The Journal of Mind and Behavior
Summer 1995, Volume 16, Number 3
Pages 215–234
ISSN 0271–0137

Consciousness, Thought, and Neurological Integrity

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The problematic features of the cognitive function of patients with brain damage are often taken to indicate that such persons have split or dual consciousness. An intentional or cognitive theory of consciousness which focuses on the structure and contents of conscious experience makes this thesis look quite unattractive. Consciousness is active and directed toward objects and in the human case it shows an internally reflective structure based on the abilities required to grasp and use concepts. On this view, consciousness is a way of referring to the active, integrative, conceptualizing activity of a human thinker in a world of other objects and persons. When we look at consciousness this way and re-examine, in the light of that analysis, the performance of split brain patients, one sees such persons as individuals afflicted with internal difficulties in their information processing capacities but neither as split consciousnesses nor as split minds.

What is consciousness and what is its relation to various types of neurological disruption of human thought or cognition? Discontinuities in the cognitive capacities of people with brain damage are sometimes taken both by philosophers and psychologists to indicate that there is more than one stream of consciousness (Nagel, 1971; Parfit, 1984; Puccetti, 1973; Sperry, 1965). This claim can only be evaluated in the light of a philosophical account of consciousness and its relation to the cognitive abilities tested in neuro-psychology. There is no doubt that split brain patients and those with other types of brain damage cannot process cognitive information with the facility and integration of normal subjects but this fact may not be adequate to ground far-reaching claims about the brain and consciousness. I will outline a view of consciousness which forges a close relation between consciousness and cognition. On this view, consciousness is an open-ended cognitive stance toward the things one encounters. This strips a certain amount of the

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mystery from consciousness and makes it more accessible to psychological investigation. The present cognitive account also has implications for a number of problems in the theory of representation.

The Need for Clarity

In fact, the problem of consciousness is part of a much wider problem concerning the contents of mental ascriptions. For instance, when we say of a subject "She has noticed the faces in the picture," we are remarking on the fact that the faces are somehow affecting her cognitive structuring of the picture. But how can we ever know about these things going on in her mind if we think of consciousness and thought as hidden within the subject? The problem poses questions about the relation between our practices of self-ascription and other ascription (of mental contents). We tend to assume that in one's own case the knowledge of what is in the mind is straight-forward whereas in the case of others we have to infer what is going on in their "private" or "Cartesian" minds. This assumption rests, in part, on a widespread disregard for logical or philosophical constraints in discussing mental life. Thus, in order to develop the present account so that we can use it to examine claims about consciousness in cases of neurological damage we need to look carefully at these constraints.

The first constraint is the *principle of economy*. This constraint requires that we do not credit any subject with mental abilities that go beyond those needed to account for the behaviour we see. Thus, for instance, we would not say of the snail that it is trying to hide in the hedge when its behaviour is perfectly well explained by a *taxis* toward dark or shady places. In order to justify crediting the snail with thoughts about hiding in hedges we would need evidence that it had a concept of hedges as distinct from other shady places such as trees, shrubs, or walls. It is unlikely that we would find good evidence of this level of differentiation in the snail's behaviour and thus we would be wrong to think of the snail as intending to hide in the hedge.

In the same way, we can overstep our epistemic marks in relation to split-brain patients. The patient may be able to respond to a pipe she feels with her hand by mimicking the use of the pipe in smoking but this does not mean that she has the conscious thought that she is feeling a pipe. The belief that she does have such a thought is unwarranted because many of the normal entailments of having that thought are missing. For example, she may not be able to reason about the shape or construction of the pipe, she may not be able to tell whether it contains tobacco, she might not know, as she normally would, whether it was one of her husband's pipes, and so on. All of these would be possible if she were fully conscious of the pipe and in possession of the faculties that normally go along with conscious thought. We

might, on balance, and depending on the abilities and cognitive operations (with pipes) that remained intact, conclude that she had some conscious knowledge of the pipe as a pipe but that her knowledge was impaired. We are likely to be unsure just what to say because our normal practices of mental ascription (and self-ascription) do not take account of these abnormal cases. In any event, we will need to be mindful of the principle of economy in our claims about the conscious thoughts of brain-injured people.

A *second* major feature of any rigorous discussion of such patients and their consciousness, is the need for *a clear account of human consciousness* and its contents. In order to provide this, we must do more than just assume that consciousness is either there or not there (depending, perhaps, on a hunch about what it might be like to be the creature concerned). In the normal case, we assume that we know what is involved in being conscious, but these judgments soon become unclear when we apply them to abnormal cases. For instance, we know that subjects who have lesions in the secondary visual area of either hemisphere deny any awareness of what is happening in the anopic field. But if asked to ignore the fact that they cannot see what is happening and just guess whether the stimulus is there or not, they do significantly better than chance (Weiskrantz, 1980). Thus, in these patients, there is a difference between assured conscious knowledge of visually perceptible events and a bare or primitive visual awareness of what is going on. But are such patients conscious or unconscious of the events in the anopic field? We could jump either way but we need to be clear just what we mean when we do so. If we are unclear just what is involved in being conscious of something, then, whichever way we jump, we will not really be sure what is being claimed.

