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Two Essays on Cognitive Science Subjects

for Books by

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Comprising:

“The Belief Machine and its Propensity to Dream Delusions of Gods”

for

***London Bridges: Essays on Collaboration* (2016)**

and

“*The Brain-Mind: Religion as a Product of Conceptual Awareness*”

A Foreword to

***Godbrain* (2018)**

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I: Essay

“The Belief Machine and its Propensity to Dream Delusions of Gods”

This essay, like the volume as a whole in which you find it, is the result of a refreshingly unconventional vision of acquiring and sharing knowledge that has become the fully realized dream of that indomitable dreamer and dream scientist, J. Allan Hobson. As this book is intended to illustrate, Professor Hobson’s vision of an egalitarian “university of the mind” operating outside the corridors of academic publishing politics is no mere pipe dream but an exhilarating waking reality. Allan’s idiosyncratic preference for fresh ideas over stale conventions is perfectly suited to the ease with which contemporary technologies allow us to communicate our inspirations to like (and better yet, *unlike*) minds while still hot enough to kindle further intellectual fires. This university is chartered solely by his indefatigable enthusiasm for learning as well as the inspiration he sparks with it in those lucky enough to fall within his ever-widening circle of colleagues and friends. It is an arena of thought open to all, without regard to what might be traditionally considered the requisite credentials or affiliations. My own inclusion in this book serves as an example of Allan’s facility to inspire people well outside his field and to embrace their own contributions (when worthwhile) despite any shortage of official credentials. As a professional art appraiser with amateur interest pursuits in the fields of music, literature, philosophy, and science, I myself lack the formal education

necessary to the professional scientific world in which Allan's careers as neuroscientist and psychiatrist had taken root and flourished. So, were it not for Allan's characteristic open-armed inclusiveness into this world of inquiry so beloved to him, the chapter you are about to read would have necessarily been written by someone else. But more on that later; in this essay I offer observations derived from my long-standing interest in the idea of religious faith as a type of virus to which the human brain is peculiarly, yet *understandably*, susceptible. You may well recognize in it a conspicuous debt to my deep friendship with Allan and the reciprocal free flow of ideas that has characterized it. That *is* the point here.

On a recent visit to Rome, while standing in front of Michelangelo's magnificent marble sculpture of the *Pietà* in St. Peter's Basilica, I was asked by a fellow tourist why this celebrated artistic relic was sequestered behind a thick plate of impenetrable glass. Upon explaining the incident of its significant damage in 1972 by a psychotic armed with a geologist's hammer and an erroneous notion of his own identity as the "real" Jesus Christ, my questioner responded in disgusted disbelief as to the height of depravity to which a mind can descend, especially concerning the ludicrous delusion under which this vandal labored of being himself the son of God. But I could not stop from wondering out loud to my outraged inquisitor just how different was the case of the man depicted *in the sculpture* who, after all, some two millennia earlier, fervently believed and proudly proclaimed *precisely the same thing about himself*, i.e., that *he* was the son of God. The followers of Jesus seem to have had little

trouble in accepting the factual truth of *his* preposterous assertion rather than question the man's sanity, yet a *contemporary* pretender to the same imaginary throne is, on the other hand, *obviously* bonkers. Of course, without religion, it would be impossible to distinguish the claims to truth of these two men. I contend in this essay that the mindset whereby one of them is seen as an incarnation of the creator of the universe and the other a mere garden-variety lunatic is but a natural byproduct of one of the evolved brain mechanisms that helped us to become the most resourceful species on our planet. I will attempt to distinguish the natural, necessary process of belief from its insidious mutation, religious faith.

The human brain is the most complex and expensive object in the known universe, the ongoing creation of a billion years of evolutionary tweaking that gradually refined the simplest of reflex mechanisms into the most sophisticated of navigational machines—an engine of belief and narrative-weaving so powerfully resourceful as to conceive its own authority and scrupulously confuse its dreaming with objective truth. What began as a simple reflex device, allowing our earliest ancestors to negotiate their environment, rudely but satisfactorily moving from danger toward sustenance, eventually evolved into an unimaginably complicated narrative machine capable of watching itself watch itself predict and change its future, as well as recreate its past.

