

Intellectual property rights, the bioeconomy and the challenge of biopiracy

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Abstract

The last several decades have seen the emergence of intellectual property rights (IPRs), especially patents, as a key issue in developments across the fields of law, the economy and the biosciences, and as part of the burgeoning “bioeconomy”. This paper examines how the categories of nature and knowledge, so vital to IPR regimes that support bioeconomy-type projects, are challenged by the allegation of biopiracy. It reflects on the relationship between nature, IPR and the bioeconomy, and presents an example of how the creation of new categories, in this case genetic resources, come to impact on how we come to understand nature in relation to the economy and IPRs. The paper then follows this with an analysis of how knowledge is treated in those same systems, focusing specifically on some of the challenges that arise when attempting to bring traditional knowledge (TK) under the rubric of the IPR system. Finally, it examines the allegation of biopiracy in greater depth, and reflects on how it critiques the way the bioeconomy and the IPR regime treat nature, culture, knowledge, and the relationship between them.

Introduction

Over the last several decades intellectual property rights (IPRs), especially patents² have emerged as a key issue for developments across the fields of law, the economy and the biosciences. However, as this special issue attests to, there are many who feel that the IPR system has not shown itself dynamic enough to deal with some of the complicated questions brought up by the interplay between the IPR system and the natural world, both human and non-human. It has thus emerged as a key area of contestation for many groups concerned about the role IPR will play in the new regimes of governance which impact on these areas. This paper will present an analysis of one specific area of contestation, namely that of “biopiracy”, and will reflect on how the discourse of biopiracy can help us to understand some of the current and no doubt future areas of concern for the IPR system at the national and indeed at the international levels.

Biopiracy is a term which was first used in 1993 in a *Communiqué*³ by the Rural Advancement Foundation International (RAFI), which has since changed its name to the Action Group on Erosion, Technology and Concentration (ETC Group – pronounced *et cetera* group). ETC Group has remained active in the biopiracy discourse, among other areas, and its most current definition of biopiracy is:

the appropriation of the knowledge and genetic resources of farming and indigenous communities by individuals or institutions who seek

*exclusive monopoly control (patents or intellectual property) over these resources and knowledge.*⁴

The concept of biopiracy gained momentum through the 1990s, largely due to the exposure, both in the media and elsewhere, of several high-profile instances where allegations of biopiracy were made publicly. Another very prominent activist involved in the early deployment of the term was Vandana Shiva, who published a book entitled *Biopiracy: The plunder of nature and knowledge* in 1997.⁵ In another of her books, she offers this definition of biopiracy:

*[Biopiracy] refers to the use of intellectual property systems to legitimize the exclusive ownership and control over biological resources and biological products that have been used over centuries in non-industrialized cultures.*⁶

Taken together, these two similar definitions introduce some of the main features of the biopiracy discourse which will be revisited later: IPRs, genetic resources and “traditional knowledge”. This paper is not concerning itself with complicated questions that form the substance of individual claims of biopiracy, as these have been extensively investigated elsewhere,⁷ and are beyond the scope of the present paper. However, I will draw on a wide range of these examples, and the writings of these actors (ETC Group, Shiva and others) in order to demonstrate the way that the discourse of biopiracy, built up through these and other instances where the allegation has been used, has come to present a specific challenge to the IPR system.

Since much of the debate about biopiracy has taken place against a backdrop of what could be considered a burgeoning “bioeconomy”, the notion of the bioeconomy provides a practical demarcation point to examine some of the new developments in the realm of IPRs and the natural world. The Organization for Economic Cooperation and Development (OECD) gives the most thorough account of the bioeconomy in their project, *The Bioeconomy to 2030*, with the aim to “design a bioeconomy policy agenda for governments”.⁸ For their purposes, they suppose the bioeconomy to be “the aggregate set of economic operations in a society that uses the latent value incumbent in biological products and processes to capture new growth and welfare benefits for citizens and nations”.⁹ Though the OECD presents this as a new field for the economy, I intend to follow Parry in saying that: “[w]hen appropriately contextualized within a longer and more nuanced historiography of the social studies of technology there seem, in fact, to be remarkably few grounds on which claims for the distinctiveness of biotechnology might be made”.¹⁰ As such, I will not present a thorough analysis of the bioeconomy in the paper, but rather I will use the term bioeconomy here as a convenient catch-all to denote the latest in a series of processes, occurring over the last several decades, wherein elements of “nature” are increasingly brought into the economy and are structured by understanding them in narrowly economic terms.

As they have long been considered as an integral part of western capitalist economies, it will come as no surprise that IPRs are also integral to the development and the shaping of the bioeconomy. On the whole, there are several functions performed by

the decisions we make about the direction that IPR regimes take (particularly when these decisions are about the relationship between the IPR system and living organisms), none the least of which is in shaping how we come to understand both nature and knowledge itself. As Hilgartner explains: “Like many future-making projects, the [bioeconomy project] must be understood not only as an effort to anticipate the future but simultaneously as one to shape it [...] The project is quite self-consciously an effort to advance ‘the bioeconomy’ – both as a *concept* and as a set of technological and economic *activities*.”¹¹ In this vein, we have to consider shifts in IPR regimes as being also social interventions, engaged in the demarcations of boundaries and the creation of categories. In this case, the IPR regime is acting to shape the boundaries around what counts as natural and what counts as inventable.

