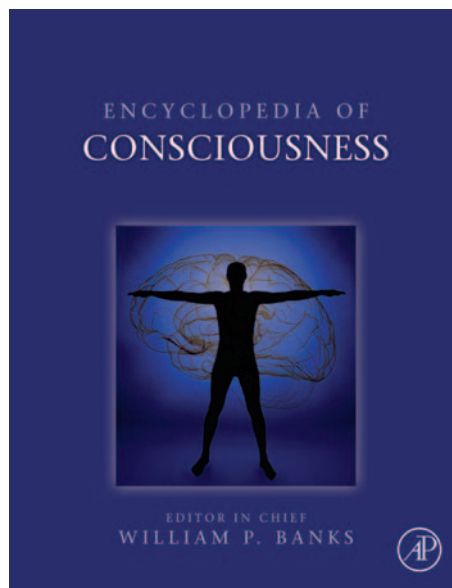


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William James on the Mind and Its Fringes

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Glossary

Automaticity, habit – The tendency of practiced, predictable events to fade from consciousness after repetition, including voluntary actions, concepts, mental images, and attentional routines. Automatic processes tend to be specialized, take up little conscious capacity, and may resist voluntary control.

Behaviorism – An influential physicalistic philosophy of psychology, some forms of which deny the existence or functional role of consciousness.

Conscious experiences, focal – Experiences like sensory perception, visual imagery, inner speech, visualizable action plans, etc., which tend to have sensory features like color, texture, taste, object identity, and the like.

Conscious experiences, fringe – Experiences that lack specific, sensory qualities, like the tip-of-the-tongue state (the intention to seek a missing word), feelings of knowing, familiarity, and plausibility, intuitive judgments, specific intentions to act, expectations, relational terms in grammar, logic and reasoning, abstract meanings, emotional connotations, and numerous other conscious or quasi-conscious events that can be reported with high accuracy but low sensory specificity.

Conscious experiences, operational definition of – While there is no agreed-upon theoretical definition of conscious experiences, in actual practice scientists have used “accurate verbal report” for several centuries with excellent reliability. This is a useful operational definition of a large range of conscious experiences, both sensory and endogenous (as in the case of conscious inner speech, visual imagery, and

episodic recall). All of sensory psychophysics is based on this straightforward method, going back to Newton’s discovery of the subjective color spectrum, which is highly reliable between subjects.

Hypnosis – A state of surprisingly high compliance with external suggestions, especially after a perceived induction procedure, which may be arbitrary or symbolic. Hypnotic suggests can influence sensory perception, the normal sense of voluntary control, emotions, imagery, pain perception, analgesia, and their known brain correlates. A high percentage of the normal population is considered to be “highly hypnotizable” as measured by standardized tasks. Such subjects seem to treat the hypnotist’s suggestions as highly credible, although they do not act in violation of their ordinary social norms. Hypnosis may involve an absorbed state with minimal self-examination.

Ideomotor theory – In William James and others, the notion that conscious goals are inherently impulsive, and tend to be carried out by default unless they are inhibited by other conscious thoughts or intentions.

Introspective reports – Reports about conscious experiences, which can range from highly reliable ones (such as psychophysical reports) to unreliable ones (such as mental images evoked by abstract concepts).

Introspectionism – A controversial term attributed by behavioristic historians to nineteenth century researchers on the topic of consciousness. Introspection was explicitly disavowed as a useful method by the most productive experimental psychologist of the nineteenth century, Wilhelm Wundt. Wundt criticized

introspection as unreliable, and rarely used it. However, Wundt's popular introduction to psychology used introspective examples, which may have misled many of his readers in English. Most of Wundt's extensive body of writing was never translated into English, leading to decades of highly misleading interpretation of Wundt as an "introspectionist." However, introspective method was utilized by the Wuertzburg School and by Edward Titchener, who were strongly criticized for that by Wundt.

Stream of consciousness – The apparently unpredictable moment-to-moment contents and discontinuities of spontaneous conscious thinking. William James popularized the "stream of consciousness" metaphor, and also the bird flight analogy of "flights" and "perches" in the flow of conscious experiences.

"Psychology," William James wrote in 1890, "is the description and explanation of states of consciousness, such as sensations, desires, emotions, cognitions, reasonings, decisions, volitions, and the like."