We also need to ground an account of consciousness in our understanding of normal neurophysiology and psychology. When we formulate a theory of what it is to be conscious we should, therefore, pay attention to the brain processes which underlie conscious thought and the kinds of behaviour and cognitive operations these make possible. I will argue that we are driven toward a cognitive account of consciousness when we try to make meaningful and defensible distinctions between *conscious* and *mere reflexive or respondant* information processing systems. The resulting holistic cognitive account of consciousness undercuts many of the extreme claims in the literature and embeds the following definition:

> Consciousness is paradigmatically the state that a person is in when the multifaceted richness of human experience is available to that individual.

This allows for the possibility that degrees of consciousness are present in any entity which sufficiently approximates that state.

What is Consciousness?

Some writers assume that simple consciousness or awareness is an unproblematic mental state and that questions about its contents are secondary. The idea that primary state of mind is that of "contentless awareness" — an empty stream which may or may not bear features of interest seems to arise from a view of consciousness as "turning the light on inside." This can, I think, be traced at least as far as Hume's metaphor of the mental theatre:

> The mind is a kind of theatre, where several perceptions successively make their appearance; pass, re-pass, glide away, and mingle in an infinite variety of postures and situations. (Hume, 1739)

According to Hume, the contents of consciousness parade before the inner vision and so, presumably, the primitive state is one in which the theatre is lit, the audience is in, but nothing is happening on the stage. The metaphor is, however, prima facie inconsistent with his discussion of the self in which he claims that he never finds an inner experience which does not involve perceptions or ideas.

The theatre metaphor derives directly from the Cartesian model of mind. On this model, the mind is a receiver of impressions which arrive for conscious contemplation in a private or inner mental space. The private viewer of these mental events is both passive and privileged because they are given to her by information coming in from her senses and she has immediate, incorrigible, knowledge of them. However, the events concerned are mere representations or images of things external to the mind and may or may not correspond with objects and events in that outer realm.

The view is flawed, in part because Descartes, unlike his continental followers, neglects to provide a detailed phenomenological analysis of conscious experience and its intentionality. Brentano, for instance, notes the selectivity of consciousness:

> A person who hears a chord and distinguishes every single note that it contains is conscious of the fact that he hears them. But a person who does not distinguish the various notes is only indistinctly conscious of them, since he hears them all together, and is conscious of hearing the whole, which includes hearing every individual note. His consciousness, however, does not distinguish every part of the whole. (1929, p. 25)

These observations remind us that consciousness is more than receiving input, it involves distinguishing details on which attention can be focussed and, what is more, being aware of oneself as doing that. We will return to the "two tier" structure implicit in Brentano's account but, for the moment, it is the idea of thematic focusing that is important.

Sophisticated analyses engaging consciousness in an active and dynamic way with things in the world are also available through some strands of contemporary psychology (Neisser, 1976). The interactive cycle of perception, gestalt figure–ground differentiation, the difference between subliminal consciousness and focused attention, the intentionality of perception, and so on must all be part of any adequate account. Current cognitive psychology also emphasizes the fact that the organism is active in and interactive with the environment and selectively gathers information related to those objects important in adaptive behaviour. This suggests a different view of consciousness from that found in the theatre analogy.

It is interesting to explore the relationship between the active nature of consciousness and the intentionality or "aboutness" which Brentano considered to be the essential property of the mental (1929, p. 58). The conscious mind actively differentiates a focus of attention from the array of information potentially available to it. In this sense, as Kant (1789/1929) suggested, it structures experience by distinguishing a topic or object of thought. This differentiation prompts us to consider the active, exploratory, role of the mind. Brentano made certain distinctions in analysing the structure of consciousness. He noted the difference between the focus of attention and its context (Gestalt — figure versus ground; Husserl — "thematic" versus "automatic" awareness), and observed that the objects of which one is conscious are differentiated from other objects in that they are characterised as having a certain quality or nature. Thus, when I notice the fly on the wall, I must notice it as something (e.g., a black speck, a piece of dirt, or a fly). The content of my consciousness therefore depends not only on the object as a physical bit of the world but on the way in which I am thinking of that object, the way in which I have differentiated it from context or ground in my conscious experience. This active definition of the content of my consciousness emphasizes the intentional nature of the object of perception (Anscombe, 1965).