In many ways, one of the categories most impacted by the bioeconomy is nature itself, and it is quite clear that the IPR aspects of the bioeconomy both structure and are predicated on a particular version of nature and of patentability, where elements of nature can be considered inventions if they can be shown to have been sufficiently altered. In applying for a patent, inventors in this system are called upon to demonstrate how they have contributed enough of their own labour to a product of nature so that it can be considered no longer “natural”. These same inventors must also show how their invention is novel, and thus no longer part of an existing body of knowledge known to society. This paper will examine each of these aspects of the IPR system in turn, and will argue that the categories of nature and knowledge, so vital to IPR regimes that support bioeconomy-type projects, are challenged by the allegation of biopiracy. In order to do so, this paper will proceed in four parts. The first will examine how social scientists have addressed these and related kinds of questions as they have emerged over the last several decades. The second will reflect on the relationship between nature, IPR and the bioeconomy, and will present an example of how the creation of new categories, in this case genetic resources, come to impact on how we come to understand nature in relation to the economy. This will be followed with an analysis of how knowledge is treated in that same system, focusing specifically on some of the challenges that arise when attempting to bring traditional knowledge (TK) under the rubric of the IPR system. Finally, I will examine the allegation of biopiracy in greater depth, and will reflect on how it critiques the way the bioeconomy and the IPR regime treat nature, knowledge, and the relationship between them. Throughout, as mentioned above, I will draw on selected examples from cases where allegations of biopiracy have been publicized throughout the past several years, and which have been fundamental to shaping how the term is understood, but also how it challenges the development and expanse of the IPR system.

Theorizing the bioeconomy and IPR

Of course, the OECD’s bioeconomic notion that there is a direct connection to be made between the economy and the “latent value incumbent in biological products and processes” is not at all alien to social scientists, who have long been analyzing these developments. As such, it will be instructive at this point to consider how some social scientists have reflected on the process(es) whereby economic value is derived

from biological products and processes, before moving on to consider IPR and biopiracy in greater depth.

Much of the current thinking in the social sciences has focused on the human and biomedical aspects of the bioeconomy. Although there is no doubt that the somatic elements are principal drivers of the bioeconomy, it is not necessarily appropriate to limit the term to its use in this context. In fact, as Rose puts it, “[i]n a sense, contemporary projects to embody human desires and aspirations within living entities – organisms, organs, cells, molecules – in order to extract a surplus – be it food, health or capital – can be traced to much earlier attempts to put the vital properties of the natural world to work for humans, as with the domestication of animals and plants”.¹² Of course, bringing the vital properties of the natural world to work for humans did not stop at the mere domestication of animals and plants, as many of the original “bioeconomic” forays into the natural world involved some of the earliest plant variety protection instruments that enabled in large part the business of seeds to become the multi-billion pound industry it has become today.¹³ It is worth noting at this point that, although this paper focuses primarily on some of the more discursive aspects of the developments grouped under the rubric of the “bioeconomy” which form the subjects for the biopiracy critique, the bioeconomy is not purely a discursive exercise. In fact, it is underpinned by very significant and very real resource values in the products of the bioeconomy, particularly in areas such as commercial plant breeding and pharmaceutical development.¹⁴

Waldby provides a possible framework for conceptualizing some of the transitions effected by the bioeconomy when she articulates her notion of “biovalue”. As she explains, “biovalue refers to the yield of vitality produced by the biotechnological reformulation of living processes”.¹⁵ She goes on to describe one of the incentives to produce “biovalue”, the production of exchange value, and explains, “the production of ‘biovalue’ is caught up with the production of capital value. The process of producing ‘biovalue’ is also the process of technical innovation that enables the patenting of cell lines, genes and transgenic organisms as inventions, securing their status as intellectual property and possible sources of profit for their inventors”.¹⁶

These resources are also significant to the bioeconomy because their resource potential mirrors more general features of speculative finance capital in positioning their potentiality as the resource to be exploited. The fact that much of the value that may be contained among the diversity of flora and fauna is unknown, or more appropriately seen as *incumbent*, is what gives it, to use Thompson’s term, its “promissory value”.¹⁷ In a related way, IPR also becomes important to this sector of the bioeconomy as it is increasingly not the quantity of the given natural resource that is economically significant to this bioeconomic regime, but rather the information that it contains. It is no longer a question of growing, gathering, or harvesting the biomaterial itself, but of extracting the information within it and commodifying that information so that it can be used in industrial processes, pharmaceutical development or elsewhere. Thus, in this particular aspect of the bioeconomy, it is the plant’s information – genetic or otherwise - that is valuable, rather than the physical plant itself; and thus it is through the promissory realm that IPR gets implicated in this project at the most intimate of levels.¹⁸

IPRs also become especially significant to this bioeconomy for the legitimizing or normative function that they provide. In particular, they provide the normative frame of reference which allows this regime to be understood as the best, or even the only, one through which we can govern the relationship between society and “nature”. This is an example of what Jasanoff refers to as co-production, which she stresses is where “in broad areas of both present and past human activity, we gain explanatory power by thinking of natural and social orders as being produced together. [...] co-production is shorthand for the proposition that the ways in which we know and represent the world (both nature and society) are inseparable from the ways in which we choose to live in it”.¹⁹ This co-production is important because it provides a convenient way to understand a rather complicated set of processes, and thus contributes to IPR being taken for granted as a way to engage with nature. This rationale can be used to explain how elements of nature come to be seen as (naturally) a promissory resource. As Jasanoff explains:

