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Meaning, God, Volition, and Art

How Rightness and the Fringe Bring it All Together

Abstract: *This paper investigates how global coherence is represented in consciousness. It summarizes various lines of research that I have developed over the last twenty years, employing a method that intersects phenomenological with bio-functional analysis. The phenomenological analysis derives from William James's treatment of the fringe, especially a component feeling he called 'right direction' and I call 'rightness'. My bio-functional analysis centres on the limitations of consciousness, and the design strategies that have evolved to finesse these limitations. I argue that fringe phenomenology, in general, has been shaped by its cognitive functions. The function of rightness, in particular, is to represent degrees of fit between a conscious content and the vast body of relevant non-conscious context information. Rightness, then, signals degrees of global positive evaluation. Phenomenologically, rightness is the common element in our feeling that something is correct, meaningful, fits together, or makes sense. It is at the heart of the Aha! experience and, when intense, aesthetic and mystical experience. This analysis also provides a new argument for the efficacy of conscious volition, and a general view of consciousness as a biological information bearing medium.*

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1. Overview

My research over the last 20 years could be said to have a serious case of tunnel vision. All of it is concerned, in one way or another, with what I take to be a single, analytically distinct experience that I now call rightness.[1] And yet rightness is so central to the operation of consciousness that the natural scope of its investigation is very wide.

Rightness is only one of a host of diaphanous experiences that inhabit what William James called the 'fringe' of consciousness. On his account, fringe experiences surround and interpenetrate the sensory contents of focal attention (the 'nucleus' of consciousness) and, for reasons we will take up later, generally resist direct introspective access. The result is that when people talk or write about the subjective character of experience, often in terms of 'qualia', they almost always use a sensory content in the nucleus as their example — and altogether miss the influence of the fringe. This is a serious oversight for anyone interested in consciousness — whether they are committed to rigorous scientific research, or find the scientific habit of mind too narrow to deal with the mysteries of art and religious experience.

Ignoring the fringe restricts many established lines of consciousness research. Without the fringe in general, and rightness in particular, no complex cognitive activity in consciousness would be possible. In many ways *the fringe tells us more about the operation and function of consciousness than the nucleus does*. The fringe is a subtle but essential interface mechanism, binding conscious and non-conscious processes together into an integrated cognitive system. This has many implications: among them, it gives us a new reason to think that consciousness is causally efficacious, the base premise for a range of views such as free will. And rightness lets us identify the locus of what is arguably the single most powerful experience a human being can have.

My curiosity about the experience I now call rightness goes back to my youth. Music, especially, could evoke in me an overwhelming sense of meaning and exaltation. Yet I could not say precisely what that meaning was or what constituted its power. Something felt intensely significant, but just what that something was eluded specification (I found out later I'd encountered one of the classic features of a strong aesthetic experience: ineffability). This sent me to the study of consciousness. I dutifully read Husserl and Heidegger, assuming they were the fountainheads of phenomenology. They opened many vistas,

[1] I used to call it *Meaningfulness* (Mangan, 1991), but that led to confusion. The phenomenology behind these terms will be unpacked in Section 2.

but not the one I wanted. My interests were moving toward that interdisciplinary aspiration known as cognitive science.

Then I read James's treatment of the fringe and found what I was looking for: a phenomenology that dealt with vague and elusive experiences, a flexible methodology, a style eminently accessible to an English speaking reader, teeming with apt examples and naturally resonant with a scientific mindset.

James himself only considered rightness in passing, but he said enough to convince me I was on the right track: 'The most important feeling in these fringes… is a feeling of harmony or discord, of a right or a wrong direction…' (James, 1890, p. 261). Though he recognized their importance, James said very little directly about rightness and its mirror image wrongness. In part this was because his aim in examining fringe experiences was to establish two wide-ranging and related points that had been missed by the introspective psychology of his day: that consciousness contained a vast swarm of experiences that could not be stabilized and inspected in the focus of attention, and that most of these experiences were 'feelings of relation' pertaining to — but phenomenologically and functionally quite distinct from — the sensory experiences that *do* occupy the nucleus and accommodate direct introspection. Section 3 will sketch out James's treatment of the fringe and its relation to the nucleus. But, again, for James, rightness and wrongness were just two relational experiences among a multitude: 'We aught to say a feeling of *and*, a feeling of *if*, a feeling of *by*, quite as readily as we say a feeling of *blue* or a feeling of *cold*' (*ibid.*, p. 246). Rightness and wrongness had no special standing given his aim.

But I did not study James's fringe phenomenology to rectify oversights in nineteenth-century introspection. I consider myself a child of the Cognitive Revolution. In that light, some major features of James's treatment of the fringe turn out to be less central (e.g. the continuity of consciousness), while many undeveloped points (e.g. rightness/wrongness and our sense of meaning, the non-sensory character of fringe experience,[2] mechanisms of conscious retrieval) deserve far more attention. And James had no nascent sympathy for, and certainly did not pursue, what was to become one of the most important findings of the Cognitive Revolution: that massive and complex processing of information takes place before it reaches consciousness. Of all philosophers before the later twentieth century, Kant is generally held

[2] There is also a *sensory* fringe discussed in Section 5. But elsewhere I will only use 'fringe' to refer to its non-sensory aspect.

to have anticipated this stance most clearly.[3] But James ridiculed this aspect of Kant, calling Kant's view of cognition a 'great internal machine shop'. And though James did recognize another central point to be confirmed by later cognitive research — the limited capacity of consciousness — he did not, so far as I know, consider its relation to fringe experience.