Intentionality, by relating mental representations to the objects which they represent, enables a subject to develop structures for mapping the world so as the subject can plan and organise her activity. Thus, a *re*-presentation becomes literally that, a way of recovering for present use the significant and meaningful features of an object or situation with which one has, in the past, been presented. Brentano's insights not only lead us to a view of the nature of consciousness and thought which is radically different from the inner state or Cartesian theory but also expose a problem lurking in the epistemology of that theory.

Cartesian conceptions of the mind accept the premise that my thoughts are in my head and essentially private to me and yours are similarly internal and private to you. I can, however, communicate my thoughts to you by using language. My "inner thought" gives meaning to my words and your

inner thought is the basis of your understanding of my words (Frege, 1977, pp. 4–5). But how is it that I know what you mean? I cannot see what thoughts accompany your words and therefore I cannot assume that my understanding bears anything more than a fortuitous relationship to your meaning. On the Cartesian view we have no way of detecting the meanings that lie behind our words and therefore no way of knowing what to make of what another person says. This implies that we have no justified expectation of achieving a shared conception of truth. But this is an intolerable conclusion because scientific knowledge is built on the presumption that what is true is true for anyone who thinks it and that the truth can be communicated and understood by different thinkers. If, however, what I think when I report a scientific result or write an article like this is quite possibly opaque to you and vice versa because neither of us can ascertain the connection between words and their accompanying inner states, then a universal foundation for scientific inquiry is undermined. Thus the communication of thoughts and therefore the determination of truth cannot depend on what Frege calls "men's varying states of consciousness" (1977, p. 17). If it did then our apparent store of objective knowledge about the world could be based on nothing more than guesswork about the thoughts behind the words of others and there may be no essential connection between what I hear and what you mean.

This view is, of course, as absurd as it is unavoidable on the Cartesian model which informs our common conceptions of consciousness and its mysteries. We therefore need an alternative understanding of the mind which meets four desiderata:

(1) it explains why intentionality is a basic feature of mental content;

(2) it respects the complexity of contentful conscious experience;

(3) it allows the meaningful content of our thoughts to be an intrinsic part of the function of language; and

(4) it gives us a way of discerning when we have grounds for saying that a creature is conscious.

These requirements are related and I have already offered reasons why we should accept (1), (2), and (3). The last is not so obviously related to the other three but the relationship emerges when we reconsider the implications of the need for communicability in language. Communicability implies that our language about mental attributes such as consciousness depends on more than one person knowing if a word is true on a sufficient number of occasions so as to establish what Wittgenstein calls "agreement in judgments" (1953, #241). This implies that one cannot learn the meaningful use of a term like "conscious" unless there is some way our use of that term can have a mutually accessible basis. But this means that my saying of you that you are conscious (and therefore, if you are learning the language, your use

of "conscious" to describe yourself) must be based on something that I can establish and not merely on a guess about hidden goings on in your mind or head (Gillett, 1992b; Strawson, 1959). This in turn implies, among other things, that consciousness is a property we attribute to beings about whom we can make judgments and is not a feature of internal processes and states about which we can only conjecture. Of course, we may not always be sure about whether a given individual is conscious but we should, in principle, be able to agree on what would count as being in that state. This constraint therefore suggests that an adequate account of consciousness should be able to say how, in general, we are quite competent in judging whether self or others are conscious.

Meeting these four desiderata will allow us to see why the attribution of consciousness to a creature is both significant and tells us something not easily replaced by other descriptions. This entails that eliminativist views such as that of Rey (1983) or Wilkes (1984) or the other reductive views as outlined by Natsoulas (1987, 1990) are equally deficient.

Animal Thought

Animals direct their activity on the things around them. In their simplest form, such responsive abilities are mere reflexes which cause the animal to react in a certain way when stimulated. For instance, we might notice that a moth flies in circles around a candle but not be tempted to say that it has a conscious conception of that candle. On the other hand we would say of a kitten who walks around, looks at, and repeatedly makes pawing movements at a lighted candle that it is conscious of that candle. But to explain the behaviour of a moth we need only a set of automatic (light-sensitive) dispositions; for the kitten we need to make reference to the intentional object which is the focus of its purposive behaviour. Once the creature concerned shows flexibility and integration in its responses not only to a particular object but more generally to aspects of the environment around it, we are justified in saying that it has conscious representations of the world (including that object). In saying this we are not saying that those conscious representations have all the attributes of human consciousness but that they are sufficiently like them to be called conscious. The contrast between the moth and the kitten shows that even if intentionality is at the heart of mental representation we cannot credit the moth with consciousness on the basis of simple object-directedness in its behaviour. Thus there is more to the intentionality of conscious representation as seen in the kitten or in a human being (Gillett, 1989), than some crude sense of "aboutness" (there being an object on which the activity is directed).