*As a social technology, patents naturalize the idea of property, appearing to recognize property rights that are, quite simply, already present. Taken as merely ratifying an underlying status quo, patents are regarded as apolitical with respect to both the ‘what’ questions (what can be owned?) and the ‘who’ questions (who can own it) that they regulate; patents operate, in this respect, not as norms but as tools. A counter analysis...would point out, however, that patents are not simply declaratory instruments that affirm a prior order of ownership, but that they create and maintain property rights in specific forms that are anything but preordained.*²⁰

One of the most important ways in which regimes such as this are justified is through making reference to market analogies, often in very normative ways. Sunder Rajan’s work on stem cells provides an interesting take on this normalizing of the market model for science:

*that ‘market logic’ is not natural, but rather a strategic-rhetorical invocation that allows the (re)structuring and negotiation of biocapitalist terrains. In other words, the apparent naturalization of complete commodification as the condition for scientific innovation masks the fact that commodification is selected and contested, subject to conflicting interests and ethical representations.*²¹

IPR systems are also vital to bioeconomy-type projects because they are instrumental in defining what is inventable, and thus what is patentable. This aspect of the IPR system obviously leads to very particular understandings of what can count as inventible (or perhaps more interestingly what can be considered as already invented), but also who can count as an inventor. This system allows for lines of separation to be drawn around inventions and knowledge, often in ways that remain blind to the potential that they may follow on from a certain collective heritage. As Coombe writes:

The range of Western beliefs that define intellectual and cultural property laws – that ideas can easily be separated from expressions,

*that expressions are the singular products of the individual minds of Romantic authors, that these expressive works can be abstracted from the meaningful words in which they figure to circulate as the signs of unique personality, that cultures have essences embodied in objects that represent unbroken traditions – are not universal values that express the full range of human possibility, but particular, interested fictions emergent from a history of colonialism that has disempowered many of the world's peoples.*²²

In a number of the instances of biopiracy referenced below, it becomes clear that while the IPR system might correctly (by its own internal logic) interpret genetic resources as patentable, it is not calibrated to deal with instances where those genetic resources, or even the patent system, are understood differently. In these instances, the normative elements of what counts as nature and what counts as knowledge are challenged and reconfigured. In the interest of providing further context to biopiracy and IPR, I will first present a brief history of the emergence of the category of “genetic resources”, which provides a particularly helpful example of how an understanding of nature can be created or reshaped in and by the economy.

Nature/society in the bioeconomy – the evolution of genetic resources

I earlier described briefly how projects such as those captured under the rubric of the bioeconomy are geared towards the creation of new or reshaped categories, and are thus engaged in a process of, as Hilgartner pointed out, anticipating but also shaping the future. One such example of this is the emergence of the concept of “genetic resources”, which effectively recasts what was formerly understood primarily as “nature” as a potential “genetic” resource. Though nature has of course long been thought of as a resource in economic terms, what exactly is understood as genetic resources is not so simply defined and is subject to multiple readings. What follows will be an examination of the ways in which recognizing genetic resources as a category grants nature a new economic, but also a new political and ethical, status.

The first international recognition of genetic resources *as a category* came though the Food and Agriculture Organization (FAO)’s creation of a Commission on Plant Genetic Resources in 1983, whose first major action was the development and adoption of the “International Undertaking on Plant Genetic Resources”.²³ The objective of the Undertaking is:

*to ensure that plant genetic resources of economic and/or social interest, particularly for agriculture, will be explored, preserved, evaluated and made available for plant breeding and scientific purposes. This Undertaking is based on the universally accepted principle that plant genetic resources are a heritage of mankind and consequently should be available without restriction.*²⁴

It is generally acknowledged that the impetus for this particular undertaking came about to address a concern raised by the countries in the developing world about the system employed to define these kinds of resources. Specifically, it has to do with a tension in how the notion of common heritage was being used at the time. The

concern on the part of these developing countries came about in recognizing the significance of an increasingly lucrative agri-business industry, and recognizing that the value that was being derived from this industry was one that was inherent in the plants' genetics themselves. This genetic material was collected in a variety of ways and at a variety of sites over a substantial period of time, but much of it was gathered into germplasm banks such as those associated with the Consultative Group on International Agricultural Research or International Rice Research Institute. Seed companies obtained genetic material from these banks under the understanding that the resources contained within them were the common heritage of mankind [sic], and used these genetic materials to develop proprietary seed strains that were sold worldwide. The tension in this system arose with a recognition that, as Kloppenburg puts it, "[w]hereas germplasm flows out of the South as the 'common heritage of mankind', it returns as a commodity".²⁵

Much of the interest about this particular issue – the apparent imbalance in who was making a profit from genetic material in seeds – came about because of a book published by Pat Mooney (director of RAFI/ETC Group) in 1979, called *Seeds of the Earth*. The book proved to be quite controversial on the whole, but even those most critical of it, such as Frankel, who referred to it as "propagandist and political but not a scientific statement [...] full of half-truths and untruths, spurious references and misleading quotations taken out of context",²⁶ acknowledge Witt's assertion that "it is Pat Mooney's book *Seeds of the Earth* [...] where many developing country delegates at the FAO learned of the whole topic of genetic resources".²⁷ This is significant because it manifests a transition from seeing genetic resources and their attendant concerns as falling strictly within the realm of science or nature (which, according to Frankel, apparently operates entirely apolitically in the interest of preserving a broad genetic base for agriculture) to a realm of politics which concerned itself with a new set of issues now bundled with genetic resources, such as compensation and equity, which were articulated alongside conservation. The importance of this shift cannot be underestimated: the new recognition of genetic resources in this way essentially made the science of "genetic resources" all the more overtly political, or, in a way, brought nature more visibly into the world of politics.

