

THE NEW EUGENICS: JACQUES TESTART AND FRENCH BIOETHICS

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In recent years, the notion has gained currency that a new form of eugenics may be in the process of emerging. This new eugenics has, it is claimed, managed to divest itself of the totalitarian associations of the past, and functions primarily by means of the ever-increasing use of genetic screening techniques. In *The Future of Human Nature* Jürgen Habermas has sought to engage with the philosophical and ethical implications of techniques such as preimplantation genetic diagnosis.¹ As he emphasises, developments in the area of genetics and biotechnology ultimately challenge our self-understanding as human beings. Although there have been any number of eugenic projects throughout history, the mainstream of humanist secular and religious thought in Europe has based the notion of the uniqueness of the individual upon the certainty that a human being's genetic endowment could not be programmed or manipulated in advance.² However, Habermas argues that, once manipulation does become possible, the 'rather ordinary contingency' of the individual's genetic inheritance - the uncontrollable result of human fertilisation - is thrown into question. If it becomes possible for parents to consider the genetic traits of their offspring as being open to manipulation, they begin to exercise a kind of control that intervenes in the ethical freedom of the unborn child. What Habermas calls 'organic nature' was previously either 'given' or, in the case of eugenics, 'bred', but now we face the possibility of it being produced as an 'artifact'. This situation raises the issue of whether this new possibility of genetic intervention necessitates normative regulation or can be seen simply as a means of individual 'self-empowerment' and of expressing individual preferences.

In attempting to conceive of some sort of framework that might encourage informed regulation of such forms of genetic intervention, Habermas draws on the twin tenets of Kant's categorical imperative: the principle that human beings should always be treated as ends in themselves, along with the principle that we should act in conformity with what we perceive to be universal laws.³ He also draws on Hannah Arendt's concept of 'natality', which is to say the link she perceives between birth and the 'beginning' that is inherent to all human action. It is only when we are on the point of mastering the contingency of our genetic inheritance, Habermas argues, that we realise how crucial the contingency of birth is to our conception of ourselves as individuals capable of action in the world.⁴

Troy Duster, in *Backdoor to Eugenics*, has located this new eugenics within what he identifies as a gradual, almost imperceptible, shift towards the

1. Jürgen Habermas, *The Future of Human Nature*, Cambridge, Polity, 2003.

2. *Ibid.*, p13.

3. *Ibid.*, pp55-6.

4. *Ibid.*, p59.

acceptance of a genetic paradigm in recent years, which threatens to facilitate a 'backdoor' route to eugenics.⁵ He acknowledges that by the 1950s social - rather than hereditarian - theories *appeared* to have won the battle to explain and analyse the great human concerns of the era. However, he feels that, partly as a result of the fact that the new genetic technologies promise more immediate, practical, and apparently unproblematic gains for the individual, and partly because science quite simply makes such powerful and persuasive claims, genetic explanations have become increasingly prevalent. Pierre Bourdieu, in the foreword to Duster's book, sees the fact that characteristics such as intelligence and the propensity to violence are viewed in purely genetic terms as one symptom of a return to essentialism that characterises what he regards as the current era of cultural reaction and conservatism.⁶ He fears that the outcome of this resurgence of essentialist thinking and the rise of the new biotechnologies will be the slow imposition of a eugenic worldview by means of routine bureaucratic practices of genetic intervention. Duster points to developments in the field of human molecular biology as a key component of this putative return to genetics and, from a historical perspective, Lily E. Kay has put forward a similar argument. She looks at the way in which molecular biology emerged as a dominant disciplinary trend in the United States from the 1930s through to the 1950s. She argues that eugenic concerns were, from the start, central to the development of the molecular biology programme in the United States, and in particular in the Rockefeller Foundation's 'Science of Man' agenda.⁷

For the past twenty years or so, the French biologist Jacques Testart has added his voice to the growing concern relating to a resurgent eugenics. Testart offers a humanist critique of the hegemony of a molecular genetic framework, and associates this molecular eugenics with the more general development of technoscience. In many ways, his work constitutes a revival of a broadly existentialist humanism which, particularly in the 1970s, forged intellectual links with ecological thought.⁸ Testart's critique of 'systematic' or 'synthetic' biology's instrumentalising and reductive grip on living beings is, for example, very close to the ideas expressed by André Gorz in his recent book *Limmatériel: connaissance, valeur et capital*.⁹ Gorz goes so far as to argue that the technoscientific tendencies of the global economy have effectively created a world in which human beings will be forced to resort to genetic 're-engineering' in order to keep pace with the machines which control and co-ordinate capital.¹⁰ Testart, for his part, insists upon the fact that there are human 'truths' - such as those found within the realms of intuition and affectivity - which are not scientific. Scientific research tends to establish a single, self-justifying and exclusive form of truth which is defined according to pre-existing approaches and theories. Testart counters claims from the scientific community that his position is obscurantist by arguing that the dominance of notions of scientific progress has led to an unwarranted concentration on the 'rational' at the expense of other, equally valid, forms of human understanding and solidarity.¹¹ This essay will look primarily at

5. Troy Duster, *Backdoor to Eugenics*, 2nd Edition, London, Routledge, 2003.

6. Pierre Bourdieu, 'Foreword: Advocating a "Genethics"', in Troy Duster, *Backdoor to Eugenics*, op. cit., ppvii-viii.

7. Lily E. Kay, *The Molecular Vision of Life: Caltech, the Rockefeller Foundation, and the Rise of the New Biology*, Oxford, OUP, 1993.