If we move "up a notch" in cognitive processing complexity and consider a subject's thoughts about something less salient than a burning candle right in front of her face, we get closer to the normal phenomenology of conscious thought. In the normal setting, the achievement of a clear awareness of a thing requires the differentiation of the object from its context. For instance, imagine that Crusoe and a crab were walking along a beach on Crusoe's island. They encounter Friday's footprint. Crusoe thinks <that's a human footprint>, but what thoughts might the crab have? Is the crab conscious of the fact that it has just crawled across a human footprint? I think not. Crusoe's thought about the situation shows a certain internal complexity and structural articulation which is indicative of its richness of content. It has identifiable elements such as *human*, and *footprint*, and therefore indicates an appreciation of the pattern of stimuli which form a footprint, a conception of a human being, the realization that human feet leave traces in sand, and so on, all of which are complex in themselves. These qualities and connections of Crusoe's thought connect it in systematic ways to many other thoughts (Clark, 1988, p. 272). Without these things Crusoe could not be conscious of what he was seeing even though it might be displayed in full sight for him to see. The relevant background conceptual abilities enrich and deepen his conscious appreciation of what is before him such that the information that eludes the crab is highly significant to Crusoe the moment he sees it.

Mental Content and Consciousness

I have used the word "articulation" in a way that suggests that my thought is linked to language but there is more to articulation than just words or propositional forms. This is evident the moment we notice that even if someone wrote words in my brain I would still need to learn how those words applied to the world around me and could be used. However, once I had got these cognitive abilities it is unclear that I would need the words written there in my brain to do the work (of meaning and understanding) because that would flow from the abilities themselves. Thus we need to find a way of understanding the connections in thought that will explain our conscious intentional abilities and, through them, our ability to use words to help us along in the cognitive and communicative project in which all human beings are engaged. I think that these abilities and connections have three facets.

First, I pick out some gestalt or grouping of stimulus features as constituting an item worthy of attention. When I encounter such an item I use the term "that" and, were I to add nothing further to "that" — as in "look at that" — this would indicate a bare focussing of attention on an object which not yet characterised as anything in particular. But, in addition to my use of "that," I use cognitive abilities to characterise the object. These are taught me in sit-

uations where words have been used to pick things out and to help me to focus on certain aspects of the array of information presented to me so as to differentiate the object of my thought and see it as a figure of a certain type as distinct from the ground or context in which it occurs. Thus I become aware of *that frog, that footprint in the sand, that square shape, that leaf, that chord, that note*, and so on.

Second, I link what I am seeing to other concepts and conceptions of things. For instance, when I perceive the footprint, I link it to my encounters with human beings. I do not just think <what a strange mark in the sand> or some other nondescript thought but I identify that mark as the kind of thing that has an essential relation to the presence of a human being.

Third, I make the linkages explicit and propositional so that they can provide me with further thoughts that are true or false. In my example, I identify the mark on the sand as recording the imprint of a foot belonging to a living human being. Each of these facets of my thought forges certain links between this present situation and other experiences and it does so because I have a conceptual system which structures my experiences (Kant, 1789/1929, B74).

It is my concepts that give perspicuity to my conscious experiences. My world comes to me as a succession of rich arrays of stimuli which my conceptual system can parse or differentiate/characterise in indefinitely many different ways. Thus I can stop on my walk along the beach and become conscious of the breaking of the waves, the gathering clouds indicating a forthcoming storm, the feeling of sand squeaking under my feet, the intense green of the jungle and so on. I have a flexible and selective appreciation of my environment which shifts between a number of theme–context or figure–ground relations as the information presented to me is articulated by certain concepts — <green>, <blue>, <wave>, <roar>, <sand>, <the future> and so on. This deepens my "mental hold" on what is around me, and makes me conscious of things not accessible to simpler creatures in the same articulated way. Thus, when I am conscious of a candle, there is so much more to that experience than what is available to the kitten; we could say that there are layers of consciousness waiting to be explored by me of which the kitten cannot even dream.

It is clear that this complex representational ability of human beings is continuous with that of their simpler animal cousins but much richer because of the multiplicity of links that humans make between experiences at different times and places. It is questionable to what extent one could do this without flexible perceptuo–cognitive abilities which arise from the use of signs. Human beings pick out stimulus groupings as they are marked by signs or symbols detachable from the stimulus patterns themselves. These signs or symbols are able to be used by the mind independently of present context

and therefore without specific contextual triggers. Thus they connect experiences in rich and diverse ways not easily amenable to purely physical descriptions (Harré and Gillett, 1994).