We also see two starkly different versions of common heritage being presented here. Although all seem to be willing to support the idea that plant genetic resources are a common heritage of mankind, there is a fundamental difference of opinion about where these resources, and ultimately this heritage, begin and end. The fact that the basis for these commercial seed strains came originally from genetic material of the South is something that many of the Southern countries felt justified their claims that this furthered a colonial-type exploitation. The seed companies, and the developed countries in which they were based, claimed that though the source genetic material from these strains may indeed have come from seed banks which stored germplasm collected from all over the world, their intervention into the breeding was something which could not have happened naturally, and thus obtaining IPR protection for the seed strains was justified as it rewarded their innovation. In some ways, this can be seen as a fundamental question demarking where nature stops and "invention" begins with respect to genetic resources. Taking the most literal reading, as many do, these plant genetic resources are too "natural" to be subject to IPR – plants are, after all,

products of nature and thus should not be patentable. Privately developed strains of plants, however, are put together with natural material which is apparently too socially worked upon to be considered natural, and are thus invented and hence subject to patentability. In advancing this particular reading of common heritage for genetic resources, those interests (mostly from the developed world) are engaged in drawing boundaries about what counts as natural and thus common heritage (which is consequently unpatentable) in international environmental governance regimes.

Although it did not invent the category of genetic resources *per se*, the Convention on Biological Diversity (CBD), one of the major environmental initiatives to come out of the celebrated 1992 Rio Earth Summit, has made some very substantial contributions to how it has come to be interpreted, and it has become the principal forum in which the genetic resources debate has played out. The Convention's objectives are defined as being the "conservation of biological diversity, the sustainable use of its components and the fair and equitable sharing of the benefits arising out of the utilization of genetic resources". In article 2, the Convention text somewhat ambiguously defines genetic resources as "genetic material of actual or potential value." Perhaps most succinctly, the CBD's guide to the convention, *Sustaining life on earth*, explains that the CBD's overarching responsibility is to "[set] out commitments for maintaining the world's ecological underpinnings as we go about the business of economic development".²⁸

As might be anticipated given the ambiguousness of some of these definitions, the CBD also gave rise to further conflicts about exactly what shape our understanding of genetic resources would take, and who would come to decide this. The notion of genetic resources as a source of economic validation for nature is, of course, intimately bound up with the idea of property, and ultimately that of IPR. IPR here serves as the means of translation between genetic resources and their benefits, the ones which are ostensibly to be shared as per the CBD's third objective. As McAfee explains regarding the place of "genetic resources" in the CBD:

*The equation of 'biodiversity benefits' with 'genetic resources', enshrined in the CBD text, represents a discursive conquest by the short-sighted instrumentalism of the environmental-economic paradigm. It reduces biological diversity to its purported essence as a commodity, presumably separable from its complex relationship with other 'units' of nature, and valuable only to the extent that it is consumed.*²⁹

What this brief history points to is how the transition to genetic resources effectively makes nature thinkable in new ways. What sets this new concept of resources apart is that it relates specifically to the genetic aspect of these resources, something which creates a dramatically new category in our understanding of our environment. No longer, it would seem, are issues of resources limited by the tangibility or even corporeality of resources. Thus, genetic resources become thinkable and contestable in new ways; in a word, they become governable.

In creating and maintaining this separation, the specific aspect of the bioeconomy at issue here – genetic resources – employs (while also being shaped by) an IPR regime

which provides the conceptual framework to re-affirm a particular version of nature. This version of nature seemingly exists outside of society's sphere of influence, and remains an external, passive, resource pool from which we can draw our new genetic resources rather than one that we participate in and are actively involved in shaping. This version of nature does not go far enough in recognizing what many understand to be nature's cultural underpinnings – the only version of participation in nature that is allowed in this version automatically reconfigures that nature as a possible ownable commodity, something which will be taken up more thoroughly in the following section.

Knowledge/Society in IPR and the bioeconomy

When considered in relation to the debate at hand, new categories such as genetic resources take on an interesting relationship with the bioeconomy (and the IPR aspects thereof) where they create and sustain particular versions of both nature and society. The version of nature that is supported by the bioeconomy is one where inventors can disentangle “products of nature” from both their natural and their socio-cultural entwinings. At risk of oversimplifying, it can be said that when moving to patent an invention derived from nature, inventors engage in a process of demonstrating that they have intervened sufficiently enough in their invention so that it can no longer be seen as “in” nature. Likewise, they are also called upon to show how their invention is different from the “state of the art” (eg, those ideas that are now or have been previously held by other patent owners, or are so widely acknowledged so as to be considered part of the public domain), and thus to demonstrate how far out of the existing body of knowledge they have taken it.

