

Who Has Subjectivity?

Michael Lyvers

Department of Psychology
Bond University
Gold Coast QLD 4229
AUSTRALIA

mike_lyvers@bond.edu.au

Copyright (c) Michael Lyvers 1999

PSYCHE, 5(31), December 1999

<http://psyche.cs.monash.edu.au/v5/psyche-5-31-lyvers.html>

KEYWORDS: animal consciousness, mind-body problem, phenomenal consciousness, philosophy of mind, subjectivity.

COMMENTARY ON: Carruthers, P. (1998). Natural theories of consciousness. *European Journal of Philosophy*, 6(2), 203-222. (<http://psyche.cs.monash.edu.au/v4/psyche-4-03-carruthers.html>).

ABSTRACT: Carruthers' case against animal consciousness employs deeply flawed reasoning and is contradicted by both empirical and introspective evidence. Although in principle we cannot objectively establish for certain that anyone -- human or otherwise -- is phenomenally conscious, results of animal research on consciousness-changing drugs are uninterpretable unless one assumes that non-human animals have discriminable subjective states. Carruthers tries to argue that higher-order thoughts are the basis of subjective experiences, but the former are derived from the latter, not the other way around. The position that only humans are conscious is reminiscent of other anthropocentric errors including outmoded notions of an Earth-centered universe created solely for humans.

Peter Carruthers' (1998a) essay "Natural Theories of Consciousness" and his extended synopsis "Animal Subjectivity" (1998b) offer highly abstract, speculative arguments to support an extreme and counter-intuitive contention -- reminiscent of certain anthropocentric religious doctrines -- that only humans have subjective states or phenomenal consciousness. I shall begin my critique by establishing what I consider to be the bottom line on the issue of *subjectivity*, which Carruthers rightly considers the "hard problem" of consciousness. This bottom line has, of course, been delineated before (e.g.,

Chalmers, 1998), but deserves going over briefly here because Carruthers claims to have penetrated the "hard problem" when he has actually done nothing of the kind.

From a scientific standpoint, the question of subjectivity is quite different from, say, questions concerning the perceptual capabilities of humans and non-human animals, which can be evaluated empirically. In the case of color perception (Carruthers' example), we can determine that many animals can behaviorally discriminate between certain wavelengths of light. We can also, of course, determine that humans can behaviorally discriminate between certain wavelengths of light. Where is the evidence, though, for any *subjective experience of colors* in such purely *behavioral* data (including verbal behaviors)?

Upon close examination, it is apparent that, strictly speaking, there is *none*. This certainly does not mean that humans and non-human animals have *no* subjective experiences of color or other phenomena, but rather that we cannot ever objectively determine for certain that they do. Our best guess is that at least some do, insofar as they possess the presumed organ of consciousness, the cerebral cortex, and to the extent that they exhibit behaviors which, in oneself, are motivated by subjective thoughts or feelings. Yet, as others have often noted (e.g., Dennett, 1998), one might imagine a world of functional "zombies" with physical brains and bodies just like ours and which behave just like ourselves in every respect, but which lack *subjectivity* or phenomenal consciousness (as opposed to Carruthers' consciousness *simpliciter*; 1998a, p.1). Indeed, one can argue that this is exactly how the physical world of biological organisms (including humans) presents itself to modern neuroscience: there is no detectable "subjectivity" in the brains of organisms or their behavior.

Subjectivity is thus a superfluous concept from a purely objective, scientific perspective, as it does not seem necessary to explain behavior -- including behaviors resulting from so-called "higher-order" processing (even discussions about "subjectivity", a term which could be interpreted as a mere artifact of language); the complex circuitry of the physical brain is probably sufficient without postulating an additional subjective element. This argument also applies to the cumbersome "theory of mind" which Carruthers proposes as the very basis of phenomenal consciousness. Although an organism (or a computer) might encode much information about its own behavioral tendencies and those of others, and act appropriately upon that information, there is nevertheless no intrinsic reason to think that information processing per se -- even that concerned with self-monitoring -- necessarily requires a *subjective experience* to go along with it.