That was the broad consensus during most of Western and Asian history, and during the century of scientific studies summarized in James' *Principles of Psychology* (1890).

The period from 1780 to 1910 was arguably the Golden Age of consciousness science, simply filled with discoveries about sensory experiences, mental and neurological disorders, hypnotic suggestion, visual imagery, voluntary control and its loss, and much more. James' *Principles* offers 1400 pages of inspired writing on the major questions of human psychology. Building on mostly European studies, it has given us classic descriptions of the stream of conscious thought, selective attention, mental imagery, hypnosis, multiple personality, habit, effortful concentration, the basic arguments for and against unconscious processes, a theory of voluntary control and its disorders, the crucial distinction between self-as-subject and self-as-agent, and much more. On many of these topics James' thinking is fully up to date, and it is embarrassing that much of the time he is still ahead of the scientific curve today.

One of the wonderful things about James' *Principles* is his open embrace of the whole range of human experiences. He has the rare gift of letting go of his own biases for a while to let the phenomena shine. That, plus his extraordinary ability to describe and analyze subtle aspects of our experiences makes him more than a man obsessed with philosophical disputes. That is why scientists find themselves revisiting James on topics like selective attention, the stream of consciousness, the remarkable range of fringe experiences, and much more.

James attributed his penchant for observation to Luis Agassiz, one of the great naturalists of the nineteenth century, with whom he traveled on an expedition to the Amazon. Like Charles Darwin, Agassiz was a passionate observer of flora and fauna, a great collector, endlessly seeking the patterns in living things. For example, Agassiz is credited with discovering the geological evidence for the Ice Ages, a remarkable feat of naturalistic observation. From Agassiz, James learned the vital habit of trying to free one's mind from prior beliefs, for, in biology as in psychology, preconceptions undermine our ability to see. This habit was sometimes called 'botanism,' the passionate observation, collection, and classification of plants and animals for their own sake. James' *Principles* 'botanized' the psychology of the nineteenth century. As a compendium of psychological facts and ideas the *Principles* has not been surpassed.

James despised obstacles to free inquiry and pursued his interest in the mind everywhere, through hypnosis, nitrous oxide intoxication, accounts of religious experiences, his reluctance to get out of bed on a cold morning, the tip-of-the-tongue state, psychic claims, and clinical accounts of multiple personality syndromes. He was rarely a true believer or a rigid skeptic, but always an explorer.

Fringe Consciousness

By far the bulk of James' *Principles* is devoted to the same empirical phenomena we study today. Only a few out of some thirty chapters of that work were philosophical, but those few chapters have received far more attention than

James' empirical side. Philosophers have done a better job in appreciating William James than have scientists, in general, though he was at least as much an empiricist as a metaphysician.

Fringe-conscious experiences provide an excellent example of the empirical James. Intuitively we tend to think of conscious experiences as clear, percept-like, reportable events that stand out well as figure from ground. Those are the most commonly studied cases. But a large part of our mental life is occupied with 'fringe' events, which are experienced as fuzzy or vague, but which have properties suggesting that something very precise is going on. They include feelings of knowing, of familiarity, of beauty and goodness, of mismatch, incongruity, or surprise. As James points out, the fringe also includes a great variety of judgments, expectations, intentions, abstractions, intuitions, and logical or grammatical relations (like 'if,' 'or,' and 'but'). Further, we seem to have accurate 'feelings of knowing' about potential conscious contents that are readily available, though they are not immediately conscious – our ability to retrieve words, our moods, potential actions, knowledge about others and ourselves, semantic memories, and much more.

Feelings of knowing have now been studied experimentally in considerable detail, and the evidence indicates that (1) they are often accurate; (2) they enjoy high confidence ratings; but (3) they do not involve detailed, structured experiences – unlike the sight of a coffee cup, where we can talk about shape, color, shading, texture, figure-ground contrast, clear temporal boundaries, and much else.

In addition, we now know of brain regions that seem to be activated by some fringe experiences. For example, the 'sense of mental effort' appears to evoke BOLD (fMRI) activity in the anterior cingulate and dorsolateral prefrontal cortex. These regions are known to be involved in expressed goals, and to be triggered by goal conflicts and barriers. These functional properties relate closely to the 'sense of mental effort.'