By intersecting contemporary cognitive research with James's fringe phenomenology, we can see that rightness plays an absolutely fundamental role in human cognition, and at the same time see why rightness is so consistently overlooked: for rightness, as with all fringe experiences, has no evident sensory content and eludes the 'grasp' of focal attention.

Functionally, rightness signals the degree to which, at any given moment, the other contents of consciousness fit with the vast body of relevant context information processed non-consciously.[4] It also signals degrees of fit among conscious contents, which too rests on complex non-conscious processing. Habituation aside (an important qualification), the more tightly conscious/non-conscious processing is integrated, the stronger the experience of rightness will be. Rightness is, then, the basis of our sense of wholeness and integration — the more intense the experience of rightness, the more integrated and unified the other contents of consciousness will feel. Rightness is the positive half of the evaluative nexus. It binds the radically different architectures of serial (conscious) and parallel (non-conscious) processing into an integrated hybrid system. Given its severe limitations, consciousness must somehow take account of far more information than it can explicitly contain. Rightness in particular, and the fringe more generally, work to finesse this bottleneck.

By augmenting James's fringe phenomenology with a bio-functional analysis (Sections 4, 5, 6), we increase the likelihood that his account of the fringe is at least roughly correct. James's treatment of the fringe is essentially descriptive, and I have tried to extend it. In general we have more confidence in the accuracy of a description of a phenomenon if we can explain why it should be as described. In this case we can explain the specific character and structure of fringe phenomenology as a consequence of the cognitive functions it executes

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[3] This has been evident since the early days of the Cognitive Revolution, e.g. 'Of all the historical figures in philosophy, Kant (1724–1804) offered views that are most closely aligned with thoseadvanced in contemporary cognitive science…' (Bechtel, 1988). See also Kant (1951).

[4] I use non-conscious rather than unconscious because it is the least theoretically loaded term I can find. It simply means *not* in consciousness.

(e.g. mediating voluntary retrieval, signalling context fit, finessing the limits of consciousness). This applies the same principle of biological explanation we use to understand why, say, the specific character and structure of our foot has been shaped by its ambulatory function.

On my view, the most inclusive way to characterize the biological function of consciousness is as an information-bearing medium. It is important to see that this approach is not functionalism in its current sense (i.e. the view that consciousness can be multiply instantiated, e.g. in a computer). Making this clear will help avoid a terminological confusion. Beyond that, by applying functional analysis to the nucleus/fringe structure of consciousness we can frame a new argument *against* functionalism. The crucial point is this: if consciousness is an information-bearing medium, it cannot be multiply instantiated. And many strands of my work constitute evidence supporting the medium hypothesis (Section 8). At the least the medium hypothesis lets us shift the argument about functionalism from a conceptual to a more empirical level. It also gives us a way to define consciousness using the classic genus/differentia format: consciousness is the biological information-bearing medium that bears its information as experience.

To return to the puzzle that set my research in motion: the ineffable aspect of aesthetic experience that has intrigued thinkers for millennia. Plato considered it from many angles, especially in the *Phaedrus* (e.g. Plato, 2005). By the eighteenth century it was known in various European languages as the *je ne sais quoi*. Kant gave it its most important modern treatment in the *Critique of Judgment* (1951), and many other discussions of ineffability, ancient and modern, are standard fare in aesthetics. After a close reading of some of this literature (in effect applying protocol analysis), I realized that in discussions of aesthetic experience, its ineffable aspect was often qualified in recurring ways. Something *could* be said about it, but only in very general terms: the experience felt quintessentially cognitive — it was a state of knowing (*noetic*), but a knowledge that resisted conceptual specification (*ineffable*). This inexpressible knowledge was typically evoked by especially well-integrated or unified things (*unistic*), be they natural or human made. And the experience involved a strong but vague sense of something 'higher' — a purer realm of some sort seemed to beckon (*transcendent*). The last point was often given a spiritual interpretation, as in Plato, but it could be cast in a more agnostic light, as in Kant. This set of characteristics — ineffable, noetic, unistic, and transcendent — I call the alpha cluster.

The reader may already suspect where this is going. Besides its central role in normal cognition, rightness, when intensified beyond its everyday range, appears to be at the heart of aesthetic experience. And the same alpha cluster features, intensified further, characterize many accounts of mystical experience. In effect, we can use the bio-explanatory analysis of the fringe to predict what an extremely intense experience of rightness would be like, and this yields the alpha cluster profile. Section 7 derives the alpha cluster from rightness.

Informing my overall argument is a method I call Convergent Phenomenology (Section 9). Its fundamental premise, shared by many research programmes, is difficult to deny: that the likelihood of a given claim increases as more supportive lines of evidence and argument converge on it. I've already appealed to this principle when I noted that James's description of fringe phenomenology becomes more likely if we can explain *why* consciousness contains a diaphanous fringe that eludes focal inspection.

But my bio-explanatory augmentation of James's work on the fringe is just one of many relevant lines of converging support we will consider. And of course the more diverse and independent these lines are, the better. A further benefit of this method is that the force of an hypothesis evaluated in this way can be substantially greater than the force of any of its constituent lines of support. This is an especially useful feature of a convergence paradigm when it is applied to claims about first-person experience: in this case that rightness and the fringe are conscious contents with certain characteristics. Introspective claims are not apodictic, as Pure Phenomenology maintains, nor are they incorrigible, as Behaviourism maintains. The likelihood of a claim about a conscious content will rise or fall with shifts in supporting evidence and argument — just like any other claim in science.

