

Human Gene Patents and the Question of Liberal Morality

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Abstract: Since the establishment of the Human Genome Project and the identification of genes in human DNA that play a role in human diseases and disorders, a battle has begun over the extension of IPRs to information contained in human genetic material. Over the past 20 years, large numbers of genes, sections of genes and proteins they produce have been the subject of thousand patent applications. Many patents have been granted. This paper examines whether human gene patents can be justified in terms of liberal theories of morality such as natural law, personality development, just reward and social utility. The argument is that human gene patents are in conflict with fundamental principles of liberal morality and justice because they result in genetic information feudalism. That is another antinomy of capitalism through which the division of knowledge and labour are reproduced as genetically and socially class divisions between individuals and between nation states. This antinomy not only threatens equality but also liberty and human welfare.

1. INTRODUCTION

In the literature of Intellectual Property Rights (IPRs), patenting is considered to be a statutory and moral way of increasing innovations and boosting technological development. For this reason, individual rights to patents have been extended to almost all knowledge intensive sectors, including health care. For instance, in recent years, there have been a number of legislative attempts to protect human genetic materials. The EU Directive on the Legal Protection of Biotechnology Inventions in 1998, and the subsequent United Kingdom (UK) law via the Patent Regulations in 2000 are some of them.

This paper draws on my recent critique of the moral foundations of IPRs (Papaioannou, 2006). Specifically, it examines whether human gene patents can be justified in terms of liberal theories of morality. The latter include the theories of natural law, personality development, just reward and social utility. The argument of this paper is that human gene patents are in conflict with fundamental principles of liberal morality and justice.

The argument is structured as follows: section 2 focuses on liberal theories of morality and IPRs; section 3 examines the case of human gene patents; section 4 concludes that IPRs are morally indefensible.

2. LIBERAL THEORIES OF MORALITY AND IPRS

Natural Law

The first attempt to justify IPRs morally is in terms of the theory of natural law. Specifically, it is stated that IPRs are moral-claim rights that each individual naturally has independently of the laws and government of civil society (Hughes, 1988; Bouckaert, 1990).

The moral justification of IPRs on the grounds of natural law derives from the Lockean theory of private property. In his *Second Treatise of Government*, Locke introduces the principle of self-ownership as a natural right of each individual to her

own person and labour (Locke, 1988: 287). Owning herself, each person is free to do with her powers whatever she chooses so long as she does not cause or threaten harm to non-consenting others (Arneson: 1991: 36). However, in the case of harm without prior consent, the affected person has the right to full compensation (ibid: 37). On the grounds of self-ownership, Locke forms his mixing labour theory that justifies private property as a natural right. According to him ‘The *Labour* of [Man’s] Body and the *Work* of his Hands, we may say, are properly his. Whatsoever then he removes out of the State that Nature hath provided, and left it in he hath mixed his *Labour* with, and joyned to it something that is his own, and thereby makes it his *Property*’ (Locke, 1988: 288).

Locke’s theory of private property is theologically founded. Locke argues that God gave the world to human beings in common and provided them with reason to make use of it to the best advantage of their life (ibid: 286). This argument theoretically leads to the formation of two provisos. The first is the ‘enough and as good’ proviso: *private appropriation is morally justified only if it leaves enough and as good to newcomers*. The second is the ‘no waste’ proviso: *appropriated resources must be used, otherwise they become common again* (Waldron, 1988: 207). Both provisos condition individual property rights and develop presuppositions of social reproduction. Locke’s theory justifies the transition from the ‘general’ right of common ownership in the state of nature to the ‘special’ right of private ownership in civil society (ibid).

In the liberal literature, thinkers such as Hughes tend to believe that the conception of IPRs as moral-claim rights founded upon the principle of self-ownership is theoretically sustainable. Hughes’ defence of IPRs is based on three propositions: first of all, that the production of ideas requires a person’s labour; secondly, that these ideas are appropriated from a “common” which is not significantly devaluated by the ideas removal; and thirdly, that ideas can be appropriated without breaking the ‘enough and as good’ and ‘non-waste’ conditions’ (Hughes, 1988: 300). The question is whether these propositions are true? Can the Lockean provisos be applied in IPRs?

Let us begin with the proposition that the production of ideas requires a person’s labour. It might be said that this proposition is individualistic. As Richards (2002: 531) argues, ideas are the result of social rather than individual creation. Indeed, person’s labour in creating ideas has to be conceived as a special labour based on interaction and learning within society. Hughes’ interpretation of Locke is rather anachronistic and fails to produce a convincing argument about the relevance of the mixing-labour theory for the moral justification of IPRs.