The most famous example of a fringe experience is the tip-of-the-tongue state – the tantalizing feeling of searching for an elusive word. At first it seems like a curiosity, but then begins to reveal deeper and deeper implications. James writes,

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

The tip-of-the-tongue state is a delayed intention to find a missing word, a mental state that lacks qualities like color, sound, or taste; it has no clear boundaries in space and time, and no contrast between figure and ground. All expectations and intentions seem to be like this. To show the power of such states we need only interrupt some dense flow of predictable experience, for example, a printed _____ like this one. Spontaneously we want to fill in a word that fits. We can see the same effect by interrupting a joke just before the punch line; clever musical composers continuously play with our expectations about songs. Expectations and intentional states like this govern all our activities. They are not images or perceptions. Yet such colorless mental events compete against other sensory events for access to our conscious mental sphere.

James thought that 'fringe' states comprise perhaps a third of our mental life. Some of us now believe that they shape all of our conscious experience, without exception. All human thought and action appear to be driven by expectations. The tip-of-the-tongue state provides a good case to study, because it draws out a colorless expectation over many seconds. We now have the first brain imaging studies of the tip-of-the-tongue state. It shows, as we might expect, that the state activates frontal cortex much more than the sensory regions of the back of the brain. That is presumably why it lacks sensory qualities.

'The fringe' is therefore a fine example of the way in which nineteenth century science went far beyond common sense in studying consciousness. Probably the most famous fringe event is the 'tip-of-the-tongue' experience, which has proven to be a rich and productive domain of experimental study. But the range of fringe or 'vague' conscious phenomena, as James described it, is far broader than is generally recognized. It has only barely been touched in contemporary science.

James Rejected the Unconscious

Toward the end of the nineteenth century scientific thinkers like Pierre Janet and Sigmund Freud began to infer unconscious processes quite freely, based on hypnotic suggestion, conversion hysteria, slips of the tongue, self-serving forgetfulness, and the like. Freud's ideas achieved unparalleled influence, so that the art and literature of the twentieth century is incomprehensible without them.

Unlike Freud, William James fiercely resisted the psychological unconscious. In a remarkable section called 'Refutation of alleged proofs of unconscious thoughts,' he considers the possibility of unconscious intelligence. In his characteristically fair-minded way, he provided ten basic arguments 'pro,' followed by arguments 'con.' The ten arguments pro are still some of the best we have.

The first real clash comes in the famous chapter on 'Habit,' where James considers how it is that, in learning a new skill like riding a bicycle, the conscious details of pedaling, steering, and balancing soon turn into the unconscious routines of expert cycling. We know today that the brain contains numerous unconscious networks that analyze and control such things as balance, eye movements, visual space, and the muscular control. Their existence can be inferred from vast amounts of psychological evidence, and today, with neuroimaging, we can actually see them at work in the brain. Unconscious habits seem to involve less cortical activity, and more subcortical mechanisms like the basal ganglia and cerebellum.

James stated the case for the notion that habits are unconscious:

...we do what originally required a chain of deliberately conscious perceptions and sensations. As the (habitual) actions still keep their intelligent character, intelligence must still preside over their execution. But since our consciousness seems all the while elsewhere engaged, such intelligence must consist of unconscious perceptions, inferences, and volitions.

But he could not tolerate unconscious intelligence. He wrote that,

Reply: There is more than one alternate explanation. . . One is that the perceptions and volitions in habitual actions may be performed consciously, only so quickly and inattentively that no memory remains. Another

is that the consciousness of these actions exists, but is split-off from the rest of the consciousness of the hemispheres. . . .

Habits may therefore reflect fast, hard-to-remember, or split-off conscious contents. Rapid conscious 'flashes' may in fact exist, and there may indeed be dissociated conscious contents, as we know from studies of hypnotic dissociation. So James' counterargument is by no means silly, but few scientists today rule out a major role for complex, unconscious intelligence.

Take another of James' arguments about the unconscious, drawn from biological instincts, like nest-building in birds.

Instincts, as pursuit of ends by appropriate means, are manifestations of intelligence; but as the ends are not foreseen (consciously), the intelligence must be unconscious.

But again,

Reply: . . .all the phenomena of instinct are actions of the nervous system, mechanically discharged by stimuli to the senses.

Unconscious processes are 'merely physical.' Crucially, James often resorts to a mind-body argument to rule out unconscious intelligence. In an age of computers, we no longer share James' intuitions that all intelligent processes must be conscious. But he was too much a child of his times to accept the shocking consequences of unconscious thought.

