recent debate, actually about predictive genetic testing, illustrates this well. In 1987 Margery W. Shaw, a professor of health law at the University of Texas, suggested that a predictive genetic test for Huntington's meant that it was 'now possible to begin to eradicate the Huntington gene from our species' within the next two generations and suggested 'it is necessary that those who possibly or certainly carry the gene take positive steps to prevent its transmission' (Shaw, 1987: 243). Her argument brought immediate and heated rejections from those involved in developing pre-clinical testing programmes:

While all would welcome a reduction in the gene frequency for HD this eugenic argument is both impractical and certainly not a primary goal for the preclinical testing programmes in Canada and the United Kingdom . . . [the] major goal of preclinical detection of HD is the improvement of the quality of life for persons at risk. (Hayden et al., 1987: 762)

I owe these references to Carlos Novas, who is researching the history of genetic testing and counselling for Huntington's.

14. I am leaving to one side the areas of crime control and psychiatry where these famous ethical principles have only limited purchase.

15. There are some analogies here with general developments in the insurance industry. As Richard Ericson and his colleagues have pointed out, there is a widespread contemporary tendency within the private insurance industry to attempt an 'unpooling of risks' and to seek a finer and finer risk segmentation (Ericson et al., 2000).

16. In this context, many critics have been concerned about the implications of the development of behavioural genetics – for example the claims that anti-social or violent conduct has a strong genetic basis. I have discussed these claims elsewhere, and I reach the same conclusions as most contributions to two recent collections on the subject: not only are the claims of enthusiasts for behavioural genetics vastly overstated and unlikely to find support in the genetics and biology itself, but even were they to find such support, they would be unlikely to undermine the increasing emphasis in the criminal courts, at least in English-speaking jurisdictions, on the ultimate moral responsibility and culpability of the violent or anti-social offender (Rose, 2000b; see also Botkin et al., 1999 and Wasserman and Wachbroit, 2001).

17. Ludmerer (1972: 34) points out that every member of the first editorial board of *Genetics* in 1916 participated in or supported the eugenics movement at some point in its early history.

18. The example most familiar to social scientists is the 'OncomouseTM' made famous by Donna Haraway (Haraway, 1997).

19. <http://www.rxlist.com/top200.htm>.