8. The work of André Gorz is particularly significant in this respect. See also Finn Bowring, *Science, Seeds and Cyborgs: Biotechnology and the Appropriation of Life*, London, Verso, 2003.

9. André Gorz, *Limmatériel: connaissance, valeur et capital*, Paris, Galilée, 2003.

10. *Ibid.*, pp136-7.

11. Jacques Testart, 'L'Effet Testart" trois ans après', op cit., p57.

Testart's arguments relating to eugenics, in the context of new reproductive techniques in the field of molecular genetics. In addition, it will be suggested that Testart's work can be situated within a network of *philosophical* speculation in France on matters relating to eugenics and bioethics. This philosophical dimension has meant that French debates on bioethical matters are frequently framed against wider questions, such as the epistemological and ontological legitimacy of a human form that is subject to 'modification'. Testart sees his own interventions in what might be regarded as the field of bioethics as being part of a wider struggle to establish meaningful and sustainable interactions between humanity and the environment.¹²

It is important to consider Testart's work in the context of a distinctively French approach to bioethical issues. In 1983, France became the first country to create a national bioethics committee (Le Comité consultatif national d'éthique pour les sciences de la vie et de santé - CCNE) and, a decade later, it introduced the first comprehensive bioethics legislation. It is widely recognised that the French approach of establishing an abstract legal framework, based on general principles such as human 'dignity', contrasts with the more 'pragmatic' Anglo-Saxon approach.¹³ Testart is certainly aware of these differences, and acknowledges the general quality of debates on bioethics in France.¹⁴ However, he is generally critical of the fact that bioethics committees are, by definition, the province of *experts*. He suggests that the French bioethics committee is compromised by the fact that most of its members are scientific researchers or medical practitioners who generally subscribe to the dominant ideology of scientific progress. He is concerned to make sure that discussion of these issues does not remain the province of an elite, but rather springs from the active participation of citizens. Testart calls for alternatives to a culture of co-opted expertise, both in terms of greater democratic participation in decision-making and also in terms of a more critical and independent stance from expert practitioners in all fields.¹⁵ What is more, the way in which such committees work leads to a sort of ethical drift, whereby legislation proceeds on a 'case-by-case' basis, rather than setting out clear and definitive principles from which medical and scientific practice should flow. In short, it seems to Testart that contemporary technoscientific developments have their own incremental logic. It is impossible, he claims, to construct an ethics *à la française* in an era of global capitalism.¹⁶ It is only through the construction of a universal, globally applicable ethics, free from economic or technoscientific pressures, that it will be possible to avoid a drift towards an ever-increasing instrumentalisation and commodification of life. In the contemporary context of globalisation, he recognises that new scientific techniques are rapidly disseminated across the world, and that cultural and political differences mean that it is difficult to construct a viable global bioethics. However, Testart is committed to the notion of an underlying human unity which requires us to construct an ethics that is not mediated through the distorting lenses of expert culture and the ambitions of scientific 'progress'.¹⁷

12. See Jacques Testart, 'Éthique n'est pas technique', *Le Monde diplomatique*, November 1995, p32.

13. See Declan Butler, 'France reaps benefits of going by the book', *Nature*, 389, 16 October 1997: 661-2.

14. Jacques Testart, *Des hommes probables: de la procréation aléatoire à la reproduction normative*, Paris, Seuil, 1999, p163.

15. See Jacques Testart, 'Les experts, la science et la loi', *Le Monde Diplomatique*, September 2000, pp1, 26 & 27.

16. Jacques Testart, *Des hommes probables*, op. cit., p166.

17. *Ibid.*, p167.

In recent times, Testart has become increasingly preoccupied with the general commodification of 'la vie biologique'. He locates the attempt to 'master' biological life within a wider drive to control and normalise individuals in order to create an unproblematic *homme moyen*. This *homme moyen* is, as far as Testart is concerned, the ideal, passive consumer-citizen of an increasingly market-orientated society. In the same way that this consumer-citizen is required to provide statistical information by responding to polls and questionnaires, so s/he will in the future increasingly be defined in terms of a statistical relation to the utility and 'normality' of his or her genome.¹⁸

18. Ibid., pp36-7 & 194-5.

LA 'PULSION' EUGENIQUE

Testart started his professional career as a geneticist working in the field of agriculture. He first came to public attention in France in 1982 as a prominent member of the scientific team that facilitated the birth of France's first so-called 'test-tube' baby. Subsequently, in 1986, he published *L'œuf transparent*,¹⁹ in which he reflected on the ethical issues raised by *in vitro* fertilisation and its potential articulation with advances in molecular biology. He argued that the combination of advances in genetic testing and developments in artificially assisted procreation - 'assistance médicale à la procréation' - provide fertile ground for a new eugenics. IVF procedures produce a number of embryos, and the development of pre-implantation genetic diagnosis techniques means that the 'best' embryo can be chosen according to pre-determined genetic criteria. His unease with the selection of embryos ultimately led to Testart's announcement in 1986 in *L'œuf transparent* that the time had come to 'take a break' from certain kinds of research.²⁰ For Testart, this was a necessary moment of self-censorship, as well as a symbolic gesture of resistance to a logic that he felt would eventually lead to the imposition of a new eugenics. The decision he made was to continue with research that 'helps us to do more effectively what we already do', but to cease research that works towards 'a radical transformation of the human being'. To this end, he has sought in the intervening period to maintain the distinction between *procreative* and *predictive* medicine. In other words, he feels that the development of techniques that enable otherwise infertile couples to have children is a perfectly legitimate and laudable medical goal, since such children will be subject to the genetic contingencies that inevitably arise from the combination of two sets of chromosomes.²¹ Predictive medicine, on the other hand, focuses on the selection of the embryo that is deemed to be the most genetically 'normal' or healthy.