James and his contemporaries just could not imagine a high degree of unconscious intelligence. In their century, reason, purpose, and intelligence were believed to be the exclusive possession of consciousness. 'Unconscious intelligence' seemed a bizarre violation of common sense, as Helmholtz found out in the 1860s, when he suggested that the brain may come to unconscious conclusions about the visual world when direct information is missing. For example, each eye has a blind spot, about the size of a quarter at arm's length. There are simply no light receptor cells in the blind spot. But we almost never see it, because we 'fill in' the gap, based on surrounding colors and textures. This idea is perfectly plausible and is generally believed today. In the nineteenth century it was heresy, leading to furious protests until Helmholtz

felt compelled to withdraw the offending words 'unconscious conclusion' (unbewusste Schluss). The existence of unconscious processes in the visual brain was not fully accepted until the 1970s! Today many scientists believe that the brain makes innumerable inferences every second.

Thus in the nineteenth century unconscious events had to be attributed to the physical brain. But the brain was held to be incapable of logic; it was still a mechanical servant of lived experience. Ever since Aristotle, logic and rationality were believed to be the unique preserve of consciousness, the seat of reason. Sigmund Freud, who made the unconscious interesting to the public, never really believed that it could reason. Freud's unconscious is bereft of logic or consistency, always in romantic turmoil. It is the irrational 'cauldron of seething excitations,' the dark dungeon of contending passions. The idea of an intelligent unconscious began to make sense only very recently, driven by the new tangible reality of the logic-crunching computer.

When James tried to understand how unconscious habits could form from conscious origins he faced a forbidding paradox. On one side, accepting a brain basis for consciousness would go against his lifelong commitment to free will; on the other, he could not abandon his understanding of brain science. His solution was amazingly awkward: Novel actions had to originate in the nonphysical land of consciousness. As they became habits and faded from consciousness, they would somehow cross the great mind-body divide into the physical domain of the brain. Wrote James,

An acquired habit, from the physiological point of view, is nothing but a new pathway of discharge formed in the brain, by which certain incoming currents ever after tend to escape. . . . *the philosophy of habit is thus a chapter in physics rather than psychology.* (italics added)

James was not happy with this awkward dualism; he twisted and turned through all the alternatives, but could not escape contradiction, hemmed in by his own incompatible assumptions.

James and the Mind-Body Problem

This was the empirical James, who summed up the most important discoveries of the nineteenth century. But there is another James, the metaphysician.

This is the person who tried for a lifetime to solve the unending problem of free will. The metaphysical James came to the fore again in the last decades of his life. Unfortunately, James' metaphysics undermined his own scientific writing, and may have destroyed his high reputation among psychologists, who were trying to create a stable academic profession.

On metaphysics, James admitted that his thinking was not purely rational. We know from his history of suicidal despair and the need to believe in free will that there is a great undercurrent of emotion in his thinking. James never denied that. In an essay called *The Will to Believe*, he defended a belief in God even in the face of a lack of evidence.

We have the right to believe at our own risk any hypothesis that is live enough to tempt our will. . . . So if I accept the religious hypothesis because doing so makes me more happy than I would otherwise be, then I am rationally justified in my decision.

And in *Is Life Worth Living?* he wrote,

These, then, are my last words to you: Be not afraid of life. Believe that life is worth living, and your belief will help to create the fact.

Saving Free Will

Human beings are all mind-brain philosophers, whether we know it or not. Are you freely responsible for your actions? If you say so, you are claiming free-will mentalism. If you do not believe in free will, but think that all human experience is only a fictional gloss on the firing of neurons, physicalism is your game. And if, like most of humanity, you find yourself switching between mind and body explanations in everyday life, you are adopting dualism.

In any moment of the day we can slip subtly between two very different ways of thinking about ourselves. We appeal to a physical vocabulary to explain the effect of aspirin on headaches, but we switch to mind words whenever we want to claim credit or to assert our freedom from external control. Did I break my glasses? No, a book just fell on them. (Physical) But do I work hard to provide for my family? You bet, and I expect a little credit for it. (Mental) Children learn early on to excuse their

actions as uncontrollable accidents when they might be blamed for the results, but to take personal credit when they do something praiseworthy; this childhood pattern hardly changes for many of us until the end of life. When we get a little more sophisticated we learn to import physical causation into psychological events: I did the wrong thing, yes, but it was because of sleepiness, distraction, something came over me. This is of course the key defense in the courts when a defendant claims extenuating circumstances – Prozac, the failures of society, a history of abuse, or the Twinkie defense, a murderous rage said to result from eating too much sugar.

