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2009

### Poincaré's "Delicate Sieve" : on creativity and constraints in the arts

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#### Recommended Citation

Livingston, P. (2009). Poincaré's "Delicate Sieve": On creativity in the arts'. In M. Krausz, D. Dutton, & K. Bardsley (Eds.), *In The idea of creativity* (pp.129-146). Leiden: Brill.

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Poincaré's "Delicate Sieve":  
On Creativity and Constraints in the Arts  
by Paisley Livingston

In Michael Krausz, Denis Dutton and Karen Bardsley, eds., *The Idea of Creativity*. Leiden: Brill, 2009, pp. 129-46.

Testimony about episodes of artistic creativity often describes a puzzling combination of deliberate and involuntary elements. For example, Vincent Van Gogh wrote that it was possible for him to make an especially expressive picture, or as he put it, something with "feeling" in it, because the picture had already spontaneously taken form in his mind before he started drawing. He added, however, that if there was something worthwhile in the picture, this was "not by accident but because of real intention and purpose."<sup>1</sup> Reflection on such testimony and on his own experience as a poet led Paul Valéry to conclude that artistic creation *always* involves a combination of "conscious acts" and "spontaneous formation"; only their relative proportion varies.<sup>2</sup> If this point is granted, the outstanding and notoriously difficult problem is to understand how such different elements combine in the creative process. In other words, how is inspiration, or the work of the muse, related to the artist's deliberations, plans, rational choices, and intentional actions? In what follows I shall develop a conjecture that falls within the conceptual space defined by two extreme theses--the popular, inspirationist idea that artistic creativity is a sudden, involuntary, and ultimately inexplicable event, and the dubious, rationalistic counterthesis, which characterizes artistic creation as a principled,

deliberate selection from amongst an array of previously known options, each of which is associated with an expected quantity of artistic value. In my first section I discuss Henri Poincaré's reflections on creativity in his 1908 essay, "L'Invention mathématique."<sup>3</sup> Although some of Poincaré's ideas have been restated and elaborated upon in the literature on creativity, I contend that his most important claims still merit a closer look. Taking Poincaré's general model as my point of departure, I sketch a new conjecture about artistic creativity in section 2; I also discuss a kindred proposal by Jon Elster. In section 3 I further illustrate and explain this conjecture with reference to Virginia Woolf's artistic breakthrough in the writing of *Jacob's Room*. In my final section I take up and respond to objections that may be raised against these claims about artistic creativity.

### *1. Poincaré on Creativity*

Poincaré famously reported that some of his best mathematical ideas simply popped into his head while he was on holiday and not consciously doing mathematics:

I then began to study arithmetical questions, apparently without any great result, and without suspecting that they could have the least connection with my previous investigations. Disgusted by my lack of success, I went away to spend a few days at the seaside, and thought about entirely different things. One day, as I was walking along the edge of the cliff, the idea came to me, again with the same characteristics of brevity, suddenness, and immediate certainty, that arithmetical

transformations of indefinite ternary quadratic forms are identical with those of non-Euclidian geometry (p. 52).

Poincaré goes on to say that after a stint of hard work on these functions, he encountered new obstacles. His narrative continues:

Thereupon I left for Mont-Valérien, where I had to serve my time in the army, and so my mind was preoccupied with very different matters. One day, as I was crossing the street, the solution of the difficulty which had brought me to a standstill came to me all at once. I did not try to fathom it immediately, and it was only after my service was finished that I returned to the question. I had all the elements, and had only to assemble and arrange them. Accordingly I composed my definitive treatise at a sitting and without any difficulty (p. 53).

At first glance, Poincaré may seem to be espousing an inspirationist conception of creativity--the idea that genuine creativity is largely if not entirely a matter of sudden, involuntary illumination or insight. A closer look at Poincaré's narrative reveals, however, that he is no straightforward exponent of a simple inspirationist thesis. Instead, Poincaré deserves to be acknowledged as an early exponent of the view that creative achievements are often the product of different sorts of interacting psychological processes, including the stages of preparation, incubation, insight, and revision that have become a commonplace in the literature on creativity.<sup>4</sup>

According to Poincaré, a necessary condition of what he calls “appearances of sudden illumination” is that they are “first preceded and then followed by a period of conscious work” (p. 54). Prior, conscious work is necessary to inspiration because it sets in motion what Poincaré called *la machine inconsciente* [the unconscious machine] (p. 54). The basic idea here is uncontroversial: someone who is truly idle, in the sense of not being at any time engaging in any relevant projects, will not be likely to experience the sort of episodes of inspiration that Poincaré and many other creative persons have described. Yet Poincaré gives other reasons why inspiration must be accompanied by conscious effort: unless the researcher or artist makes a prior selection of the elements upon which the mind is to operate, the search will be too open-ended and will most likely be fruitless as a result. Conscious, voluntary work *posterior* to moments of inspiration is necessary because the ideas that pop into one’s mind usually require some development and polishing. Also, it is necessary to verify them: although inspiration tends to be accompanied by a second-order attitude, a belief or feeling, to the effect that the inspired thoughts are correct, worthwhile, or otherwise appropriate, sometimes this feeling of “absolute certainty” is belied by subsequent examination or critical reflection.