References

- Agamben, Giorgio (1998) *Homo Sacer: Sovereign Power and Bare Life*, trans. D. Heller-Roazen. Stanford, CA: Stanford University Press.
- Andreasen, Nancy (2001) *Brave New Brain: Conquering Mental Illness in the Era of the Genome*. New York: Oxford University Press.
- Baker, Keith M. (1994) 'A Foucauldian French Revolution', pp. 187–205 in Jan Goldstein (ed.) *Foucault and the Writing of History*. Oxford: Blackwell.
- Baker, Tom and Jonathan Simon (eds) (2001) *Embracing Risk*. Chicago, IL: University of Chicago Press.
- Bauman, Zygmunt (1989) *Modernity and the Holocaust*. Cambridge: Polity.
- Botkin, Jeffrey, William McMahon and Leslie Pickering Francis (eds) (1999) *Genetics and Criminality: The Potential Misuse of Scientific Information in Court*. Washington, DC: American Psychological Association.
- Broberg, Gunnar and Roll-Hansen, Nils (eds) (1996) *Eugenics and the Welfare State: Sterilisation Policy in Denmark, Sweden, Norway and Finland*. East Lansing: Michigan State University Press.
- Burleigh, Michael (1994) *Death and Deliverance: 'Euthanasia' in Germany 1900–1945*. Cambridge: Cambridge University Press.
- Canguilhem, Georges (1978) *On the Normal and the Pathological*. Dordrecht, Holland: Reidel. (Orig. 1943.)
- Canguilhem, Georges (1994) *A Vital Rationalist*, ed. F. Delaporte. New York: Zone.
- Carol, Anne (1995) *Histoire de l'eugénisme en France: Les médecins et la procréation XIX-XX siècle*. Paris: Seuil.
- Carter, C.O., J.A. Fraser Roberts, K.A. Evans and A.R. Buck (1971) 'Genetic Clinic: A Follow-Up', *Lancet* 1 (6 Feb.): 281–5.
- Castel, Robert (1991) 'From Dangerousness to Risk', pp. 281–98 in G. Burchell, C. Gordon and P. Miller (eds) *The Foucault Effect: Studies in Governmentality*. Hemel Hempstead: Harvester Wheatsheaf.
- De Chadrevian, S. and H. Kamminga (eds) (1998) *Molecularizing Biology and Medicine: New Practices and Alliances, 1910s–1970s*. Amsterdam: Harwood.
- Dickinson, Robert and Clarence Gamble (1950) *Human Sterilization*. n.p.
- Donzelot, Jacques (1979) *The Policing of Families*. London: Hutchinson.
- Dowbiggin, Ian R. (1997) *Keeping America Sane: Psychiatry and Eugenics in the United States and Canada, 1880–1940*. Ithaca, NY: Cornell University Press.
- Dreyfuss, Rochelle Cooper and Dorothy Nelkin (1992) 'The Genetics of Jurisprudence', *Vanderbilt Law Review* 45(2): 313–48.
- Drouard, Alain (1999) 'Eugenics and Bioethics in Today's France', pp. 20–30 in Tartu University History Museum *Annual Report 1998*. Tartu, Estonia: History Museum of Tartu University.
- Duster, Troy (1990) *Backdoor to Eugenics*. London: Routledge.
- Edwards, Jeanette (2000) *Born and Bred: Idioms of Kinship and New Reproductive Technologies in England*. Oxford: Oxford University Press.
- Ericson, Richard and Kevin Haggerty (1998) *Policing the Risk Society*. Oxford: Oxford University Press.
- Ericson, Richard, Dean Barry and Aaron Doyle (2000) 'The Moral Hazards of

Neoliberalism: Lessons from The Private Insurance Industry', *Economy and Society* 29(4): 532–58.

Ewald, François (1986) *L'État providence*. Paris: Grasset.

Ewald, François (1991) 'Insurance and Risk', pp. 197–210 in Graham Burchell, Colin Gordon and Peter Miller (eds) *The Foucault Effect*. Hemel Hempstead: Harvester.

Ewald, François (2001) 'The Return of Descartes' Malicious Demon: An Outline of a Philosophy of Precaution', pp. 273–301 in Tom Baker and Jonathan Simon (eds) *Embracing Risk*. Chicago, IL: Chicago University Press.

Feeley, Malcolm and Jonathan Simon (1992) 'The New Penology: Notes on the Emerging Strategy of Corrections and Its Implications', *Criminology* 30(4): 449–74.

Feeley, Malcolm and Jonathan Simon (1994) 'Actuarial Justice: Power/Knowledge in Contemporary Criminal Justice', pp. 173–201 in D. Nelkin (ed.) *The Futures of Criminology*. London: Sage.

Fine, Beth A. (1993) 'The Evolution of Nondirectiveness in Genetic Counseling and Implications of the Human Genome Project', pp. 101–17 in Dionne M. Bartels, Bonnie S. LeRoy and Arthur L. Caplan (eds) *Prescribing Our Future: Ethical Challenges in Genetic Counseling*. New York: Aldine de Gruyter.

Foucault, Michel (1972) *Birth of the Clinic: An Archaeology of the Clinical Gaze*. London: Tavistock.

Foucault, Michel (1979) *The History of Sexuality, Volume 1: An Introduction*. London: Allen Lane.

Foucault, Michel (2001) '“Omnes et Singulatim”: Towards a Critique of Political Reason', pp. 298–325 in *Power: The Essential Works, Volume 3*. London: Allen Lane.

Fox Keller, Evelyn (2000) *The Century of the Gene*. Cambridge, MA: Harvard University Press.

Franklin, Sarah (1997) *Embodied Progress: A Cultural Account of Assisted Conception*. London: Routledge.