But the very features of this magnificent apparatus that help its owners navigate the dangers, necessities, and pleasures of life to such a high-yield degree are those same ones that allow them in less

propitious circumstances to founder on the sand bar of fantasy. These beneficial attributes comprise the workings of the human brain mechanism we know as BELIEF, a sophisticated thought construct central to our human ability to weave narratives that help us acquire and share knowledge, practice rational, moral, social behavior, create art and, alas, *wallow in the murky depths of delusion*. For, while leaving us *constructively* vulnerable to the acceptance of new information about our world, belief also leaves our brains susceptible to its hijacking by highly contagious toxic ideas as well. The mental correlate in the human brain of an immune system to toxic ideas is easily compromised by the insidious pathogenic parasite of RELIGIOUS FAITH, a virulent mutation of belief that resembles a grotesque exaggeration of belief and works by closely imitating the antigens of reason until eluding its target host's defense mechanisms and gaining entrance to its ill-protected cache of fears and desires. Once there it is free to feed, relatively undisturbed by its occasional border skirmishes with knowledge, quietly converting the glucose of reason into the glycogen of complete and utter folly.

The continuous refinement over the eons of our ever-resourceful belief machine is driven by that elegantly simple yet indescribably fecund algorithm of reproduction, mutation, recombination, and selection we now know by the name of Evolution by Natural Selection. But this is a formula that yields such well-adapted products only because it harnesses the opportunities of chance—and this at the expense of waste—to continually test them against the pressures of environment. And since this powerful algorithm unfolds

by selecting for *reproductive success* rather than for more seductive concepts like perfection, beauty, reason, morality, or similar “end results,” the work in progress that is our brain remains an irrepressible generator not only of poetry and politics, but also of delirium and delusion. In other words, in the slow accrual of the heritable architecture that is our human brain, the useful benefits of belief have simply outweighed the deplorable liabilities of faith.

Now, the benefits are easy to see. Belief allows the privileging of selected data long enough for use toward refining our predictive model of the outside world and reducing its prediction error (known as *surprise*). Our brain has developed through its reliance on the mechanism of belief as a means toward efficiently favoring what works and discarding what doesn't while avoiding the fatally expensive waste of an exponentially expanding redundancy of data testing. In other words, the mechanism of belief invites such a machine to read not only what is out there in the world but also what *might* be there, allowing us to efficiently prune predictions while we feed them. In this process, the benefits from the imagination's tendency to see what might connect the dots and fill in the blanks appear to outweigh the liabilities of doing so. Hence, our ancestors were those who erred on the side of seeing something that wasn't there *but might have been*, like a dangerous beast of prey in the peripheral vision where happened to be standing merely a bolder, and *not* those less fortunate (and therefore less *propagative*) ones who *misinterpreted* the dangerous beast shape as a mere mound of harmless rock. An evolutionary byproduct of this art of *seeing what is*

not there if only because it might be is the equally human art of Magical Thinking, which may be most simply defined as the interpretation of coincidence as cause. It is a perversion of an inherited tendency of brain process elevated by culture to higher status than enjoyed by plain old delusion. And this type of thinking requires no dual-citizenship passport to visit the hocus-pocus world of religious faith, as it is easily smuggled back and forth across sanity's porous, shifting border clothed only in TABOO, that most impenetrable protective coating for a bad idea ever developed. You see, some ideas are just so dumb that their only chance of surviving reason's lamp in the transfer of their dull cargo to the dark corridors of another brain is the irrational threat of some irrelevant consequence in questioning it. Religion survives around the world in large measure thanks to the reason-resistant properties of this important protective coating, wherein euphemisms, such as "mysterious" (for "ridiculous") are felt, absurdly, to be appropriate under the circumstances.