A vast and mysterious gulf is often said to separate the first- and third-person approaches to consciousness. But, whatever else it may be, it is not a methodological gulf. Many third-person scientific modes of explanation operate quite well on first-person evidence, though of course converging third-person evidence strengthens things. In psychophysics the first/third-person divide is bridged by the concept of intensity: the first-person felt intensity has a precise mathematical relation to third-person measures of physical intensity. In my own work, I appeal to a conservation principle — the conservation of consciousness — to help explain various aspects of nucleus/fringe structure (Section 5). Conservation explanations can be applied independently to first-person evidence though, again, the addition of converging third-person evidence will add force to the finding.

2. Rightness as Meaning[5]

As a preliminary, consider the following paragraph. For full effect, it is important that you read it out loud all the way through, however frustrating this may become.

> A newspaper is better than a magazine. A seashore is a better place than the street. At first it is better to run than to walk. You may have to try several times. It takes some skill but it is easy to learn. Even young children can enjoy it. Once successful, complications are minimal. Birds seldom get too close. Rain, however, soaks in very fast. Too many people doing the same thing can also cause problems. One needs lots of room. If there are no complications it can be very peaceful. A rock will serve as an anchor. If things break loose from it, however, you will not get a second chance. (Klein, 1981, p. 83)

For most readers the paragraph as a whole makes no sense, even though its component parts certainly do make sense. Each sentence is well-formed and made up of common English words. But as a matter of phenomenology, the experience is anything but meaningful: the overall feel that envelops the paragraph is discordant, puzzling, unpleasant; the individual sentences clash with one another and do not coalesce into a larger idea.

However, we can change the phenomenological character of the paragraph radically and instantly with a single word: kite. The experience I'm calling rightness should now explode in consciousness. There are, of course, many other and more natural ways to refer to this experience in English: we could say that the paragraph suddenly *makes sense*; or that it is *meaningful*; or that its component sentences now *fit well* with one another; or that they now constitute a *coherent whole*. In more formal terms we could call this the experience of *successful cognitive integration*, or the quality that characterizes a *good Gestalt*. And when this experience is relatively intense, as in a moment of insight, people spontaneously say things like *Aha! Yes! Of course! Right!* Cartoons indicate this feeling with a light bulb flashing over a character's head when a 'bright' idea first strikes. I suspect this is roughly the intensity level that most people feel when they first realize that the paragraph is about flying a kite.

So we have an initial reason to suspect that all of these terms and many of their cognates *point to the same core experience*. Nevertheless they often have different overtones and are applied in different

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[5] To reduce citation clutter I will note at the top of each section those articles of mine that are especially relevant. In this case, see Mangan (1991; 2001; 2003a). Generally my exposition blends earlier and later material, and adds a few new points to the mix.

contexts. And so I have used rightness as the covering term intended to refer to all manifestations of this feeling. Rightness, then, as I understand it, is the purely subjective feeling that constitutes our sense of overall coherence, wholeness, meaningfulness, correctness; it is the primal feeling of Yes! and, as such, is the basis of all consciousness evaluation.

Now to consider the phenomenology of rightness in more detail:

Rightness varies in intensity: When the paragraph first made sense, the feeling of rightness was relatively intense; then it began to habituate and fade away as a distinct experience. Occasionally, rightness can be far more intense than it was during the moment of insight in the kite-flying paragraph: sometimes it can be overwhelming, rapturous, exalted. The classic example is Archimedes' ecstasy on discovering the principle of specific gravity, running naked through the streets of Syracuse shouting *Eureka! Eureka!*

Rightness is normally inconspicuous and ubiquitous: When rightness was no longer a distinct presence in the kite-flying paragraph, the paragraph still felt like an integrated, meaningful unit. Normally rightness merges seamlessly with other conscious contents. Unless it is quite intense, introspection cannot directly distinguish the feeling of meaningfulness from contents that feel meaningful. But even when rightness does not stand out, there are various indirect ways to show that it is still there — and one of them is familiar to most children. Remember saying a word over and over again rapidly? In any case, try it now with 'fortitude'. After 20 or 30 repetitions something fundamental about the feel of the word will definitely change. People typically and spontaneously say it has 'lost its meaning' and has become a 'mere sound'. This effect has been verified experimentally since the early years of the twentieth century, and is technically called semantic satiation. When satiated, meaningfulness falls below its normal intensity range, and then becomes evident by contrast.

Rightness, then, envelops *all* conscious contents that feel they make sense, have meaning, are coherent, etc. Rightness is not just a component of intense feelings of insight.

Rightness has no evident sensory content: The notion of a non-sensory experience can be confusing, in part because it is usually difficult to separate non-sensory contents from the sensory contents that bear them. One way to do this is via memory-mediated comparisons, as we just saw in semantic satiation. For the kite-flying paragraph, its visual and auditory sensory components (e.g. the shape of the letters, word spacing, punctuation marks, voice pitch and timbre, the various vowel/consonant mixtures that are words) remained constant, and yet

something certainly changed in our phenomenology at the moment of insight. Before insight, a non-sensory feeling of incoherence or wrongness enveloped the paragraph's sensory contents; after insight, the same sensory contents were enveloped by a strong sense of meaning. Again, neither wrongness nor rightness had sensory content: certainly neither was experienced as a colour, shape, or sound. Non-sensory is defined negatively. If an experience has no discernible sensory content — and especially if it can manifest across sense modalities — it is non-sensory.