In everyday life, on the other hand, most people generally assume that if it looks like a (phenomenally) conscious duck, walks like a conscious duck, and quacks like a conscious duck, then it probably *is* a conscious duck. We simply have no good reason to think otherwise. A few of us might occasionally contemplate the counter-intuitive hypothesis that it could be an imposter, a mere mechanism or "zombie" that only *acts as if* conscious, but most of us -- except, perhaps, those with an anthropocentric axe to grind -- have no reason to think this is the case for ducks, much less for non-human mammals.

Indeed, most of us have a strong sense that many other beings besides ourselves -- human and non-human -- experience subjective states. We sense this even though the subjectivity of others is wholly inaccessible to us at the most fundamental level, as subjectivity is by definition closed to everyone but oneself. I have no direct evidence that Carruthers is phenomenally conscious, for example, as I cannot possibly perceive any subjectivity other than my own, and Carruthers cannot *prove* that he experiences subjective states. Why, then, do most of us find implausible the notion that others lack subjective states?

I think our sense of the experiences of others reflects the normal operation of a faculty we call *empathy* -- a visceral, inborn tendency to identify with other beings. Even happy newborns will suddenly cry when they hear other babies cry; such innate imitative responses are likely the biological foundation of empathy (Azar, 1997). Empathic tendencies are probably present to some degree in many social mammals, and like other behaviors are ultimately rooted in brain physiology. Thus when a monkey observes other monkeys performing certain actions, the same parts of his frontal cortex are activated as when he himself performs those actions (Graziano, Yap & Gross, 1994). Such a process must confer tremendous evolutionary advantages in social mammals (not the least of which is observational learning or "monkey see, monkey do"). Empathy can sometimes mislead -- as when a child imagines that her favorite doll is "hurt" when it is accidentally dropped -- and empathic tendencies can be blocked by factors such as anger, hatred or prejudice, but empathy can also markedly enhance the ability of humans and other social mammals to respond appropriately to the behaviors of others. A being who lacks empathy, on the other hand, would more often tend to respond inappropriately to others in their social group, and would probably find it quite natural to imagine that others lack a subjective or "feeling" experience of the world (perhaps this is how psychopaths perceive other humans and non-human animals). But for most of us, our empathy makes "zombie" hypotheses -- and, likewise, assertions that only oneself or one's own species is conscious -- seem nonsensical.

Moreover, if we assume that humans are phenomenally conscious, and that this condition results from brain functioning (which would seem rather difficult to deny), then the findings of modern behavioral neuroscience certainly give us no reason to think that other mammals (at the very least) are not phenomenally conscious as well. On the contrary, the evidence, taken at face value, clearly suggests that humans and non-human mammals alike are conscious when their brains are in the normal activated state associated with wakeful behavior, and that they are in an altered state of consciousness during REM sleep or drug-induced states.

The presumed organ of consciousness, the cerebral cortex, is present in all mammals. Like humans, all other mammals exhibit a daily rhythmic alternation between behaviorally (or *simpliciter*) conscious and unconscious states, and they exhibit the same brain signs of dreaming during REM sleep that humans do. When given the chance, laboratory animals abuse the same drugs that produce pleasurable changes in consciousness in humans (e.g., cocaine, heroin, alcohol); in fact, the reinforcing efficacy of a drug in laboratory animals is a strong predictor of how likely the drug is to be abused

by humans and how subjectively pleasurable humans will report its effects to be (Feldman, Meyer & Quenzer, 1997). Further, when laboratory animals (rats or non-human primates) who have free access to alcohol and abundant food and water are subjected to various forms of social stress (such as social isolation or being placed with unfamiliar or aggressive conspecifics), there is a dramatic and selective increase in alcohol consumption and intoxication, which is commonly interpreted as the animals' use of the anxiolytic drug alcohol to relieve an aversive subjective state of anxiety (Higley & Linnoila, 1997; Miczek, DeBold, van Erp & Tornatzky, 1997; Yudko, Blanchard, Henrie & Blanchard, 1997). Thus laboratory animals, like humans, tend to drink more alcohol than normal when they are stressed or experiencing social anxiety -- an "animal model" of certain forms of human alcohol use.