This problem of anachronism is also apparent in the second proposition that Hughes puts forward. Specifically, his view that ideas are held in common until some individuals legitimately appropriate them is metaphysical. In fact, ideas are neither developed outside of society nor are mysteriously distributed to all human beings in common until some individuals mix their labour with them. Ideas are produced with the contribution of society as a whole but become alienated under the capitalist social structure of private property (Marx, 1975). Classical liberal theories abstract from this essential contradiction of capitalism, due to their metaphysical foundations and their individualism. Liberal writers such as Hughes fail to bridge the gap between liberal theory and the capitalist practice.

Now, what about Hughes' third proposition on the Lockean provisos? Is it plausible to say that private appropriation of ideas leaves 'enough and as good' for individuals and satisfies the 'no waste' proviso? Hughes' answer is positive because he thinks that as long as there is a growing common of ideas, everyone has an opportunity to make appropriation (Hughes, 1988: 325). This position is theoretically unconvincing. Even if there was a growing common of ideas and even if each individual could make appropriation, this would not always be according to his preferences and thus the principle of self-ownership would be violated. For instance, some individuals might appropriate unique or basic scientific-ideas and thereby cause or threaten harm to non-consenting others.¹

IPRs also violate the 'no waste' proviso. According to this proviso, the appropriation of new and valuable ideas via patents and copyrights ought not to involve waste. Although Hughes (1988: 325) dismisses the 'no waste' proviso as irrelevant, Richards (2002: 532) argue that 'The history of patents is rife with example of cases where new ideas and innovations have been delayed or permanently lost by interests who used patents to prolong their existing intellectual and physical capital stock'. In fact, appropriated ideas can be also (temporally) wasted if they are not be fully used. For instance, if one patents a specific idea and fails to fully exploit (use) it, due to lack of resources, then the idea is temporally wasted and the 'no waste' proviso is violated. The application of the 'no waste' condition to IP morally requires owners to have enough resources to exploit their ideas and to ensure sufficient access to the products/processes embodying their ideas.

Personality Development

Another attempt to justify IPRs is in terms of the theory of personality development. In this attempt, IPRs constitute a moral necessity for the development of each individual's personality (Richards, 2002). The latter can only be adequately expressed in ethical community. That is a liberal realm in which contracts and exchange take place. IPRs are moral rights because facilitate the achievement of each individual's personality in ethical community.

The moral justification of IPRs in terms of personality development derives from Hegel's theory of property. In his *Philosophy of Right*, Hegel (1942) conceives private property as an abstract right related to human needs and freedom. In order to satisfy their physical needs and develop their individuality and freedom, people need to have control of resources. In Hegel's theory freedom is conceived as each individual's ability to form abstracted thoughts and to relate them straight back to particular needs

¹ The more basic or unique the idea, the fewer prospects there are of developing innovations which do not rely directly on the idea itself (Rosenberg, 2004: 91). Here, Rosenberg uses as an example Newton's laws. According to him, 'effects which require, for example, completely unshieldable forces that are transmitted at infinite speed through all mediums, including vacuums, must rely on Newton's laws, as only gravity fills the bill. There is no way to discover around gravity. By contrast, effects such as the build up of electrical potential in batteries that require, for example, proton donors, can rely on any of a dozen or so acids it is within the chemist's power to synthesize' (ibid.).

and desires (Waldron, 1988: 352). Personality is viewed as a part of the inner subjective world of each individual. Hegel stresses that both freedom and personality must be translated into the external objective world by means of private property. This implies that private property reconciles the subjective and objective, the particular and universal. Hegel is idealist; he believes that abstract thought rules the world (Callinicos, 1999: 49). Therefore, in Hegel's theory, the individual who owns an object is able to abstract herself in thought from any particular need and to embody her free will and personality into that object. Denial of this personal link to an object results in alienation. In paragraph (§) 65 of his *Philosophy of Right*, Hegel writes: 'The reason I can alienate my property is that it is mine only in so far as I put my will into it'.

Hegel's concept of alienation is crucial for his justification of private property in ethical community. Hegel believes that those individuals, who are alienated from their property or those who have no property at all, fail to get recognition as persons in community. In his view, only property owners can be recognised as persons entering into several contractual relationships (Hegel, 1942: § 71). Hegel's concept of ethical community refers to the liberal market place as one moment of ethical life. That is the specific social context rooted to custom and tradition of the ancient city-states (Callinicos, 1999: 44).