19. Jacques Testart, *L'œuf transparent*, Paris, Flammarion, 1986.

20. Ibid., p33.

21. It is for this reason that Testart defends the legitimacy of the technique known as ICSI (Intracytoplasmic Sperm Injection), which, he claims, has revolutionised the treatment of male sterility. See *Des hommes probables*, op. cit., pp110-118.

An important aspect of the ethical responsibility that is, for Testart, integral to his engagement as both a scientist and a citizen is a duty to resist any move towards eugenics in contemporary society. For Testart, eugenics is not a historical aberration - associated primarily with Nazism - that we have now overcome, but rather a recurrent 'impulse' ['pulsion'], which has taken any number of forms throughout history and across cultures. He

argues, for example, that even the relatively routine medical procedure of an amniocentesis during pregnancy to screen for genetic defects is part of this drift towards eugenics. In *Le désir du gène* he claims that most ancient cultures were characterised by ‘une volonté génétique’, in that they sought to prevent certain individuals from procreating, whilst at the same time assuring the procreation of an elite. In showing that a range of eugenic practices have operated throughout history, Testart suggests that ‘positive’ and ‘negative’ forms of eugenics, as well as authoritarian and individualistic forms, have existed alongside one another. He points to several examples of ‘positive’ eugenics, understood as the promotion of procreation amongst individuals who have been identified as most likely to ‘improve’ a race or social group: the practice of incest in Ancient Egyptian and Inca dynasties in order to preserve a royal line; the policies associated with the Nazi *Lebensborn* project; and the creation of sperm banks for Nobel prize-winners in the United States. He draws particular attention to the policy of positive eugenics adopted by Singapore in the 1980s, designed to encourage procreation amongst certain socio-economic groups. This scheme, whereby graduates were offered financial incentives to have children, is a good example of ‘liberal’ eugenics, in that it is neither repressive nor coercive, and it has no explicitly racial dimension. As far as ‘negative’ eugenics - the attempt to prevent ‘defective’ individuals from procreating - is concerned, it appears in similarly diverse forms across time: infanticide, both in ancient Sparta, but also in a contemporary ‘medicalised’ version in the form of abortion; the use of genetic counselling and ‘le certificat prénuptial’ in France to dissuade certain individuals from procreating; and the sterilisation of ‘defective’ individuals. (It is now widely accepted that in Sweden between 1935 and 1976 over 60,000 individuals were subject to what amounted to compulsory sterilisation.)²²

22. Jacques Testart, *Le désir du gène*, Paris, Flammarion, 1992, p29.

Testart suggests that this contemporary eugenic impulse functions according to the familiar rationale of scientific ‘progress’ within a developed economy. In contemporary industrialised societies the widespread availability of effective contraception, along with breakthroughs in the treatment of infertility, means that it is now more or less possible to produce a desired number of offspring. In such circumstances he suggests it is inevitable that, having conquered a quantitative problem, attention is turned towards ‘qualitative’ issues. The child, Testart provocatively claims, will suffer the fate of domestic labour-saving devices: it will be ‘improved’, and the means of achieving this improvement will be a genetic analysis of the embryo.²³ Testart’s position is broadly shared by Habermas, who points to the fact that embryo research and PGD (pre-implantation genetic diagnosis) evoke the spectre of ‘human breeding’, in that these techniques threaten to remove the element of contingency from the fusion of two sets of chromosomes. Previously, Testart claims, eugenics, although an ever-present impulse, at the same time ultimately proved to be unpalatable to any society with democratic pretensions, since the techniques of intervention - infanticide, forced abortions, sterilisations, the prevention of certain couples from

23. Jacques Testart, *Des grenouilles et des hommes: conversations avec Jean Rostand*, Paris, Seuil, 2000, p161.

procreating - were to a greater or lesser extent eventually seen as incompatible with 'civilised' values. However, the embryo *in vitro* does not appear to pose the same threat; it gives eugenics an air of scientific and medical legitimacy. Testart rejects this sanitised representation of what he views as a practice of selection that finds its genealogy in the more obviously brutal and 'uncivilised' eugenic procedures of the past.²⁴

In short, Testart claims that eugenics effectively finds a new object, in the form of the human embryo *in vitro*. Ultimately, this new eugenics will, he feels, express itself as a drift towards cloning techniques. Cloning, in the sense that Testart talks of it, does not refer exclusively to the highly controversial and sensationalised issue of the cloned human individual, but in more general terms to the attempt to perpetuate and replicate a particular genetic stock that has been identified as 'normal' and desirable. He suggests that the firm opposition of ethics committees to human cloning diverts attention from the fact that the fetishising of DNA will inevitably lead to a drive towards the technological *reproduction* of this genetic material. That is to say, it will be DNA that will be cloned, rather than individuals as in the scenarios imagined by science fiction. In other words, it will not be unbridled and unscrupulous narcissism that leads to the widespread adoption of cloning as a reproductive technique. It will instead be the reductive identification of human beings with their DNA, along with the normalising drive to reproduce 'healthy' DNA, that will encourage the growth of cloning techniques. Cloning is, Testart claims, a paradigmatic expression of the scientific desire to construct a new 'human object' that it feels it can control and understand. It will be a way of mastering the unreliable contingencies of procreation.²⁵