The language of the law is the language of free will, personal responsibility and just deserts. But the language of science is the language of simple physical causation. From this perspective a murderer has no more responsibility for killing his victim than a billiard ball has for a missed shot.

The Mind–Body Vortex Tends to Swallow All Else

The mind–body problem is still today the dominant obsession in the philosophy of mind. It asks how the physical world could possibly be reflected in our private experience; how our subjectively free intentions could emerge in physical action; and how all this could relate to the physical substrate of experience, the brain. Whenever scientists make significant advances – as in two centuries of findings about color perception – philosophers routinely tell us it is not good enough; we still do not know about real consciousness, which is now redefined to exclude the new discoveries. It looks an awful lot like a city-slicker trick that psychologists, simple country folk, fall for with astonishing regularity.

Twentieth century science made a great commitment to physicalism. The most extreme versions of physicalism deny private experience completely, aiming to explain all things exclusively by public observables – neurons, or stimuli and responses, or molecules. Behaviorism is a psychological version of this philosophy, as B.F. Skinner often said. So is the neural reductionism that is widely held by neurobiologists today. Francis Crick's hypothesis is that our experience of each

precious moment is fully explainable in terms of neurons in the brain. While this is a long-standing scientific hypothesis, it has an undeniable philosophical agenda.

However, mentalism is alive. The physics Nobelist Roger Penrose claims that consciousness can only be understood by way of quantum mechanics. Penrose argues for a modern mentalism, that reality is to be found in the 'quantum mind.' Physics seems to show a division between quantum phenomena and the visible world of objects, but quantum explanations are thought to be more fundamental. Penrose defines consciousness in terms of the direct apprehension of mathematical truths – exactly Plato's idea 24 centuries ago. The realm of consciousness – the quantum level – underlies visible reality. Those views make no contact with psychology or the brain, but they are sincerely held by some very intelligent scientists.

Each classical position on mind and body seems plausible at certain times and perverse at others. Each is seductive, and each seems to lead to paradox. Intuitively we all swing back and forth between the three classical positions, sometimes in a single sentence. Taking a 'physical' aspirin for a 'mental' headache is intellectually perplexing; being a physicalist and yet taking personal credit for one's own achievements – as if they were freely chosen – is equally inconsistent. Dualism avoids these contradictions at the price of its own unanswered puzzles: How could a mind relate to its brain? How do conscious intentions turn into the physical actions of the muscles? And how do physical sensations end up as conscious experiences?

The mind–body puzzle is not some artifact of Western thought. Each classical position appears early in Asia as well as Europe, starting in India and China and later in Japan and South East Asia. In the West, mentalism was first stated in writing by Plato in fourth century BCE. Athens. A few centuries earlier, it was articulated with great power by Gautama Buddha and the Vedanta philosophers in India, and by the early Taoists in China. All mystical philosophies are mentalistic – they claim, like Roger Penrose, that a transcendent reality underlies our everyday world. Asian philosophies acknowledge the physical world, but suggest that it results from an imperfect realization of one's own consciousness; at the bottom, reality is

mental. Another strand in Indian philosophy is called *dvaita*, or dualism, from the same root as 'dual.' Dualism, physicalism, and mentalism can be found in many parts of the world.

A lively philosophical cottage industry survives today on the mind–body problem. Philosophical thinking about consciousness is almost exclusively concerned with it, though thousands of other questions can be asked. Every novel has something to say about the varieties of human experience, but we dance around only one philosophical mulberry bush, and the dance never seems to change.

So far, no one has found a settled solution. After more than two millennia of written debate on the subject, arguments are as persistent as ever. Arthur Schopenhauer called it the 'World Knot' – unsolvable but also unavoidable. It is interesting that Schopenhauer's ideas were shaped by the Vedanta scriptures written more than 2000 years before, which had just been translated into Western languages in his time. Wilhelm Wundt, often called the founder of Western experimental psychology, was very much influenced by Schopenhauer, so that we can trace a direct line from the mind–body philosophers of the ancient Indian world to the beginnings of Western scientific psychology. The seductiveness of the World Knot is difficult to overstate. The *Encyclopedia of Philosophy* concludes that

The mind–body problem remains a source of acute discomfort for philosophers. . . . It may well be that the relation between mind and body is an ultimate, unique, and unanalyzable one. If so, philosophical wisdom consists in . . . accepting it as the anomaly it is.