Of course, all of this happens in the same three pounds of human flesh that made it possible to put a man on the moon. It is all, alas, a natural byproduct of thinking outside the container of mere veridicality. Evolution made possible the eventual development of a nervous system so immense, complex, and finely tuned as to achieve a continuum of narrative that anticipates its outside world, gathers sense data to map its findings of that world against its own model, and acts upon the world of which it is a part. This process, known by the variously understood catch-all term, *consciousness*, was traditionally conceived to operate only during what might be thought

of as the body's normal "business hours," those of wakefulness, and not during the time the brain was then thought to have been "turned off" during sleep. Of course, we now know that the brain is *never* "turned off," unless it has died, and that it is often as busy while asleep as it is when the rest of its body might be, say, sitting for the bar exam. What the scientific study of the sleeping and dreaming brain reveals however is the liberating fact that sleep dreams are *not* the "top-down" outcome of censorial intervention by some tutelary spirit exercising free will over the dumb flesh of its bodily machinery but rather the outcome of spontaneous regulatory neuronal firings and the collateral effect of these completed circuitries on various other circuitries. And the result, a fluid, reciprocally-interactive continuum of bodily brain process, known as "mind," may be seen to operate through the dovetailed pressures of both "top-down" *and* "bottom-up" mechanisms. Yet, no matter how much is learned in the lab about the material cause of this phenomenon we call "mind," obscurity is amply shed on the subject via a tendency of our brain to interpret this reciprocal-interaction dynamic ontologically as that of *spirit versus matter*. We in the western world are probably most familiar with the machinations of this tendency in the ghostly legacy of Cartesian dualism. Though long dead and buried among elite philosophers, the specter of this far-fetched use for the pineal gland continues to haunt the back halls of the thought structures of most of the living members of our species, spooking the scientific reason out of even professional practitioners of mental health and medical research, and thereby further complicating their reasonable diagnosis

and treatment of patients possessed of bodily brains not quite running smoothly. This insidious legacy of theological thinking, leaving its sticky ectoplasmic droppings in the machinery of even our most secular, scientific endeavors, may be seen as a historic failure of simple recognition: namely, seeing the mind for what it is: the *process* of the bodily object that is our brain while it is alive and working amid its environment. To see the mind as anything else, particularly anything actually *separable from* the brain as part of a physical body, cannot avoid the subliminal inclination toward a woefully unhelpful model—one that may be seen infiltrating the furthest reaches of our otherwise enlightened brain-minds, including those powering our scientific community. It ignores the truth of the nature/nurture relationship the brain *as body* enjoys with the brain *process* we call “mind.” And it also misrepresents what we like to call “free will,” a myopic concept that easily serves as the bespectacled poster-boy for the Cartesian ghost in anyone’s machine. Since we now know through brain imagining that our conscious impression of having decided to do something percolates into our conscious awareness only *after* the causal chain to achieve that end had already been set into motion elsewhere in our brain, we’ve come to see that truly “Free” Will ain’t what it used to be.

This tendency we have of seeing ourselves as ghosts at the controls of our machine-bodies, though it has its roots deep in our evolutionary physiology, is also in part the unfortunate cultural legacy of religion. The indoctrination of innocent young children with dangerous memes of slave-society authority worship and its

discontents by their well-meaning religiously obedient parents tends to have far-reaching consequences in the way the former put their brains to endeavors later on, even as apostate adults. This institutionalized insistence on preferring unseen, untested “truths” solely on the basis of authority rather than the reasoned contemplation of evidence can leave its mark on structures of thought difficult to distinguish from “wiring.” Such knots in our circuitry tend to result in subliminal validation, if not outright privileging, of the acceptance as *fact* of other unseen figments of the fecund creative imagination. The usual suspects include of course gods, prophets of gods, and their deplorable incarnation in politicians respectful of the rights and entitlements of prophets of gods.

And even the narratives we enjoy losing ourselves in among the arts, such as fiction, verse, visual arts, and music seem to be born of these same architectural features of the brain as are used to conjure up worshipful attitudes toward unseen authorities—though typically to more benign ends. That “willing suspension of disbelief” described by Coleridge in reference to the creative imagination and its apprehension appears after all to be less a quirk of human unreason than a necessary structural feature of the brain’s efficiency in delegating trust in veridical experience to only front-burner challenges rather than inefficiently duplicating its efforts at verisimilitude-testing at all levels. For example, my brain is wired to find it comfortable to accept the fact that a man named Leopold Bloom masturbated to the sight of an attractive young woman on the

