

THE SELF OF THE SCIENTIST, MATERIAL FOR THE ARTIST

Emergent Distinctions in an Interdisciplinary Collaboration

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Abstract: This article analyzes ethnographic material from several art and science research collaborations that were funded under a single funding scheme in the UK between 2003 and 2006. The material illustrates the way that distinctions between aesthetic value and utility value emerged during the interactions of the participants. It outlines how conceptual positions about the contrasting value of art and of science shaped their collaborative practice. I relate key distinctions that emerged in their statements to the parallel division in intellectual property law between copyright and patent. The intention is to show how seemingly natural and given differences that inform both law and disciplinary practice are generated and regenerated in a manner that divides persons, things, and disciplines in the very practices that these categories reciprocally inform and shape.

Keywords: aesthetics, art and science collaboration, copyright law, interdisciplinary research, knowledge, patent law, utility

In the pages of this journal in 2005, I reported on a pilot art and science research initiative in the UK, the New Technology Arts Fellowships, which involved a series of collaborations between artists and scientists that were coordinated and facilitated by various educational institutions and that drew support from Arts Council England, a national development agency for the arts. In that piece (Leach 2005), I argued that the organizers and participants in those projects exhibited a particular sense of urgency that, in part, mirrored concerns about the trajectory and implications of artistic practice and scientific research and their value to society. In this article, I refer to research undertaken as part of a much-expanded follow-up scheme to that earlier initiative. This article then takes as its subject matter an institutionalized collaboration between artists and scientists.



In it, I pursue an exploration, through ethnographic material, of the way that distinctions between art-as-knowledge-making and science-as-knowledge-making¹ emerged for the participants of this interdisciplinary research.

In 2003, the United Kingdom Arts and Humanities Research Board (AHRB), which became the Arts and Humanities Research Council (AHRC) in 2004, and Arts Council England established a competitive Arts and Science Research Fellowships scheme (hereafter referred to as ‘the Scheme’), with the aim of supporting collaborative research in the arts and sciences.² As the application information related:

A report published by the Council for Science and Technology on the arts and humanities in relation to science and technology concluded: “The greatest challenges for UK society ... are all ones in which the arts and humanities and science and technology need each other ... In the circumstances of modern society and the modern global economy, the concept of a distinct frontier between science and the arts and humanities is anachronistic ... the relationships between the arts and humanities and science and technology need to be strengthened further ... Many of the most exciting areas of research lie between and across the boundaries of the traditionally defined disciplines.”³

To the end of achieving new cross-boundary research, the Scheme supported 16 different collaborations between university-based research scientists and (mainly visual) artists. What was striking, given the Council for Science and Technology’s drive for synergy, was how distinctions between art and science were continually remade and rearticulated by the participants. It seemed that practical and conceptual distinctions were made more real in the process of the collaboration itself. This was true in spite of the fact that these participants were well-aware of the long history of critique against the radical separation of the arts and sciences. One might even say that it was this awareness that spurred participation. However, in their practice, distinctions were regenerated. This points to a more fundamental embedding of what generates these distinctions in wider social arenas. These are ideas of objectivity (in science) and subjectivity (in art) and corresponding ideas of utility for scientific knowledge and a different kind of value for aesthetic expression. How and why those distinctions were generated is the focus of this article. It appears to be tied up with the way that the actors perceived their personal and individual relation to the material that they worked with and to the knowledge outcomes or objects that they produced. Put simply, the distinctions that kept emerging between art-as-knowledge-making and science-as-knowledge-making were fascinatingly entwined with how much of the self (and self-expression) could be ‘in’ the objects.

Motivation, Distinction, and Purification

The scientists who agreed to participate in this art and science collaboration did so (and said they did so) because they were interested in an opportunity to ‘align’ better their perception of themselves and of their work. That is, they

wished to make their individual and internal sense of self apparent in their professional outputs, a process that would involve making their subjective and expressive ‘self’ visible. The scientists simultaneously asserted the fundamental value of the scientific method—one that ‘purifies’ knowledge outcomes of subjective bias—while also showing concerns that being represented as scientists in this sense (i.e., people who work on external, pre-existent entities) does not do justice to them as persons. What the scientists gained by entering this collaboration was the possibility to narrate what they do, to make visible the unseen (or deleted) dimensions of their work and thus their ‘sense of self’.

The artists, on the other hand, were interested in engaging with the scientists in order to access a specific kind of material for their making processes. The emphasis on subjectivity and originality in art practices suggested that artists were engaged in personal expression, fulfilling their desire for self-presentation and communication, but leaving the utility of their work ambiguous. In their responses, artists in the Scheme were explicit about the fact that their work is at least intersubjective (not individually subjective), both in subject matter and consequence, and that society and nature and their interrelation are crucial to what they do. They also held that utility is not external to art-work, for once art circulates within and helps to shape culture, it has utility in the sense that it frames or enables individual perspectives and thus social and political action.

While asserting that the common description of art and science in terms of pervasive subjectivity-objectivity or expression-utility dichotomies does not do justice to the process of art making or to the person of the scientist, the participants seemed to fall back continually on these distinctions when explaining the value of what they did. I observed that the divisions between these dichotomies draw their force from their opposition to one another. When paired with other concepts in particular trajectories of thought or action, that distinction partially collapsed while other distinctions came to the fore. Consider, for example, how the scientific method’s insistence on objective observation seems fundamental to utility itself: knowing and manipulating how something in nature actually works is not a subjective opinion. Yet artists understood that their work, too, has a form of utility—one that is not based, in any straightforward way, on a claim to objectivity or on the scientific mode of establishing a truth. These distinctions reflected and refracted other distinctions in the contemporary construction of knowledge and its value—most pertinently, very similar ideas that are encoded in intellectual property law.