The question, of course, is whether the moral justification of IPRs as a necessity for personality development can be theoretically sustained. Hegel is clear that creators are rightfully the owners of their intellectual products. In § 67 he also argues that 'Single products of my particular and mental skill and of my power to act I can alienate to someone else and I can give him the use of my abilities for restricted period, because, on the strength of this restriction, my abilities acquire external relation to the totality and universality of my being'. This argument aims to resolve the problem IP exchange. For Hegel, such exchange is possible because it does not necessarily alienate the creator from the '... universal ways and means of multiplying ... books and machines..' (Hegel, 1942: §69).

It might be argued that the Hegelian justification of IPRs is quite problematical. First of all, the personality argument fails in respect of epistemology. As Hughes (1988: 339) points out, personality is manifested to varying degrees in different objects. How do we know that an IP creation embodies more personality than another? Should more personality imply more protection of IP? What about those IP products which reflect little or no personality from their creators (ibid)?

The second respect in which the Hegelian justification of IPRs fails is that of social recognition. In this respect, a number of questions can be also raised. What is social recognition and how does it come about? Can social recognition only be expressed by granting and respecting property rights? Is Hughes (1988: 49) right to argue that recognition follows from payments made to the property creator? Or, is Richards (2002: 535) right to point out that recognition comes, for instance, through publications in academic journals and in other media which provide no direct compensation to their creators? It might be said that both Hughes and Richards are wrong in their views of social recognition. The latter rather depends on whether essential social needs are satisfied. IP can only satisfy commercial needs created within the capitalist market, taking the form of individual needs. Essential needs

outside that realm remain unsatisfied. These needs include the development of presuppositions of social reproduction. Marx's critique of Hegel's dialectic is crucial at this point. In his *Economic and Philosophical Manuscripts* of 1844, Marx (1975: 394) attacks Hegel's idealism, arguing that it '... stands in opposition both to the actual being ... and to the immediate non-philosophical science or non-philosophical concepts of this being'. The actual being here is not the idea but the social labour alienated by private property in capitalism. IP is a form of private property that is the product, the result and the consequence of alienated social labour. Therefore, IP appears not to be justified on the grounds of the recognition of society as a whole.

Just Reward

The third moral justification of IPRs is in terms of the theory of just reward. According to this theory, IPRs constitute a just reward for enterprise and merit. Individual creators of innovative ideas and inventors morally deserve to be rewarded for their qualities and talents.

The moral justification of IPRs on the grounds of just reward derives from libertarianism. Libertarians (Spooner, 1971; Rand, 1967; Nozick, 1974; Narveson, 1988) introduce principles of justice which require that each individual is entitled to her talents and abilities. Whatever goods are acquired on the basis of natural talents and abilities are just. Libertarians argue that just distribution results from people's free exchanges (Kymlicka, 1990: 96). More precisely, Nozick (1974: 97) suggests an 'entitlement theory' based on three principles of justice:

1. A person who acquires a holding in accordance with the principle of justice in acquisition is entitled to that holding.
2. A person who acquires a holding in accordance with the principle of justice in transfer, from someone else entitled to the holding, is entitled to the holding.
3. No one is entitled to a holding except by (repeated) applications of 1 and 2'.

If I own an idea, then (1) tells us how the idea came to be owned. Principle (2) says that I am free to transfer my idea as I wish. Principle (3) tells us what to do in the case of violation of (1) and (2) principles. Nozick's entitlement theory implies that if people's current ideas are justly acquired (e.g. if they are not stolen but based on talent and ability), then just distribution can only take place in the free market. People have the right to sell and buy ideas, benefiting from exchange. The state is not morally justified to intervene in order to redistribute the benefits of innovative ideas to naturally disadvantaged or less creative people. Only the owners of the ideas can decide on such distribution. Although Nozick derives most of his arguments from the Lockean theory of property, he goes beyond that, leaving no space for social distribution policies. He believes that his principles are more consistent with our intuitions² than social redistributive principles. Nozick also argues that his entitlement theory does not violate the principle of self-ownership (ibid: 161-162).

It might be said that Nozick's meritocratic arguments are problematical. First of all, as Kymlicka (1990: 100) points out, '...the intuitive argument ignores our intuition about dealing fairly with unequal circumstances'. The principle of fairness is a 'self-

² Here, our use of the term 'intuition' is philosophical. Intuition refers to rational understanding of 'self-evident' truths.

evident' truth that requires social redistribution to remedy unequal circumstances developed in the process of exchange. Secondly, the self-ownership argument fails to comprehend the socio-economic presuppositions of natural talents and abilities. The latter remain natural potentialities if individuals lack the economic and social means of their development. Nozick's self-ownership argument is implicitly founded upon a genetic determinism that, as Barry (2005: 125) would say, is simply an expression of his ignorance.