Powerful evidence, if not proof, of animal consciousness comes from the animal drug discrimination paradigm used to classify psychoactive drugs on the basis of the distinctive changes in consciousness they elicit (non-human subjects are often employed for this purpose today due to the legal and ethical difficulties associated with administering illegal drugs to human volunteers). Such studies show that laboratory animals generally make the same classifications of subjective drug effects that humans do. For example, like humans, laboratory animals classify psychedelic (mind-altering) drugs into distinct PCP-like and LSD-like categories (Appel, White & Holohean, 1982). In other words, only psychedelics that qualitatively resemble LSD in terms of their subjective effects in humans will generalize to LSD cues (such as a response lever that delivers food only when the animal is in an LSD-like state of consciousness) in these animal studies. Given that what distinguishes different types of psychedelic drugs is the unique qualitative change in phenomenal consciousness each type commonly induces, the fact that non-human mammals -- even rats! -- can reliably distinguish the states induced by LSD-type drugs from the states induced by other types of consciousness-changing drugs (e.g., PCP, THC) cannot be plausibly explained unless one assumes that (1) non-human animals have subjective states of consciousness, and (2) they are capable of discriminating between such subjective states. This sort of empirical evidence would seem to contradict Carruthers' abstract arguments against phenomenal consciousness in non-human animals.

The attribution of subjective states to non-human animals is sometimes derided as "anthropomorphism", [<1>](#) but simple acknowledgment of animal subjectivity is not equivalent to assuming that an animal's conscious experience must be similar in all respects to one's own (I freely admit that I cannot possibly imagine what it is *really* like to be Peter Carruthers, much less a bat!). Nevertheless, the shared evolutionary heritage and structural and functional parallels between human and other mammalian brains, and of course the many associated behavioral parallels, all strongly suggest that some basic kinds of experiences of non-human animals -- such as pain, hunger, love/bonding, and fear -- are probably similar to my own in their most elemental aspect. Certain basic cognitive processes may be similar as well. A delayed response task, for example, requires active mental rehearsal of a target's spatial location (which changes from trial to trial) during a delay interval, and monkeys, like humans, can readily perform such tasks (unless their frontal lobes are damaged -- in which case they show deficits like those

exhibited by frontal-lobe damaged humans) (Goldman-Rakic, 1995). Of course, I have no way of establishing for certain that non-human animals have any subjective states resembling my own, but then again, I have no way of establishing for certain that other humans actually have such experiences either, as the subjective states of others are fundamentally closed to us.

Carruthers' thesis assumes such so-called "mysterian" concerns about subjectivity are false (1998b, p.1). This assumption allows him to conclude that "the hard problem is not really so very hard after all!" (1998a, p.13). But Carruthers has not really addressed the "hard problem"; instead his approach constitutes what Chalmers (1998, p.3) refers to as a "bait-and-switch." Nevertheless, it is worth taking a close look at the highly abstract theory Carruthers has presented, if for no other reason than to see that much of what he says sheds little or no light on the issue of subjectivity.

One of Carruthers' basic problems is that he wishes to regard "higher order thoughts" (HOTs) as necessary for conscious experiences. Carruthers admits that this seems inconsistent with introspective evidence when he notes (1998a, p.6) that when you focus your attention on a color, "your focus seems to go right through the experience to its objects." In other words, the subjective experience we call "red" is simply *redness*; there is nothing in the content of such phenomenally conscious experiences beyond the phenomena themselves. Yet Carruthers then goes on to assert that there *is* more than that because if he so chooses he can think abstractly about the color he is perceiving -- he can contemplate how it *seems* to him (whatever that means). But how can such post hoc rumination possibly render the experience of a color "for the first time phenomenally conscious" (p.6), as he subsequently claims? This certainly does not happen in my conscious experience; I subjectively experience a color regardless of whether I subsequently ruminate about how it "seems" or whatever.