Intellectual property law is based on a fundamental divide between expression (copyright) and utility (patent). Expression has potential aesthetic or artistic value, while patents apply knowledge for practical uses. Both require novelty, but in a different sense for each: expression is based on the right of an author over a novel creation, while utility is based on a demonstrable effect on the material world with no reference to aesthetic value. My argument is that the scientists were represented as not being creative in a subjective sense. They were seen as revealing relations between entities that already exist independent of any human subject. The ways in which their ‘subjectivity’ (or, more

precisely, the ways that the relations they develop with other people) were involved in the production of science were not made visible, but actually repressed—what I call ‘purified’—by standard accounts that are produced to maintain neat subjectivity-objectivity or expression-utility divides.

In sum, both scientists and artists in this collaboration showed that some of the foundational conceptual divisions that are evident in both intellectual property law and the general Western discourse about science and art are overlapping and shifting. The problematic utility-originality divide that is exercised by both artists and scientists—and by those making claims under either patent or copyright law—results in a problematic basis for understanding the value of different kinds of knowledge and different kinds of persons.

Aesthetics and Utility

The function of aesthetic forms is a fascinatingly ambiguous area for Western thought. Providing a pertinent comparative perspective to the material on an art and science collaboration in these pages—and following my strategy in the previous *Social Analysis* article (Leach 2005)—one can observe that the same ambiguity is not so apparent for many Melanesian people, as reported in the ethnographic literature (e.g., see Gell 1999; Küchler 2002; Strathern 1988, 1991, 1992a; Wagner 1986; Weiner 1991). For those people, effects upon others are the basis for productivity. One’s knowledge of the self, of its capacities, and of the mechanisms of material production is founded in social relations of elicitation. Aesthetic form plays a central role (see, e.g., Wagner 1987). Anything that is of value, and its recognition as such (Hirsch 2004), is always elicited from others. Even growing crops in one’s own garden cannot be achieved without attracting aid and sympathy from myriad others (Leach 2003: 106–114). Hence, what one elicits reveals one’s capacity for elicitation through displaying the correct form, an aesthetic preoccupation (Strathern 1988: 184). Aesthetic forms are foundational to any ‘function’, that is, the process or practice of achieving material or social effect. The function of aesthetic appeal is material and social reproduction.

The ethnographic data that I present here add weight to the assertion that Western people have it the other way around (Wagner 1975)—that they make the division between culture and nature appear as a distinction (Latour 1993; Strathern 1980), as if it were a given. The contrast with Melanesian perceptions is beautifully expressed by James Weiner’s (2001: 86) provocative question: “What if ... it was magic and art that were foundational, as indeed our Papua New Guinea hosts constantly tell us, and techniques and products and things made are only revealed in their thingly quality through magic, myth, art and poetry?”

This is important for the argument that follows because it shows the particularity and peculiarity of a system that has such separations emergent from a time in the past, when art and science were indistinguishable (Stafford 1991). In introducing the Melanesian material here, I am not contrasting the art-science

or subject-object distinctions per se; rather, I am highlighting the way that subjective artifice in the Western mode of elaboration makes problems specifically for utility. This is because of the correspondence between the notion of utility, objectivity, and universal validity. The Melanesian conceptualizations referred to here do not establish the same links or problems for thought. That is to say, my contrast is not between an intersubjective (Melanesian) and an objective (Western) approach. Instead, it is between the Melanesian way of conceiving aesthetic experience as a means of establishing the conditions for production and the Euro-American conceptualization of the place of aesthetics, “contemplating nothing other than the result of perpetual transactions with the subjectivity of others” (Bourriaud 2002: 22). In the Euro-American understanding, the conditions for production are assumed to be grounded in objective and universally observable reality, not in intersubjectivity.

I assume that the Western construction of the art-science distinction arises out of a particular social and historical context in which aesthetics and utility are also specifically linked constructions. Turning the same analytic language to the particular art and science collaborations I report on here can be illuminating. What each participant elicited from the other was something like disciplinary and personal difference.

Art and Science: Commonality and Divergence

This is not an article about what science is or what art is, nor is it an article detailing what all artists think or what all scientists think. Through ethnography, I pursue an exploration of the way that distinctions between art-as-knowledge-making and science-as-knowledge-making reflected and refracted other pertinent distinctions in the contemporary construction of knowledge and its value for the participants in this Scheme. As I report upon specific fieldwork, it is on the words, attitudes, actions, and opinions of particular people. The people involved were practicing scientists and artists, engaged in this Scheme that brought different disciplinary actors together for novel and experimental collaborations. The attitudes of those people, as reported here, were elicited by and expressed within that context. Distinctions between the sciences and the arts were a live and important issue for the participants.

Notwithstanding—or, rather, acknowledging—Svetlana Alpers’s (1989) important argument that seventeenth-century Dutch art was “an art of describing” involving “attentiveness to descriptive presence” (ibid.: xx–xxi), the way in which subjectivity and intersubjectivity emerge in the practice and statements, as discussed in this article, demonstrates that although both artists and scientists may understand themselves as describing what is there (see also Stafford 1991) *within* this designation, the focus on, and the license to include, the self and its obvious manifestations in perspective, opinions, mistakes, and individuality differed. In other words, far from positing that there is an absolute distinction between what is there and artifice—either ‘in reality’ (which is not my subject here) or in the understanding of my informants (which *is* my

subject)—I emphasize the ‘merographic’⁴ connection between these elements in order to demonstrate that this conceptual connection enabled these people to understand the value and interest of the collaboration at the same time as it reinforced and reinvigorated the need for active distinction making between the approaches. Indeed, when Alpers (1989: xxv) writes that “the eye was a central means of self-representation and visual experience a central mode of self-consciousness” for Dutch artists in the seventeenth century, we see that, although they were describing nature, these artists automatically included the self in the artistic process—as did the artists participating in the Scheme in a way that the scientists just did not do.