Rightness has a property I call imminence: Imminence is the ability to suggest, at a given moment, the existence and character of detailed information that is not itself in consciousness. So when you first saw the word kite and rightness blossomed, you immediately felt that all the sentences in the paragraph would fit with the idea of flying a kite. You were certainly not conscious at that moment of every constituent sentence in detail. Nor, I strongly suspect, did you then go through the entire paragraph sentence by sentence to verify serially that each sentence made sense in the context of kite-flying. A flash of rightness had *already* signalled that all the sentences would indeed refer to flying a kite if you did re-read them. But, again, this feeling did not contain the detailed information it was able to imply.

In this section I've used two converging lines of support — phenomenological and linguistic — to begin to establish my account of rightness. Later I will add bio-functional analysis. But first we need to see how rightness fits into the account of fringe experience as developed by William James.

3. James's Fringe Phenomenology[6]

For James, consciousness contains two kinds of experiences: those that do have sensory content (the nucleus) and can stabilize in attention, and those that do not have sensory content (the fringe) and resist attentive access. Fringe experience is inherently elusive. If we try to attend to it,

> …it ceases forthwith to be itself. As a snowflake crystal caught in a warm hand, [it] is no longer a crystal but a drop… The attempt at introspective analysis in these cases is in fact like seizing a spinning top to try to catch its motion, or turning up the gas quickly enough to see how the darkness looks. (James, 1890, p. 244)

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[6] For far more extensive analysis of James's fringe phenomenology, see Mangan (1991; 1993a; 1999a; 2001; 2003a).

The term ‘fringe’ is misleading in one respect; fringe feelings also *interpenetrate* sensory experiences as well as envelop them: our sense of meaning is not just peripheral. ‘[T]he significance, the value, of the image is all in this halo or penumbra that surrounds and escorts it, — or rather that is fused into one with it and has become bone of its bone and flesh of its flesh’ (*ibid.*, p. 255). The feeling that a sensory content has meaning is part of its non-sensory fringe, and this sense of meaning is primarily constituted by rightness:

> Our sense of meaning is an entirely peculiar element of [a] thought [that] pertains to the ‘fringe’ of the subjective state… This added consciousness is an absolutely positive sort of feeling, transforming what would otherwise be a mere noise or vision into something *understood* [James’s emphasis]… and determining the sequence of my thinking, the latter words and images, in a perfectly definite way… The image *per se*, the nucleus, is functionally the least important part of the thought. (*Ibid.*, p. 472)

So, on James’s account, the fringe, not the nucleus, is the cognitive workhorse of consciousness. The fringe contains most context information, guiding the direction of our thoughts; it is the domain of meaning, of interpretation, of intentions, of evaluations — indeed of relational information of all kinds, from the most concrete to the most abstract. ‘Knowledge about a thing is knowledge of its relations… Of most of its relations we are only aware in the penumbral nascent way of a “fringe” of inarticulate affinities’ (*ibid.*, p. 259). On the non-sensory character of fringe experiences, James wrote:

> Has the reader never asked himself what kind of mental fact is his intention to say a thing before he has said it? It is an… absolutely distinct state of consciousness… and yet how much of it consists of definite sensorial images, either of words or of things? Hardly anything! Linger, and the words and things come to mind: the anticipatory intention, the divination, is no more. But as the words that replace it arrive, it welcomes them successively and calls them right if they agree with it, and wrong if they do not. (*Ibid.*, p. 253)

Here James brings out three basic features of fringe experience already encountered in the kite-flying paragraph: it is non-sensory; it contains a right/wrong evaluative component; and it has the power to imply the existence and general character of detailed information that is not, itself, in consciousness.

We can also see how these aspects of the fringe work together in James’s treatment of the tip-of-the-tongue (TOT) experience. A great deal is packed into the following passage:

> Suppose we try to recall a forgotten name. The state of our consciousness is peculiar. There is a gap therein; but no mere gap. It is a gap that is intensely active. A sort of a wraith of the name is in it, beckoning us in a given direction, making us at moments tingle with the sense of closeness, and then letting us sink back without the longed-for term. If the wrong names are proposed to us, this singularly definite gap acts immediately to negate them. They do not fit into its mold. (*Ibid.*, p. 251)

The expected sensory content is somehow inhibited, and for a moment the non-sensory fringe aspect of experience stands out in its own right. We experience a structured vacancy that is certainly not void and seems to be doing important cognitive work. It involves a sense of imminence: we have a general feeling of the word's meaning and its larger relation to what we were saying. But the word's nucleus, the sensory component that is its sound, is not in consciousness. And while the state lasts, we squeeze at the fringe in vain — expecting that this act of attention will bring the missing sensory content into consciousness.

4. Explaining Fringe Phenomenology: The Call Function[7]

This section considers two closely related questions: why is the fringe so elusive? Why does it indicate imminence? The answer begins with a crucial observation: a TOT experience is *frustrating*. We attentively squeeze at the fringe, and are annoyed that this attempt does *not* immediately bring the sensory component of the word into consciousness. Why do we expect this attentive squeeze to bring information into consciousness? Because, normally, that's just what it does.

I would argue that a TOT is just an instance of routine information retrieval that has become stuck in midcycle. Usually the process of retrieval is so rapid and smooth that it passes unnoticed. Normally when we attempt to attend to a fringe experience, the imminent information *does* quickly manifest in consciousness. It is only when the process breaks down to some degree (e.g. in a TOT) that we notice it. It seems, in other words, that the fringe is an important — though usually hidden — part of the volitional process that 'calls' new information into consciousness.