strand in Dublin in the afternoon of June 16th, 1904—at least while I am engaged in reading, remembering, or discussing the novel *Ulysses*—all this *despite the fact* that I also know, *hopefully with at least slightly more certainty*, that this event did *not* transpire as described. But this capacity for belief in untested things is instrumental not only to my enjoyment of literature and other products of human imagination but also toward maintaining my propensity for exercising reason, especially as the latter depends so much upon the weighing of contrasting assets and liabilities observed to exist within the very same event, choice, response, etc. Contradicting the obsolete “blank slate” model of learning once thought to characterize our gathering of information, we now know that we come programmed in the library of our every cell with the wiring potential for expectations toward what we will find in our world and the ability to map our findings against these expectations. This efficient mechanism of suspended comparison is achieved amid the buoyant solution of memory. Belief seems, therefore, as *integral* to human consciousness as is memory. For example, we board an airplane with the reasonable trust that the vessel’s design, manufacture, maintenance, and operation is all consistent with the mutually-interactive relationship it will need to maintain with the unchangeable laws of physics, all of which conspiring to keep the plane in the air until it safely lands. This trust, which gradually becomes relegated to a less conscious awareness the more we fly (unless we are phobic about flying), may be seen as an excellent example of healthy, constructive belief. Our reasonable reliance on it helps us circumvent the inconvenience of pulling out

our computer to figure out our survival chances before boarding each plane, leaving us freer to concern ourselves with less redundant, more interesting, endeavors. But what if we have more than sufficient evidence in hand that the plane we are about to board *cannot* stay up in the air as long as it needs to in order to accomplish a successful flight. Let's suppose we can discern by eye alone and without dependence on a requisite knowledge of physics and engineering that the plane is obviously *unsound* for safe flight—say, perhaps because one of its wings is missing—yet are urged to board it anyways because a certain authority on astrology, palm reading, tea leaves, or the New Testament assures us of its guaranteed safety. (And let's assume for the sake of this argument that these same authorities have *no* authority on the subjects of aviation and physics.) Our only evidence of the appropriate safety of this vessel in this case would be the authority of, well, AUTHORITY itself, an entity that is impossible to test in such a case without taking one's life in danger. The only type of non-suicidal passenger who might willingly board such a plane without a gun to his or her back could only be one deeply deluded as to the true relationship of successful aviation and the laws of physics. Religious faith is sufficient for the accomplishment of such a delusion. In this case it is an unreasonable trust extorted by untestable authority from out our tested belief in the predictable consistency of the laws of physics. Therefore, unlike the more constructive phenomenon of belief described above, the corrupt cousin we know as religious faith represents a mutation into an unwarranted belief in something *in the face of the flagrantly ample*

evidence of its untruth. And as if this were not enough, this loss of reason is further granted the status of a *virtue* unattainable by its victim's more reasonable fellow creatures. This special virtue in the practice of unreason demonstrates a subservient submissiveness apparently attractive to the scribes of scripture (who, more typically than not had scribbled their gods' wishes during an iron-age slave culture that, not surprisingly, prized such submissiveness in their slaves). And this mindset necessary to religious faith comes so close to that necessary for the smooth operation of delusion, that it seems necessary here to ask whether it is any longer reasonable to continue to pretend that the former is anything more than a euphemism for the latter.

Yet religious faith is only one of the many hiccups to which our narrative machine is vulnerable because so well suited. For example, we are each one of us delirious during the night in our dreams. And if we are psychotic, such dreams are then not confined to our sleep but are found infiltrating our waking daytime consciousness as well. Hallucinations, too, can happen to healthy individuals, given the appropriate conditions. But each of these deviations from the smoothest route amid our brain's processes is made of the same stuff: completed circuits of neuronal firings. In other words, whether we believe ourselves to be directly experiencing a current physical event or whether we are reliving it in a night dream, day dream, or even pipe dream, we can never know *the thing itself* but only the experience of the translation of its readings into the language of our neuron circuitry—this via the electro-chemical grammar of charged