Testart is not alone in voicing these concerns and, in the late 1980s and early 1990s, he was involved in a form of public debate concerning the issue of a new eugenics.²⁶ In the course of defending his position, Testart engaged in a sometimes highly charged exchange with the French philosopher and historian of ideas Pierre-André Taguieff. In many ways, the object of debate concerned not only the issue of eugenics itself, but also focused on the question of how to define a genuinely *secular* response to molecular genetics and the potential for a new eugenics. Taguieff argues that it would run contrary to Enlightenment principles of reason and progress to dismiss out-of-hand the possibility that there might be scope for the 'self-improvement' of the human race by means of environmental or genetic intervention.²⁷ In a move that prefigures Peter Sloterdijk's provocative challenge to adapt the ethical framework of Western humanism in the light of molecular genetics and biotechnology,²⁸ Taguieff makes the claim that the fact that humanity now increasingly has access to the human genome means that we can 'improve' our genetic inheritance by means other than the relatively crude techniques of selective reproduction. This situation imposes upon us an altruistic ethical duty to the future, and we would be failing in this duty if we did not consider rationally just how we might best carry out these 'improvements'. Responding to this, Testart accuses Taguieff of falling under the spell of the arrogant ideology of scientific progress, and

24. See Jacques Testart, *Le désir du gène*, op. cit., pp67-8.

25. Jacques Testart, *Des hommes probables*, op. cit., p81.

26. For a clear summary of the re-appearance of eugenics as a subject for debate in France see Michel Blanc, 'Peut-on défendre l'eugénisme?', *Esprit*, 192, June 1993: 66-80.

27. Pierre-André Taguieff, 'L'eugénisme, objet de phobie idéologique: lectures françaises récentes', *Esprit*, 156, November 1989: pp99-115. See also Pierre-André Taguieff, 'Sur l'eugénisme: du fantasme au débat', *Pouvoirs*, 56 (1991): pp23-64.

28. Peter Sloterdijk, *Regeln für de Menschenpark: Ein Antwortschreiben zu Heideggers Brief über den Humanismus*, Frankfurt/Main, SuhrkampVerlag, 1999.

29. Jacques Testart, 'Les risques de la purification génétique: questions à Pierre-André Taguieff', *Esprit*, 199, February 1994:178-184.

30. See André Pichot, *Leugénisme: ou les généticiens saisis par la philanthropie*, Paris, Hatier, 1995.

31. *Ibid.*, p54.

32. See François Jacob, *La logique du vivant: une histoire de l'hérédité*, Paris, Gallimard, 1970 & Jacques Monod, *Le Hasard et la nécessité: essai sur la philosophie naturelle de la biologie moderne*, Paris, Editions du Seuil, 1970.

33. Jacques Testart, *Le désir du gène*, op. cit., p34.

of providing intellectual legitimacy for the dubious claims of 'biomedicine'.²⁹ Ultimately, Testart's version of humanism comes into conflict with Taguieff's secular, Republican (in the French sense) drive to improve humanity as a whole in order to avoid the dangers of social, ethnic and racial division. Testart's view is that human life should not be defined in narrowly genetic terms, but rather by means of the active and free creation of meaning and value.

MOLECULAR BIOLOGY

Testart shares with commentators such as André Pichot the belief that molecular genetics provides a sort of 'alibi' for the new eugenics.³⁰ Pichot points to the way in which 'la génétique moléculaire' achieves a form of discursive supremacy in France in the post-war era, particularly through the publications and public profile of figures such as Francois Jacob and Jacques Monod.³¹ Jacob and Monod, along with André Lwoff, won the Nobel Prize in 1965 for their work in the area of the genetic control of enzyme and virus synthesis. They both argued that, in the light of discoveries in the field of molecular biology, DNA could now be regarded as the material support that Darwinism needed to function as a general theory of evolution, and they were strongly identified with the claim that DNA constituted the 'code' or 'script' for life.³² Initially, in the context of a post-war reaction against Nazi racist eugenics, molecular biology appeared to deal a scientific blow to eugenic thinking. For one thing, the concept of a genetic *programme* that functions autonomously and impersonally shifted the focus away from the possibility of actively intervening in the process of evolution. Also, molecular biology substituted the notion of intercommunicating genetic 'pools' for the concept of *race*.

Testart, however, like Pichot, suggests that under this 'politically correct' cover molecular biology actually prepares the ground for a new eugenics. He argues, for example, that figures such as Darwin, Mendel and Weismann, rather than laying the foundations for a scientific rejection of eugenics, formulated theories that have been appropriated in order to give eugenics a 'rational', scientific basis. The cumulative effect of their concentration upon selection and heredity, at the expense of environmental factors, has been to shift emphasis away from the Lamarckian model of a link between progress and the influence of environment to the 'mysterious route' of the bloodline.³³ As far as the influence of environment is concerned, Testart's apparent regret for the passing of a neo-Lamarckian paradigm betrays the influence of what some have seen as biology's own version of the Cold War in the 1950s in France. French biology was notoriously late in abandoning a residual attachment to Lamarck's theories, and the situation was undoubtedly given further political inflections by the impact of the Lysenko affair upon the French Communist Party. A large number of French intellectuals and scientists were shocked that Lysenko's 'new biology', which dismissed the science of genetics as 'metaphysical' and promoted the notion of acquired characteristics, should be defended in such brazenly political and ideological terms. However,

there were voices raised, primarily within the Communist Party, in defence of Lysenko's scientific theories. It was claimed that Lysenko's biology was in conformity with dialectical materialism because, rather than there being a special substance which is the sole vehicle for heredity, the living organism is defined by all its parts, which constitute a dynamic and interactive unity. Also, it was argued Lysenko's attack on genetics was simply one element of a wider ideological battle. By implication, any theory that rejected the principle of acquired characteristics in favour of a theory of evolution based on genetics and natural selection, was associated with 'racist' forms of thinking.