In fact, some powerful critiques of IPRs can derive from the very principle of libertarianism e.g. self-ownership. For instance, Palmer (1990) argues that self-ownership is incompatible with IP because the latter interferes with the freedom of other persons to use their own talents and abilities in certain ways. Palmer (ibid: 830) quotes Rand's (1967) example of two inventors who may work independently on the same invention, but one succeeds to beat the other to the patent office by ten minutes. In this case, a full monopoly is awarded by government to one inventor while another with a self-ownership claim equally valid is denied any right to exploit the fruits of his talents and abilities (ibid.).

Social Welfare

The liberal theories of morality we have discussed so far in relation to IPRs are predominantly deontological and therefore antagonistic to utilitarianism. The latter is a consequentialist theory of social and political morality which holds that moral and legal rules such as IPRs are justified to the extent that they promote happiness in society (Rayan, 1987: 53). Utilitarianism, especially in its hedonistic version formulated by Bentham (1700) and Mill (1837) conceives happiness as a sum of pleasures. 'Pleasure is good and pain or displeasure is bad' (Raphael, 1994: 34). Utilitarianism is a goal-based theory concerned with the social welfare of each individual in so far as this contributes to a particular conception of the good (Dworkin, 1977: 160). Therefore, this theory is hostile towards right-based theories such as natural law, personality development and reward-based theories of IPRs.

Although it is true that the link between happiness and well-being is not clearly established in moral philosophy (Williams, 1972), it is also true that utilitarian arguments constitute the most popular defences of IPRs (Richards, 2002: 536) as institutional pre-conditions of social welfare. The reason for this is that IP is considered by utilitarians to be crucial for the development of useful knowledge and innovations which can benefit the public, increasing social welfare (Rosenberg, 2004). Critics of utilitarianism object to the conception of IPRs as legal arrangements for maximising social welfare on the grounds that it is instrumental. IPRs are not intrinsically good. If IPRs fail the utility test, then, they can no longer be justified in society. This implies that creators are entitled to their ideas only in so far as these ideas are valued as useful instruments for maximising social welfare. The interest of society in maximising welfare prevails over the property right of each creator in her ideas. Theorists such as Nozick and Rawls would argue that utilitarianism treats intellectual creators as merely means and never as ends in themselves. Both theorists would stress that this violates Kantian principles of morality and justice. Although Nozick and Rawls would differ in their interpretation of Kantianism, they would agree that moral justification of IPRs should be based on deontological principles and not on utility.

The moral conflict between deontology and utility has serious political and policy implications. For instance, should government adopt a policy which would strengthen IPRs in pharmaceutical products to increase economic growth or should it adopt a policy which would allow all interested parties in society to have access to new ideas of drug development? In fact, as Raphael (1994: 48) points out, this is a conflict between justice and utility. Although there are variations of Utilitarianism, almost all of them argue that right actions are useful actions and not just actions. Just actions are right actions to the extent that they are useful actions.

Apart from its instrumental nature and its conflict with deontological theories of justice, utilitarianism also faces the epistemological problem: how the aggregate welfare produced by IPRs can be objectively measured? Moral scepticists such as Mackie (1997) clearly dismiss that objective calculation of pleasure and pain can ever be possible. Happiness or well-being is subjective as it is any particular conception of the good. In capitalism, the state and the legal framework of rules appear not to be neutral towards particular conceptions of the good. Therefore, any valuation of IPRs is relative to such conceptions.

4. THE CASE OF HUMAN GENE PATENTS

The Context

Since the establishment of the Human Genome Project in 1990 and the identification of genes in human DNA that play a role in human diseases and disorders, a battle has began over the extension of IPRs to information contained in human genetic material. According to Nuffield Council on Bioethics (2002: 5) 'over the past 20 years, large number of genes, section of genes and proteins they produce have been the subject of several thousand patent applications. Many patents have been granted. The identification and cloning of genes that produce therapeutic proteins has led to the development of a number of new medicines based on human proteins whilst the identification of genetic mutations that cause disease has been widely applied in the development of diagnostic tests for relatively rare diseases'. The Nuffield Council of Bioethics (NCB) had correctly predicted that with the completion of the sequencing of the human genome, there would be even more increase of patent applications for new medicines and treatments (ibid.). The question that arises is whether IPRs over human genomics can be morally justified. Can patents of human genes be morally grounded upon principles of natural law, personality development, just reward and social welfare?