To sum up, the moments of idleness or “incubation,” when the artistic or scientist has set aside his or her work and takes up some unrelated pastime, can be crucial to the creative process. Yet if the thinker is at such times “idle” in the sense of not being consciously occupied by work, in fact the mind is not at all idle in the sense of being useless, empty, or unoccupied, for in fact an “unconscious machine” has been set in motion and is hard at work.

Or to shift to another image employed by Poincaré, one wheel on the pulley is idle so that the other wheels can work all the more efficiently.

One of the most original and fascinating aspects of Poincaré's discussion of creativity is his attempt to say something about how the process of incubation works, and more specifically, about how this process is functionally related to the efforts of the conscious ego or self. Poincaré repeatedly insists that the key to mathematical innovation, be it conscious or unconscious, cannot simply be the application of "a tremendous power of attention" or of a heightened capacity of calculation. The symbolic combinations to be searched through are simply too numerous for this to be the key to discovery. The possible permutations are in principle infinite, and even if the unconscious mind has generative capacities that far exceed those of conscious attention or reasoning, its superior success cannot be explained in these terms: "Invention consists precisely in not constructing useless combinations, but in constructing those that are useful, which are a tiny minority. To invent is to discern, to choose (p. 48)."

Should this point be granted, and if it is further allowed that some unconscious mental process is at times highly successful at realizing the relevant sort of discernment, it would seem to follow that the unconscious ego must employ tact and discernment so as to achieve a kind of selection or "divination" of a (or even *the*) useful combination. Yet Poincaré rejects this conclusion. It is not a solution of the problem simply to assume that the unconscious mental processes can reliably identify a new, useful combination or idea without working through any of the numerous possibilities. Talk of unconscious divination would merely relocate the mystery, since it is no good

postulating the existence of an unconscious genius at work inside the mind of the genius. It can be added that the attribution of a capacity of discernment or divination to an unconscious homunculus does not square with Poincaré's observation that not all products of inspiration in fact prove to be good ideas.

With these problems in mind, Poincaré pursues the thought that the unconscious mental processes must in fact "blindly" and rather rapidly generate a large number of combinations, most of which are of no interest or utility, but a few of which are truly genial. He suggests in passing that the unconscious machine can in a brief amount of time form more combinations than could be comprised in the whole life of a conscious being. He further observes that in the subliminal ego's symbolic operations or "couplings," there is a high degree of disorder or chance amounting to a kind of "freedom" (p. 62). So a key ingredient to creative inspiration is a chaotic, rapid, unconscious recombination of ideas. This conjecture remains central to some (but not all) psychological theorizing and modelling in this domain, especially amongst connectionists and those who think of creativity as a kind of evolutionary process involving blind variation followed by the operation of a selective mechanism.<sup>5</sup>

Poincaré's conjecture about the extraordinary generative capacities of the unconscious mental machine raises a key question. How is it that in the oft-recounted experience of inspiration or "insight," a few of the results of the chaotic process of generation pop into mind and become candidates for verification and refinement? And how can we explain the fact that most of the unconsciously generated ideas go unnoticed, while most, *but not all*, of those

that do pop into awareness are genuinely creative, in the sense of being both innovative and valuable in the relevant context?<sup>6</sup>

In an effort to respond to this question, Poincaré hypothesizes that the good and useful mathematical ideas are harmonious and beautiful, and therefore are capable of affecting the mathematician's aesthetic sensibility, which somehow remains attuned to the outputs of unconscious cognitive processes. The arousal of this aesthetic sensibility is what directs conscious attention to these harmonious findings, in the form of the recognition of their apparent fittingness or correctness. In this context Poincaré makes a few relevant remarks about his notion of a specifically mathematical elegance or beauty. He contends that it is not "the beauty of qualities and appearances" that strikes the senses. Instead, the talented mathematician has a sensibility attuned to the "more intimate" beauty which arises from the harmonious order of the parts of some whole, and which pure intelligence can grasp independently of sensorial perception. Elegance, he tells us, is a matter of the harmony between the parts; it is symmetry, a "happy adjustment," order, unity.<sup>7</sup> With this in mind, Poincaré explicitly rules out the "garish colours and the blatant noise of the drum," which he castigated as the preferred objects of the "barbarian" sensibility (p. 17).

Poincaré surmises that while one unconscious mental process blindly generates combinations, the aesthetic sensibility scans the results, singling out those that are especially pleasing, elegant, harmonious, or well-proportioned. In other words, when he was strolling idly along the cliff, Poincaré was not aware of the unconscious search going on in his unconscious mind, yet part of his mind--the mathematician's aesthetic



sensibility--continued to monitor the ongoing calculations, and recognizing an especially harmonious or beautiful result, signalled this to the conscious ego, which thereby enjoyed the experience of inspiration. With these assumptions in place, Poincaré seeks to explain the advent of the occasional false inspiration. What he wants to say in this regard is that while all good mathematical ideas are beautiful, most, but not all beautiful ones are good. That some of the “poppings” do not turn out to be true or useful meshes with the thought that false ideas can have features, such as elegance, that please the aesthetic sensibility sufficiently to call attention to themselves. Usually, however, unconsciously generated combinations that have the requisite aesthetic virtue to win recognition and pop into awareness turn out to have whatever other epistemic merits qualify them as genuine discoveries. Poincaré concludes, then, that the talented mathematician’s special aesthetic sensibility “plays the part of a delicate sieve” (p. 59), singling out the elegant new combinations. Conscious deliberation must then take up the problem of deciding which products of the inspiration can be worked up into genuine discoveries and which cannot.