In parallel, it is quite easy to find scientists and commentators on science who readily acknowledge that, as Rheinberger (1997: 2) puts it, “experimental systems ... are, inseparably and at one and the same time, local, individual, social, institutional, technical, instrumental, and, above all, epistemic units.” Heisenberg (1971: v) asserts that “science is quite inseparable from these more general questions” in reference to “[h]uman, philosophical, or political problems.” While these critiques of the absolute distinction between science and art, with their venerable history (see Snow [1960] 1993), were embedded in the discourse and motivation of those taking part in the Scheme, they guided its inception and outcomes against, as it were, the continual differentiation of approach that is most characteristic of the material reported on below.

Tracing the process of collaboration and linking the form that it took to wider understandings and assumptions about value, effect, utility, and the person is my attempt to make sense of that process. In making my observations about differentiated disciplines and selves, I follow Strathern (1992b) in noting that the merographic relations that these authors and commentators are aware of have their own emergent properties as disciplinary distinctions and differentiated persons. I take these emergent distinctions as an avenue to discuss the contexts provided by intellectual property laws, specifically, patent law and copyright law. This allows us to investigate the assumptions and expectations that the contrast between those two approaches to the ownership of knowledge reveal as aspects of a social form in which the art-science distinction makes at least partial sense. Patent law and copyright law demand a certain ‘purification of knowledge objects’⁵ and, in this way, participate in the structuring of relations from which complex social personas emerge.

Merographic Relations

In both intellectual property law and the statements of participants in the Scheme, material reality and, following from this, potential utility were, on the one hand, privileged, situating the producer in relation to the world. On the other hand, mental artifice and subjectivity were also key, again connecting the person to objects, but differently. Patent and copyright add the weight of the law, not just to the establishment of systems whereby innovations and

creations belong to certain people, but to the very formation of different persons in the process of the creation of claimable objects.

The term 'artifice' is doubly complex in this process. Firstly, artifice was central to both art and science in this material. The purification process, whereby objects come to stand for themselves while still, in subtle and different ways, indexing their author (Gell 1998; Latour 1987; Leach 2007a), is very different in each case. Each apparently requires the explicit exclusion of the other. As Biagioli (2003) notes, scientific knowledge does not require any aesthetic appeal or 'authorial' aspect; patent claims require potential utility but no aesthetic appeal; and copyright law assumes that original expression is enough for ownership, due to creative authorship. But then they refract again when described in these indigenous terms. The term 'prior art'—the basis on which a patent can be refused—refers to a previous human artifice and thus relies upon knowledge of an intersubjective reality rather than the potential utility of an object, for example.

The following section addresses these overlapping differences, leading into a discussion of the possibilities for the emergence of different kinds of self/person in each mode of action. As then becomes clear, no one person participating in the Scheme was purely an artist or a scientist. A second process of purification occurred through institutional structures in which persons became defined as exclusively one or the other. Yet these persons, being more than their institutional definition, replicated and played out within themselves wider institutionalized distinctions. Thus, participating scientists often undertook artistic endeavors outside their working life; however, they could not directly relate their individuality to the description of the world that was produced in science as if it were their creation. Artists drew upon their understandings of the given and natural world in making work, yet they produced objects that were explicitly related to their individuality. I articulate this complex process utilizing Marilyn Strathern's idea of merographic relations.

In her book *After Nature*, Strathern (1992b) addresses contemporary English kinship as instantiating a pluralist model of reality and effect within the make-up of the person. Older understandings of the 'hybrid' nature of the human being (a mix of biology and culture) had been challenged by recent developments in reproductive technology that introduced complex and overlapping images of what it is that makes a person. Any one element or determinant domain could always be seen as connected to multiple other elements and domains, and instead of a simple definition of elements as aspects of a single conceptual domain, both elements and domains appear sometimes as whole entities, sometimes encompassing other domains or as parts of other entities or domains (Strathern 1980: 191).

This is very much how the notions (domains) of aesthetics and utility, and of art(ifice) and science, subjective and objective, operate in the material that I present. Strathern (1992b: 72–73) explains the purchase of the term 'merographic' thus:

Consider: domains such as 'culture' and 'nature' appear to be linked by virtue of being at once similar and dissimilar. What makes the similarities is the effort

to ‘see’ connections; what makes the dissimilarities is the ‘recognition’ of difference. ... [W]hat looks as though it is connected to one fact can also be connected to another. Culture and nature may be connected together as domains that run in analogous fashion insofar as each operates in a similar way according to laws of its own; at the same time, each is connected to a whole range of other phenomena which differentiate them—the activities of human beings, for instance, by contrast with the physical properties of the universe. This second connection makes the partial nature of the analogy obvious. It presupposes that one thing differs from another insofar as it belongs to or is part of something else. I call this kind of connection, link or relationship *merographic*.

The second half of my article describes the social effects of merographic distinctions between aesthetic value and utility value, as instantiated by the law, on the generation of the person and on claims to value creation.