Before answering this question let us briefly examine the current patent legislation. Generally speaking, a patent applicant in Europe has two options: either to apply to the National Patent Office (NPO) of her country or to go to the European Patent Office (EPO) in Munich. As far as the United Kingdom (UK) law is concerned, it is the Patents Act of 1977 that covers both the British and the European systems for granting patents. This Act incorporates the European Patent Convention (EPC) of 1973 and the Community Patent Convention (CPC) of 1975. However, in the particular case of protection of biological materials, it is the European Union (EU) Directive on the Legal Protection of Biotechnological Inventions of 1998 (98/44/EC) that regulates patents. The Directive, that became law in the UK via the Patents

Regulation of 2000 (SI 2000, No: 2037), requires biotechnological inventions that meet the granting criteria of novelty, inventiveness and utility be patentable. From legal protectability are excluded the human body and simple discoveries of its elements (e.g. the human body and elements which could be used for commercial or industrial purposes), plant and animal varieties (e.g. materials which are protected by the International Convention on the Protection of New Plant Varieties) and inventions the exploitation of which would be contrary to morality or 'ordre public' (e.g. cloning human beings, modifying the germ line genetic identity of human beings, commercial uses of human embryos, modifying the genetic identity of animals and causing them suffering without substantial benefit to man or animals, etc) (Cornish et al, 2003: 17).

However, it might be argued that the UK patent law makes a problematical distinction: on the one hand it states that neither the human body nor the simple discovery of a sequence or partial sequence of a gene can be patented; on the other hand it requires that once an element such as a sequence of a gene has been isolated from the human body or produced by a technical process can be patented. This reflects an epistemological distinction between scientific knowledge concerning a natural phenomenon (say genetic information which is encoded in a natural molecule) and scientific knowledge concerning an artificial phenomenon (say genetic information which is encoded in an artificial molecule). According to NCB (2002: 27) 'Patent offices take the view that extracting the genetic information encoded by a DNA sequence is not just a matter of gaining scientific knowledge about a natural phenomenon: it involves the use of cloning techniques to create an artificial molecule in such a way that it includes much the same genetic information as is to be found in the natural phenomenon. And what is held to be important here is that the scientific knowledge concerning the genetic information has been discovered through the creation of the artificial molecule. That is to say, without isolating and cloning a gene it is not possible to identify the sequence of bases of which it is comprised'. Certainly, patent offices, by taking this view, aim to prove that genetic information (as to how proteins are to be constructed) encoded in an artificial molecule is not mere 'discovery' but 'invention' and therefore, according to law, patentable. Nevertheless, it is clear that both forms of scientific knowledge refer to the same information namely, human genetic information. Whether this information is discovered through a natural molecule in the human body (naturally occurred genes) or through the creation of an artificial molecule isolated from the human body (cloned genes) is a matter of the scientific route followed and not a matter of the information as such. Ontologically speaking, in both cases, human genetic information is the same. For this reason, according to NCB (ibid: 28) 'as computational techniques replace cloning as the main route to identifying genes, the issue of the eligibility for patenting of DNA sequences needs to be reopened. The fact that DNA sequences obtained by cloning have in the past been regarded as eligible for patenting does not imply that they should continue to be eligible for patenting when they can be identified from databases constructed by others'.

Whatever epistemological and ontological problems the current legislation faces, it is clear that human gene patents contain private property claims to different ways of using a DNA sequence. These ways include:

'i) *Diagnostic testing*. The presence of a faulty gene in an individual can be detected by techniques based on knowledge of the structure of the gene...

ii) *Research tools*. Since all genes encode parts of biological pathways and systems, knowledge of their DNA sequence can help in the identification of potential targets for which new drugs can be designed and in the development of new vaccines...

iii) *Gene therapy*. The main aim here is to replace a faulty gene with a normal gene by introducing it into the body. This approach is being pursued in the development of treatment for diseases including cystic fibrosis, various cancers and disorders and the immune system.

iv) *The production of therapeutic proteins to be used as medicines*. Here, a distinctive therapeutic use has been identified for the protein encoded by DNA sequence' (ibid: 47-48).

The NCB examines whether granting patents on each of these ways of using a DNA sequence can meet the legal criteria for patenting e.g. novelty, inventiveness and utility. Nevertheless, it does not answer the question of morality due to the lack of sufficient expertise: whether granting patents on diagnostic testing, research tools, gene therapies, and therapeutic proteins can be morally grounded upon principles of natural law, personality development, just reward and social welfare? To answer these questions let us consider the moral justification of two different ways of using a DNA sequence separately: diagnostic testing and research tools.

Diagnostic Testing

Diagnostic testing is based on the scientific identification of DNA sequences that are implicated in a disease (ibid: 48). For instance, the identification of the BRCA 1 gene located to chromosome 17 is implicated in some forms of breast cancer and for this reason has been used to develop the BRCA 1 diagnostic test. In 1995 patents of the BRCA 1 gene sequence and various mutations were granted to Myriad Genetics, the University of Utah Research Foundation and the US Secretary of Health. These patents give their owners not only monopoly of their diagnostic method, but also the opportunity to prevent others from developing improved diagnostic methods, using the same DNA sequence.