As discussed above, the IPR system and ideas such as the bioeconomy allow for an interpretation of nature, culture and IPR which establishes that things rooted in nature are unpatentable, as they could only be *discovered* there, whereas things existing in the social realm (ie, human ideas) have been “invented”, thus cannot be construed as natural, and are therefore patentable. As Jasanoff explains:

*Patents not only underwrite a scheme of property rights, but they order the process of invention in two ways that could be seen as intrinsically political. One is to designate classes of things that can be considered property. The extension of patents to new domains alters basic notions of what is a commodity and who can assert ownership over it. When a patent is awarded for a biological product, it has the effect of removing the thing being patented from the category of nature to the category of artifice.*³⁰

As explained here, components of biodiversity are brought in to IPR regimes by overcoming the notion that they are simply discovered in nature. Nature can no longer be an inventor of or by itself.

Likewise, in the process of securing a patent, inventors must also make explicit how separate from the “state of the art” their invention is. They must describe how, although it might draw on existing ideas from the public domain, their invention incorporates an inventive step, is indeed novel and is thus patentable. Thus, in the

case of biotechnology inventions, in addition to demonstrating how far out of nature an invention is, an inventor also has to demonstrate *how far out of culture* (this common pool of ideas in the public domain), though still not in nature, it is. This demonstration, encapsulated in a patent, is a very nuanced and particular notion of property, albeit one which has seen wide normative take-up. In the case of biotechnology patents, the movement from the realm of the natural into the realm of the cultural is what renders these particular “products of nature” patentable.

One cannot, of course, merely move to patent anything that is “discovered in nature” as this is precluded by what is often called the “product of nature” doctrine in the United States.³¹ Similarly, one cannot move to patent something which exists in the public domain or which is already patented. This is precluded by the concept of prior art, which is fundamentally related to two criteria for patentability – novelty and inventive (non-obvious) step. WIPO, in their *Intellectual Property Handbook*, explain: “‘Prior art’ is, in general, all the knowledge that existed prior to the relevant filing or priority date of a patent application, whether it existed by way of written or oral disclosure.”³² This is not to say, however, that this area does not merit further consideration. In fact, these inventions’ double movement, out of culture (ie, the public domain) and of nature, is a key element of patent system in the bioeconomy, but also a key element to many critiques of the patent system more generally. In particular, it is at the point where we consider these concepts of the patent system alongside critiques of that same system that some of the underlying logics of IPR become more apparent and in some ways more problematic. Indeed, it is precisely these versions of nature and of knowledge that are constructed by the bioeconomy with which many of those presenting contestations such as biopiracy are taking issue.

It is especially this separation of the two realms, or more fundamentally the idea that they are separable and that movement from one to the other is possible, which is being contested in much of the biopiracy discourse. For example, a group of Brazilian shamans made the following submission to WIPO:

*As traditional indigenous peoples who inhabit diverse ecosystems, we possess knowledge on the sustainable management and use of this biological diversity. The knowledge is collective and is not a commodity that may be commercialized as any good in the market. Our knowledge on biodiversity is not separate from our identities, our laws, our institutions, our system of values and our cosmological view as indigenous peoples [...] As indigenous representatives, we affirm our opposition to all forms of patentability arising out of the use of traditional knowledge and we request the creation of mechanisms of punishment to prevent the threat of our biodiversity)*³³

The notion that this knowledge would be inseparable from identities, laws, institutions, value systems and cosmologies is, of course, one which is fundamentally alien to the IPR system. What is at work here is a contest over the IPR system generally but also over what is able to “count” as an appropriate translation mechanism for the IPR system. If traditional knowledge, reproduced in any of its varied forms, is not sufficient to count as prior art, then groups such as the Brazilian shamans quoted above will not accept the IPR system as an effective enough

interlocutor for their concerns stemming from the exploitation of TK and genetic resources.

Too natural/too cultural

As introduced above, biopiracy discourses challenge the normative version of nature, knowledge and society and how these are alternatively brought together but also forced apart when passed through IPR systems in the bioeconomy. This has been done by presenting two overlapping critiques of the IPR system's treatment of the natural and cultural aspects of particular "inventions", and this has been a key component to the discourse around various instances of biopiracy that have become problematic over the last several decades. The first of these critiques suggests that there is too much "nature" in the inventions claimed, and as such in the relevant aspects of living things themselves, for them to be eligible to be considered as invented rather than merely "discovered". The second suggests that there is also too much "culture" in these "inventions" for them to be considered as new or novel, and thus eligible creations for patentability. The allegation that this knowledge is "too cultural" is made in two ways, first by invoking specific instances of prior human influence in the shaping of these organisms (such as in the case of patent claims on traditional medicines or on agricultural products such as seed strains), and also by invoking a much more holistic perspective on the relationship between humans and nature at the most general which put humans squarely back into a nature that they are actively participating in. The particular artefacts being challenged by the allegation of biopiracy are thus positioned uniquely at the nexus of nature/culture – they are at once profoundly "natural" as they are derived from plants, animals, or even people themselves, but are also profoundly cultural, because they speak to how these particular natural artefacts have come about as part of, are shaped by, and exist in relation to culture. The next section will examine the nature and cultural aspects of the biopiracy discourse more closely.