Franklin, Sarah (n.d.) 'Life Itself: Global Nature and the Genetic Imaginary' (draft). Department of Sociology and the Centre for Science Studies, Lancaster University, at <http://www.comp.lancaster.ac.uk/sociology/soc048sf.html>.

Fraser, Mariam (2001) 'The Nature of Prozac', *History of the Human Sciences* 14 (3): 56–84.

Gilbert, Walter (1992) 'A Vision of the Grail', pp. 83–97 in Daniel Kevles and Leroy Hood (eds) *The Code of Codes*. Cambridge, MA: Harvard University Press.

Glass, Bentley (1971) 'Science: Endless Horizons or Golden Age?', *Science* 171: 23–9.

Gostin, Larry (1991) 'Genetic Discrimination: The Use of Genetically Based Diagnostic Tests by Employers and Insurers', *American Journal of Law and Medicine* 17(1–2): 109–44.

Hacking, Ian (1983) *Representing and Intervening*. Cambridge: Cambridge University Press.

Hacking, Ian (1990) *The Taming of Chance*. Cambridge: Cambridge University Press.

Hacking, Ian (1992) 'World-Making by Kind-Making: Child Abuse for Example', pp. 180–238 in M. Douglas and D. Hull (eds) *How Classification Works: Nelson Goodman among the Social Sciences*. Edinburgh: Edinburgh University Press.

- Hacking, Ian (1995) 'The Looping Effects of Human Kinds', pp. 351–94 in D. Sperber, D. Premack and A.J. Premack (eds) *Causal Cognition: A Multi-Disciplinary Approach*. Oxford: Clarendon Press.
- Haraway, Donna (1997) 'FemaleMan[®]_Meets_OncoMouse[™]', pp. 49–119 in *Modest_Witness @Second_Millennium*. New York: Routledge.
- Hayden, M.R., M. Bloch, S. Fox and D. Crauford (1987) 'Ethical Issues in Pre-clinical Testing in Huntington Disease: Response to Margery Shaw's Invited Editorial Comment (Letter)', *American Journal of Medical Genetics* 28(3): 761–3.
- Healy, David (1997) *The Anti-Depressant Era*. Cambridge, MA: Harvard University Press.
- Henman, Paul (2000) 'Discerning and Governing the "Risky"', Paper given to Ethos of Welfare conference, University of Helsinki, September.
- Holtzman, Neil (1998) 'Eugenics and Genetic Testing', *Science in Context* 11(3/4): 397–417.
- Horsburgh, Beverley (1996) 'Schrodinger's Cat, Eugenics and the Compulsory Sterilization of Welfare Mothers', *Cardozo Law Review* 17: 531–82.
- Hubbard, Ruth and Elijah Wald (1999) *Exploding the Gene Myth*. Boston, MA: Beacon.
- Hyde, Alan (1997) 'The Body as Property', pp. 48–80 in *Bodies of Law*. Princeton, NJ: Princeton University Press.
- Kay, Lily (1995) *The Molecular Vision of Life: Caltech, The Rockefeller Foundation and the Rise of the New Biology*. New York: Oxford University Press.
- Kay, Lily (2000) *Who Wrote the Book of Life?* Stanford, CA: Stanford University Press.
- Kenen, Regina H. (1984) 'Genetic Counseling: The Development of a New Interdisciplinary Occupational Field', *Social Science and Medicine* 18(7): 541–9.
- Kevles, Daniel J. (1985) *In the Name of Eugenics: Genetics and the Uses of Human Heredity*. New York: Knopf.
- Kevles, Daniel J. and Leroy Hood (eds) (1992) *The Code of Codes: Scientific and Social Issues in the Human Genome Project*. Cambridge, MA: Harvard University Press.
- Koch, Lene (2000) 'Eugenics and Genetics', Paper given to Ethos of Welfare conference, University of Helsinki, September.
- Kramer, Peter (1994) *Listening to Prozac*. London: Fourth Estate.
- Kühl, Stefan (1994) *The Nazi Connection: Eugenics, American Racism and German National Socialism*. New York: Oxford University Press.
- Larson, Edward J. (1995) *Sex, Race and Science: Eugenics in the Deep South*. Baltimore, MD: Johns Hopkins University Press.
- Lippman, Abby (1992) 'Led (Astray) by Genetic Maps: The Cartography of the Human Genome and Healthcare', *Social Science and Medicine* 35: 1469–76.
- Ludmerer, Kenneth (1972) *Genetics and American Society*. Baltimore, MD: Johns Hopkins University Press.
- Luhrmann, Tanya W. (2001) *Of Two Minds: The Growing Disorder in American Psychiatry*. New York: Picador.
- Lury, Celia (1998) *Prosthetic Culture: Photography, Memory and Identity*. London: Routledge.