Indeed, I find that the kind of verbalizable abstractions Carruthers calls HOTs are anything but the basis of phenomenal consciousness. Rather, I would call them *afterthoughts*, as they are in effect post hoc mental associations *evoked by* a conscious experience. Carruthers is (to borrow a Zen saying) mistaking the finger that points to the moon for the moon itself when he suggests that the abstract thoughts or verbal labels evoked by our subjective experiences are the *basis* of those experiences. In any case, consciousness *per se* must be more fundamental than HOTs, as such abstract thoughts are self-generated or "mental" *objects* of consciousness.

In another appeal to introspection, Carruthers (1998a, pp.3-4) states that focusing his attention on his experience of red leads him to pay close attention to what he calls "the quality of the world represented [i.e., redness] while being aware of it *as* represented." This doesn't happen for me; when I focus on my experience of red, I become engrossed in redness *per se* -- the thought of redness "as represented" does not come to mind. Redness, pain, tickles (to use Carruthers' examples) are indeed *qualia*, directly presented, phenomenally distinct experiences, whereas our abstract/verbal representations of them are mental associations or afterthoughts, hardly crucial for having the experiences themselves. The experiences are primary, whereas the abstractions are derivatives.

Carruthers has things reversed. Abstractions *come from* conscious experiences, not the other way around, as conscious experiences are the raw material for concept formation. Thus, for example, although a color-blind person readily acquires the card-sorting concepts of shape and number on the Wisconsin Card Sorting Test (a neuropsychological test assessing concept formation and abstracting ability), such an individual never acquires the sorting principle of color -- as I have observed in many administrations of this test. Clearly they fail to acquire the color concept because they do not *experience* the stimuli on the cards as differently colored.

On p.9 Carruthers (1998a) contemplates the notion that conscious perception of a surface as green might require a creature to generate the thought "I am perceiving a green surface." Again, I must object that I almost never do this when experiencing the greenness of things. Of course, when we *talk about* someone's experience, we must specify the "experiencer" so the listener may know who we are talking about, but there is no intrinsic reason why an *actual* experience (as opposed to one merely described) must necessarily include self-awareness. Indeed, the idea seems intuitively wrong because self-awareness is not commonly regarded as a particularly desirable state; a frequently given rationale for social consumption of alcohol, for example, is to *reduce* self-awareness (Hull, Young & Jouriles, 1986). In some meditative traditions, such as Zen, one of the goals of meditation is "to forget the self" -- not so that one may attain a state of unconsciousness, but rather in order to reach a "higher" state of consciousness which confers a more direct and vivid experience of life (Epstein, 1995). A similar sort of state is sometimes attained by non-meditators too in so-called "flow" experiences, when one becomes so completely engrossed in some activity that to become acutely self-aware would disrupt subjective involvement and interfere with performance. The absence of self-awareness clearly does not render us unconscious during such states of intense absorption.

The idea of an observing self, which, like many other basic concepts, has its origins in our early subjective experiences, can certainly be brought to mind when contemplating, say, the color red. But the conscious experience of redness does not *require* summoning the abstract thought of a self who is contemplating red. Moreover, consciousness per se cannot be reduced to any mere abstract thought, such as the concept of an observing self, because (again) both the subjective experience of reality and our reflective thoughts derived from our experiences (including self-concept) are all *objects* of consciousness. In any case, self-consciousness does not appear to be unique to humans anyway, as there are many indications of at least rudimentary self-knowledge in most, if not all, social mammals -- manifested in, for example, behaviors consistent with an animal's knowledge of its rank or status in the group, or a dog's obsession with distinguishing its own scent markings from those of other dogs. Self-awareness thus probably cannot render humans uniquely sentient even if this criterion were valid -- and I can find no reason to regard it as such.