sodium and potassium ions crossing synaptic clefts. Memory seems to be the common denominator in this process, the one outcome of these connected neuronal firings in common with all experience, whether seemingly immediate, as in the so-called *remembered present*, or “relived” via the recombined recollections of day or night. But given the necessarily malleable nature of memory, it is highly vulnerable to change by the fingerprints of its each handling, resulting in potentially substantive transformation in its content with each (figurative) viewing and re-shelving. This being the case, any attempt to separate into concrete classification boundaries these different memory-driven tributaries of this ever-flowing river of brain process we call consciousness seems understandably doomed to ambiguity. Yet, traditionally the practice of psychiatry has preferred the convenience of categorization to the more challenging continuum model. For example, the current professional handbook for psychiatrists, *The Diagnostic and Statistical Manual of Mental Disorders* (or DSM), despite its prefatory claim to avoid considering each category of mental disorder as a “completely discrete entity with absolute boundaries,” nevertheless remains a categorical classification system of prototypes, one that tends to invite patients to come lie down on a particular chalk outline and see if they can be made to fit satisfactorily within it, thereby qualifying them for the requisite treatment, health insurance, or compassion.

Enter Allan Hobson, who has ever so stalwartly pioneered this intrinsically important concept of a continuum of conscious states in place of the more traditional predilection for our instinct for

compartmentalization. Beginning with the landmark Activation-Synthesis hypothesis of dreaming he devised with Robert McCarley (in the 1970s), and continuing with his update of the Reciprocal Interaction Model posited in that theory refined into the AIM Model of Sleeping, Dreaming and Waking Consciousness (in the '90s), and even more recently with his far-reaching Protoconsciousness theory (published 2009), Professor Hobson has continued to inspire colleagues and general readers alike to glimpse a more integrated picture of the continuum of consciousness that is the process of a working human brain. And just as Allan has eschewed the mythologies constituting Freud's Disguise-Censorship Model, and has likewise rejected as unscientific (because *untestable*) the latter's insistence on interpreting dream *content* rather than dream *process*, he has also refused to toe the traditional line separating consciousness into clearly outlined products of the brain rather than state-dependent positions along a fluidly modulated continuum. His long and distinguished careers in neuroscience and psychiatry reveal a consistency that fingerprints Allan as a true scientist in his yearning for nothing short of the whole picture as opposed to the transitory gratifications of savoring only the most acceptable passages. In short, Allan Hobson has been unafraid to consider the seemingly odd bedfellows of creativity, delirium, and delusion to be merely symptoms of the same affliction: *being human*. And it is this human character of Allan's scientific vision that brought a scientific layperson such as myself into the confidence of his beloved friendship. Allan's paradigm-shattering first opus, *The Dreaming*

Brain, left me forever changed upon first reading. But it was not until a few decades later that I got up the nerve to contact him and tell him so. I asked with unnecessary trepidation whether he might deign to read a poem I'd written on dreaming, inspired by his book. Of course he would and did. And characteristic of his open-armed disregard for credentials, invited me to write not only more such poems for him but also this very essay you've just read.

II: Foreword

The Brain-Mind: Religion as a Product of Conceptual Awareness

A mind is merely the fullest process of a working brain. It is no more than what the brain *does*. Kill the brain and you have permanently wiped out the mind. Poof! This is one side of the ultimate point of everything you will read in this book. The other side, however, of equal consequence to who we are as living minds, is the inescapable importance of the first-person *experience* of this material process of consciousness. It is the private, untranslatably subjective *isness* of experiencing this brain in operation that is the mind—the end result of a complex physical process that nevertheless remains stubbornly irreducible to those component parts of brain physiology that brought it into being. The main ambition of this book, therefore, is to recognize and appreciate *both* these aspects of a wholly physical process so that we may avoid succumbing to the seemingly instinctual desire to sacrifice one of them to the other in our attempt to understand *either*.