Lyon, David (1994) *The Electronic Eye: The Rise of Surveillance Society*. Cambridge: Polity.

Marteau, Theresa and Martin Richards (1996) *The Troubled Helix: Social and Psychological Implications of the New Genetics*. Cambridge: Cambridge University Press.

Nelkin, Dorothy (1992) 'The Social Power of Genetic Information', pp. 177–90 in Daniel Kevles and Leroy Hood (eds) *The Code of Codes*. Cambridge, MA: Harvard University Press.

Nelkin, Dorothy and Susan Lindee (1995) *The DNA Mystique: The Gene as a Cultural Icon*. New York: Freeman.

Nelkin, Dorothy and Laurence Tancredi (1994) *Dangerous Diagnostics: The Social Power of Genetic Information* (with a new Preface). Chicago, IL: University of Chicago Press.

Newnes, Craig, Guy Holmes and Cailzie Dunn (2001) *This is Madness Too*. Ross on Wye: PCCS Books.

Novas, Carlos and Nikolas Rose (2000) 'Genetic Risk and the Birth of the Somatic Individual', *Economy and Society* Special Issue on 'Configurations of Risk' 29(4): 484–513.

O'Malley, Pat (ed.) (2000) *Configurations of Risk: A Special Issue of Economy and Society* 29(4): 457–606.

Osborne, Thomas (1996) 'Security and Vitality: Drains, Liberalism and Power in the Nineteenth Century', pp. 99–122 in Andrew Barry, Thomas Osborne and Nikolas Rose (eds) *Foucault and Political Reason*. London: UCL Press.

Parens, Eric et al. (1998) *Enhancing Human Traits: Ethical and Social Implications*. Washington, DC: Georgetown University Press.

Parton, Nigel (1991) *Governing the Family: Child Care, Child Protection and the State*. London: Macmillan.

Paul, Diane (1998a) *The Politics of Heredity: Essays on Eugenics, Biomedicine, and the Nature–Nurture Debate*. New York: State University of New York Press.

Paul, Diane (1998b) 'Genetic Services, Economics and Eugenics', *Science in Context* 11 (3/4): 481–91.

Porter, Theodore (1996) *Trust in Numbers: The Pursuit of Objectivity in Science and Public Life*. Princeton, NJ: Princeton University Press.

Pottage, Alain (1998) 'The Inscription of Life in Law: Genes, Patents and Biopolitics', pp. 148–73 in R. Brownsword, W.R. Cornish and M. Llewelyn (eds) *Law and Human Genetics: Regulating a Revolution*. Oxford: Hart.

Pratt, John (1995) 'Dangerousness, Risk and Technologies of Power', *Australian and New Zealand Journal of Criminology* 28(1): 3–31.

Pratt, John (2000) 'Sex Crime and the New Punitiveness', *Behavioural Sciences and the Law* 18: 135–57.

Proctor, Robert (1988) *Racial Hygiene: Medicine Under the Nazis*. Cambridge, MA: Harvard University Press.

Rabeharisoa, V. and M. Callon (1998) 'L'implication des malades dans les activités de recherche soutenues par l'Association Française contre les myopathies', *Sciences Sociales et Santé* 16(3): 41–65.

Rabinow, Paul (1994) 'The Third Culture', *History of the Human Sciences* 7(2): 53–64.