If so, we can explain why the fringe is designed to actively avoid focal inspection: *the fringe could not perform its call function if it could stabilize in consciousness*. One way to see this is to consider an analogy with a menu bar on a computer screen. The bar's constituent

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[7] For this and Sections 5 and 6, see Mangan (1991; 1993a; 1999a; 2000; 2001; 2003a).

icons identify various kinds of off-screen information available for retrieval. And how do we call the information an icon implies? We move the cursor to the icon and click the mouse. New information, implied by the icon, then fills the screen. But what would happen if, when clicked, the icon *itself* simply moved to the centre of the screen? In that case it could no longer mediate retrieval. The aim of clicking an icon is not to inspect that icon, but to call and inspect the information that the icon implies.

The parallel with the fringe should now be obvious. The fringe indicates, via imminence, the existence of non-conscious, context-relevant information available for conscious inspection. The *attempt* to focus attention on that imminent form of information transforms it into an explicit focal content. But imminent representations themselves cannot become focal contents or the process of voluntary conscious retrieval would short-circuit.

Here, then, is one example of a bio-explanatory analysis applied to consciousness. By recognizing that one function of the fringe is to mediate the retrieval of information into consciousness, we can explain why a complex and subtle aspect of our phenomenology has the character that it does. And so we have another line of support converge on James's descriptive account of the fringe.

5. Explaining Fringe Phenomenology: The Conservation of Consciousness

Now to address a more inclusive question: why does consciousness have a fringe/nucleus structure at all? The answer here is more complicated and in some respects more tentative than my treatment of the call function. However, at the least, it shows that by applying a conservation principle we can plausibly explain many aspects of our phenomenology — sensory, non-sensory, their interrelation and, perhaps, their evolution. So in this section (but only in this section) I will also examine aspects of the nucleus/fringe structure of sensory experience.

The classic example of a third-person conservation explanation is the conservation of energy: the energy in a system remains constant, but moves from one form to another — from light to heat, for example. In general the principle of conservation — first- or third-person — lets us explain how apparently diverse phenomena relate to one another by identifying a salient limitation that conditions their character and interaction.

Since the early days of the Cognitive Revolution, many findings have shown that consciousness has striking limitations. The late

George Miller's famous paper 'The Magic Number 7 Plus or Minus 2' (1956) tried to capture this point in terms of a few distinct, relatively well delineated 'chunks' of experience. The chunking limit constrains the structure of our phenomenology however variegated the contents of consciousness may otherwise be.[8] Since my research interest also includes indefinite, vague, and non-sensory experiences, I use a more fine-grained way to conceptualize our basic phenomenological limitation: consciousness has a limited *resolution* or *articulation capacity.* At any given moment we can only experience things to a certain degree of clarity or detail. If something in the field of consciousness becomes clearer and draws on more articulation capacity, something else will lose articulation and become more vague and indefinite — but total articulation capacity is roughly conserved.

From a survival standpoint, it would presumably be better if we could deal efficiently with more than one stream of information at a time. Apparently something about the production of consciousness in our brain is 'expensive'. Consciousness is a scarce resource and many cognitive devices, especially the fringe, husband it carefully. Non-conscious processing is not encumbered by this limitation (Baars, 1988), nor are most other complex biological processes.

The conservation principle underlying the nucleus/fringe structure is easiest to illustrate when there is a substantial sensory component. Do you remember trying to overhear two conversations at the same time? We naturally focus attention on one or the other. The conversation on which we focus will be experienced in detail (high articulation), but the other one will be far less distinct (low articulation). By shifting attention to the other conversation *it* will immediately become highly articulated, while the first conversation will immediately lose articulation and become part of the low-resolution background. With effort it is sometimes possible to attend to both conversations simultaneously for a moment. But on the conservation presumption, they will then be experienced at an *intermediate* level of articulation: not as clear as when solely in the foreground, not as blurry as when solely in the background.

A similar intermediate articulation level consistent with conservation can be evoked visually using the Gestalt face/vase image. In an unpublished experiment I ran with Jonathan Sammartino, 67% of subjects (n = 83) reported they could briefly focus on both the face and

[8] The precise chunk limit can be disputed (it is probably more like 3 or 4 chunks once we factor out our short-term memory buffer) but the upper limit is in any case surprisingly low. No one claims to experience, say, twenty clear component chunks of something simultaneously.

vase simultaneously. Without prompting, 45% reported intermediate articulation of the face and vase and 22% reported it when asked.

The nucleus/fringe structure of consciousness appears to be the result of a limited resource trade-off allocation mandated by conservation. Both the sensory and non-sensory fringe work, in effect, to condense information in consciousness. In both cases, the nucleus/fringe structure appears to result from a balance between the need to articulate information in detail in the nucleus, and the need to represent, via fringe experience, the larger context in which that information is embedded, and which can be *potentially* clarified via retrieval. Since consciousness's limited resources are apparently less taxed when information is represented at lower resolution, fringe experiences only need to be distinct enough to reliably deliver their message. It is inefficient to burden consciousness with detailed information if simply informing it of a conclusion will do.