Too natural – discovery as invention

In their study of anti-GMO campaigns, Heller and Escobar explain that, "biodiversity activists emphasize preserving the natural co-evolution of organisms and cultures, and thus, embed human beings and culture inside natural systems."³⁴ Later in that same analysis they expand:

for the [biodiversity] activists, as they theorize local practices, nature is not an entity 'out there' but is produced through the collective practices of humans integrated with it (Descola & Palsson, 1996).^[35] From this perspective, the reductive view of biodiversity in terms of genetic resources to be protected through intellectual property rights is incoherent and untenable.³⁶

The position of Heller and Escobar's activists is also echoed in much of the biopiracy discourse, with many of the biopiracy activists taking issue with, to use Haraway's formulation, "who gets to count as nature's author"³⁷. Much of the rhetoric invoked in this regard relies heavily on a certain principle of self-evidence and a deliberately

essentialist reading of patent law. By this logic, if the invention derives from nature in any way it *must* therefore be a product of nature, ergo it is not patentable. For instance, the text of the Treaty Initiative to Share the Genetic Commons, which was spearheaded by Jeremy Rifkin and his organization, the Foundation on Economic Trends states:

That the intrinsic value of the Earth's gene pool, in all of its biological forms and manifestations, precedes its utility and commercial value, and therefore must be respected and safeguarded by all political, commercial and social institutions,

That the Earth's gene pool, in all of its biological forms and manifestations, exists in nature and, therefore, must not be claimed as intellectual property even if purified and synthesized in the laboratory,

That the global gene pool, in all of its biological forms and manifestations, is a shared legacy and, therefore, a collective responsibility³⁸

More than simply relating the ownership of nature via IPR to a point of legal interpretation (ie, the product of nature doctrine), the activists that contest biopiracy do so in ways that call this system of property itself into question. As seen in the excerpt quoted above, many of these groups often invoke an essentialized version of nature which posits that there is something inalienably “natural” about nature that renders its ownership unethical, or even impossible. There are a number of justifications on which this rests, many of which speak to the social embroiling(s) of nature, where nature as such is understood to have coevolved with society's understandings of it. As RAFI explains in a press release related to a particularly acrimonious “biopiracy” debate regarding an International Consultative Biodiversity Group³⁹ project in the Chiapas region of Mexico:

No "Wild Kingdoms": Bioprospectors must assume - unless there is proof otherwise - that all materials they encounter have been nurtured and enhanced by communities. [In the Maya-ICBG case a] large community garden was mistaken for a "natural" forest. Similarly, soils, insects, and fungi first assumed to be unused upon closer scrutiny have been found to have longstanding medicinal or other purposes.⁴⁰

Other actors who attempt to draw attention to biopiracy present nature's creative and reproductive capacity to serve as self-evidence of the futility and hubris of attempting to “own” nature. This logic is carried forward by Vandana Shiva, in much of her writing on biopiracy. In *Biopiracy: The plunder of nature and knowledge*, for example, she writes that “biotechnology, as the handmaiden of capital in the postindustrial era, makes it possible to colonize and control that which is autonomous, free, and self-regenerative”.⁴¹ Later in the same account, she explains:

Certainly, the idea of owning life is not new; people own their pets and farmers own their livestock. Yet IPRs create a new concept of ownership. It is not just the implanted gene, or one generation of animals, that is being claimed as intellectual property, but the

*reproduction of the entire organism, including future generations covered by the life of the patent.*⁴²

Shiva's point here presents IPRs as the tool through which seeds, in this case, are denied their "naturalness" and become patentable, and thus commodifiable at what she sees as the most intimate of levels. For her, the IPR system is an ill-equipped and inappropriate mechanism for deciding what constitutes something which is "from nature". Further, the distinction which is currently made between the natural and the invented does not go nearly far enough in recognizing nature's own inventive capacity and thereby imposes a false notion of human invention onto the natural. In these cases, though Shiva knows well that there is a time limit to patents, these particular patents cross over into a more symbolic realm, and do so on behalf of the IPR system more generally. When considered in terms of nature's perceived self-evidence as "natural" and its autonomy, including its autonomy to reproduce, then the limits that would be placed upon these organisms by seeing them as patentable would make them "too natural" to be considered invented.

Too cultural – public domain or private ownership?

Along with arguing that these contentious inventions are "too natural" to be patented, those alleging biopiracy also see the place of culture/society in this system as problematic. These critiques challenge the logic behind a perceived separation of the public and the private domains as they pertain to ownership and control over inventions that can be seen to have some form of prior cultural basis, such as in the case of TK. In brief, the problem in these instances appears to be that there is a claim that there is too much knowledge already there, albeit unrecognized by the system, to allow these "inventions" to be patented.