Although Testart and Pichot by no means subscribe to a crude Lamarckian notion of acquired characteristics, they do draw attention to the way in which the move to a rigidly genetic paradigm is reductive, dogmatic - literally so, in its advocacy of the so-called 'central dogma', according to which there is no 'route back' from proteins to DNA - and technocratic. For Pichot, 'la génétique moléculaire' succeeds in getting its 'brand image' into general circulation and has become, in effect, one more component of the culture of experts that is mobilised in support of an increasingly instrumental view of life. Anne Carol, in her survey of eugenics in France,³⁴ appears to concur with Pichot and Testart when she suggests that eugenics as a general preoccupation in the post-war era managed to survive its association with Nazism, both by establishing longer standing continuities and by finding new, sometimes unexpected, vehicles for expression, such as molecular biology. She notes, for example, that the 'diabolisation' of eugenics by association with Nazism that we now take for granted, was not yet fully developed in 1950.³⁵ In the aftermath of the Second World War, the discourse of eugenics becomes relatively sparse, but it nevertheless continues to be expressed in certain quarters 'without excessive embarrassment'. Equally as important, she suggests, is the fact that medical breakthroughs and the growth of prosperity result in a post-war baby boom. This means that the eugenic preoccupation with degeneration and decline is no longer pertinent in the post-war era, and is gradually replaced by a concern with improvements in the health of the population. In line with this change of emphasis, eugenics initially shifts away from genetics and even re-emphasises the role of the environment in human development. Subsequently, the possibility of eugenics as a predominantly genetic discourse emerges in the initially unpromising form of molecular biology, and the focus of eugenics gradually shifts away from the population to the individual.

LE TOUT GENETIQUE

The issue of environmental versus genetic paradigms is linked to a broader debate on the issue of molecular biology and materialism. The short-hand term that has been coined to define this issue in France is *le tout génétique*, which translates roughly as 'genetic reductionism' or 'genetic determinism'. The reduction of the complexity and individuality of human beings to a genetic programme is, for Testart, an example of the way in which contemporary

34. Anne Carol, *Histoire de l'eugénisme en France: les médecins et la procréation XIX-XX^e siècle*, Paris, Seuil, 1995.

35. *Ibid.*, p339.

36. Jacques Testart, *Des hommes probables*, op. cit., p22

37. Ibid., p23.

38. Ibid., p26.

39. Jacques Testart & Christian Godin, *Au bazar du vivant: biologie, médecine et bioéthique sous la coupe libérale*, Paris, Seuil, 2001, p30.

40. Jacques Testart, *Des hommes probables*, op. cit., p23.

41. See Richard C. Lewontin, *The Doctrine of DNA: Biology as Ideology*, London, Penguin, 1993.

42. Ibid., p48.

43. Jacques Testart, *Des hommes probables*, p38. See also Richard Strohmman, 'Epigenesis: The Missing Beat in Biotechnology?' *Bio/Technology*, 12 (1994): 156-64.

44. See Robin Holliday, 'Genetics: An Overview', *Developmental Genetics*, 15 (1994): 453-7.

science is moving away from any form of direct contact with, or observation of, organisms in favour of a computer-led approach.³⁶ As indicated already, Testart argues consistently for the construction of human 'meaning', or 'sense', as opposed to the reductive mechanism of what he has latterly called synthetic biology, since he is suspicious of the narrowness of perspective implied by the molecular vision of life.

On a more abstract level, this critique of the fundamental tenets of molecular biology means that Testart is effectively engaged in a struggle to propose a definition of 'life' that stands against this reductive tendency. His overall argument is that such a molecular vision disregards the 'living character', as it were, of life, in favour of an exploration of a theoretical 'virtual' life that lacks depth and meaning. For Testart, the tools of molecular biology ignore the organs, tissues and cells of the real, living organism.³⁷ The obsession with genetics and molecular biology have had the effect of making the molecule the sole reference point of contemporary biology, and has meant that the sophisticated laboratory tools of this biology have substituted for genuine concepts.³⁸ Here, Testart is close to Habermas' broad claim that the molecularisation of life undermines the concept of the 'life-world' as an embodied and 'enworlded' experience. Testart defends a particular conception of 'le vivant' that depends upon a distinction between organic and inorganic matter: a distinction which predates the major developments in molecular biology that take place in the twentieth century. For Testart, the DNA molecule, just like any molecule, is not, in and of itself, living: it is rather inert, like copper or water molecules.³⁹ The quest to accumulate sufficient molecular data to define and understand a living being is, Testart argues, doomed to failure, since such an approach is unable to grasp the true *complexity* of the being as a dynamic whole.⁴⁰ Testart draws on the work of Richard Lewontin, who has similarly sought to challenge the fetishising of DNA as a set of detailed instructions for the construction of the individual.⁴¹ Lewontin calls into question the way in which the central dogma sets up DNA and RNA as the sole supports for hereditary information. Genes do not, he argues, *make* proteins, since genes rely on an entire manufacturing machinery within the cell. It is, in short, unjustifiable to identify the gene as the 'master molecule'.⁴² Testart also points to recent work by biologists such as Richard Strohmman, who has argued that the 'programme' is not located solely in the genome. Instead, it is necessary to consider the organism in more holistic terms, and to think in terms of interacting *epigenetic* networks which respond to the genome but are also open to environmental signals.⁴³