- Rabinow, Paul (1996a) *Making PCR: A Story of Biotechnology*. Chicago, IL: University of Chicago Press.
- Rabinow, Paul (1996b) 'Artificiality and Enlightenment: From Sociobiology to Biosociality', pp. 91–111 in *Essays on the Anthropology of Reason*. Princeton, NJ: Princeton University Press.
- Rabinow, Paul (1996c) 'Severing the Ties: Fragmentation and Dignity in Late Modernity', pp. 129–52 in *Essays on the Anthropology of Reason*. Princeton, NJ: Princeton University Press.
- Rabinow, Paul (1998) 'Genetic and Molecular Bodies', pp. 135–50 in Tetsuji Yamamoto (ed.) *Philosophical Designs for a Socio-Cultural Transformation*. Paris: École des Hautes Études et Sciences Culturelles (with Rowman and Littlefield).
- Rabinow, Paul (1999) *French DNA: Trouble in Purgatory*. Chicago, IL: University of Chicago Press.
- Rapp, Rayna (1999) *Testing Women, Testing the Fetus: The Social Impact of Amniocentesis in America*. New York: Routledge.
- Reed, Sheldon (1974) 'A Short History of Genetic Counseling', *Social Biology* 21(4): 332–9.
- Reilly, Phillip R. (1991) *The Surgical Solution: A History of Involuntary Sterilisation in the United States*. Baltimore, MD: Johns Hopkins University Press.
- Rheinberger, Hans-Jörg (1995) *Towards a History of Epistemic Things: Synthesizing Proteins in the Test Tube*. Stanford, CA: Stanford University Press.
- Rifkin, Jeremy (1998) *The Biotech Century*. New York: Tarcher/Putnam.
- Robertson, John A. (1983) 'Procreative Liberty and the Control of Conception, Pregnancy and Childbirth', *Virginia Law Review* 69: 405–64.
- Robitscher, Jonas (ed.) (1973) *Eugenic Sterilisation*. Springfield, IL: Thomas.
- Rose, Nikolas (1985) *The Psychological Complex*. London: Routledge.
- Rose, Nikolas (1996) 'Governing "Advanced" Liberal Democracies', pp. 37–64 in Andrew Barry, Thomas Osborne and Nikolas Rose (eds) *Foucault and Political Reason*. London: UCL Press.
- Rose, Nikolas (1998) 'Governing Risky Individuals: The Role of Psychiatry in New Regimes of Control', *Psychiatry, Psychology and Law* 3(2): 177–96.
- Rose, Nikolas (1999) *Powers of Freedom: Reframing Political Thought*. Cambridge: Cambridge University Press.
- Rose, Nikolas (2000a) 'Government and Control', *British Journal of Criminology* Special Issue on Criminology and Social Theory edited by David Garland and Colin Sparks 40: 321–39.
- Rose, Nikolas (2000b) 'The Biology of Culpability: Pathological Identity and Crime Control in a Biological Culture', *Theoretical Criminology* 4(1): 5–34.
- Shaw, Margery W. (1987) 'Testing for the Huntington Gene: A Right to Know, a Right not to Know, or a Duty to Know?', *American Journal of Medical Genetics* 26(2): 243–6.
- Strathern, Marilyn (1999) 'What is Intellectual Property After?', pp. 179–204 in *Property, Substance and Effect*. London: Athlone.
- Waldby, Catherine (2000) *The Visible Human Project*. London: Routledge.
- Wasserman, David and Robert Wachbroit (eds) (2001) *Genetics and Criminal Behavior*. Cambridge: Cambridge University Press.

Watson, James D. (1990) 'The Human Genome Project – Past, Present and Future', *Science* 248 (6 April): 44–9.

Weir, Lorna (1996) 'Recent Developments in the Government of Pregnancy', *Economy and Society* 25(3): 373–92.

Wertz, Dorothy (1998) 'Eugenics is Alive and Well: A Survey of Genetics Professionals Around the World', *Science in Context* 11(3/4): 493–510.

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