Carruthers subsequently seems to suggest (1998a, p.9) that only creatures who can entertain the "inverted spectra" hypothesis are conscious! I've encountered a few people who could not comprehend the "inverted spectra" idea no matter how many times or how

carefully it was explained to them, yet I have no reason to think that such persons were unconscious. Even those persons who would normally be capable of comprehending the "inverted spectra" hypothesis can be rendered temporarily incapable of this by alcohol, yet still retain conscious awareness. More importantly, although we humans are probably unique (as far as we know) in terms of the extent of our ability to generate higher-order abstractions and speculative philosophical arguments such as the "inverted spectra" idea, such HOTs are often less persuasive to us than raw, immediate sensory experience. If Carruthers were suffering agonizing pain, for example, I doubt he would be thinking "I am having an experience of pain, and it is possible that this experience might be perceived as pleasure by someone else." Indeed, if the pain were great enough, his behavior would probably consist of much screaming and agitation, which would preclude even the *possibility* of HOTs about inverted spectra! But would a screaming, agitated Carruthers, whose capacity for HOTs is subdued by pain, necessarily be an unconscious Carruthers? We have no reason to think so; on the contrary, it would make more sense to say he is *too* conscious of the pain in such a case, that is, his subjective state is entirely given over to the sensation of pain.

Carruthers presents several examples of what he calls "non-conscious experiences," including "absent-minded driving" (1998a, p.6). Aside from the semantic issue of how one could have an *experience* that is non-conscious (and the related question of whether non-conscious entities such as rocks can be meaningfully said to have "experiences"), Carruthers here makes the mistake of assuming that just because a person lacks memory for a recent event, the person must therefore have not been conscious of the event in the first place. For a dramatic demonstration of the falsity of this assumption, I would refer the reader to a well-known film (WNET, 1988) which shows an unfortunate patient who had suffered bilateral destruction of the hippocampus (a brain region responsible for establishing new declarative memories). This patient is seen repeatedly insisting that *he has just become conscious for the very first time*. When confronted with his diary -- in which he had written a great many entries since his brain injury -- he at first denies having written any of the entries, but after recognising his own handwriting he concludes that he must have written them in an unconscious state ("unconscious writing"). Yet in the film, the patient clearly appears just as conscious when writing in his diary as when he subsequently denies having been conscious during that time. Lack of memory of a recent event thus does not necessarily mean there was no conscious awareness of the event when it occurred; rather, the short-term memory of the consciously experienced event may simply have not been encoded into a long-term form, hence it is unavailable to the subject later on. <2>

In the case of "absent-minded driving", many of the relatively mundane events one routinely encounters in everyday driving experiences (such as a particular traffic light being red or green) are simply not encoded by the memory processes into a readily accessible or enduring form, most likely because such events do not have any particular long-term significance. The absence of enduring memory for such events can lead to the illusory retrospective impression that one has somehow been driving "unconsciously". Many of our routine, unexceptional, everyday phenomenally conscious experiences are probably of this nature. But our lack of clear memory for many unremarkable daily

events certainly does not mean that we are only sporadically conscious throughout a typical waking day!

Carruthers also cites "the experiences which guide fast-reaction activity" (1998b, p.2) as non-conscious, but again I think he may be mistaken. Although it is true that the sort of internal verbal rumination which Carruthers apparently regards as essential for consciousness is often absent during periods of intense involvement in certain fast-reaction activities (such as playing sports or video games), this is probably because to generate such "subvocal speech" responses would divide attention and interfere with the timing of rapid sensorimotor responses, not because the subject is acutely unconscious. Indeed, it makes more sense to say the subject's conscious attention is wholly focused on *what they are doing* in such instances.