It is worth pausing briefly to consider the issue of the development of epigenetics, since this field informs much of Testart's rejection of genetic essentialism. Robin Holliday defines epigenetics in two related ways.⁴⁴ First, epigenetics refers to the complex unfolding of the genetic programme, both in terms of the development of an organism and the differentiation of cells throughout the organism's life. In this sense, epigenetics shifts the emphasis away from the notion that the entire development of the organism

is contained, *performed* as it were, in the DNA. Second, epigenetics has focused increasingly on what Holliday refers to as nuclear inheritance that is not based on differences in DNA sequence.⁴⁵ In the past thirty years or so, work on heritable epigenetic differences has challenged the notion, associated with molecular neo-Darwinism's updating of the 'Modern Synthesis', that the origins of heritable variation is random changes in DNA. Scientific interest in epigenetic inheritance began in the mid-1970s, and has grown steadily, resulting in a tentative reassessment of Lamarckian approaches to evolution. In a recent assessment of these developments, Eva Jablonka and Marion J. Lamb have gone so far as to claim that thinking on heredity and evolution is undergoing something like a paradigm shift away from what they term the 'gene-centred version of neo-Darwinism' that has been in place for the last half-century.⁴⁶ Essentially, they argue that information is transferred from generation to generation not simply by DNA, but by a series of interacting inheritance systems.

45. *Ibid.*, p454

Testart is, above all, disturbed by what he sees as the hegemony of molecular biology. This polarisation of biology in the direction of the molecular has led to a generalised industrialisation of research, and has consequently focused far too much attention and expectation upon undertakings like the human genome project. In general terms, the media have fostered the notion that the 'genetic map' of a human being constitutes a sort of genetic ID [*carte d'identité*]. This exaggeration of the role of genetics in the constitution of identity, in turn, feeds into the legitimisation of the notion of genetic 'norms'. Ultimately, Testart rejects the notion, fostered by the spectacular insights of molecular biology in the post-war era, that the genetic material contains a 'programme' that is mechanically interpreted by the cell in order to construct an organism. The effect of the paradigm of *le tout génétique* upon procreative medicine, according to Testart, is the imposition of a frame of statistical probability [*la pression probabiliste*] that is gradually invading all aspects of human life. As far as Testart is concerned, science pursues its own 'truths' and constructs a system of knowledge [*le connu*] which it can measure and delimit, and with which it feels comfortable. In this way, the human being is increasingly seen as a 'virtual' being, living under the shadow of what it might *become*, rather than what it *is*: *l'homme probable*.⁴⁷ In recent years, Testart has also, unsurprisingly, expressed scepticism regarding the human genome project. For one thing, it encourages the notion that there are such things as human norms, whilst at the same time overestimating the role that genetics plays in individuality. It also promotes the idea that effective medical procedures will be developed as a consequence of advances in knowledge of the human genome. In line with other commentators who are sceptical about the status of the human genome project, he points out that the major part of the DNA molecule is actually made of non-coding sequences. These concerns have led Testart to talk in terms of 'pangenetism' that has the triple function of fostering the notion of a human norm, exaggerating the role of genetics in determining the individual, and making the assumption that medical

46. Eva Jablonka and Marion J. Lamb, *Evolution in Four Dimensions: Genetic, Epigenetic, Behavioral, and Symbolic Variation in the History of Life*, Cambridge, Mass./London, MIT Press, 2005.

47. Jacques Testart, *Des hommes probables*, op. cit., pp16-17.

48. Jacques Testart, 'Le pangénéisme: une mystification scientifique et médicale', in Yves Michaud (ed) *Université de tous les savoirs, Qu'est-ce que la vie?* vol. 1, Paris, Odile Jacob, 2000.

49. See Paul Rabinow, 'La recherche génétique et la connaissance du vivant: un regard ethnographique sur le débat français'. Entretien avec Paul Rabinow', *Esprit*, 284, May 2002: 137-8.

50. Michel Foucault, *The History of Sexuality: An Introduction*, London, Allen Lane, 1979.

51. *Ibid.*, p142.

52. Paul Rabinow, *French DNA: Trouble in Purgatory*, Chicago/London, University of Chicago Press, 1999.

interventions will inevitably flow from our understanding of the genome.⁴⁸

BIOPOLITICS

Given that the ongoing debate on eugenics in France encompasses not only issues of state policy, but also the nature of the involvement of science and technology in the reproduction and the fostering of, human life, it must be seen as essentially 'biopolitical' - to use the Foucauldian term - in orientation. Foucault's formulation of 'biopolitics' has gained a certain currency in recent years, but remains notoriously difficult to define in precise terms.⁴⁹ Foucault outlines the notion of 'biopolitics' most comprehensively in *The History of Sexuality*.⁵⁰ Here, it is essentially an extension of his earlier formulation of 'discipline', whereby the legal subject is overlaid with the crucial figure of the 'living being'. Foucault shows that 'life' emerges in the eighteenth century as an object of knowledge and of political intervention. A politics emerges which relates to what it means to be a 'living species in a living world':

For the first time in history, no doubt, biological existence was reflected in political existence; the fact of living was no longer an inaccessible substrate that only emerged from time to time, amid the randomness of death and its fatality; part of it passed into knowledge's field of control and power's sphere of intervention.⁵¹

From this, it can be seen that the notion of biopolitics is well adapted to be used as a conceptual and analytical tool for considering the field of biotechnology. From the discovery of the double-helix structure of DNA in 1953 onwards, molecular biology has claimed to render not only visible, but also accessible, the code of life itself: a new dimension of matter that appears to be increasingly accessible and available for observation and manipulation.