The present view suggests that it is no accident that the use of the word "tell" is ambiguous as in remarks like "she can tell you herself" on the one hand, and "she can tell that that is a shark" or "she can tell a weasel from a stoat" on the other. Human discernment or differentiation of objects of thought capitalizes on the close articulation and refinement of cognitive abilities made available by our extensive use of signs and our language is the repository of our cumulative (and shared) expertise at picking out the important features of the world around us. Our consciousness is expanded by our use of language to guide and fashion our cognitive powers in relation to the environment we share (Gillett, 1992a; Vygotsky, 1962). Language is, of course, a socially constructed resource which is why Luria remarks that "voluntary attention is not biological in its origin, but a social act" (1973, p. 256).

I have argued that consciousness is a dynamic repertoire of intentional abilities to represent and appreciate the existence and properties of things around us. This view relates closely to the work of Evans (1981, p. 104) who introduces what he calls "the Generality constraint" to distinguish conscious thought from mere responding. He argues that a thinker who is conscious, say, of a block *as a block*, will be able to frame a series of thoughts about that same block which differ in their content. Thus to be conscious of *that block* would be to be able to compile a range of thoughts like <that block is yellow>, <that block is square>, <that block has rolled over>, <that block is beside the red one> and so on. These do not add up to a set of necessary or sufficient criteria for the mental content in question but they form a set of "mental acts" some subset of which would be available to any thinker who really did have the ability to think of the particular block concerned (Geach, 1957, p. 15).

There is a related ability which enables us to detect features of the world associated with general or property terms (Gillett, 1992b). To detect, say, a property such as yellowness, a subject must focus on just that aspect of a situation which grounds the application of the concept <yellow>. The subject must then link the present array to others on the basis of the fact that they share that colour. When a subject has a complex network of such abilities that subject is capable of a range of thoughts involving objects and their properties and therefore can be said to be conscious of those objects and properties rather than being simply triggered to react thus and so when a certain stimulus configuration appears. This is why human consciousness has the structure and flexibility that Brentano, Husserl, Frege, and others have described.

Consciousness, or what-it-is-like-to-be (Nagel, 1971) an experiencing human subject, is therefore a complex property arising out of a rich and holistic set of mental attributes. It is based on the fact that the subject is

capable of being *conscious of* things as being red, square, frogs, warm, moving, and so on. The potential richness of the subject's conscious experience is limited only by the extent to which the subject can extend and develop her appreciation of the things to be noted and contemplated in the world around her. On this view, Hume is right to claim that consciousness is normally replete with contents and that the notion of a simple "experience of self" on the one hand or "contentless consciousness" on the other is a secondary abstraction from the usual condition in which our experience is thoroughly intentional or occupied by objects of thought (1739, p. 676). I have already suggested that there is a close link between the active and exploratory nature of consciousness and its intentionality. The active mind seeks out and characterises objects as topics for thought by directing attention on them and it is only when this active faculty is considered in abstraction or, perhaps, functioning in relatively idle, unfocussed mode that we can speak of undifferentiated consciousness.

This recalls the claim that conscious experience is an attribute of the active subject who is exploring the world and not a passive observer (Gillett, 1990). That point is familiar from the work of Gregory, Piaget, Bruner, Marr, and Neisser each of whom applies it in his own way. The conscious subject investigates, applies concepts, synthesizes information, and formulates thoughts about the world. This activity makes use of and is articulated by all the cognitive abilities that the subject has developed. Because this set of abilities normally operates as a seamless web in which one conducts a mental engagement with one's world, it is hard to say just what experience is like for a person with aspects of this cognitive repertoire destroyed by a brain injury or for a creature such as a kitten who has never had the full repertoire. We can, however, learn something of what it is like for the brain injured patient by conversing and interacting with that person in a range of structured and unstructured situations.

One further feature of the analysis is the beginnings of a distinction between conscious and unconscious mental content. Conscious mental content is experience which is "in touch with" or structured and informed by concepts; here the subject's abilities to classify, select, explore and understand are in play. The mental content that results is therefore replete with possibilities for association which can be the focus of intentional attitudes. In a word, the subject can survey, reflect on, and make judgments about the contents of her own conscious experience.

In contrast to this is material which is not explored or articulated by concepts and understanding, not engaged with the intentional attitudes of the subject, and therefore more inchoate, although, perhaps, quite powerful in terms of its motivational influence (Church, 1987; Gillett, 1991). This latter material may be actively excluded from conscious awareness and understand-

ing (and therefore it can lead to motivated irrationality such as self-deception) or simply ignored. In either case it could be called unconscious (although Freud would call the former "unconscious" and the latter "preconscious" material). The difference between unconscious and conscious mental content is the lack of active integration with other mental content and the consequent lack of subjective judgments about the merits and implications of the material involved.