The Subject Matter of Art and of Science

Art and science have a different focus in the understanding of my informants. As a physicist participating in the Scheme put it: “We [scientists] are unveiling bits of nature.” His collaborator (a novelist) told me: “[My collaborating physicist] holds the idea that there is an objective reality we come along and discover, [whereas] I think that truth depends on there being language in order to know it.” This points to the role that perceptions of subjectivity and objectivity had in the making of these different kinds of knowledge. Another enthusiastic scientist described the difficulty he had faced with the artist he had accepted into his laboratory over accuracy in representing the scientific facts in the artwork. For him, the issue was particularly pertinent because his enthusiasm over involvement in the Scheme was based on his desire to communicate the wonder of science. As he put it: “The artist may be seeking to allow an audience to interpret and question. Science as communication requires a more direct pedagogical approach.” In another partnership, the artist confessed: “I don’t understand everything by any means. This made me worried at first—very worried—but then I realized that I am an artist, and I don’t have to understand everything. A different perspective is allowed. Misunderstanding allows me [a] different perspective.” These contrasts point to the operational understanding that many of the scientists brought to the Scheme, that is, that they are forced to deal with what they find (as opposed to what they would *like* to find) or what they construct.

There was no denial that artifice was seen as being central to the knowledge-making practice of science, most fundamentally, with regard to the construction of large laboratories that had made scientific investigations possible. In the scientists’ self-representations, the fact that science had become a large-scale operation meant that a division of labor was now necessary and that no one person could encompass all the expertise necessary for scientific discovery. That the results of investigations do not depend upon the context or the person of the investigator was an explicit part of the participating scientists’ understanding.

This was not the case for the artists in the collaborations, who made their claims to the status of artist and to the ownership of their creations by presenting the material that they had worked on as internal, as it were, to their person. Let me explain. If sense is achieved by scientists because of regularities in the reality upon which they work that are external to themselves or their ability to make connections, as it were, the meaning of artwork is in the connections that artists are able to make internally within themselves, as perceiving and thinking subjects, and then express in their works of art. For the artists in the Scheme, sense was an expression of internal creativity—not external reality—and thus was not of the same type as that which the scientists attained. As another informant put it: “I characterized art as being concerned with individualism and self-expression, while science is driven mostly by curiosity about the world.”

One can see the consistent construction of a difference, one that is found in the combination of the subject matter and the approach that is deemed suitable for presenting it. I highlight the insistence on, and institutionalized constitution of, an external world existent as a reality beyond any particular perceiver as the subject matter for science. As Law (2007: 599–601) has argued more widely, scientists assume that a thing like a habitat or ecosystem is a real entity found in nature: it has a particular “out-there-ness” that lends it singularity. Conversely, the subject matter for art is a subjective, interpretive connection; thus, it features an internal, rather than external, focus (whatever the actual subject of the artwork might be). Both have value, yet notions about the constitution of this differing value and the way in which it ought to be connected to the person of its producer have their foundation in these distinctions.

The distinction between disciplines was clearly a given for those sponsoring the Scheme. However, the material introducing it, as well as statements made by participants, demonstrated the perception that the arts and sciences should be alternatives within the same set of practices. “Can questions posed by scientists be posed by artists to achieve results in another medium?” was how one participant put it. So we can observe that the interface between the practices then must rest, conceptually, on some commonality and on some inherent difference. I believe that the commonality was made possible for the participants by a contemporary notion that conceives of ‘knowledge’ as intangible objects that can be externalized from their producers and that appear to carry their value despite this abstraction (see Leach 2012). That is, by describing the outcomes of scientific research and artistic practice as ‘knowledge production’, some level of commensurability was implied. That in turn prompted questions about how to combine them and which kind is most useful, most valuable, and so forth, in a resource-constrained environment. This move shifted the focus of attention from the relations of creation—including those between the persons (disciplines) themselves—to the objects produced. These objects contain alternative versions of ‘valuable knowledge’ and thus invoke intellectual property law as their background. This was underlined by the emergent distinctions that referred back to the separate logics of copyright and patent claims. However, to make hybrid objects containing the value of both was an aim of the Scheme. This goal was made possible by an understanding of the arts and the sciences as ‘knowledge producing’.

In making claims to knowledge through intellectual property, aspects of the production process are explicitly or implicitly referred to in the evidence for the claim. The different kinds of connection that a maker has to the object produced appear extrinsic to its existence once it is separate and appears to carry its value as a 'knowledge object' without reference to its producer. Whoever originally owns the object is a retrospective reconstruction, as it were, of the processes of production. Differences in the processes of making are put down to the requirements of different kinds of subject matter (as will be discussed below) and in the location of the potential effects of the created object. For example, scientific knowledge of medicinal plants refers to existent entities given in nature, and having that knowledge has its primary effect in the bodies of patients, not in the world of culture and art. But of course, plant knowledge is already a cultural artifact, and cultural factors are also evident in how health and well-being are judged. The requirements for understanding and utilizing the kinds of knowledge made in art or science tend to overlap, and thus purification of both object and producer are demanded at different moments in each process in order for claims over the status of such productions to stand.

Intersubjective Reality

In addition to the distinction between internal reality and external reality, it was also possible to discern the notion of a 'social reality' that artists can comment upon and of a 'physical reality' that must be described accurately by science. Works of art were contestable in the statements of participants in a way that facts about the external world were not. One of the artists told me: "If I look at science and I don't understand it, I don't doubt the quality of the science. If I look at art and don't understand it, I do doubt the quality of the artist. [There is a] tendency to trust the objectivity of science." Note well that in this statement the quality of abstract knowledge (science) is contrasted, not with the quality of an abstracted creation (art), but with the person of the artist. This contrast is one that pervaded the distinctions relevant to the art and science collaborations. I return below to the implications for personhood that making each kind of knowledge object entails. But my current purpose is to elaborate why it is that the scientists' opinions about art are seen as relevant, whereas the artists' opinions about the quality and veracity of science are not given credence.