Paul Rabinow, in *French DNA*, has already suggested that Foucault's notion of biopolitics provides ways in which to analyse the discourse that has been constructed in France around questions of the body, society and ethics in relation to recent developments in molecular biology.⁵² Rabinow proposes to look outside of the realm of 'values and opinions' in order to gain purchase on the way in which in France the relatively stable post-war forms that were conceived of as the body, society and ethics are now unavoidably being taken apart and remade. He attempts in *French DNA* to analyse the 'muffled movement and experimentation' that accompanies these poorly articulated issues. In the course of analysing a distinctively 'French' discourse on molecular biology, Rabinow locates Testart, along with a number of other commentators, within a particularly significant discursive moment in the 1970s and 1980s, when a range of books appeared in France dealing with pressing biological issues. These books expressed alarm and anxiety in response to recent developments in biology. For Rabinow, one of the striking aspects of this discursive moment is that avowedly secular intellectuals and experts

express quasi-religious sentiments, and he sees Testart's *Lœuf transparent* as central to the construction of this 'purgatorial' space, characterised by a pressing sense that the future is at stake, as well as an awareness of the complexity and ambiguity of judging actions and decisions in relation to these new issues.⁵³ Usefully, Rabinow supplements the notion of biopolitics with his own recasting of Giorgio Agamben's distinction between *bios* and *zoë*.⁵⁴ Rabinow argues that, in the French discourse on biotechnology, *bios*, life as a project to be civilised, and *zoë*, life as 'bare matter', are in the process of being disaggregated. This is precisely the dilemma with which Testart is faced: *bios*, the sphere of the genuinely 'human' and the locus of human dignity, now harbours within itself a new form of bare matter, namely DNA, which can be manipulated. Testart himself makes reference to Agamben's distinction, claiming that contemporary 'biopolitics', as he calls it, has reduced 'man' to a form of 'bare life'.⁵⁵ He illustrates his point by emphasising what he sees as the distinction between the goals of *pre-natal* and *pre-implantation* genetic diagnosis. Pre-natal diagnosis operates within the sphere of the human, since it has as its object an individual child. Pre-implantation diagnosis, on the other hand, has as its object 'la biologie du vivant', and will inevitably exclude specific instantiations of this bare life - that is to say, certain embryos - from the sphere of the human.

In addition to the concept of 'biopolitics', which helps to locate Testart's work within a discursive struggle, Foucault's concept of *problematization* also provides a useful way of understanding the philosophical debates taking place in France on issues relating to eugenics.⁵⁶ So, Testart's first major publication, *Lœuf transparent*, might be seen as corresponding to a moment in French culture when issues relating to procreation, molecular biology and genetics begin to constitute what can be thought of in Foucauldian terms as a field of problematisation. 'Problematization', as Foucault defines it, is the act of responding to a particular set of difficulties by developing conditions in which possible responses can be given.⁵⁷ A history of problematisations is precisely not a history of solutions. An area of problematisation refers to the struggle to define the status of an object of knowledge, and in consequence the articulation of that knowledge within a regime of power. The objects of knowledge under consideration here could hardly be more significant and all-embracing, given that they are reproduction and the human individual: in short 'life' itself.

TWO HUMANISMS

As discussed already, a key text in Testart's work is *Lœuf transparent*, in which he describes his role in the birth of Amandine and also announces his own withdrawal from particular forms of research relating to human reproduction. However, what makes it even more remarkable in the context of eugenics and biotechnological advances, is the presence of Michel Serres' preface, which constitutes a key document in its own right.⁵⁸ Serres, although he shares

53. *Ibid.*, pp17-18.

54. See Giorgio Agamben, *Homo Sacer: Sovereign Power and Bare Life*, Stanford University Press, 1998. Agamben is an Italian philosopher who has, in recent times, taken up what he sees as Foucault's challenge to put 'life' back within the political field.

55. Jacques Testart, *Des hommes probables*, op. cit., p200.

56. For a full discussion of Foucault's concept of problematisation see Michael Schwartz, 'Critical Reproblematisation: Foucault and the Task of Modern Philosophy', *Radical Philosophy*, 91, September/October, 1998: 19-29.

57. Michel Foucault, 'Polemics, Politics, and Problematizations: An Interview', in Paul Rabinow (ed) *The Foucault Reader*, Harmondsworth, Penguin, 1984, p389.

58. Michel Serres, 'Préface', in Jacques Testart, *Lœuf transparent*, op. cit., pp5-19.

some of Testart's humanist and humanitarian principles, argues that the new 'virtual' reality of 'le genie génétique' ultimately constitutes a new and challenging version of the inevitable human drive towards externalisation. In short, the juxtaposition of Serres' and Testart's texts within the same book is, in itself, an act of *problematisation*. For Serres, the epistemological shift associated with molecular biology implies an ontological shift, since the bare matter of life has been shown to contain, folded within itself, a series of divergent, virtual time-frames. For Testart, on the other hand, the ontological and epistemological integrity of the human must be protected against the encroachment of new technologies and new forms of knowledge which will ultimately destroy it.