The philosophic position adopted toward our exploration in this book is something called “dual-aspect monism,” a way of seeing the world as being made solely of one substance—in this case of physical materiality—yet one in which we *observe* this physicality via two different properties of that same substance: the objective physical and the subjective mental. This “monist,” or one-substance approach, is in blatant contrast to the so-called “dualism” that has pervaded our

culture (and many others) for centuries, especially since its most emphatic framing by René Descartes in the mid-17th century. (Those who wish to go straight to the source should read “Meditation VI: Concerning the Existence of Material Things, and the Real Distinction between Mind and Body,” which is the sixth and last of the distinguished French philosopher’s famous *Meditations of First Philosophy*, published in 1641.)

But it is important to recognize that Descartes was a respectful practicing Catholic, and his understanding of the world was, understandably, powerfully informed and shaped by Christian notions of an immaterial substance capable, somehow, of surviving the death of the physical body and taking with it into a more ethereal, eternal life all the best features of the body’s experience it had acquired while living.

Not enough was understood about the physiology of the brain in Descartes’ day to predict the rather sobering fact that in the mere probing or cutting of a live brain we can causally and necessarily change the thoughts, feelings, and “personality” in this seemingly intrinsic sense of self. And so, it would have been unlikely for him to predict just *which* “I” might leave my body for that other world that is imagined by Christianity. Would it be that of my present state of brain physiology or rather the one found at the precise moment of my death, by which time I might have suffered the unintentional disabilities of brain lesions, tumors, trauma, viruses or other changes to the mere flesh of my being? Because such a scientific perspective was not available to Descartes when he formulated his system known

as “substance dualism,” he ended up resorting to envisioning a system based on the practical convenience of ignoring how the brain actually created these thoughts, feelings, emotions, and various conscious states that comprise that same sense of “I” with which my body and its processes are identified.

Of course, the most important thing that must be overlooked in order for such a philosophic system to retain its necessary sense of coherence is, unfortunately that very physical environment in which each thought is actually made. I refer to the chemistry, biology, physics, physiology, systems organization, etc., underlying, in strict adherence to the reciprocal interaction of these various laws, the very process on which conscious thought supervenes. For, we now know, unequivocally, that a thought is the outcome of a complex physical process involving the precise characteristics of, and relationships between, such various physical entities as nerves, neurotransmitter chemicals, electric impulses, and an elaborate organization of all this signaling into a meaningful system informed by both “bottom-up” and “top-down” processes. In other words, each thought is the necessary product of the physical environment of a brain in the context of a body in its world.

To take this end product we call a thought and remove it to a less sustaining environment, such as thin air, which we now know to be entirely devoid of neurons, neurotransmitters, and all the rest would involve ignoring *a lot* of essentials. Such an unlikely event can be envisioned only if we imagine the mind to be something *other than* what the brain *does*—perhaps some magical entity that lives,

curiously, independent of all nourishment, like some ghost—one that is typically envisioned in the driver's seat of all this bodily machinery. Critics of this rather short-sighted view often refer to it as, among other things, "the ghost in the machine."

The problem is that even now that we have uncovered such overwhelming evidence of the direct and inescapable relationship between the physical workings of the brain and all the features of consciousness created by it, most of us still find ourselves comfortable with thoughts informed, at least to some degree, by this unfortunate legacy of what is now called "Cartesian Dualism" (i.e., the [substance] dualism theory of Descartes). Yes, it seems as if this dualistic thinking, wherein an incorporeal spirit directs mechanical processes from a cockpit-like home theater in the brain, seems not only congenial to the very architecture of our brain but even difficult to escape. Indeed, it still informs much of our public policy touching on important aspects of our wellbeing—this despite its *complete* irrelevance to how things really work.

And this legacy is kept alive in large measure in the powerful wake of religious dogma, where scientific truths are obliged to take a back seat to that unproved authority of a purely speculative supreme intelligence presumed to have been the author of it all. Never mind the inconvenient additional fact that this supreme intelligence itself lacks, like thin air, the requisite biological environment necessary for producing thought, supremely intelligent or otherwise. In other words, religious thinking itself helps keep the conceptual incoherence of substance dualism alive and well.