Natural Law

Can patents of diagnostic tests such as the BRCA 1 be morally justified on the grounds of natural law? The answer is negative. First of all, the Lockean principle of self-ownership does not apply in the case of BRCA 1. The latter is not a sequence that is deliberately created by a scientist who has mixed her labour with an unowned human gene but a natural phenomenon that already exists. From this it follows that the association between a gene variant and a disease such as breast cancer is not an artificial creation (of anyone who has mixed her labour with a human gene) but a phenomenon that already exists in nature.

Secondly, it might be argued that even if the Lockean principle of self-ownership could apply in patents of diagnostic tests such as BRCA 1, these would still be morally unjustified because they would violate the proviso of 'enough and as good'.

Specifically, the assertion of private property rights over a unique genetic information such as the BRCA 1 gene sequence does not leave ‘enough and as good’ to others. As the NCB puts it ‘when developing products based on genetic material ... this concept of *inventing around* is harder to apply because there may be no alternatives to the naturally occurring DNA sequences’ (ibid: 50; italics added). This worsens the situation of others because it creates fewer chances for them to develop an improved diagnostic test than they would otherwise have if the BRCA 1 gene was not patented. Licensing patents of diagnostic tests does not resolve the problem. According to a recent OECD report, ‘A survey of the licensing practices of holders of patents that cover diagnosis of genetic disorders showed that almost all the patents were being licensed exclusively; in theory this could allow the monopolisation of genetic testing services (OECD, 2002:16). The cost of exclusively licensed patents is extremely high. This prohibits the provision of genetic testing services, increasing health inequities in a liberal society that social justice is already marginalised (Barry, 2005). For instance, how one would answer the following question: ‘Whether it is just for only those who can afford genetic services to have access to them, especially since much of the initial research that led to these services was publicly funded?’ (Buchanan et al, 2000: 61).

Personality Development

Can patents of diagnostic tests such as the BRCA 1 be justified on the grounds of moral necessity for personality development? It might be argued that patents of diagnostic tests cannot be morally justified on such grounds because human gene sequences are not intellectual creations reflecting the personality of the scientist (s). Human gene sequences such as the BRCA 1 rather reflect the interaction between the biological and environmental factors and their impact on human beings.

On the other hand, patents of diagnostic tests cannot be taken to express the social recognition of the scientist (s) who identified a DNA sequence. Social recognition depends on whether such identification and the subsequent development of diagnostic testing satisfy the social need for better health. Satisfaction of the social need for better health does not necessarily presuppose private property and capitalist market.

Just Reward

Does the scientist (s) who identified a particular human gene sequence implicated in a disease morally deserve to be rewarded with a patent for her enterprise and merit? In response to this question it might be said, first of all, that a scientist is not an abstract individual who lives her life outside society. Therefore, her enterprise and merit are social developments. Libertarian theories of justice such as that of Nozick fail to understand the concept of individual within the context of society. For this reason they hide behind their problematical interpretation of Kant’s categorical imperative, arguing that any state intervention in private ownership (e.g. compulsory licence) for the sake of society’s benefit is morally wrong. In fact, if one accepts that enterprise and merit come about with the contribution of the whole of society, one has also to accept that no individual scientist (s) deserves to benefit exclusively from them.

Social Welfare

Can patents of human gene sequences morally justified on the utilitarian grounds? It might be said that utility is the point at which certain criteria of liberal morality meet certain criteria of legality. Therefore, a human gene patent that is not useful to society or has no industrial application is neither moral nor legal. The obvious question here is the following: Does the granting of patents on DNA sequences such as BRCA1 and subsequently diagnostic testing for diseases like breast cancer maximise social welfare? With respect to this question, one might distinguish between different arguments.

One argument being that without patents of DNA sequences the development of new diagnostic tests would be significantly reduced, minimising social welfare. This argument takes account of the significant effort and investment required for testing very large genes or multiple mutations and converting scientific knowledge into clinically reliable diagnostic tests and medicine. Therefore, protection through gene patents is viewed as economic incentive for the development of diagnostic tests and thereby maximising utility (NCB, 2002: 51). It might be said that this view is not entirely convincing. Is private property of genetic information the only economic incentive for the development of diagnostic tests? Is there empirical evidence that suggests maximisation of social welfare as a consequence of patents of diagnostic tests? The answer to these questions is rather negative. Asserting private property rights over genetic information and subsequent products reduces free competition and increases monopoly in the market. Therefore, it is an illiberal step that minimises social utility.