The adequacy of Poincaré’s scheme to mathematical discovery is not my topic here. I shall instead focus in the next section on ways in which his basic conjecture might be adapted to account for some paradigmatic instances of artistic creativity.

## *2. Artistic Creation and Aesthetic Commitments*

There is ample evidence supporting the idea that artistic creativity often arises from a multi-faceted process involving hard, deliberate work, periods of

idleness, unconscious cognitive activity, and episodes of inspiration, appreciation, and revision. What is lacking is a better understanding of the relations between moments of inspiration and the artist's plans and choices, and this is where Poincaré's evocation of the role of aesthetic intuition and sensibility may, if sufficiently reworked, lead to a new conjecture about artistic creativity and the relations between inspiration and constraints.

It was hardly an innovation on Poincaré's part to postulate a psychological faculty called the 'aesthetic sensibility'. And it may seem easy enough to identify paradigmatic instances of its operation, such as "our" instant recognition that a picture by Vincent Van Gogh is vibrant, well-balanced, and so on. Yet it is anything but uncontroversial to postulate the existence of a compartmentalized or strongly modular faculty of a *formal and universal* aesthetic response capable of fulfilling the specific function Poincaré assigns to it. Poincaré's assumptions about the intuition of mathematical truths cannot be carried over without modification to the question of the role of aesthetic sensibility in the process of artistic creation. One obvious reason for this is that we cannot accept the assumption that the sole source of artistic value is a work of art's manifestation of a purely formal beauty. In modern and contemporary art, intentionally constituted ugliness and related aesthetic features often contribute to artistic value, as works by Otto Dix, George Grosz, Michael Qvium and many other artists show. And even if we set such cases aside, the account of our responses to aesthetic beauty requires revision.

It is a truism to observe that the appreciation of some object's *aesthetic* qualities typically (if not always) depends on attunement to its perceptible features.<sup>8</sup> Yet such perceptual scrutiny is not a sufficient condition of the

appreciation of aesthetic qualities, as such qualities depend as well on relations between perceptible features and a range of other factors, such as features of the artistic medium, the relevant art-historical context and genre, and the specific nature of the artist's project.<sup>9</sup> Features that clearly appear derivative, clumsy, and inelegant given one framework assumption about the artist and context can reveal rather different aesthetic valences when a better understanding of the context is gained.

To mention a few examples, the seemingly awkward compositional qualities and apparently clumsy narrative devices of some 15<sup>th</sup>-century Sienese pictures are better perceived as the skilful marks of a wilfully anachronistic affirmation of a style associated with a proud, local authority and the favoured, Sienese precedent of Duccio di Buoninsegna.<sup>10</sup> And again, the deliberately crafted and chosen cracks and asymmetries of a *wabi* tea bowl are incorrectly judged if we categorize them as mistakes or failures to achieve proper form. It is the advocates of a rival aesthetic who apply such negative labels.<sup>11</sup> Another example is Henri Matisse's exploration of unusual colour combinations in *Woman with a Hat* (1905), which were pleasing to a sensibility attuned to such bold experimentation, but shocking to the many observers whose responses were informed by different conventions and expectations. What began as a negative label applied in outrage (*quels fauves!* [what wild animals!]) was to become a name for a successful new aesthetic—*le fauvisme*.

More generally, we can say, along with Kendall L. Walton, Richard Wollheim, and others, that the apt appreciation of a work of art's valenced, aesthetic qualities requires scrutiny of the work against a background

constituted by art forms, conventions, a level and history of achievement, recognition of the aims and standards to which the artist is committed, and a sensibility appropriately attuned to the latter. These are, I believe, relatively uncontroversial points about the determination and recognition of aesthetic and artistic qualities. The conclusion that has not been drawn in the literature is that these contextualist assumptions about the appreciation of aesthetic qualities have important implications for our understanding of artistic creation—a thought that follows from the observation that *one* of the artist's crucial tasks is the appreciation of his or her own emerging results.

As Poincaré conjectures, inspiration is not only the result of a generative or combinatorial device, but also requires a selective, that is, an appreciative or evaluative, component. As Poincaré also remarked, conscious work on a specific project is necessary to set the unconscious machine in motion, initiating its process of rapidly combining motifs or ideas. Yet it may also be conjectured that the function of prior, deliberate planning and work is not limited to the mere release or discharge of some generalized, unfocused unconscious activity, which would then be followed by the selective process guided by a universal, formal aesthetic intuition. Instead, an artist's deliberations and intentional efforts help to establish a scheme that provides crucial guidance to subsequent activities that include deliberate experimentation with an artistic medium as well as unconscious or spontaneous explorations and responses that may extend through periods of apparent idleness or incubation.