There may be (at least) two reasons for this difference. Firstly, there was clearly agreement that making art is subjective. As an informant said: "Science is based on the idea of objectivity. Subjectivity [is] central for art. This does not mean that art necessarily has to be limited to personal expression. But it does mean that [art] does not relate to the idea of objectivity in the same way. Art is more about intersubjectivity. That is good for us, it gives us more freedom. But it also means we are taken a lot less seriously." The existence and value of intersubjectivity were obviously acknowledged in the Scheme, as it was clear from participants' statements that scientists often engaged with artists because of the possibilities that art offers for communicating about science.

The participants in the Scheme contrasted this ‘subjective universalism’ as a peculiar quality of aesthetic experience with the ‘absolute universalism’ that logic allows. While there is something that one can call ‘knowledge’, the participants agreed that it is not quite what the intersubjective constructions of art can offer (de Bolla 2002).

Art as knowledge production then was about subjective interpretation that may be shared, but not in the same way that science-as-knowledge of the external, verifiable reality is shared. Art was seen not only as unverifiable but also as fundamentally contestable because the qualification for making judgments about it is being a human subject with opinions. This explains the logic of the scientific collaborators who insisted that they were in a position to make judgments about art because of their very humanity, whereas artists are not in the same position to make judgments about the accuracy of science. Artists, therefore, were taken to be suitable commentators on the social institutions of scientific practice and on the uses made of the knowledge that science offers, but that comment is on social use only and not on the reality of the external world itself. Clearly reminiscent of what Latour (1999) dubs ‘the science wars’, institutional practices make for specific perceptions of the objective and the subjective that flow seamlessly into notions of what is appropriate for a subjective agent to comment upon (the constructions of the social world) and what is not an appropriate topic of commentary (real facts).

It is here that the notion of the merographic assists us. The scientist is both a scientist and a social being. As the latter, scientists saw themselves as being qualified to make judgments about art. One artist related how she had worked hard to dissuade her collaborators from the opinion that there is no training or expertise in art, or that art is merely a construction based on subjective perceptions of the world. In making her case, she avowed the intersubjective truth of art.

A second reason why artists’ opinions about the quality and veracity of science are not given equal weight involves the notion of utility. When it comes to judgments of value, participants in the Scheme thought that there is utility value in what science discovers as objective facts about the world. Because science ‘reveals reality’ and allows interventions in that reality, utility is always a potential. As expressed by one artist: “Both scientists and artists want to poke around and discover things. Both want to construct and deconstruct. Both tend to be unconventional. The differences lie in tropes of openness and closed-ness, and of whether [they] want to open up or close things down.” The idea of ‘closing things down’ in this statement implies a close focus on singular elements or aspects. The scientists’ investigations necessitate delving deeply into one thing, with their focus at each moment being a narrow one. This in turn makes apparent the multiplicity of elements in the external world, and it is the labor of the scientists to show causal connections between these elements (Wagner 1975: 146). The singular focus of the investigator then was contrasted to the multiplicity of possible facts available externally. Artists, however, were conceptually multiple. They were represented as making connections and revealing the complexity of created, subjective interconnections. Bourriaud (2002: 15) characterizes contemporary art as an “art form where the

substrate is formed by intersubjectivity, and which takes being-together as a central theme, the ‘encounter’ between beholder and picture, and the collective elaboration of meaning.” The value in art was thus cast in terms of self-expression and culture making, not as potential utility.

Embodying a merographic relation, the scientists contained the possibility of making something that encompassed the work of science by commenting upon its findings as an aesthetic or political matter. But that aspect of their person had to be absent, purified from the process of making scientific knowledge objects. Analogously, the artist made no claim to utility (and copyright claims take no explicit account of such factors). Yet art may have social or political utility because of the kinds of action that are possible based on the understanding and insight offered by artworks. Utility then is itself merographically linked into domains of action and effect. These distinctions are thrown into relief by patent and copyright laws.

Utility and Aesthetics as Distinctions in Patent and Copyright Laws

As expressed by participants in the Scheme, a person is potentially an artist by the very nature of his or her existence as a social being. Copyright law rests on a refraction of this logic; that is, one should have rights over one’s expressions, whatever their use, merely because one has externalized them. Debates over the position of the author as creative genius (Jaszi and Woodmansee 1992, 2003; Rose 1995) and, indeed, whether it is creativity as such that is recognized by the law (see Barron 1998) are subsumed in practice by the principle that original expression automatically gives one rights over one’s creation. As Bourriaud (2002: 93) put it succinctly: “The signature ... seals into the artistic economy the exchange mechanisms of subjectivity (an exclusive form of its distribution, turning it into a commodity.” This is not the case with patents: an inventor has to make a claim that must be associated with potential utility.

However, in both patent and copyright law, the claim is over what lies beyond the person of the inventor or the author. Claims and laws supporting them are necessary because of the abstraction of the created object from the person (subject) who brought it into existence. In a patent, the claim is dependent upon the potential operation of the object. The guidelines of the United States Patent and Trademark Office (USPTO) state that the correct focus for patent examiners is “the practical application and the result that is achieved” rather than “how the invention is implemented” (USPTO 2006: annex iii, 44). The real-world connection—rather than any brought about by the law—is apparent in the function that is enabled as a result of making those particular novel connections between existent elements. There is a perceived potential utility, as it were, that is understood as being a given in the world and that is not viewed as dependent for its existence on the creativity (i.e., subjectivity) of the claimant. It is already there: it just needs revealing and harnessing. Utility can be expressed as processes in the material world as revealed by claimants on the basis of their claims.