Carruthers also cites "blindsight" as another example of "non-conscious experience". In this case we observe fairly complex nonverbal responses to stimuli in the absence of verbal responses to the same stimuli. Dissociations between verbal and nonverbal behaviors are also observed in many other syndromes resulting from brain damage, including frontal lobe and split brain syndromes. Are such cases always best interpreted in terms of a conscious vs. non-conscious processing dimension? In the case of blindsight I don't know, but most researchers who have worked with split-brain patients, for example, do not regard the isolated nonverbal right hemisphere as non-conscious (E. Zaidel, personal communication). The fact that some nonverbal behaviors are inconsistent with the subject's verbalizations does not *necessarily* mean the former behaviors resulted from non-conscious processes, although this may sometimes be the case.

Carruthers (1998a, p.7) states that redness is phenomenally conscious only when presented to a cognitive system capable of distinguishing among its contents. The famous parrot Alex can accurately describe objects he has never seen before in terms of their color, shape and number -- in English! -- indicating that he has at least rudimentary concepts of such properties (Pepperberg, 1993). Yet Carruthers (1998a, 1998b) asserts that unless an organism has a "theory of mind" which includes the abstract concept of subjective experience, it cannot actually *have* a subjective experience. He presents a weak and unconvincing argument (p.9) that the HOT "subjective experience" is the basis of our ability to subjectively distinguish red from green. I find it extremely unlikely that most humans actually utilize the abstraction "subjective experience" when they make everyday distinctions between red and green; all that seems really necessary here is the ability to perceive the distinctive qualities of redness and greenness.

On p.11, Carruthers boldly claims "we lack any real grounds for believing that animals are capable of phenomenal consciousness." Of course, strictly speaking, this is also true for humans! But common sense and neuroscientific evidence together tell us that the converse is the case, as I have already shown above: that is, we lack any real grounds for believing that animals are anything other than they appear in this regard, and they appear to be phenomenally conscious. Carruthers suggests (p.12) that our "intuitive" belief that cats are conscious is due to our projecting our own subjective experience of, say, the

smell of cheese onto a cat when the cat sniffs cheese. But of course we do this to other humans too: this sort of "projection" is called *empathy*, as I've already described above. Thus, to paraphrase Carruthers: what are the "independent grounds" (p.11) for assuming that, when Carruthers sniffs cheese, such percepts will be phenomenally conscious ones? In fact, there are *no* such "independent grounds" for any of us, which is why there is a "hard problem" of consciousness. Carruthers awkwardly appeals to "perception, *simpliciter*" to describe the cat's cheese-sniffing behavior (but not his own), in contradistinction to "phenomenally-conscious" perception, invoking an earlier distinction (p.1) between consciousness *simpliciter* (i.e., being awake as opposed to asleep) and consciousness-as-subjectivity; but in fact "simpliciter" and "phenomenally conscious" perception cannot be objectively distinguished, as there is nothing in waking behavior *per se* -- no matter how complex -- that unambiguously signals the presence or absence of subjectivity, again raising that intractable "hard problem" of consciousness.

On p.11, Carruthers (1998a) again emphasizes that one must possess the abstract concept "subjective experience" before one can actually *have* a subjective experience. He describes two sets of children where one set (older) has this concept and the other (younger) set does not, concluding "*the world as experienced by the two sets of children will be the same, but the younger children will be blind to the existence and nature of their own experiences.*" If Carruthers were presented with these two sets of children, he might be able to identify which set exhibited an apparent understanding of the abstraction "subjective experience" and which set did not, but he would have no way of ascertaining whether either set had *subjectivity*; his hypothesis that subjectivity *per se* is present only in those possessing the concept "subjective experience" is inherently untestable. Children who lack this particular abstract concept may have an egocentric perspective (as children do) and lack knowledge about many aspects of their conscious experiences (and those of others), but that is no reason to suppose that they do not *have* conscious experiences. All of us at least occasionally have conscious experiences the nature of which we do not fully comprehend. Likewise, the younger children may indeed be blind to various aspects of the nature of their experiences, but not to the existence of them.