What I have in mind in speaking of the artist's prior commitment to a scheme is the at least provisional choice of, and engagement with a given

medium, art form, genre, and some more particular project. Some such constraints are inherent in a specific technology or craft; others may be proposed or imposed by a patron or producer, while others are more independently arrived at by the individual artist, or group of collaborating artists. Artistic movements and manifestos often reflect and influence this kind of commitment, as do projects whereby an artist undertakes to produce a series of inter-related works meant to fit together in certain valued ways. Another salient type of scheme to which an artist or group of artists may become committed is an “aesthetic,” where an aesthetic is not a doctrine or theory, but a cluster of norms, expectations, and discriminations pertaining to artistic projects.

In the idiom of theories of rational choice and satisficing, we might say that what the artist’s initial, more or less deliberate selection of a project and correlative aesthetic helps to establish are the parameters and threshold for an effective “stopping rule” that can inform the spontaneous or deliberate termination of the process of combinatorial experimentation.<sup>12</sup> Yet this not the insight we are after, as this idiom may suggest that the aesthetic valence of the options to be searched through exists entirely independently of the search and parameters in question, which in artistic contexts is misleading. What will count as a remarkable discovery worthy of a eureka-like response varies in function of the set of values and expectations established by the provisional scheme and project, and more generally by the artist’s operative aesthetic.

The artist’s commitment to or engagement with a scheme helps to establish and activate certain valenced expectations that are the product of a more specific and context-sensitive counterpart to what Poincaré referred to

as the aesthetic sensibility. Commitment to artistic constraints crucially orients the creative process by establishing formal as well as substantive, or content-related parameters, and corresponding normative expectations and dispositions. This is the case in part because the artist's response to options that emerge through both hard work and inspiration involves the application not only of conscious criteria or principles, but of a sensibility attuned to the orientations and purposes of a given project.

The importance of this function of prior constraints can be highlighted by reference to empirical investigations indicating that prompt and frequent self-evaluation is strongly correlated with artistic expertise.<sup>13</sup> A good artist, it would seem, is not only someone who has the gift of unconsciously generating new combinations and skilfully manipulating some medium, but someone who has the propensity to react sensitively to his or her own results, selecting those that correspond to a scheme of artistic value. Here is another point on which Poincaré's conjecture should be acknowledged as the source for contemporary observations about creativity; for example, a key refrain in criticism of algorithmic modelling of creative practices is that such models cannot perform the evaluative function that is essential to genuine creativity.<sup>14</sup>

Poincaré reasoned that a period of incubation or idleness can contribute to creativity because it involves a kind of chaotic, unconscious cognitive search. Although there is broad agreement that incubation is often helpful, why this is so remains controversial amongst contemporary psychologists, and some even doubt that a chaotic unconscious search is part of the story.<sup>15</sup> It is hard to see, however, how a complicated new idea can pop into mind in the absence of any search or mental process whatsoever,

and by definition a period of incubation involves no relevant, conscious effort or deliberate activity. In any case, another hypothesized function of incubation is that of deactivating fruitless assumptions about how a problem can be solved: a period of inactivity makes a fresh look possible, or as the French saying goes, *la nuit porte conseil*. There is an artistic analogue, at least in cases where the artist deems that his or her results have become too stale and predictable. The choice of new initial constraints, and the corresponding initiation of a period of related, unconscious cognitive activity, can serve to forestall or inhibit reliance upon overworked strategies, of which a tiresome personal mannerism or sterile and repetitive stylistic habit is the most evident symptom. So whatever else it may achieve, settling on a new scheme may help the artist resist a habitual way of working. This is, for example, one of the main motivations of the constraints adopted by members of the influential Dogma '95 movement.<sup>16</sup>

My conjecture can be further clarified with reference to a kindred proposal made by Jon Elster, who explores the idea that strategies of rational pre-commitment or resolute choice are crucial to genuine artistic creativity. He defines 'inspiration' as the rate at which ideas move from the unconscious into the conscious mind, and conjectures that inspiration, thus defined, "is an inversely U-shaped function of the tightness of the constraints."<sup>17</sup> Given this assumption, it makes sense that in a situation where the agent faces too many options, the self-imposition of constraints could be an effective way of enhancing inspiration.

Elster does not advocate any particular explanation as to why "sufficiently" tight constraints contribute to inspiration. One of the themes of

his ongoing research on human rationality and irrationality is the idea that pre-commitments and resolute choices have the characteristic function of allowing agents to overcome anticipated hyperbolic discounting, preference changes, strategic time inconsistency, and surges of passion. Thanks to Circe's helpful advice, Ulysses anticipates that hearing the song of the sirens will cause him to steer his ship to its destruction; so in order to enjoy their lovely song while resisting its fatal call, the hero has himself bound to the mast. More prosaically, someone struggling with an addiction, weakness of the will, or bad habits can plan ahead and employ various indirect strategies to preclude giving in when the time of temptation arrives. Yet it is not obvious that the same factors explain the importance of constraints in an artistic context. The artist, it might seem, is quite unlike Ulysses because in paradigmatic cases of artistic creation, there is no Circean advice, and no risk of any drastic preference shifts. How, then, are pre-commitments and inspiration related to each other in artistic cases? And why do constraints contribute to inspiration at all, other than for the trivial reason that one cannot do everything all at once? Even if we agree with Elster's notion that pre-commitments and resolute choices are important or even crucial to artistic creativity, it is dubious that their primary or characteristic function is that of overcoming anticipated inconsistencies across time. My Poincaré-inspired conjecture is that prior commitment in the case of artistic creativity involves the selection and activation of a system of artistic and aesthetic parameters crucial to the very occurrence of a determinate, valenced response to future output or performance. Pre-commitment, in the sense of both a deliberate choice or a more or less spontaneous engagement with a particular artistic scheme,