There is a contrast here between externally observable operations (the real-world connections and effects claimed under patent law) and the operations of created entities. Because the latter do not have an operation (utility) that is external to the person, they are considered instead as operations that occur internally within the person of the producer during the moment of creation. Instead of *finding* connections in given material existence (as the inventor is deemed to do), the copyright owner *makes* connections. The subject matter of a copyrightable work may or may not be the given material world, but the location of both the raw material (ideas) and the connections between them is the human world of intersubjectively generated ideas and culture, including the internal subjective workings of the mind of the creator. Artists' endeavors have their primary effects on people, not material entities. The material connections claimed under patent do have effects in the social and intersubjective world (as they link people through the reality of the external, objective world), but their primary effect is in and on the given material world of nature, not the constructed world of culture. As the USPTO (2006: 54) puts it: "[M]usic, literature, art, photographs, and mere arrangements or compilations of facts or data, without any functional interrelationship is not a process, machine, manufacture or composition of matter." Thus, these materials are not eligible for a patent. Connections in the external world cannot be claimed as creations in the same way as copyright is claimed because the space in which the operation occurs and the materials involved in such operations are common to all.

The notion that external elements of the world are given and belong in common to humanity is a very familiar position. Following Locke (1946), one cannot claim those things without adding labor to them. In contemporary Western, capitalist economies, this means that improvements to what is given are already operations in the space that is common to all and are given as such. This is where one can also trace an element of the construction of 'objectivity'. By making judgments over an invention's utility, the patent examiner is looking for a 'functional interrelationship' and thus a series of connections that exist as objective fact, not subjective interpretation. Objectivity, as embedded in patent law, is demonstrated by function: "If all the steps of a claimed process can be carried out in the human mind, examiners must determine whether the claimed process produces a useful, tangible, and concrete result" (USPTO 2006: annex iii, 47). These are real operations when they function, and thus the person is at that moment operating not as a creator but as a laborer, making (new) connections between existent things. Objectivity here is an assumption of—and made possible by—specific processes of creation.

Why is it that one cannot claim art or literary creations through the same logical sequence? Drawing upon Sherman and Bently (1999), Strathern (2010: 64n14) addresses this point: "[M]any legal writers claim that contemporary British intellectual property law, with its pragmatic heritage, is not on the face of it concerned with creativity but rather with the expenditure of effort by which people create, i.e. make, things in a very restricted sense." In art, again there is no *sui generis* creation but rather a reworking of existing elements drawn from a common heritage of cultural creations (see Leach 2004: 160–162). But because

the elements are combined internally (in the mind of the author) prior to being externalized and have their effects on the minds of others, rather than on the material world, the value here is not so obviously one of recombination with tangible effect; rather, it resembles more an act of creation itself. Novelty alone is enough in a copyright claim, whereas it is only one factor in a patent claim. The person is a subjective cultural being who creates internally and thereby adds to the world of human artifice or creation (culture). Through their labor, artists add to culture. Because the subject matter of that labor, the material upon which they operate, is itself held internally and is artificial, its worth cannot be determined by reference to what it does in the external world beyond culture.

The justification for ownership claims in both patent and copyright law appears, in the end, to be different analogues of the Lockian logic of labor. But the focus of that labor (whether on an existent external world or on a cultural world of human artifice and history) makes all the difference to how the claim can be made. Modes for making claims purify the concepts or expressions, but that shifts complexity (a merographic relation) to within the people themselves, a topic that is discussed in the next section.

Utility, Aesthetics, and the Constitution of the Person

While studying the Scheme, I was struck time and again by the complexity of the motivations and inspirations for participation. These often revolved around extensions of personal interest beyond the limits of the disciplinary structure in which the scientists (in particular) were embedded. For instance, a senior scientist claimed that, at the outset, he had “just been curious” to see what would eventuate, but as the application process progressed, he came to view the collaboration as a chance to engage his own personal desire to communicate science widely. The process became an explicit opportunity to practice something outside his normal competence. As he explained it: “I am writing a science book about the brain to encourage public understanding, and I am very happy to talk to people about it.” The engagement was described as “very exciting” and a change from the “mundane” working life of a senior scientist. Another scientist described it as a way of reinjecting enthusiasm into his practice: “It has been a source of intellectual stimulation and fascination. I have hugely enjoyed working with [the artist].”

A high proportion of scientists involved in the Scheme made artwork in their spare time and even displayed their work in galleries. It was clear that this aspect was seen as external to their everyday institutional persona, although for many that contrast was one that they had hoped to overcome through participation in the Scheme. Why should this goal of personal expression have been an explicit motivation? Put simply, it had become increasingly difficult for the scientists to see themselves reflected in the outputs that they produced as scientists. This was an aspect of the previously discussed distinctions between artifice as creation and the process of revealing the given. Artists are concerned with the integrity and aesthetic quality of their output because these things

reflect back directly on an internal quality of the subject—unique creativity—that can be definitional of the self and its labors in a way that the discovery of a scientific truth apparently cannot be.