One senses that the real subject of Serres' preface is not Testart's stance on artificial procreation and eugenics. It is rather Serres' fascination with the fact that the human beings of the future will be of a different nature from *homo sapiens*. He claims that we are, at this point in history, faced with the task of reflecting, in material, bodily terms, upon the advent of a 'new man'.⁵⁹ This provides Serres with the opportunity to outline his own theory of 'hominisation', as he calls it in later work.⁶⁰ He argues that the essential difference between humans and animals is that human beings are constantly directing their energies out from their bodies: the mouth speaks and signifies; the hand, rather than being a paw touching the ground, holds tools and writes; memory is transferred into written archives. The animal remains within the 'fortress' of its body, whilst the human body externalises the functions of the body. Why should we expect, Serres asks, that human reproduction should be an exception to this process of evolution that has caused us to walk upright, to use language, to record our memories onto computers, and to create a technological network of machines and institutions?⁶¹

For Serres, the key to understanding this important evolution of 'le vivant' is to think of it in terms of a new dimension of time. Serres suggests that 'le vivant' can be provisionally defined as a 'knot' of diverse times, a single interchange for a flow of disparate temporalities. The fields of science and technology that seek to intervene in, or manipulate 'le vivant', operate therefore by describing, exploring and unravelling these flows of time. For Serres, the temporality that preoccupies us more than any other at the present time (that is, the mid-1980s) is that encoded in the genetic material contained in our cells, our DNA.⁶² Our genotype beats out a different rhythm to our phenotype. We live our everyday lives according to an 'actual' rhythm, orientated towards the immediate future, whilst we carry within us, in the form of our DNA, a set of 'virtual' rhythms. The genotype of the individual contains the possible in a dormant state, in the form of an 'enveloped virtual'. Serres argues that we are confronted by nothing less than a shift away from an ontology of presence and material solidity, towards techniques that will allow us to explore the virtual potential that lies behind the phenotype. We now have the responsibility of managing the 'infinite cone of possibles' that exist behind the physical appearances that our forebears took as a starting point

59. *Ibid.*, p7.

60. See Michel Serres, *Hominescence*, Paris, Le Pommier, 2001.

61. Michel Serres, 'Préface', in Jacques Testart, *Loeuf transparent*, *op. cit.*, p8.

62. *Ibid.*, p10.

for the construction of reality.⁶³ Serres tentatively proposes three elements of an ethics that emerge from this situation. Firstly, in a formulation that has Heideggerian connotations, he argues that we are now effectively 'shepherds of multiplicity'. We are confronted with the ethical imperative of protecting and respecting the multiplicity and diversity of 'disparate possibles'. Secondly, he argues, as we have seen, that the strict division between moralist/jurist and expert can no longer hold. Thirdly, he suggests that we must acknowledge that, although it is increasingly within our power to take over the role of God, we must expand upon the first principle in order to avoid the imposition of a unitary conception of man.

63. *Ibid.*, p14.

The concept of the virtual that Serres proposes in this preface stands in contrast to the formulation of the virtual that Testart ultimately arrives at in *Des hommes probables*. Here, Testart insists upon the fact that the emerging discipline of bioinformatics *reduces* life to the virtual, rather than opening up a new dimension. Far from facilitating a new phase of hominisation, Testart claims that the capacity to control reproduction through genetic screening and as yet largely putative manipulations may in reality return us to forms of reproduction that predated the human capacity to procreate. In *Le désir du gène* Testart suggests that what we are currently experiencing is nothing less than an unconscious drive to reverse the process of evolution and to return to reproduction by means of 'propagation' - such as that employed by simple cellular life-forms - rather than procreation. Rather than preparing to be the 'shepherds' of a new, 'modified' humanity, we are, Testart suggests, dreaming of a return to simpler times. Rather than pointing to the future, cloning will return us to the very beginning.⁶⁴ These differences, which we see in nascent form in the contrast between Serres' and Testart's different conceptions of ethical duties in an era of molecular genetics, have crystallised into distinct approaches in the intervening twenty years. For some, such as Sloterdijk, biotechnology will inevitably lead to a modified humanity, and the pressing ethical and political questions entailed by this scenario relate to the construction of a transparent procedure for carrying out these modifications. In less provocative terms, others have suggested that it might be possible to found a new 'bio-ethics' by exploring Spinoza's open-ended definition of a 'body'.⁶⁵ However, for humanists such as Testart, Gorz and Habermas we must look to protect what they see as our shared sense of humanity, which would be radically undermined by the widespread development of eugenic techniques.

64. Jacques Testart, *Le désir du gène*, op. cit., p12.

65. See Eugene Thacker, *Biomedica*, Minneapolis/ London, University of Minnesota Press, 2004, pp184-91.

In philosophical terms, particularly as the issues have been formulated in France, what we see here are competing conceptualisations of humanism. Along these lines, Jérôme Bindé has recently talked in terms of two humanisms: an essentialist humanism, and a 'humanism of formation', within which he includes Serres' concept of 'hominescence'.⁶⁶ The first, essentialist form of humanism is 'segregating', relying as it does on the three pillars of transcendence, the grand narratives of politics, and the 'interior citadel' of the self, in order to separate humanity from the realms of matter, nature and

66. Jérôme Bindé, 'Human, Still Human!', *Diogenes*, 52, 2 (2005): 55-61.

67. *Ibid.*, p59.

the external world. In contrast to this defensive humanism, Bindé favours the notion that there is no essential human nature, only a 'human condition' that is a work in process: 'From this viewpoint, being human means becoming human. We are born human, but we also continually become it'.⁶⁷ Testart's work constitutes a passionate and forceful argument in favour of a form of essentialist humanism. His interpretation of humanism undoubtedly provides a timely reminder of the political and existential stakes involved in the rapidly emerging genetic era. However, it also seems inevitable that this defensive humanism will have to engage in some form of dialogue with the ethics of invention and becoming associated with thinkers like Serres. The potential for a new eugenics means that the need for a genuine dialogue between these two humanisms becomes ever more urgent.