Another argument with respect to diagnostic tests is that in some areas patents are not even necessary. According to the NCB (ibid: 52) 'Many conventional diagnostic tests for a wide range of diseases and disorders have used the presence or absence of other molecules such as proteins as a means of detection. By comparison with medicines, the costs of research and development in the case of diagnostic tests have been relatively low, the time for development relatively short, and the impact of regulation reduced'. Although one might think of maximisation of social welfare as a consequence of the absence of patents, this still has to be empirically verified. Given the epistemological difficulty of measuring social utility objectively, both agreements (for and against human gene patents) lack strong empirical foundation.

Research Tools

A DNA sequence that has use in research but no immediate therapeutic or diagnostic value is defined as a research tool. According to NCB (ibid: 56) 'Over the past few years, there has been a marked increase in the number of patents that assert rights over DNA sequences that fall into the category of research tools'. For instance, since 1990's, researchers have extensively used partial DNA sequence or expressed sequence tags (ESTs) as 'a shortcut to identifying genes' (ibid: 32). Companies such as GlaxoSmithKline immediately took the opportunity to fill patent applications in order to secure exclusive rights to the whole genes (whenever these would be identified). Granting patents over parts of genes means that these can be privately owned as research tools, excluding others from research to identify the whole genes.

Natural Law

Whether patents on research tools such as ESTs can be morally justified on the grounds of natural law? The answer is again negative. ESTs are not intellectual creations of scientists but natural phenomena the discovery of which results in the identification of full-length DNA sequences. Therefore, it cannot be claimed that scientists are morally justified to own ESTs on the grounds of self-ownership. Even if one argues that human genes are unowned information, even if one mixes her labour with these information, one cannot claim ownership unless she creates something different out of these information. In the case of ESTs and full-length DNA sequences what we have is scientific discovery e.g. discovery of information that already exists in nature.

It might be said that even if the principle of self-ownership could apply to patents of research tools such as ESTs, these would still violate the Lockean provisos: 'enough and as good' and 'non-waste' proviso. First of all, each EST should be regarded as unique genetic information. ESTs are not abundant in nature. Therefore, the assertion of patent rights over ESTs does not leave 'enough and as good' to others. The problem here is that if someone has a patent on partial DNA sequence or EST, the patent will also extend to the full DNA sequence, even if the full sequence may be isolated by someone else without using the particular EST as a research tool (ibid: 58). This results in blocking patents or increased research and transaction costs. According to OECD (2002: 14) 'Even where patent owners are amenable to licensing, the price demanded for use of a genetic invention might pose a barrier to researcher'. Secondly, patenting of partial DNA sequence or ESTs implies patenting of DNA sequence the function of which is unknown. If for some reason (say, high cost) no new drugs or other research could come out of the patented DNA sequence or ESTs, the 'non-waste' proviso would be violated. Indeed, as the OECD stresses, '...patents on early "foundational" discoveries, if not widely licensed, may discourage or limit the use of these important innovations and slow the pace of R&D in a particular field.

Personality Development

Can patents of research tools such as ESTs be morally justified on the grounds of necessity for personality development? It might be said that since partial and full DNA sequences are not artificial creations but discoveries, they do not reflect the personality of scientists (s). In addition to this, patents of research tools such as ESTs do not express social recognition of scientists. The knowledge developed by the use of patented research tools might result in a monopoly of new drugs or other research. This might increase cost and therefore might not satisfy the needs of society for better health welfare and resources.

Just Reward

Does the scientist (s) who discovered a partial DNA sequence deserve to be rewarded with a patent of research tool for her enterprise and merit? The answer is negative. As has been also stressed in the previous case of diagnostic tests, no enterprise and merit come about without the contribution of the whole of society. Therefore, no scientist (s) deserves to benefit exclusively from them.

On the other hand, Kant's categorical imperative can have a different application in the cases of partial and full DNA sequences of humans. For instance, this imperative

might not allow patents of research tools: if one accepts that whether isolated from the human body or not, human genes are ontologically the same, one has to accept that they have to be treated as end in themselves and not as merely means to utility.

Social Welfare

Are patents of research tools morally justified on the grounds of maximising social welfare? As has been argued throughout this paper, the epistemological problem of utilitarianism limits objective moral judgement. Theoretically speaking, patents on research tools may inhibit social welfare in various ways. According to NCB (*ibid*: 59), these ways include:

- the cost of research may increase ...
- research may ... be made more difficult if researchers are required first to negotiate the use of patented genes and sequences;
- a patent owner may withhold a licence to gain maximum financial benefits, or licence it exclusively to one or a limited number of licences;
- companies that wish to acquire the rights to several DNA sequences may decide not to develop a therapeutic protein or diagnostic test because of the number of royalty payments that would be required ...'