One way in which the scientists whom I observed constituted themselves as distinct and individual persons was to describe their interests, such as those exemplified by their willingness to participate in the Scheme, as an adjunct to the actual potential utility of their work, but one that was vital for their satisfaction and sense of fulfillment. We see then an effort to point to internal capacities—be they for creativity or for labor—as these can be made to reflect/define the person. The fact that the process and logic of claims in intellectual property law align so closely with this description of making the self appear can be no coincidence. Whether by producing artworks that are not objective (i.e., not discoverable by anybody) and that reflect the artists' unique subjectivity or through narratives of labor, coincidental (even lucky) expressions of a unique internal self (not necessarily self-authored) are brought into being alongside the objective and non-personal knowledge objects of science. The scientists did not imagine a self based on the description of the world that they produce, as such. They did imagine a self based on the narrative of what led to that description (see Heisenberg 1971)⁶ or on ancillary projects. In this vein, as one scientist expressed it, being in the Scheme was “of great benefit to me personally.”

In contrast, an artist described how she resisted any responsibility to communicate science as a justification for her work. “I want to make work that stands on its own merits,” she declared, rejecting any appeal to this utility. There was a complaint in another collaboration that the artist was “very focused on the project” and that this was “not necessarily good in a multi-dimensional, multi-disciplinary context.” It was the focus on creation that was deemed “unreasonable” and then related to the artist as a type of person in terms of the way that artists were perceived to work. They were thought to be blinded to the demands and difficulties that they left in their wake because of an exclusive focus on the desire for an aesthetically acceptable output. On a creative level, this also seemed to contrast with the modes of working in science: aesthetic considerations were seen to take precedence over accuracy, to some extent.

What I describe here then are variations upon a multiple self, one that is purified in its appearance for certain purposes of institutional definition, while being expanded for claims made to personhood in less specialized contexts. Based on the analysis so far, it seems that the self came into being through its relations with others, and what it produced was a vital aspect of such relations. This particular creation of a self must be achieved through artifice, not through merely describing what is there or through its potential utility.

In patent law, it is the ‘inventive step’ that allows space for the person to appear in the claim. But this claim is based on the labor of discovering function rather than genius. The process of coming to an invention (i.e., realizing it) is irrelevant to the patent office. We have seen the same with copyright claims: only the expression, not the process, is at issue. Nevertheless, to infer that each instance of studied ignorance or disinterest on the part of the law arises from the same trajectory through these concepts would be to miss the fundamental

dynamic of the system. In patentable objects, one has an aspect of the person claimed as central to the object produced, not through creativity but through a Lockian emphasis on labor. Labor is crucial in copyright, too, but it is the fact of creation that results from labor—not the labor itself—that makes the claim of copyright possible.

The contrast examined in this section can be stated simply: scientists in the Scheme said that they could be only partly fulfilled as persons by their work in science. Artists do not appear to have the same operational understanding of their creative process. They do, however, have a merographic relationship to the person of the scientist, since a work of art can be constituted only in part by the person of the creator. In other words, neither artist nor scientist can draw on internal resources alone in the constitution of their object. Each adds labor to existing resources and recombines them, one as an internal operation, the other as an external operation (Leach 2004: 152). But as the artists drew in external resources and transformed them internally, the resulting output seemed definitional of their internal creative self (*ibid.*: 162; Leach 2007b: 108). By contrast, the scientists' labor was focused on connecting things external to and independent of themselves. For exactly that reason, these creations could not index their author in the same way.

We have thus seen that, whether it was in the realm of communication, of professional development, or of artistic endeavor itself, the value and purpose of the interactions for the participating scientists were consistently about bodying forth aspects of their work and themselves in ways that were not otherwise possible in the actual production of purified science-knowledge-objects. The scientists were consistently explicit about the opportunity that the Scheme provided to see themselves as more whole when they engaged with artistic collaborators. The artists took the practices and outputs of science and then made art from them. The objects that they produced were 'about' themselves as well as the intersubjective understandings made possible through their observations. The art-knowledge-object may speak to others (via interpretation), but that comes about initially through subjectivity (internal creativity), with communication as a secondary aspect of intersubjectivity.

The distinctions between how the subject matters of art and science are conceived, as outlined above, are further enforced through the law's insistence that rights over an expression are automatic, contestable only on the grounds of replicating an already existent object. In contrast, there are expressions of certain scientific formulas—indeed, of hypotheses—that may be original as expressions (apparently indexing creative agency on the part of the author), but which nevertheless cannot be claimed through the law of patent, however much utility they might engender. Again, this is explicitly because of their status as existent in the external world prior to being identified. The USPTO (2006: 45) guidelines state: "There is no other recognized exception to eligible subject matter other than laws of nature, natural phenomena, and abstract ideas." This means that when claims are made involving such objects, the labor involved in their discovery has to be presented in a way that is different from either artists' descriptions of their labor in creation (the existence of a form demonstrating

the labor required for the claim to stand) or from the descriptions that one has to produce in order for a patent to be granted. Purification occurs at the level of the person in this process, as well as at the level of the claimed object. These social and conceptual contexts left the artists in the Scheme in search of material and the scientists in search of self-fulfillment as emergent aspects of their relationship in that context.