project or aesthetic, forestalls aesthetic indifference, directionless scrutiny, and the inability to experience a spontaneous judgement of the results of artistic experimentation. What artistic pre-commitments achieve, then, is not the prevention of an unwanted shift of preference, but the attunement and enhanced activation of a capacity for response not directly under the artist's conscious control. To rephrase the point in terms of Elster's allegory, while Ulysses prudently anticipates that hearing the lovely siren song will produce a disastrous change of preferences if he does not somehow pre-commit, what the artist risks in the absence of pre-commitment is the failure to hear any song at all, or better, any new song having what can be recognized as a determinate artistic value.

### *3. Virginia Woolf's Novelistic Breakthrough*

In order to flesh out my schematic indications with regard to both the emergence and function of artists' commitments to artistic schemes, in this section I shall briefly discuss a few relevant aspects of a particular episode of successful artistic creativity, namely, Virginia Woolf's composition of her first genuinely modernist novel, *Jacob's Room*.

After Woolf had published her second novel, *Night and Day*, in 1919, she was "irritated" (as she put it) by criticisms raised in print by her friend and rival, Katherine Mansfield, who suggested that Woolf's long novel was far too traditional.<sup>18</sup> One reason why Woolf was genuinely bothered by this criticism was that she was basically in agreement with Mansfield and others about the tenets and values associated with modernism in the arts, and had come to understand her own greatest ambition as that of contributing something

important to the modernist revolution in literature.<sup>19</sup> Entries in her diaries express worries that such figures as James Joyce and T. S. Eliot might surpass her in this regard, and that Marcel Proust had already done so. In the period following the completion of *Night and Day*, Woolf was thinking and writing at a very general level about the very idea of modernist art. Her appreciation of her sister's paintings, and her engagement with the artistic interests and activities of such figures as Roger Fry, was part of an ongoing process through which she immersed herself in a modernist aesthetic. She began to write a number of episodic and impressionistic short stories (including a short fiction entitled "An Unwritten Novel") that eschewed the sorts of characterizations and descriptions that Woolf had come to associate with Victorian fiction. Her deliberations and writings, guided by the very general scheme of achieving a truly modern form of literature, led to the emergence of a new, more specific leading idea, namely, a scheme for the creation of a modernist, experimental novel. Having come up with exciting new thoughts in this vein, Woolf wrote with enthusiasm in her diary:

The day after my birthday; in fact I'm 38. Well, no doubt I'm a great deal happier than I was at 28; & happier today than I was yesterday having this afternoon arrived at some idea of a new form for a new novel. Suppose one thing should open out of another—as in An Unwritten Novel—only not for 10 pages but for 200 or so—Doesn't that give the looseness and lightness I want: doesnt [sic] that get closer & yet keep form & speed, & enclose everything? My doubt is how far it will enclose the human heart—Am I sufficiently mistress of my dialogue to net it

there? For I figure that the approach will be entirely different this time: no scaffolding; scarcely a brick to be seen; all crepuscular, but the heart, the passion, the humour, everything as bright as fire in the mist. Then I'll find room for so much—a gaiety—an inconsequence—a light spirited stepping at my sweet will. Whether I'm sufficiently mistress of things—thats [sic] the doubt; but conceive mark on the wall, K. G. [Kew Gardens] & unwritten novel taking hands & dancing in unity. What the unity shall be I have yet to discover: the theme is a blank to me; but I see immense possibilities in the form I hit upon more or less by chance 2 weeks ago. I suppose the danger is the damned egotistical self; which ruins Joyce & Richardson to my mind [ . . . ] I must grope and experiment but this afternoon I had a gleam of light. Indeed, I think from the ease which I'm developing the unwritten novel there must be a path for me there.<sup>20</sup>

Woolf explicitly records here her decision to pursue a scheme for the writing of her next novel, a scheme that is labelled “a new form for a new novel.” This scheme receives various other, metaphorical characterizations in the diary entry, including an architectural image. Woolf clearly has in mind a style or narrative “voice” that has emerged here and there in some of her most recent writings. The more proximate “breakthrough” idea, which seems to have crystallized some two weeks after these stylistic experiments, is that of making this sort of “free” narrative form the organizational principle for an entire novel. Thus the artist is simultaneously engaged in a retrospective appreciation of her own earlier efforts, in which she culls what she now perceives as promising moments, and an anticipatory plan for combining

those elements so as to generate a result of even greater value in this same vein. In her anticipation of future efforts to apply this scheme, Woolf expresses worries about possible shortcomings of the “path” or approach she has in mind. She knows she will need to find a theme for her new novel, and she worries whether this new form she has in view will truly serve as a vehicle for psychological insights. Woolf’s discovery of a general scheme or formal strategy was accompanied by a high level of excitement, and was followed by a burst of deliberate, conscious work, as well as by related, spontaneous and unconscious mental activities. (In Poincaré’s terms, the ‘unconscious machine’ had been set in motion.) Woolf’s own manner of talking about this aspect of the writerly process reads as follows:

After a hard day’s work, trudging round, seeing all he can, feeling all he can, taking in the book of his mind innumerable notes, the writer becomes—if he can—unconscious. In fact, his under mind works at top speed while his upper mind drowns. Then, after a pause the veil lifts; and there is the thing—the thing he wants to write about—simplified, composed.<sup>21</sup>

In the months that followed her experience of the “gleam of light” about “a new form for a new novel,” Woolf made swift progress on *Jacob’s Room*, continuing to monitor her results in terms of the initial scheme and ambition.<sup>22</sup> She recorded in her diary how, when things were going well, she got ideas for her narrator’s flights of fancy while she was out on her daily walk. When her first draft was completed, she edited and rewrote some of her pages in

function of her initial scheme, deleting, for example, passages which were taken as having recourse to more traditional plot development and explanatory and descriptive devices.<sup>23</sup> Although not everyone agrees about the merits of her results, it is fairly uncontroversial to recognize *Jacob's Room* as an important modernist work, and it is clear that it was a major breakthrough for Woolf in that it pointed the way towards such masterpieces as *Orlando*, *To the Lighthouse*, and *The Waves*.

To sum up, I have not suggested that episodes of creative artistry are reducible to, or can be fully reconstructed as sequences of rational choice, if by this is meant the deliberate singling out of an option expected to maximize some function. In the case of Virginia Woolf, the scheme she settles on before she begins writing *Jacob's Room* is indeed a highly schematic notion about a kind of work that she wants to create, a "path" and not a definite result or destination. This scheme is, however, sufficiently particularized in her mind to have both a generative and evaluative function: Woolf is in a position to assess her own results, and subsequent readers can follow her at least part of the way in this regard. It would appear, then, that strategies of rational problem-solving, including planning and pre-commitments, are an important part of the story of artistic creation and reception. These strategies are functionally related even to those aspects of creativity that seem most suited to an a-rationalist, inspirationist account, namely, the "top speed" work of an "under mind" that is not under the agent's direct control, as well as those moments when valuable new ideas suddenly pop into awareness following a period of incubation. Yet it is not the operation of a universal, formal sensibility that makes such spontaneous, selective responses possible, but an

operative aesthetic partly shaped and generated through an artist's context-bound selection of and engagement with a prior scheme or project, which in happy cases is at least partly a product of a moderately rational choice made in function of a range of worthwhile artistic goals.

#### *4. Objections and Replies*

I turn now to a series of objections to these conjectures about creativity and commitment to constraints.

In his probing comments on Elster's proposal, Jerrold Levinson claims that artists are typically free to change their minds and abandon or revise whatever prior commitments they may engage in, in which case there may be no correlative to Ulysses' strategy of self-binding or resolute choice.<sup>24</sup> After all, someone who starts out trying to draft a serious philosophical novel could, if things went wrong, bail out and reclassify the results as an ironic fragment. To this one may respond that although such cases no doubt obtain, in many others the commitment is much more binding, if only because of the degree to which the artist's attitudes effectively become entrenched, psychologically as well as legally and economically. Artists often refrain from an opportunistic abandonment of prior engagements, in part because the artist's own critical judgement remains informed by a given project and by related norms determining what can and cannot be experienced as an artistically successful result. The relevant device or method of pre-commitment, then, is the creation of a disposition to respond. What at one point appears as one distant and schematic option amongst others finally becomes the object of an irresistible desire and "self-evident" judgement. In some cases, the means of

artistic pre-commitment is a public proclamation of intent (as in the programmatic statements of a manifesto), the unexplained repudiation or abandonment of which would have serious repercussions for the artist's self-understanding and status.

Levinson levels another objection against what he characterizes as the overly "inflexible" model proposed by Elster, namely, that Ulysses's self-binding is entered into explicitly and deliberately, whereas this is not the case with artists. I think the correct response here is to split the difference; in other words, we should acknowledge that some artists do deliberately and explicitly settle on, and commit to a scheme, whereas in other cases the operative scheme or aesthetic spontaneously emerges against a background of factors that are not entirely or even predominantly a matter of the artist's own doings. Mixed or hybrid cases are no doubt common. Pre-commitment is often, but not always, then, the product of the artist's deliberation and choice. A similar point can be made about Elster's postulation of the existence of a definite, overall objective in the artist's mind, namely, the maximization of artistic value: at least some of the schemes that motivate and guide subsequent activities are indeed oriented towards the creation of artistically valuable works, given a suitably broad and plausible conception of this kind of value. This moderate thesis is not contradicted by the existence of cases where an artist deliberately makes an artistically less valuable work in order to achieve some other goal, such as the maximization of an expected economic payoff.