Now, returning to that crucial question of the complex environment necessary to sustain thought, it is worth observing that we humans spend an enormous amount of our time on earth making artifacts out of our thoughts toward the convenient storage, retrieval, revisiting, manipulation, and recommunication of these veritable instruction manuals for mental events. However, these artifacts we make are not thoughts, *per se*, any more than a drawing of, or a poem about, a tree is *really* a tree. Each time we open a book and peruse the symbols we find meaningfully ordered across its pages we are able to imitate in our own brain some reflection of this same state of organization that represents, again to varying degrees of precision, the thoughts of its author. But then, once we've closed the book and redirected our attention to unrelated business, it is safe to say those thoughts are no longer living entities, at least not until we have again endeavored to configure our brain circuitry sufficiently to recreate the live event of such a thought. Otherwise, these symbols remain mere recipes, as yet unrealized, for recreating that specific neural event.

But this modern understanding of the physical relationship of body and thought was most presciently gleaned from within the rigorous argument of a philosophical system developed within only a generation or so of Descartes' death—this despite the still-lacking physiological knowledge that would have helped demonstrate how this relationship might work. This was achieved by a remarkable maverick of thought whose daring lack of deference to the dictates of religious dogma, to which Descartes had been so closely bound, was

considered heretical and dangerous by his contemporaries. I refer to the rationalist metaphysical system conceived by Benedict de Spinoza, a Dutch philosopher of Sephardic Portuguese ancestry. Spinoza's magnum opus, entitled *Ethica, ordine geometrico demonstrata* (*Ethics, Demonstrated in Geometrical Order*) was published posthumously in 1677, the product of a rigorous Euclidian geometric argument of propositions and corollaries painstakingly derived from definitions and axioms. In the course of his audaciously independent metaphysical system, Spinoza was able to methodologically reject the whole substrate of Descartes' system that had alienated mind from body as well as God from God's creation. Spinoza achieved this thorough-going critique, not only of Descartes but also of nothing short of the entire Judeo-Christian understanding of man's place in God's world, all via an intrinsically pantheistic notion of God's immanence in the world, one in which God is defined *as* the natural world and not some transcendent entity manipulating it from outside.

Using the term *Deus sive Natura* (God or Nature), Spinoza identifies God as the very process of nature itself, the aggregate of physical laws and matter that comprise the universe, an entity he bravely envisioned to be wholly devoid of anthropomorphized qualities. This was not a God as judge, or authority figure, or even friend. Man could not expect his love returned, or favors bought, from such a God any more than one might behave as servile supplicant before the laws of physics or chemistry.

So, in place of the inevitably problematic separation of mind from body, as well as God from world, that remains Descartes' most pernicious legacy, Spinoza offered a single metaphysical substance of materiality admitting in turn infinite "attributes" (or properties of ontological correlation) comprising the whole of nature, which he calls "God," a totality that is perceptible to man through only two of these attributes: namely, material things and thought. This, Spinoza's vision, is, essentially, the metaphysical view now known as dual-aspect monism. And it is through the majestically elegant consistency sustained in such a view that we today can approach the brain-mind problem with the perspective in which brain and mind are given equal respect and, as such, no longer *necessarily* a problem. But just as importantly, it is a view that ultimately aspires to reconcile atheist and believer through a world in which *both* are automatically and necessarily correct.

As viewed by Spinoza, the brain has conceived, finally, of a God that is essentially itself, one with its world and the creative forces of that world and, perhaps most importantly, a futile target of our demeaning servile obsequies. For, Spinoza's God is an objective *process*, intrinsically neither good nor bad, and absolutely incapable of interfering in our lives or producing miracles—activities that would turn upon the inherent contradiction of its very own laws. Hence, there is no need any longer for man to prostrate himself in fearful, superstitious worship of that totality to which he intrinsically belongs. Worship is irrelevant now, though understanding is not. Furthermore, Spinoza found the notion of belief in an afterlife of an

immortal soul to be absurd, suggesting that our proper focus is not on what happens *after* death, but rather *before* it.

Together with Karl Friston, Allan Hobson has applied the theory of dual-aspect monism to sleep, dreams, *and* waking consciousness. Indeed, this book may be seen as an experimental attempt to utilize subjective experience as a way of testing this hypothesis. The bold effort is to regard subjective experience as awareness of brain function. This attempt is mounted against the fact that we are unaware of our brains and can only become aware of our brains by regarding our subjective experience as a brain function. The invitation to you, reader, is to examine your own subjective experience in terms of the theory and data presented here.