Conclusion

In this article, I have pursued an exploration of the way that distinctions between art-as-knowledge-making and science-as-knowledge-making in a particular historical and cultural context reflected and refracted other pertinent distinctions relating to the contemporary construction of knowledge. I have examined how aspects of these constructions were constituted by a series of conceptual and social relations that distinguished utility value from aesthetic value. I focused on the triad of creation, claims to ownership, and how the person is constituted in internal-external, subjective-objective, and expressive-functional terms. This series of relations made possible the recognition of two distinct kinds of knowledge object. I have sketched the effects of the world being perceived, on the one hand, as an external reality, ontologically independent of the perceiver prior to action (Law 2007), and, on the other, as a social reality that all perceivers take part in creating (Bourriaud 2002). I investigated how working in one or the other kind of reality comes to structure the emergence of different kinds of persons, defined in different ways through their association with the outcomes of their endeavors. This research has also analyzed contrasting notions of value: those that arise from perceptions of potential utility, and those that arise through a notion of an aesthetic form that reveals artificial interconnections. The latter offers utility of a kind, in that it may prompt action and understanding in the realm of the social.

The experiential way in which the Scheme aligned science and art highlighted the conceptual distinctions and similarities for the participants. It is in the overlap of the concepts—or, preferably, the relations—that some are highlighted and therefore appear to offer a frame for actions in which the self and others come into being. But the concepts bring their counterparts with them, as it were. In making these points, I have consciously followed Strathern's (1992b) lead in observing the phenomenon of merographic relations and thus unconsciously also followed what Viveiros de Castro (2010: 225, citing Zourabichvili 2004) calls "Deleuze's most profound insight ... that difference is also communication and contagion between heterogeneities; in other words, that a divergence never arises without reciprocal contamination of points of view ... To connect is always to communicate across a distance, through the very heterogeneity of the terms." Likening Strathern's approach to Deleuze, Viveiros de Castro (2010: 225) writes: "To summarize, soon after distinguishing two poles, processes or tendencies, the Deleuzian analysis, on the one hand, unfolds the polarity into further polarities, asymmetrically embedded in the first (thus bringing about a 'mixture' *de jure*),

and on the other, it indicates the de facto mixture of the initial poles. And the typical conclusion is: ‘All of this happens at the same time’” (citing Deleuze and Guattari 2004). So saying that art is about intersubjectivity, for example, means that the informant is already thinking of art as connected to subjectivity, and therefore objectivity is there in the background somewhere.

I have tried to argue that the intersubjective realm of culture (what is recognized to have been created by human relationships and artifice by my informants) provides some of the material for the artists, but it is the only register for the artists to witness the ‘utility’ of their work. What artists do and how their creations function are visible primarily in human actions and relations and secondarily in material realities that follow from these developments of culture. For the scientists, it was the other way around. What they do has its register primarily in the material world beyond culture, and then that work has influences, as a secondary process, on the shape of human society and subjectivity-intersubjectivity constructions such as culture.

The artists participating in the Scheme were seen to be making culture. This made judgment about the usefulness of their work contestable for the scientists in a way that their own work was not. Scientists were seen to be involved in a highly technical process of revealing what is there. The purification demanded by the context of claim making meant that scientists had less scope for influencing their output other than through (a failure of) impersonal labor or rigor. The output of artists remained associated much more closely with them as unique individual persons.

My argument would stand without taking into account the issue of utility. Scientists were represented not as being creative in a subjective sense, but as establishing relations between things already there. It was the reorganization of these things already there that created the possibility for something with utility and could have therefore resulted in a patent claim. Finally, we can see that underlying a patent claim is another kind of claim, an epistemological one. In scientific authorship, an epistemological claim—a truth claim—is valued as such and not because of its utility. An epistemological claim of this kind does not create property. If the result of scientific work is a truth claim, a scientific journal is its appropriate medium of transmission, and its register is the community of other scientists. If a utility claim follows, this finds its medium in a patent, which allows for the creation of property. The construction of such a claim follows the same process: relations between entities are established that are external to the scientists’ subjectivity, with consequences for the emergence of different kinds of persons (artists and scientists) and diverse ways that their outputs are connected to them.

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Notes

1. In order to justify public funding, performance or interventionist art practices were being rebranded as ‘knowledge producing’ in the UK at this time so that they could be framed as contributing to the ‘knowledge economy’.
2. Throughout I will be drawing upon observations made during fieldwork with collaborators in the Scheme. I have chosen a slightly unusual method of incorporating their opinions and understandings—that of unattributed quotation. Thus, any unattributed quotes are statements made by participants. I take this route for two practical reasons. Firstly, it allows me to preserve the anonymity of my interlocutors. Secondly, it allows me to draw upon the fieldwork as a coherent body of data and to dispense with long explanations about the identity of each commentator, how the participants were related to each other, and which projects they were involved with. The rubric of my research was to treat the Scheme as a whole and draw conclusions from the interactions that make apparent something of the wider context and its effects upon the collaborations. For the record, I am drawing mainly on observations and interviews concerning three distinct projects, two of which had multiple personnel on the science side, and all of which involved a single artist.
3. For the full report, see Council for Science and Technology (2001).
4. The term ‘merographic’ is described in the next section.
5. ‘Purification of knowledge objects’ refers to the need to prove certain criteria in order to be granted ownership of knowledge under intellectual property laws. That requirement is to ‘purify’ or cleanse the knowledge object of elements that would undermine the claim. For example, novelty must be apparent in both copyright and patent claims, while function or utility is paramount in patent. Non-functional aspects must then be purged from a claim if it is to have smooth progress toward legal rights. I am informed by Latour’s (1993: 10–12) description of the purification of the categories of science and politics under ‘modernity’ as itself an ideologically driven process with material effects.
6. In a *New York Times* book review by Elting Morison, now quoted on the dust jacket of Heisenberg’s (1971) *Physics and Beyond*, this impetus for the scientist to narrate the process of scientific work as separate from the work itself is confirmed: “Heisenberg has scored impressively in the (cultural) gap-closing business by creating a work of art out of the memory of his life in science.”

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