Where does this put simple awareness, say that something is happening in one's vicinity, which seems not to be unconscious but is clearly not conceptually structured in the detailed way I have described. Brentano would, I think, regard this as non-topicalized mental activity. The object of thought as such has not been "firmed up" or given form such that one has a proper conscious characterisation of it. This is indicated by the fact that one might say "I was not really conscious what was going on, it was a few minutes later that I noticed the body lying on the floor." In this state one is affected by or sensitive to situations which are not really grasped in a way that allows cognitive exploration. It is an approximation to full conceptually structured consciousness in a way that many examples of animal awareness might be. It is unclear just where on the scale from mainly responsive behaviour through to active, directed, articulated, cognitive exploration one would put certain animal behaviours such as gull chicks pecking at a mother's beak, imprinting, or stickleback rituals. The mismatch between conscious thought and animal experience means that one can often expect too much of animals and say things like "Stupid dog! Can't you see?"

The present analysis implies that consciousness is built up from the many ways that we are *conscious of* this or that. It is primarily a state of active, exploratory, cognitive engagement with things around. When we talk of consciousness (simpliciter) we are using an umbrella term for the holistic complex of mental activity which comprises more detailed consciousness of this and that. This accords well with Sartre's contention that consciousness is an activity, not a passive or receptive state of being (1958, p. xxviff).

To summarise, I have argued that conscious mental activity comprises an indeterminate because open-ended capacity for conceptually structured thoughts about what is presented to one (or represented by one as having this or that content). I have argued also that the conceptual structure inherent in consciousness is object-directed and closely related to the use of linguistic terms which aid in cognitive focussing and differentiation. When we are dealing with a creature whose interactions with the world do not show the degree of integration and cognitive open-endedness associated with normal human cognition our attributions of consciousness must be more tentative. I have finally suggested that, along with material in the mind which is subject to the structuring activity involved in concept-use and therefore

conscious, there is other activity which is not open to reflection and evaluation in the same way and is therefore "beneath" consciousness.

Self-consciousness

If human consciousness involves intentionality in the sense of conceptual engagement with the world around one, it is plausible that self-consciousness is the ability to respond in that way to one's own intentional activity. This ability may also arise through interaction with others. As I respond to things — by directing my attention to them, using words about them, acting on them, and so on, people around me respond to my responses; they say, for example, "Look, it's a dog," "Yes, that's a black one," "You have built a tower" and other things which link what I am doing and what is there to be interacted with. Their responses bring me, the sensitive, active subject, into focus along with the bit of the world that is our mutual object of attention. But surely I can respond in the same way and therefore bring myself as subject into focus?

Brentano refers to this move (whereby I am the topic of my own thought) as showing a duality of structure in which I (or another) can become directly conscious of myself as a mental subject and "obliquely" or indirectly conscious of the object of my thought. Thus, when I think, say, <I am thinking that that is a leaf> or <I am aware that that is C# minor>, I am directly conscious of my own act of thinking and indirectly aware of the objects which appear in them. You are in a similar position *vis a vis* my direct thoughts: in regarding me as thinking either of the thoughts <that is a leaf> or <that is C# minor> you are directly thinking of me as a thinker and obliquely or indirectly thinking of the leaf or the C# minor chord (the object of my thought).

Unfortunately Brentano confuses his account at this point by using the terms "primary" and "secondary." He remarks of self consciousness in relation to visual perception:

> someone who sees, sees something coloured and at the same time perceives himself as the one who sees. The relation to the coloured object is called the relation to the primary object, the relation to himself as the one who sees is called the relation to the secondary object. (1929, p. 41)

The confusion is to some extent cleared when we realise that his use of "oblique" to refer to the awareness of an object of my thought highlights two facts about the oblique context:

(i) I am/you are primarily focussed on myself as thinker and only through my thought am I/are you thinking of the object of that thought;

(ii) I/you understand the object in a particular way, namely as I have characterised it in my thought.

Thus, even if an object is a primary object in some acts of thought, the fact that the topic is my *act of thinking* and that my act of thinking about the object has already given it a particular intentional form entails that it is presented to me or you (or to anybody thinking about my act of thinking) obliquely and not directly (i.e. as a "raw" or undifferentiated object). Normally I am not thinking about my own acts of thought and therefore the secondary object is myself as thinker (which only admits one characterisation — *I as thinker*). For our present purposes, we need not dwell on the philosophical implications of these distinctions save to note that they support the general thesis that in self-reflexive or self-conscious thoughts we think of ourselves as conscious, to the extent that we conceptualise things in a variety of ways (as a leaf, as a C# minor chord, as a hat, as a Baroque church, and so on).