From an evolutionary standpoint, the non-sensory fringe is the limiting case of this process. I would speculate that the non-sensory fringe evolved from the sensory fringe, and that our far-reaching power of conscious abstract thought derives from this jump in cognitive evolution. For if evolutionary pressure tends to select for greater conscious cognitive ability, it would select for the *least* sensory laden fringe experiences still able to execute their function. This means there would be constant pressure for the emergence of proto non-sensory experiences. And when they did emerge, further benefits would quickly strip away residual sensory content. Non-sensory experience provides a means of integrating information from different sensory modalities that is less susceptible to cross-modal interference. For an experience not bound by any sensory mode can envelop them all, bind them into larger wholes, and, free of sensory content, transcend them.

To return to the computer screen analogy and another case in which analogous constraints have produced an analogous architecture: a screen only has so many pixels; this puts an upper limit on the capacity of the graphical user interface (GUI) to articulate visual information at any time, and mandates a conservation trade-off. The more pixels allocated for menu bars, status bars, and so on, the fewer pixels will be available to articulate the immediate task at hand at the centre of the workspace; peripheral controls such as icons are diminutive for this reason. So both cases — computer screens and consciousness — employ a similar allocation strategy: a central domain deals with the present task, and a peripheral domain both indicates the existence of many kinds of context-relevant information not in awareness, and provides a way to selectively call that information into awareness.

6. Volition[9]

So far I've concentrated on the functional analysis of the fringe, treating it like a hidden control panel on which our feelings of volition act. I've implied more than once that the analogue to volitional feelings is the cursor on the screen, and that an act of volition is like the point and click operation of the mouse. Here the analogue of volition and our feeling of volition literally touch. Is this just a coincidence?

The parallels here and in Sections 4 and 5 are certainly suggestive. It is unlikely they derive solely from the application of the same design principle to two otherwise independent cases of an articulation limitation. The design of a tool jointly reflects the function it executes, narrowly construed, *and* the pre-existing features of the organism that manipulates the tool. Tools have handles because we have hands; the shape of our hand is reflected in the shape of a handle. A computer is the quintessential cognitive tool, and it would be surprising if it *didn't* reflect cognitive aspects of the organism that manipulates it. And certainly the structure and operation of a GUI does, to a remarkable degree, reflect the nucleus/fringe architecture of consciousness.

This leads to a new argument for the efficacy of conscious volition. Paradoxically, it derives from Max Velmans (2003), who argues for the opposite position. Velmans holds that the information consciousness would need to exercise volition is simply not there. I agree with his premise: if there is not enough information in consciousness to inform intelligent volitional acts — i.e. relevant phenomenological contents — then I do not see how consciousness could be the causal locus of these acts. But this point cuts both ways. If careful examination of our phenomenology does find the requisite information in consciousness, we have a new line of evidence for the efficacy of conscious volition. And sufficient information *is* there via imminence. So the nucleus/fringe structure of consciousness constitutes a further and, until now, overlooked line of evidence for the efficacy of voluntary conscious control.

7. Rightness and the Alpha Cluster[10]

The fringe in general has received much less attention than one of its components — rightness. In one guise or another, an intense experi-

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[9] Mangan (1991; 2003b).

[10] For discussions of the alpha cluster, see Mangan (1991; 1999b; 2008). For a more general discussion of Classical aesthetics in this context, see Chapter 2, and for relevant aspects of Kant's aesthetics, see Chapters 11 through 14, of Mangan (1991).

ence of rightness has been a recurring topic of western thought since Plato, notably in the context of aesthetic experience broadly construed, and of related metaphysical speculations that shade into mysticism.[11] There is no sharp boundary between a strong aesthetic and weak mystical experience; they can flow into one another.

My fringe analysis of normal cognition lets us, in effect, *predict* what an especially intense experience of rightness would be like and how people would tend to describe it. To help show this I've used a bridging device I call the alpha cluster. Its four components — ineffable, unistic, noetic, transcendent — capture in various combinations the ways people typically characterize intense aesthetic, and many mystical, experiences.

But at low or moderate intensities of rightness, the ineffable aspect would be inconspicuous, and a sense of transcendence would be weak if present at all. Here the dominant ways of describing an aesthetic experience would be unistic (i.e. how well the various parts of the entity in question seem to fit with one another) and noetic (i.e. how significant or meaningful the entity in question feels). The noetic aspect of rightness has greater cognitive scope: for to know something means to know its relations (as we saw James point out). From a cognitive standpoint, this knowledge is constituted by extremely complex non-conscious information networks that ramify in many directions from the entity in consciousness. Rightness indicates *both* the degree of fit among the component parts of an entity, *and* the degree of fit between that entity and its extended network of non-conscious relations. Degrees of fit are represented in consciousness via intensity variations; ignoring habituation, the stronger the non-conscious determination of good-fit, the stronger the experience of rightness will be — and so the more unified and significant the work of nature or human art will feel.

In the last analysis, aesthetic unity is a phenomenological quality. Clement Greenburg (1961), the critical voice of Abstract Expressionism, put it this way: 'Art… [is] a matter of self-evidence and feeling rather than of intellection… the reality of art is disclosed only in experience… Coherence is either there or not there.' The question of what constitutes unity or coherence (in the temporal arts) '…boils down to a right succession of parts'.