Now, regardless of the serenity to be found in the wisdom of such a metaphysical system, belief in an afterlife is a perfectly understandable outcome of our inherited instinct to cling on to life at any cost. But being understandable doesn't make it rational. Religious dogma (with only a few arguable exceptions worldwide) aspires to clothe the delusionary irrationality of this notion—that of a soul surviving a body—by conveniently disregarding what learned through careful scientific inquiry about the actual workings of our world. In fact, religious sensibility has evolved in us in such a way as to protect itself against the inconvenient truths unveiled by science with enormously successful protective mechanisms. Principal among these is the apparatus of dogma, a contrivance of “black box” authority wherein the mystery of nature's complexity elicits from us the attribution of some special moral virtue to those minds willing to

ignore facts and trust intuitions. And where this proves insufficient, the biggest gun of all is then wheeled out: that of blasphemy taboo, wherein it is not only virtuous to believe flapdoodle in the face of persuasive evidence to the contrary, but it is outright immoral and, worse yet, *eminently punishable*, to do otherwise!

Religion has attempted in recent centuries to set a place for itself at the banquet table of science and to enjoy, for free, the fruits of all the painstaking open-minded inquiry discussed there. But because religious thinking tests *its* truths not on the basis of observable evidence, as does science, but rather on that of the low-hanging fruit of “revealed” (meaning *self-proclaimed*) authority, religion has insisted on being placed *at the head of the table*, the only appropriate seat, really, from where an imagined supreme intelligence might best oversee the very laws by which it is said itself to be conveniently unconstrained. So, despite the relative rarity of the superstitious among true scientists, those few anomalous representatives typically find room for their justification of clinging to the comforts of unearned authority via the convenient notion of God as a necessary foreman of all that has yet to be explained through open-minded inquiry. This sleight-of-thought maneuver provides sufficient room for the delusion of having it both ways: thinking scientifically while in the lab and irrationally all the rest of the time.

But though a life-long man of science, Allan Hobson is nevertheless keenly aware of the importance of other perspectives necessary toward living life to the fullest, such as those provided by creativity through the arts. It is obvious to him after a long lifetime of

scientific inquiry that the arts provide other important lenses through which to meaningfully explore the world around us and, most importantly perhaps, ourselves. For, although he clearly does *not* take seriously Keats's suggestion that pursuing the science of Newton's color spectrum threatens to unweave for us the poetry of rainbows, he does agree there's far more to experiencing a rainbow than can be measured by atmospheric optics.

And it is precisely this point that brings us to the other side of the main premise of this book: namely, that the evolved architecture of the human brain is quite naturally responsive to exploring our world through the disciplines of both scientific inquiry *and* poetic understanding (as made available to us through such expressions as literature, visual art, music and, yes, mythology) and that the insights into human behavior offered by our study of religion in particular is significant. The most salient difference provided by the perspective of Allan's approach in this book, as compared with that provided by most religious thinking, may be seen in the primacy of the human brain in his hierarchy.

Yes, Allan argues, perhaps not surprisingly, that among the great achievements of the human brain is its creation of God. Indeed, the hosts of gods it has created worldwide over the past several thousand years speaks eloquently to the sophistication of the brain's creative force, given the huge impact these magnificent creations have had on the ways we've learned to live with one another amid the frightening mysteries of our world. He agrees with Sam Harris that science *can* meaningfully explore the deepest questions of human values and that

these fields of inquiry are *not*, therefore, the necessary domain of religion. But this is not to say that he has no respect for the creative achievements of religion or in the vast cultural heritage that remains its most lasting legacy. Indeed, Allan believes we are the richer for these most unscientific modes of interpreting our world—provided, that is, they are not assigned privilege over the truths learned by science. That there is room in our brain for both is clearly evidenced by the inescapable fact that our brain has conceived of and developed both. *Godbrain*, therefore, is an attempt to appreciate the creative powers of the human brain one important step further than even those recognized through the study of the arts and sciences—namely, the creation of God.

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Two Essays on Cognitive Science Subjects

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