The fact that I can, in general, unambiguously understand the structure of your conscious thought and you mine (or else, for instance, there would be no use in writing scientific articles) reintroduces the social dimension of mental life. Concepts are marked by symbols or linguistic terms and it is their full engagement with our mental activity that gives consciousness its richly varied contents and cognitive powers. The techniques of thought are conveyed through the use of words and allow human beings to differentiate the meanings that can be found in experience (Vygotsky, 1962, p. 126). Thus language pervades consciousness and, as it does so, brings with it interactively based techniques of regarding myself as "secondary object" (Brentano). I have a model for self-directed responding, for reacting to my own thoughts and judgments about experience as I internalise the words and responses of others to me. Humans are adept at mimicking the behaviour of others and it is a small step to see the beginnings of self-directed attitudes or self-consciousness in such learning. It is plausible that self-consciousness involves taking attitudes to one's own mental acts and contents and that it is similar to the articulation of experience in terms of concepts shared with other thinkers. On my view, human consciousness depends on a subject internalising shared ways of thinking about a shared world. These involve a person and a range of techniques through which she has access to and explores a range of varied situations potentially shared with others.

Consciousness and the Brain

An exploration of brain function supports this analysis of consciousness (Gillett, 1988). At the simplest level, the Brain Stem Reticular Formation (BSRF) alerts or arouses the entire neuraxis to the incidence of significant information and modulates general cerebral tone so as to enhance any exploratory processing that might possibly be required.

The Hippocampal–limbic system sets up more directed information processing operations which are generally called *orienting reactions*. These are different from the general arousal reaction in that they are "highly directive and selective in character" (Luria, 1973, p. 259). The directed and selective orienting reactions enable discrimination of stimuli, produce the EEG indicators of expectancy, and mediate voluntary attention. They would be expected to be closely related to the motivational structuring of cognitive processes so that the organism spent "cognitive effort" on information which was worth the trouble. In humans these abilities to direct and focus attention seem to develop with speech and social function so that they are, as Luria remarks, not essentially biological but social in their origin. Such directed or higher levels of attention are, therefore, intentional in that they are intimately tied to the repository of significant experiences that inform the learning sets and response dispositions of an individual human organism. Luria argues that they "are the product, not of the biological maturing of the organism but of forms of activity created in the child during his relations with adults" (1973, p. 262). This is what one would expect in any organism which had sacrificed a high level of complex instinctive techniques for survival so as to achieve a relatively open-ended capacity to learn techniques developed by other members of its species.

The cerebral cortex provides the final articulated level of analysis of stimuli. It links occurrent stimulation into the multifaceted and articulated informational capacities underpinning the use of concepts; here the dominant role of communication and shared rules for the use of linguistic terms to structure cognition and experience become explicit in that "word meaning is the fundamental tool of thinking" (Luria, 1973, p. 326). It would, of course, be unlikely that spoken language filled a mediating and directly enabling role for all higher cognitive processes, and there is neuro-psychological evidence that it does not (Allport, 1983). However, it is harder to argue that these processes would have achieved their richness and complexity without the participation of language in the cognitive development of the individual. Indeed it is likely that our cognitive skills form a smoothly integrated whole in which certain tasks, such as keeping track of whereabout in space one is, are better performed by analogue functioning than in a system where symbolic markers predominate.

Brain Integrity and Consciousness

Although brain bisection disrupts this finely tuned system in a relatively crude way, it has a surprisingly slight effect on normal conscious activity. The current analysis makes this understandable. If consciousness is a holistic set of integrated cognitive abilities which allows one to explore and deal with

the environment around one, then there will be many levels of integration possible. It could be done by using different parts of one's multi-modal sensory apparatus to gather data from a problematic object which is difficult to characterise — as when one stops and listens to hear if any noises are being made by the indistinct object in one's visual field. One can develop behavioural skills, such as feeling for a catch under a car bonnet, which provide a given modality with as much information as possible about an indistinct object as when one feels for the surface features of an object put in the hand. One can use words to articulate and spark associations from an unclear visual presentation — "A handle, lever, trigger, finger catch, part of a ring, half-round, a broken wedding ring, that's it!" The human subject has many tricks designed to overcome internal informational disruptions and a callosal section is just the sort of problem to test some of them out.

An important starting point in understanding the experimental data is that the subject is conscious of the fact that information is not being dealt with in the normal way and she therefore sets out to overcome the mistakes caused by this disruption (due to interruptions of normal connections). This single fact shows more powerfully than any other that the subject is a unitary consciousness with internal problems in information processing rather than two consciousnesses which, one would infer, need not regard themselves as conceptually connected to each other (or responsible for deficiencies in each other's performances).