Although the NCB recognises that there is no sufficient empirical evidence to support all the above statements, there are cases in which social welfare is dramatically minimised and therefore need to be avoided. One of them is the case of CCR 5 receptor. According to the NCB (*ibid*: 41) 'In February 2000, Human Genome Sciences Inc (HGS), a US company, was granted a US patent which asserted rights over the gene that codes for CCR 5 receptor. The CCR 5 receptor is the route by which the HIV/AIDS virus enters a cell. When HGS originally isolated the gene for this receptor and filed the for the patent in June 1995 ... they were unaware of the receptor's role in HIV/AIDS Subsequently the role of CCR 5 receptor was revealed by other researchers, six months after HGS filed its patent application. Another researcher, Dr M Parmentier, had isolated the gene some years earlier but only filed a patent application in March 1996 Parmentier's patent has not yet been granted'. In order to avoid a case such as that of CCR 5 receptor, the NCB discourages patents which assert rights over DNA sequences as research tools. For the same reason, Cornish et al (2003: 65) recommends that the Department of Health 'should not adopt a hard and fast rule regarding the patentability of research tools'.

5. CONCLUSION

This paper has examined the moral justifications of IPRs, taking a closer look at the case of human gene patents. Theoretically speaking, first of all, patents cannot be sustained as moral rights on the grounds of Locke's labour theory of property. The application of the 'no waste' and 'enough and as good' provisos in the private appropriation of ideas through a persons' labour is problematical. The social character of intellectual creativity philosophically weakens the position according to which the mixing-labour theory can be plausibly used in the moral justification of IPRs. On the other hand, the purpose of intellectual appropriation is to prevent free access to 'enough and as good' ideas, at least, for a certain period of time. This is also the reason why the 'no waste' proviso cannot be satisfied by IPRs. Patented ideas which

are not fully exploited or used for a certain period of time can be considered as being wasted in the Lockean sense. Second, IPRs cannot be justified as a necessity for personality development. The Hegelian theory of intellectual property leaves open the epistemological question of personality embodiment in IP products and fails to resolve the problem of social recognition of IP creators. Third, patents cannot constitute just reward for enterprise and merit. Individual inventors do not morally deserve to be rewarded for their qualities and talents. Apart from the fact that these qualities and talents are to a certain extent the outcome of an arbitrary 'natural lottery' in the Rawlsian sense, they can only be fully developed within particular economic and social conditions. Fourth, patents fail the universal test of social utility. Existing research in the socio-economic costs and benefits of patents reveals that, in many cases, they reduce growth and minimise social welfare. Therefore, utilitarianism does not necessarily justify IPRs from the point of view of morality.

The implausibility of IPRs is strongly reflected in the case of human gene patents. First of all, patents of diagnostic tests and research tools cannot be morally justified because DNA sequences are natural phenomena and not creations of human labour which can be privately owned. In addition to this, the Lockean provisos of 'no-waste' and 'enough and as good' cannot justify patents because these do not leave alternatives to the naturally occurring DNA sequences. Secondly, patents of human genes cannot be justified on the grounds of personality development. Since DNA sequences are natural phenomena and not artificial creations, they reflect interactions between biological and environmental factors and not personality. Thirdly, scientists who identify human gene sequences do not morally deserve to benefit exclusively for their enterprise and merit. The latter come about with the contribution of society as a whole. Fourthly, patents of human gene sequences are not always justified on utilitarian grounds. The problem here is that patents of diagnostic tests and research tools do not always maximise social welfare. To make things worst, utility is epistemologically difficult to be measured.

IPRs can be rather seen as political developments which aim to reproduce the capitalist division of knowledge and labour at national, international and global levels. In this sense, it can be concluded their extension to genomics is not morally defensible. It constitutes a political decision that, in fact, sacrifices liberal morality on the altar of genetic information feudalism. According to Drahos and Braithwaite (2002:2) 'The redistribution of property rights in the case of information feudalism involves a transfer of knowledge assets from intellectual commons into private hands ... The effect of this ... is to raise levels of private monopolistic power to dangerous global heights, at a time when states, which have been weakened by the forces of globalisation, have less capacity to protect their citizens from consequences of the exercise of this power'. In the case of human gene patents, information feudalism involves a transfer of human genetic knowledge from the 'common heritage of humanity' (OECD, 2002: 11) to private hands.

In essence, genetic information feudalism is nothing but another antinomy of capitalism through which the division of knowledge and labour are reproduced as genetically and socially founded class divisions between individuals and between nation states. This antinomy not only threatens equality but also liberty and human welfare. IPRs violate scientists' right of freedom to research and improvement of human condition.

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