Much of the thrust of this "too cultural" aspect of the biopiracy discourse thus takes issue with the recognition of prior art in patent claims. In many of the cases where biopiracy has been alleged, one of the claims made is that prior art has not been adequately taken into account by the patent system. This is often explained away by those in favour of robust IPR regimes as simply untrue, or, at worst, as a case of a "bad patent" being issued, where prior art was indeed not recognized. Biopiracy activists, however, often present this as a more fundamental, systemic problem with what is allowed to "count" as prior art within the IPR system. Specifically, it is claimed that Euro-American IPR systems are blind to types of prior art that might not exist in immediately accessible formats. For example, this was a major point of contention in both the neem and turmeric biopiracy challenge cases. The neem case refers to a patent granted to WR Grace and Co. for an insecticide/fungicide derived from the neem tree, which was subject to a very public patent challenge.⁴³ The turmeric case refers to US patent 5, 401, 504, granted initially to two scientists from the University of Mississippi for the use of turmeric for healing wounds. As Genetic Resources Action International (GRAIN) explains: "The Indian government challenged the patent as blatant theft, and provided endless research papers predating the patent providing that turmeric has long been used in India to heal wounds. In the face of this overwhelming evidence, the US Patent and Trademark office rejected all 6 patent claims".⁴⁴ With specific reference to the turmeric case, Shiva takes issue with

those that would attempt to dismiss biopiracy as merely a slight systematic oversight that allowed for “bad” patents to be issued:

This indigenous knowledge and use consists of "prior art". No patent should be given where prior art exists since patents are supposed to be granted only for new inventions on the basis of novelty and non-obviousness. These criteria establish inventiveness, and patents are exclusive rights granted for inventions. [...] If there were only one or two cases of such false claims to invention on the basis of Biopiracy, they could be called an error. However, Biopiracy is an epidemic. [...] The problem is not, as was made out to be in the case of turmeric, an error made by a patent clerk. The problem is deep and systemic. And it calls for a systemic change, not a case by case challenge.

If a patent system which is supposed to reward inventiveness and creativity systematically rewards piracy, if a patent system fails to honestly apply criteria of novelty and non-obviousness in the granting of patents related to indigenous knowledge, then the system is flawed, and it needs to change. It cannot be the basis of granting patents or establishing exclusive marketing rights. The problem of Biopiracy is a result of western style IPR systems, not the absence of such IPR systems in India.⁴⁵

Recalling the argument from the previous section that suggests that it is the movement of these contested objects out of the realm of nature into a separate realm of culture which makes them patentable, the claim here is that there is also *too much culture*, albeit rendered invisible and unrecognized, in these inventions for them to count as sufficiently inventive enough to be patentable.

In many ways, this can also be seen to be an issue about what is allowed to count as a sufficient means through which to make the requisite movement from the natural to the knowledge-based. It is clear that in the dominant paradigm, which suggests that cases of biopiracy are simply “bad patents”, the biosciences are seen to be sufficient enough interlocutors to facilitate this transition. If one can demonstrate that the specific product of nature which enables their invention has been sufficiently removed from nature - for instance, a particular gene sequence has been isolated and purified - then the invention is rendered patentable. However, in many of the cases where biopiracy is being alleged, there is a question as to whether TK is able to count as fulfilling a similar function. In the last sentence of the passage quoted above, Shiva strikes out at this deficit model of IPR protection, which suggests that biopiracy only occurs where the IPR system is not evolved or robust enough to provide sufficient protection. Here, she links this claim with a critique of the IPR system itself, suggesting that the IPR system is, in fact, instrumental in causing biopiracy. The point where biopiracy interjects here is in claiming that TK is either invisible to the system, or is wilfully ignored by it. In these cases, if TK were recognized as a suitable enough interlocutor to make this nature-to-culture movement, then the claimed inventions would not be able to demonstrate that they have moved their invention *far enough out of culture* so as to make it patentable. Put another way, if TK were recognized as a suitable enough way to intervene on “products of nature” so as to make them useful

for humans, then the inventions or discovery projects that are alleged to be engaged in biopiracy would already be part of the public domain, and hence unpatentable.

One of the most confusing aspects of the biopiracy discourse has been the issue of what is to be done to address the relationship between TK and the IPR system. If the “too cultural” critique were understood as being solely about a claim for reparations, or about laying the groundwork for the future profitability of TK as it appears to be for many who have used the term⁴⁶, then it would not move the debate too far from merely adjusting the parameters of the IPR system to include TK in some way. For many of the biopiracy activists, simply adjusting the IPR system to include TK would be an incomplete version of biopiracy. For them, advocating this position side-by-side with one which suggests that the system itself is fatally flawed in its treatment of living things is unproblematic. It would be misleading, however, to attempt to portray this as a way in which “biopiracy” as a whole has betrayed itself. Conversely, the wide take-up of the term is a reminder that, once deployed into the charged atmosphere around IPR and biotechnology, these terms are constantly in flux and come to mean different things to different actors across the spectrum.

This is also further evidenced in how the terms have been used by developing world governments, who have widely used the term biopiracy in some of their submissions to international forums such as the WTO and the CBD(c.f. Peru’s explanation of its National Anti-Biopiracy Commission⁴⁷). Many of these submissions focus on developing some system for a “declaration of origin” for genetic material, with the idea being that the benefits from the exploitation of genetic resources would flow back to those countries from where the material “originated”. Of course, this does not converge with many of the biopiracy activists, who suggest that IPR-based systems of ownership are themselves largely at fault for biopiracy⁴⁸. Again, the way in which the term itself has shown an ability to lend itself to related but quite different applications, demonstrates ultimately how effective a “political” term it can be.

Conclusion

This paper has demonstrated how projects like those gathered under the rubric of the bioeconomy rely on the creation and structuring of certain categories, such as genetic resources, for their functioning. It further demonstrated how the categories of nature and of invention are vital to the bioeconomy, and to the IPR system which forms an integral part to it. The paper then proceeded to analyse how the discourse(s) of biopiracy presents a challenge to the categories which underwrite the bioeconomy, and ultimately present a challenge to this kind of project.