It is crucial to see that the use of 'right' or 'coherent' in an aesthetic context is quite different from the use of 'right' or 'coherent' when

[11] '[T]he great philosophies of art have interpreted beauty in metaphysical terms…' (Hofstadter and Kuhns, 1964, p. xiv).

something is said to satisfy conceptually specified criteria. To analytic philosopher types, Greenburg's language may seem very confused. How can 'self-evidence', 'coherence', and 'right' be opposed to 'intellection'? By 'intellection' Greenburg means that no conceptual apparatus can tell us if a work of art will *feel* right or coherent. In this sense aesthetic experience is pre-conceptual, but it is still fully cognitive (Kant called it 'cognition in general'). The evaluative capacity of rightness rests on the operation of non-conscious neural networks; and, so far as we can tell, these are far more flexible and sensitive than any formal conceptual system available to consciousness. Indeed, the inability of formal systems to handle aesthetic evaluation is one line of evidence supporting this conclusion.

No less a student of usage than Wittgenstein (1967) noted that in aesthetic judgments 'the words you use are more akin to "right" and "correct" (as these words are used in ordinary speech) than to "beautiful" and "lovely"'. So, for example, Georgia O'Keefe, during a *PBS* documentary (1977) celebrating her 90th birthday, discussed overseeing making copies of her paintings this way: 'It doesn't matter if the colors are absolutely right [i.e. match the original] just so they seem right when you're finished.' The colours in the reproduction may be quite wrong in terms of matching the original, and so don't satisfy the objective criterion — but O'Keefe still called them 'right' when aesthetically pleasing.

The ineffable and transcendent aspects of the alpha cluster emerge when rightness is especially intense and its non-sensory and elusive aspects become more evident. Then something of fundamental importance — a revelation, a meaning that transcends the boundaries of normal experience — seems *about* to declare itself. But the meaning remains unspecified, ungraspable, haunting. The celebrated Argentine writer Jorge Luis Borges, reflecting western aesthetics from Plato on, and developed especially by Kant, took this to be the defining feature of aesthetic experience:

> Music, states of happiness, mythology, faces belabored by time, certain twilights and certain places try to tell us something, or have said something we should not have missed, or are about to say something; this imminence of a revelation which does not occur is, perhaps, the aesthetic phenomenon. (Borges, 1964)

Profound knowledge seems at hand, but it eludes specification; it hovers forever on the verge of disclosure like a massive, never resolved TOT.

Here we shade into mystical experience. With qualifications, we could say that an aesthetic experience is just a low-intensity mystical experience of a certain type. So the art historian E.H. Gombrich (1969), who himself rejects a spiritual *interpretation* of these experiences, nevertheless insists that the aesthetic is often connected with 'the transcendent realm of religious traditions' and 'ineffable content'.[12]

'Transcendent' doesn't have to have a mystical connotation. Its literal meaning, to go beyond a limit, will do for the spiritually squeamish. It is enough to see that an intense aesthetic experience lifts us above the tedious and discordant limits of everyday life into a realm of deep meaning and coherence, however difficult it may be to specify further.

Certainly alpha cluster components are prominent in *some* expressions of mystical experience. For example, in a commentary that began my relationship with this journal twenty years ago (Mangan, 1994), I considered two passages quoted by Robert Forman (1994) from the *Maitri* Upanishad.

> That which is not thought, [yet] which stands in the midst of thought
> The unthinkable, supreme mystery! Thereon let one concentrate his attention. (Forman, 1994, p. 44)

> When a person sees the brilliant
> Maker, Lord, Person, the Brahma-source,
> Then, being a knower, shaking off good and evil,
> He reduces everything to unity in the supreme Imperishable. (*Ibid.*, pp. 45f)

If 'not thought' and 'unthinkable' and 'supreme mystery' can be interpreted as referring to ineffability, we have the first element of the alpha cluster. There is no doubt about the noetic component: while 'That' is not a thought (I suspect it means not any *specific* thought), it is certainly related intimately to the process of thinking — it 'stands in the midst of thoughts' (not, for example, in the midst of emotions or sensations). Again, in the second stanza, the person who finds the Brahma-source is called a 'knower'. The insight 'reduces everything to unity'. And the passages certainly deal with transcendent experience. So three of the four alpha cluster components are directly evident, and the fourth, ineffability, is, at the least, arguably present. All

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[12] 'I do not think that any psychological study of art can be worth its salt that cannot somehow account for [the] experience of revelation through profundity… [A]rt as we know it did not begin its career as self-expression, but… [begins] among those who wanted the symbols of their faith to make visible the invisible, who looked for the message of the mystery' (Gombrich, 1969, p. 169).

of this in two short passages *not* selected by Forman to make any of these points.

Another piece of evidence supporting the ubiquity of the alpha cluster is inelegant and dated. But it is worth a hundred straightforward examples — for it shows that the conjunction of alpha cluster elements is so common that they have become an integrated cliché. When the so-called Harmonic Convergence occurred in August 1987, Gary Trudeau lampooned New Age enthusing in Doonesbury this way: 'In the cusp of the converging ages, one binding holy moment of transcendence shall transform the Zeitgeist… into the pure, ineffable expression of indivisible oneness' (Trudeau, 1987). In a single sentence, only an explicit reference to the noetic aspect is missing.

8. The Medium Hypothesis[13]

Consciousness, as I understand it, is an information-bearing medium — one of many in our organism. This formulation has various implications, and one of them cuts off functionalism at its root, at least functionalism as treated by people like Dennett. This is because no *medium* can be multiply instantiated. Functional identity is something very different from ontological identity. Only abstract or structural features like an airfoil or a computer program can be multiply instantiated; an information-bearing medium, cochlear fluid, for example, cannot. A chemically different fluid in the ear with the right properties would indeed function *as if* it were cochlear fluid, but it would not thereby transubstantiate into cochlear fluid.