When we consider the many human techniques for improving and integrating faulty data it is no wonder that we find it hard to detect cognitive problems when such patients are in an ecologically valid situation. A human being's conscious mental life is built on multiple interacting techniques which allow constant integration and balancing of competing response tendencies, often based on partial information. Consciousness reflects the fact that our cognition is flexible and exploratory so that it can make up for gaps and discontinuities in presented information. We do this by exercising a whole range of exploratory techniques and by making use of diverse sensitivities and response types. It is therefore decidedly odd to say that a patient with brain bisection has two minds or streams of consciousness. In fact, the patient has a fracture within the set of connected cognitive abilities that are normally exercised in waking experience. The whole set contributes to the conscious intentional content and it is a mistake to invest any part of it with an emergent property of the whole. Not only that, we have clear evidence that the person considers himself as one subject who has a cognitive problem to overcome and who acknowledges that sometimes he (singular) makes mistakes. This attitude logically demands that there is one subject, a point I have made in previous publications (Gillett, 1990). We are therefore best to restrict ourselves to the unspectacular claim that the subject shows a

disruption of the normally smooth and pervasive synergy of speech-based and other performance-based abilities to locate, explore, and characterise intentional objects, a synergy which is the basis of conscious thought.

Why do we not say that the right hemisphere is conscious? To say this would be as much of a mistake as to say that the right hemisphere behaves. The person is conscious, thinks, solves problems, and acts in certain ways. The whole of this activity is intentional because it is directed on and responsive to bits of the world and its richness closely approximates that available to a normal waking human being. Thus it is a conscious mental life although it is flawed in detectable ways. We discern these mental attributes by noting holistic patterns of behaviour which show conceptual content. On the basis of these patterns, we use intentional concepts (such as consciousness, problem-solving, thought, behaviour, anger, frustration, belief, and so on) to describe the person concerned. We cannot make these attributions to a hemisphere even if the things we say about a person depend on certain things going on in her brain or cerebral hemisphere. A hemisphere cannot behave; only a person can do that.

Similar considerations apply to Weiskrantz's (1980) discussion of blindsight. In this condition, a patient claims that she cannot see what is going on in half of her visual field but she detects stimuli there when tested in ways parallel to those used in animal experiments. One patient of mine with this disorder commented that he could not tell if there was a stimulus there but he thought there might be. When I encouraged him "to act on suspicion," he detected most of the stimuli in the hemianopic field. I would argue that the patient with blindsight is impaired in his conscious awareness of the stimuli because he is used to being able to cognitively explore "real" objects in the open-ended way I have described. He cannot fulfill the normal requirements for knowledge of an object because the information from the hemianopic field does not have the holistic and ramified (transcortical) connections to the conceptual system that is basic to conscious thought. But the patient still has a (responsive, unanalysable, uncheckable, and self-reflexively inaccessible) tendency to think that something is there. We could say he has a presentation which he cannot transform into an explicit (focussed and differentiated — Brentano) representation (Church, 1987). That is why the patient appears so vague and indecisive and can only report the stimuli when told to act on suspicion rather than on (conscious) knowledge of events. Again we are forced to conclude that consciousness is tied to widespread cognitive articulation of presented information and not to an on–off inner light which shines in a "theatre of the mind."

The present view of split-brain cognition suggests that callosotomy disrupts the structure of consciousness in readily understandable ways. Lack of attention to the detailed (phenomenological) structure of conscious thought

leads some writers to lapse into talk about two streams of consciousness or even two conscious subjects co-inhabiting the same body. When we construct an adequate understanding of the nature and phenomenology of consciousness it is clear that this view is mistaken. The limited operations which can be performed on information only available to one hemisphere leave us unsure what to say about the intentional contents attributable to the subject. This uncertainty infects any claims about the consciousness or otherwise of the activity we observe. A more adequate view is that consciousness is a holistic structure of psychological abilities which give a subject an open-ended cognitive engagement with an object. That view results from close attention to the phenomenology or structure of conscious experience in general and in split-brain cases and it undermines a number of alarming metaphysical conclusions based on neurological findings. In particular it undermines the claim that each of us may have two minds one of which is systematically suppressed. It also suggests that conscious thought is an important aspect of human cognition rather than some epiphenomenal icing on the cake of psychological function.

The Thorny Questions

Questions as to where the seat of consciousness might lie, whether consciousness is the function of some yet-to-be-located monitor or integrator of mental life are, on the present account, non-questions. There is no seat of consciousness; the bearer of consciousness is not an "inner person" or homunculus but a sensitive, responsive, active and interacting human being who makes judgments about and classifies the things around her so as to think about what is happening. This complex and articulated conceptual engagement with the world equips her with a range of psychological skills that is indefinitely rich and open-ended. The same processes, of directed attention, response, and judgment enable one to respond to one's own responses. Thus one can regard oneself and one's mental acts as themselves objects of thought and this fact is the essence of self-consciousness. A conscious thinker is constantly reviewing and reworking her abilities to respond to material that has in the past been picked out and differentiated in a variety of ways. As a result she has enhanced cognitive access to this material and the potential for a rich, culturally informed and even abstract conscious thought life. Human beings have realised this potential not because they are contemplaters of an inner array too wonderful to understand but because they are categorizers, explorers and integrators of information and masters of the multiple and articulated techniques which constitute conscious mental activity.

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