Even in the most rigorous and conventional understandings of IPR, were it demonstrated that an invention were either too natural (ie, was found in nature, as such) or too cultural (ie, was already known or was obvious) then it would be unpatentable. This paper has demonstrated that what sets biopiracy apart and gives it its rhetorical and conceptual force, however, is the conflation of these two, or, rather, their re-combination. The conflation of these two tenets of argument (too natural/too cultural) into one single semantic point – biopiracy – demonstrates the ways in which

a cascade of ethical questions can be combined in the complicated and ambivalent world of IPR and the biosciences.

This paper has also helped to shed some light on how the natural and the cultural are represented in contemporary configurations of IPR and bioscience, notably at the point where these intersect with TK. Examples such as those instances alleged as biopiracy demonstrate how these objects, and their “in-between” positioning, confound the logic of IPR which makes up many of these economic future-making projects. Ultimately, a controversy like biopiracy brings nature and culture back together, and in so doing presents a challenge to the IPR system’s contention that they can be disentangled via patents.

In effect, these activists are taking issue with what they see as a denial of both a system of knowledge (ie, traditional knowledge) *and* a system of nature (one in which patents on “products of nature” are considerably more limited than at present). Biopiracy challenges these aspects of the IPR system by presenting examples of things that are at once both in nature *and* in the public domain, and are not so easily abstracted from either of those realms when taken individually, or more crucially, when taken together. As developments in bioscience and biotechnology continue to shape and be shaped by concepts and processes such as the bioeconomy, there will undoubtedly be further examples of artefacts that are not so easily understood as invented, on one hand, or ownable on the other – something which should figure in future attempts at defining and thus shaping the bioeconomy.

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¹ This article is based on research conducted as part of a PhD dissertation undertaken at the BIOS Centre, at the London School of Economics. c.j.hamilton@alumni.lse.ac.uk

² In most instances, the IPR which I will be referring to in this paper are patents, though there are areas where the biopiracy critique of the “bioeconomy” or of bioeconomy-related mechanisms concerns itself with other forms of IPR which are integral to the bioeconomy such as plant breeders rights and copyright. For those reason, I will use the term IPR throughout the paper.

³ “Communique” is the term given by RAFI/ETC to their occasional reports, papers, etc.

⁴ ETC Group. 2002. *Biopiracy + 10: Captain Hook awards 2002* (No.75). Available at www.captainhookawards.org/content/download/118/604/file/Biopiracy+10Comm.pdf

⁵ V. Shiva. 1997. *Biopiracy: The plunder of nature and knowledge*. Toronto: Between the Lines.

⁶ V. Shiva. 2001. *Protect or plunder?: Understanding intellectual property rights*. London: Zed Books: 49

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- ²⁸ Secretariat of the Convention on Biological Diversity. 2000. *Sustaining life on earth: How the Convention on Biological Diversity promotes nature and human well being*. Montreal: Secretariat of Convention on Biological Diversity/UNEP: 2.
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- ³² World Intellectual Property Organization. 2004. *WIPO Intellectual property handbook: Policy law and use*. Geneva: WIPO (2nd edition).
- ³³ World Intellectual Property Organization Intergovernmental Committee on Intellectual Property and Genetic Resources Traditional Knowledge and Folklore Second Session. 2001. *Declaration of shamans on intellectual property and protection of traditional knowledge and genetic resources: Document submitted by the delegation of Brazil. WIPO/GTRKF/IC/2/14*: pp. 2-3 (emphasis added). It should be noted that the Shamans quoted here do not reference the term “biopiracy” *per se* in their declaration. They do, however, set out a number of concerns and recommendations, such as the need to prevent the “theft of [their] biodiversity”, which resonate in much of the biopiracy discourse and I use it as an example here for that reason.
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- ³⁷ D. Haraway. 1997. *Modest_witness@Second_millennium.FemaleMan_meets_Oncomouse: Feminism and Technoscience*. London: Routledge: 100.
- ³⁸ Foundation on Economic Trends. 2002. The Treaty Initiative to Share the Genetic Commons. Available at <http://www.foet.org/past/Treaty%20Document%20English.html> (emphasis added).
- ³⁹ The ICBG program is a group of projects jointly funded by several components of the United States’ National Institutes of Health (NIH), and is described as “a unique effort that addresses the interdependent issues of drug discovery, biodiversity conservation, and sustainable economic growth” (National Institute of Health, 2006). The projects are considered to be among the most major of the government-funded bioprospecting projects and were initiated in 1992, and subsequently renewed, most recently in 2005.
- ⁴⁰ Rural Advancement Foundation International. 2000. *RAFI Geno-type: Call to dialogue or call to 911?* Available at http://www.etcgroup.org/upload/publication/301/01/geno_call911.pdf
- ⁴¹ Shiva 1997, op. cit. note 5, p. 45.
- ⁴² Ibid, p. 96

⁴³ See Hamilton, op. cit. note 7.

⁴⁴ Genetic Resources Action International. 2000. *Of patents and pirates*. Available at <http://www.grain.org/briefings/?id=141>

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⁴⁶ The way it is used by these governments represents a rather different usage of the biopiracy concept/terminology, and though it is beyond the scope of the current study, it is an interesting development and one which calls for further research.

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⁴⁸ See Shiva, op. cit. note 5 & ETC Group, op. cit. note 4.