Carruthers suggests (1998a, pp.11-12) that non-human animals are incapable of making distinctions between appearances and reality. Unlike Carruthers' other speculations, this hypothesis is amenable to empirical investigation, and I doubt it is correct. For example, I have observed that some cats, in their first encounter with television images, show apparent intense interest in the images and then go behind the television in an apparent effort to find the "miniature" people or animals depicted -- only to quickly lose interest, subsequently showing no further investigative behavior in encounters with televisions. A straightforward interpretation of this behavior change is that they have determined there are no real entities present corresponding to the images on the screen.

On p.12, Carruthers states "consciousness breeds cognitive flexibility and improvement," but in reading the text it is evident he has confused "thinking about thinking" with consciousness *per se*, when the latter necessarily encompasses far more than the former (although I would certainly agree that "thinking about thinking" probably breeds cognitive flexibility and improvement). On the same page Carruthers undermines his

earlier arguments by acknowledging "the complexity of focal vision, which far outstrips any powers of description we might have." He notes that although (in his view) we can only consciously *think* one thing at a time, [3](#) we can consciously *experience* far more, contradicting his earlier arguments about the necessity of HOTs for conscious experiences. On pages 12-13 Carruthers (1998a) further contradicts his earlier assertions that HOTs are necessary for subjectivity by suggesting that perhaps only the *potential* to entertain such thoughts is necessary. But why should this be? He makes no supporting case here, which is surprising as it does not follow that an organism with only the *potential* for generating HOTs would be phenomenally conscious if the HOTs themselves are necessary for conscious experiences, as he had earlier argued.

Carruthers concludes that in order to be conscious the organism must possess "a system ... with its contents, *poised*, available for use by various theoretical and practical reasoning systems" (p.12). Carruthers has (again) failed to show how such a "poised" system could be conscious given his earlier arguments. He introduces the notion of "availability" almost as an afterthought, in order to avoid the redundant computational complexity required for an "actualist," as opposed to a "dispositionalist," version of HOT theory. Carruthers is then forced to conclude (p.13) that a percept is consciously experienced by virtue of its presence in short-term memory even in the absence of HOTs, again contradicting earlier assertions that HOTs are what render an experience conscious. Of course, all mammals clearly have short-term memory, hence by this reasoning they are all capable of phenomenal consciousness -- exactly the conclusion Carruthers so desperately wants to avoid.

In conclusion, Carruthers' speculations about the nature of phenomenal consciousness are deeply flawed in their reasoning and fly in the face of both empirical and introspective evidence. The notion that only humans are phenomenally conscious is reminiscent of a long tradition of theologically-motivated anthropocentric errors in which the Earth was regarded as the center and *raison d'etre* of a universe only a few thousand years old, where non-human animals were conjured up by a creator god specifically for human use, and man alone was endowed with a "soul" or consciousness. Some may *want* to believe that only humans are conscious, but the veracity of such speculations can never be determined; I could just as easily assert that only I am conscious and no one could disprove it. Nevertheless, given the many basic behavioral dispositions and physiological features each of us shares in common with other humans and with many non-human animals (and which make us obviously different from truly non-conscious entities such as rocks, trees, hurricanes, volcanoes, etc.), most of us have no reason to think that other humans and non-human mammals and birds (at least) are anything other than they appear in this regard, and they appear to be phenomenally conscious. One may take issue with the notion of "animal rights" for various reasons, but it is nonsense to deny the sentience of animals.

Notes

<1>Of course, such use of the term "anthropomorphism" presupposes an absolute distinction between humans and other animals. Using a different (post-Darwinian) set of assumptions, it could just as easily be said that when I attribute a subjective state such as pain or hunger to a non-human mammal, I am "mammalomorphizing" -- which is non-problematic.

<2>In normal sleep states, too, long-term memory encoding functions are (in this case temporarily) "off-line", such that most mental experiences during sleep (including most dreams) are not subsequently recalled -- except for those that were ongoing when awakening occurred (Van de Castle, 1971). The fact that even persons who claim they "never dream" will reliably report dreaming if they are awakened directly from REM sleep suggests that phenomenal consciousness is at least sporadically present during sleep states, but we subsequently fail to remember most of what we subjectively experienced (such as dreams) during those states.