Another objection that may come to mind here is that it is viciously circular to propose that creativity is explicable in terms of a prior, *creative* and rational selection of the constraints corresponding to an aesthetic or to some

general artistic project. And indeed it would be hopeless to propose that to be creative at making a particular work, the artist must first be creative in selecting an entire aesthetic, where the latter feat remains a perfect mystery. However, my proposal is not that all prior constraints and schemes are the products of great creativity. The mistaken thesis would be what Robin Collingwood called “aesthetic individualism,” the idea that the artist is a perfectly self-sufficient individual who creatively generates everything -- including the medium, art form, themes, techniques, and genres.<sup>25</sup> Sometimes new artistic constraints are indeed devised, but then the artist relies on a background of traditional artistic conventions and methods, as well as received orientations and norms.<sup>26</sup> Yet deliberate experimentation with seemingly arbitrary constraints is sometimes an important part of the story, and can indeed establish a scheme within which unanticipated yet viable aesthetic discernments become possible.<sup>27</sup> In other cases, the attunement of the requisite sensibility and capacities of discernment is a product of training and experience that are only partly the object of the artist’s deliberate selection.

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## Notes

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<sup>1</sup> Vincent van Gogh, "Letter to Anton Ridder Van Rappard," in *The Creative Process*, ed. Brewster Ghiselin (New York: Mentor, 1952), 55.

<sup>2</sup> Paul Valéry, "L'invention esthétique," in *Oeuvres*, ed. Jean Hytier (Paris: Gallimard, 1957), vol. 1, 412-15.

<sup>3</sup> Henri Poincaré, "L'invention mathématique," *Bulletin de l'Institut Général Psychologique* 8 (1908): 175-87; the same text appeared as chapter 3 of *Science et méthode* (Paris: Flammarion, 1908), 43-63; reprinted in *L'Invention mathématique* (Paris: Jacques Gabay, 1993), 35-51; trans. George Bruce Halstead, "Mathematical Creation," in *The Foundations of Science* (London: Science Press, 1924), 383-94. Page numbers given in the text are to the 1908 edition of *Science et méthode*; all translations are my own.

<sup>4</sup> See, for example, Graham Wallas's influential pamphlet, *The Art of Thought* (London: Jonathan Cape, 1926). More recently, Poincaré's views have been taken up by Howard E. Gruber, "Insight and Affect in the History of Science," in *The Nature of Insight*, ed. Robert J. Sternberg and Janet E. Davidson (Cambridge: MIT Press, 1995), 397-432. One of the few authors who emphasizes Poincaré's historical importance on this topic is Robert W. Weisberg, *Creativity: Understanding Innovation in Problem Solving, Science, Invention, and the Arts* (Hoboken, NJ: John Wiley & Sons, 2006), chapter 8; I first saw Weisberg's book while revising the notes to this essay. For additional philosophical background on artistic creativity, see Berys Gaut and Paisley Livingston, "Introduction: The Creation of Art: Issues and Perspectives," in *The Creation of Art: New Essays in Philosophical Aesthetics*, ed. Berys Gaut

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and Paisley Livingston (New York and Cambridge: Cambridge University Press, 2003), 1-32.

<sup>5</sup> Colin Martindale, "Creativity and Connectionism," in *The Creative Cognition Approach*, ed. Steven M. Smith, Thomas B. Ward, and Ronald Finke (Cambridge, MA: MIT, 1995), 249-68; D. T. Campbell, "Blind Variation and Selective Retention in Creative Thought and Other Knowledge Processes," *Psychological Review* 67 (1960), 380-400; Dean K. Simonton, "Foresight in Insight? A Darwinian Answer," in *The Nature of Insight*, ed. Robert J. Sternberg and Janet E. Davidson (Cambridge, MA: MIT Press, 1995), 465-94.

<sup>6</sup> On the semantics of 'creativity' and divergent conceptions of creation, see Gaut and Livingston, "Introduction," *The Creation of Art*; Margaret A. Boden, *The Creative Mind: Myths and Mechanisms* (London: Weidenfeld and Nicholson; 1990); 2<sup>nd</sup> edition revised (London: Routledge, 2004); Monroe C. Beardsley, "On the Creation of Art," *Journal of Aesthetics and Art Criticism* 23 (1965): 291-304; David Ecker, "The Artistic Process as Qualitative Problem Solving," *Journal of Aesthetics and Art Criticism* 21 (1963): 283-90; Vincent Tomas, "Creativity in Art," *The Philosophical Review* 67 (1958): 1-15; R. Keith Sawyer, *Explaining Creativity: The Science of Human Innovation* (Oxford: Oxford University Press, 2006).

<sup>7</sup> In Poincaré's view, mathematical beauty may be purely formal, but it is not conventional. He rejects the idea that mathematics is reducible to some conventional, rule-governed formal calculus. Were mathematics purely a matter of convention, why should the mind prefer any one set of possible conventions? According to Poincaré, mathematical judgement is guided by a vague consciousness of some profound, hidden geometry which is the source

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of the appropriateness or truth of any constructed formal system. Intuition, or an immediate grasp or awareness of an instance of elegant form or of the hidden geometry, is necessary to both the discovery and demonstration of mathematical truths. In this regard Poincaré suggests that the sentiment of mathematical elegance is nothing but the satisfaction due to some conformity between the solution we wish to discover and the “necessities of our mind.” These contentions are linked to Poincaré’s more general, Kant-inspired opposition to the logicist programme of reducing mathematics to logic; for background, see Michael Detlefsen, “Poincaré against the Logicians,” *Synthese* 90 (1992): 349-72; and Janet Folina, *Poincaré and the Philosophy of Mathematics* (New York: Macmillan, 1992).