Functionalism simply *assumes* that 'consciousness' only refers to certain abstract cognitive capacities and their causal relationships. This is serious question-begging. For even Dennett agrees that my formulation of the medium hypothesis clarifies the widespread intuition that consciousness can't be multiply instantiated: 'What a fine expression of Cartesian materialism! I wish I had thought of it myself' (Dennett, 1993).[14] But his apparent joy here may be misleading. In his reply Dennett does not address *either* point at issue: (a) that *no* medium can be multiply instantiated, and (b) that consciousness in particular can be plausibly construed to be an information-bearing medium. The medium hypothesis lets us move the evaluation of func-

[13] Mangan (1993b; 1998; in preparation).

[14] See also MacDorman (2004).

tionalism to a less abstract level: evidence for the medium hypothesis is, in effect, evidence against one of functionalism's central claims.[15]

The most telling objective evidence for the medium hypothesis is consciousness's limited capacity. All information-bearing media have a bandwidth limitation, and this signature limitation is especially conspicuous for consciousness: its severe content and processing limits at any given moment have been noted repeatedly since the dawn of the Cognitive Revolution. This limitation mandates conservation.

The most telling phenomenological evidence for the medium hypothesis is subject/object fusion; during it we no longer experience ourselves as a distinct observing subject: self and object merge. This can occur in a strong aesthetic experience, and may also evoke a feeling of spiritual ineffability. As T.S. Elliot put it in 'The Dry Salvages':

> The wild thyme unseen, or the winter lightening
> Or the waterfall, or music heard so deeply
> That it is not heard at all, but *you are the music*
> *While the music lasts*. These are only hints and guesses
> Hints followed by guesses; and the rest
> Is prayer…[16]

The most celebrated and intense case of fusion is probably during the *kensho* experience in Zen, taken to be the first glimpse of the Buddha-nature: 'The world doesn't stand outside of me — it *is* me!' (Yasutani-roshi).[17] (But 'world' here cannot mean the world physics tells us is there.) In *kensho* (*satori*), knowing takes place at the thing known. There is no sense of a separate observing self. The entire field of consciousness is felt to be a sort of self-knowing or sentient clay moulded into the experienced entities. This is a general feature of information-bearing media: *they bear information as configurations of their own substance*. The subject/object distinction is an accurate representation of the relation of our organism to the external world, and to this end consciousness must generally obscure its own self-knowing nature. Feeling at one with the world of experience is not an efficient survival strategy.

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[15] Taken seriously, functionalism's mindset would also truncate consciousness research. The medium hypothesis encourages research in two directions: establishing *what* information consciousness bears, and also *how* it bears it, i.e. the particular character of the phenomenology involved. Functionalism only asks 'what'. The absence of a 'how' is an enormous limitation. Consider an analogy with genetic research: it not only asks what information our genes bear, but also precisely how they bear it. The functionalist mindset would only ask about DNA's information content; it would have no interest in establishing the particular way DNA bears its information.

[16] T.S. Elliot (1952), emphasis added.

[17] Quoted by Kapleau (1956), emphasis in the original.

When approached as an information-bearing medium, consciousness loses some of its apparent isolation and gains a biological family: it becomes one more information-bearing medium among many at work in our organism: cochlear fluid bears its information as compression waves; DNA bears its information as base pairs; consciousness bears its information as experience. We can then apply the standard genus/differentia formalism, and define consciousness as the biological information-bearing medium that bears its information as experience.

9. Convergent Phenomenology[18]

Convergent Phenomenology is based on an intuition that is the backbone of science and as old as common sense: that the likelihood of a claim is increased as more lines of supporting evidence and argument converge on it.[19] An auxiliary intuition is almost as basic: all else being equal, the likelihood of a claim is increased further when its lines of converging support are relatively independent of one another. Approached this way, introspective evidence is neither intractable nor apodictic.

Converging lines of support in this paper include: direct phenomenological evocation of rightness; linguistic analysis of basic terms of cognitive evaluation; James's quasi-poetic descriptions of fringe experience; bio-functional explanation of fringe phenomenology at normal intensities; the conservation of consciousness; evolutionary speculations; linguistic and phenomenological analysis of rightness at high intensities in aesthetic and mystical experience; the medium hypothesis *contra* functionalism.

This list is not exhaustive. Over the years I have developed other lines of converging evidence that would take up too much space to consider here. These include: analysis of supporting experimental findings on blindsight, implicit learning, tacit knowledge, feeling-of-knowing, and artificial grammars; application of Smolensky's *goodness-of-fit* metric to show one way neural networks might 'compute' rightness; and a detailed examination of the alpha cluster in western aesthetics, especially in Kant.

Finally, let me note that nothing in this paper constitutes a reductive account of aesthetic or mystical experience. I have attempted to locate

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[18] Mangan (1991; 2012). For an extensive discussion of converging experimental support, as well as 'goodness-of-fit', see Mangan (2001; 2003a; 2007); for my treatment of aesthetics, see footnote 10.

[19] An analogy: in one form of cancer therapy, many beams of radiation of relatively slight intensity, coming from different angles, produce an intense dose of radiation at their point of convergence.

their core component, and to understand its biological function in normal cognition; but the *ultimate* nature of rightness, and of consciousness in general, is an open question.[20]

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[20] Many friends have helped me boil down 20 years of work to these relatively few pages, but I want to thank Evan Reed and Russ McBride especially for their assistance.

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