<3>As an aside in regard to Carruthers' "thinking one thing at a time" idea, it occurs to me that although we can only *say one word* at a time, thinking in words -- subvocal speech -- is not the sum total of all conscious mental activity; nonverbal mentation (such as mental imagery) seems to be consciously employed in many kinds of tasks (e.g., Shepard & Metzler, 1971). In any case, I cannot see how any kind of abstract or higher-order mentation -- verbal or nonverbal -- could possibly be the basis of consciousness per se, as qualia are directly experienced prior to any derivative second-order thoughts.

References

Appel, J.B., White, F.J., & Holohean, A.M. (1982). Analyzing mechanisms of hallucinogenic drug action with drug discrimination procedures. *Neuroscience and Biobehavioral Reviews*, 6, 529-536.

Azar, B. (1997). Can your dog empathize with you? *APA Monitor*, 28 (11), 15.

Carruthers, P. (1998a). Natural theories of consciousness. *European Journal of Philosophy*, 6(2), 203-222.

Carruthers, P. (1998b). Animal subjectivity. *Psyche*, 4 (3).
<http://psyche.cs.monash.edu.au/v4/psyche-4-03-carruthers.html>

Chalmers, D.J. (1998). Facing up to the problem of consciousness (online essay).
<http://www.u.arizona.edu/~chalmers/papers/facing.html>

Dennett, D.C. (1998). *Brainchildren: Essays on designing minds*. Cambridge, MA: MIT.

Epstein, M. (1995). *Thoughts without a thinker: Psychotherapy from a Buddhist perspective*. New York: Basic Books.

Feldman, R.S., Meyer, J.S., & Quenzer, L.F. (1997). *Principles of neuropsychopharmacology*. Sunderland, MA: Sinauer.

Goldman-Rakic, P.S. (1995). Cellular basis of working memory. *Neuron*, *14*, 477-485.

Graziano, M.S.A., Yap, G.S., & Gross, C.G. (1994). Coding of visual space by premotor neurons. *Science*, *266*, 1054-1057.

Higley, J.D., & Linnoila, M. (1997). A nonhuman primate model of excessive alcohol intake: Personality and neurobiological parallels of Type I- and Type II-like alcoholism. In M. Galanter (Ed.), *Recent developments in alcoholism*, vol. 13 (pp.192-219). New York: Plenum Press.

Hull, J.G., Young, R.D., & Jouriles, E. (1986). Applications of the self-awareness model of alcohol consumption: Predicting patterns of use and abuse. *Journal of Personality and Social Psychology*, *51*, 790-796.

Miczek, K.A., DeBold, J.F., van Erp, A.M.M., & Tornatzky, W. (1997). Alcohol, GABA-A-benzodiazepine receptor complex, and aggression. In M. Galanter (Ed.), *Recent developments in alcoholism*, vol. 13. (pp. 139-171). New York: Plenum Press.

Pepperberg, I.M. (1993). Cognition and communication in an African Grey parrot (*Psittacus erithacus*): Studies on a nonhuman, nonprimate, nonmammalian subject. In H.L. Roitblat, L.M. Herman, & P.E. Nachtigall (Eds.), *Language and communication: Comparative perspectives* (pp.221-248). Hillsdale, NJ: Erlbaum.

Shepard, R.N., & Metzler, J. (1971). Mental rotation of three-dimensional objects. *Science*, *171*, 701-703.

Van de Castle, R.L. (1971). *The psychology of dreaming*. Morristown, NJ: General Learning Press.

WNET (1988). *The search for the mind*. New York: PBS Video.

Yudko, E., Blanchard, D.C., Henrie, J.A., & Blanchard, R.J. (1997). Emerging themes in preclinical research on alcohol and aggression. In M. Galanter (Ed.), *Recent developments in alcoholism*, vol. 13 (pp.124-138). New York: Plenum Press.