<sup>8</sup> Paisley Livingston, “On an Apparent Truism in Aesthetics,” *British Journal of Aesthetics* 43 (2003): 260-78.

<sup>9</sup> Kendall L. Walton, “Categories of Art,” *Philosophical Review* 79 (1970): 334-67; Richard Wollheim, “Criticism as Retrieval,” in *Art and its Objects*, 2<sup>nd</sup> edn. (Cambridge: Cambridge University Press, 1980), 185-204. One way to couch the key idea here is to say that the “supervenience base” of aesthetic qualities is far broader than the perceptible features of some artistic structure or object on display.

<sup>10</sup> An example is a Sienese picture attributed variously to Sassetta, Sano di Pietro, and the Master of the Osservanza, *The Meeting of St Anthony and St Paul*, ca. 1430/35 (47 x 33.6 cm), The National Gallery, Washington DC.

<sup>11</sup> For example, the Seto stoneware teabowl named Asaina (Momyama period, 1568-1615). The neo-Confucian scholar Dazai Shundai, for example, called such items ‘filthy and damaged old bowls’; cited in Paul H. Varley,

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- "Chanoyu: From the Genroku Epoch to Modern Times," in *Tea in Japan: Essays on the History of Chanoyu*, ed. Paul H. Varley and Kumakura Isao (Honolulu: University of Hawaii Press, 1989), 175.
- <sup>12</sup> David Schmitz, "Satisficing as a Humanly Rational Strategy," in *Satisficing and Maximizing: Moral Theorists on Practical Reason*, ed. Michael Byron (Cambridge: Cambridge University Press, 2004), 30-58.
- <sup>13</sup> Todd I. Lubart, "Models of the Creative Process: Past, Present, and Future," *Creativity Research Journal* 13 (2000-1), 295-308.
- <sup>14</sup> This critique is stated, for example, in R. Keith Sawyer, *Explaining Creativity: The Science of Human Innovation* (Oxford: Oxford University Press, 2006), chapter 6.
- <sup>15</sup> Eliaz Segal, "Incubation in Problem Solving," *Creativity Research Journal* 16 (2004): 141-48.
- <sup>16</sup> Mette Hjort and Scott MacKenzie, eds. *Purity and Provocation: Dogma 95*. (London: British Film Institute Press, 2003).
- <sup>17</sup> Jon Elster, *Ulysses Unbound: Studies in Rationality, Precommitment, and Constraints* (Cambridge: Cambridge University Press, 2000), 212.
- <sup>18</sup> For Mansfield's criticisms, see Clare Hanson, ed., *The Critical Writings of Katherine Mansfield* (London: Macmillan, 1987), 56-63; for plausible comments on Woolf's reaction and more general relation to Mansfield, see Angela Smith, *Katherine Mansfield and Virginia Woolf: A Public of Two* (Oxford: Clarendon, 1999).
- <sup>19</sup> For background on Woolf and artistic modernism, see Hermione Lee, *The Novels of Virginia Woolf* (London: Methuen, 1977), 11-24.
- <sup>20</sup> Entry of Monday 26 January 1920, *The Diary of Virginia Woolf*, vol. 2, ed.

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Anne Olivier Bell (Harmondsworth: Penquin, 1981), 13-14.

<sup>21</sup> Virginia Woolf, "The Leaning Tower," in *A Woman's Essays: Selected Essays*, ed. Rachel Bowlby (London: Penquin, 1992), 163.

<sup>22</sup> Her progress was seriously delayed, however, when she learned that Desmond MacCarthy had endorsed Arnold Bennett's sexist generalizations in *Our Women*. Woolf was discouraged, distracted, and felt it important to write something in response to these public proclamations of women's intellectual inferiority. For background, see Naomi Black, *Virginia Woolf as Feminist* (Ithaca and New York: Cornell University Press, 2004).

<sup>23</sup> For this general claim about Woolf's revisions and an example, see James King, *Virginia Woolf* (London: Hamish Hamilton, 1994), 315.

<sup>24</sup> Jerrold Levinson, "Elster on Artistic Creativity," in *The Creation of Art*, pp. 235-56.

<sup>25</sup> R. G. Collingwood, *The Principles of Art* (Oxford: Oxford University Press, 1938), 316.

<sup>26</sup> This point is underscored and developed by Stein Haugom Olsen in "Culture, Convention, and Creativity," and by Noël Carroll in "Art, Creativity, and Tradition," in *The Creation of Art*, ed. Gaut and Livingston, respectively 192-207, 208-234.

<sup>27</sup> A first version of this paper was initially presented at Stanford University at a conference on rational choice and the humanities organized by David Palumbo-Liu. I thank David for his helpful editorial advice. Another version was presented in Providence, Rhode Island at the annual meeting of the American Society for Aesthetics. I thank my respondent on that occasion, Gary Fuller, for his comments and encouragement. David Davies and other

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members of the audience raised some helpful questions. The work described in this paper was partially supported by a grant from the Research Grants Council of the Hong Kong Special Administrative Region, China (Project No. LU3401/06H). I am very grateful for this support.