Science Usually Evades Unresolved Philosophical Puzzles

Great philosophical controversies always arise with major scientific changes. When Copernicus and Newton argued that the sun could keep the earth in orbit, philosophers attacked them for proposing an obviously absurd idea: action at a distance. There were no giant rubber bands connecting the sun and the earth, or the earth and the moon. They just happened to stay connected because of an invisible thing called 'gravity.' But gravity could not be seen or touched. It was an imaginary theoretical idea. Newton had no answer, and we

still do not have one today. His response was to be purely pragmatic, saying '*non fingo hypothesis*' – I do not speculate – which was no answer at all.

Charles Darwin's evolutionary theory also evoked attacks from philosophical vitalists, like Henri Bergson, who argued for an invisible 'vital essence' in all living things. That may not seem a powerful argument in the age of biotechnology, but it convinced generations of philosophers that something was wrong with biological science. Biologists essentially ignored those attacks and went on studying the genetics of peas and fruit flies. Over many decades that paid off, and the philosophical arguments faded away.

Successful science does not wait for all philosophical questions to be solved. It is very pragmatic. One of its practical moves is to sidestep questions that cannot be resolved, and simply find a straightforward way to gather evidence. After 25 centuries of debate about mind versus body there is little doubt that scientists should not try to solve the metaphysical problem first – that effort has a long record of failure. They should simply collect evidence about human consciousness and try to understand it. We need to follow our empirical noses unburdened by metaphysical baggage. That is happening today. But William James could not make that choice. He was too deeply committed to his own need to believe in free will, which protected him from suicidal despair.

James Torn

Mind–body debates were one front in the long-running battle between science and religion in the nineteenth century. It took place in heated family arguments between parents and children around Victorian dinner tables, about ancient religious faiths and the new faith in Science and Progress. William James found himself squarely in the middle of this battle. He was a physician after all, trained in the physicalistic medicine of the nineteenth century; he was hired to teach brain anatomy at Harvard. Like other physicians of the time – Freud, Helmholtz, and Charcot – he learned to explain the mind's evolutions in terms of brain processes first of all.

But James was also a child of the transcendental tradition of Emerson and Thoreau, raised in a

family where religious and philosophical debate flourished. Henry James Sr. was an enthusiastic Swedenborgian mystic and close friend of Ralph Waldo Emerson. Henry Jr. became one of the foremost psychological novelists. Alice, their brilliant sister, spent a life of suffering and illness that was thought to have a psychological element. It is not surprising that William was torn between physical and mind-centered science; the perfect person, in fact, to symbolize psychology at the end of the nineteenth century.

James' Quest for Personal Meaning

James was a man blessed, and at times cursed, with an extravagance of talent. As his student wrote, "Brilliant, high-strung, dynamic, vivacious, resilient, unexpected, unconventional, picturesque – these are some of the terms that at once recur in recalling James." It was a widely shared judgment. He was that rare thinker who was also admired as a human being. From his Swedenborgian father, he first learned about metaphysics and religion; with his brother Henry, the novelist, and his sister Alice, he talked for years about everything that three brilliant young people of the nineteenth century could imagine. The family traveled to Europe and the children learned to speak French and German. William trained as a medical doctor and painter, studied with some of the foremost scholars in Europe, accompanied the naturalist Luis Agassiz on an expedition to the Amazon; and finally found a profession teaching at Harvard. In psychology, James' greatest achievement was *The Principles of Psychology* of 1890. It is still a bottomless well of ideas. A few years later he reduced it to a handier *Briefes Psychology*, which became the standard introductory text in America for the next 30 years.

James Sometimes Wandered Away from Standard Science

In the very next chapter, William James jumps off the edge of science as we know it. He begins with a warning:

The reader who found himself swamped with too much metaphysics in the last chapter will have a still worse time of it in this one, which is exclusively metaphysical.

It is an ominous sign, for here James is forced to adopt panpsychism, the idea that all matter must have some rudimentary consciousness. In a section titled 'Evolutionary psychology demands a mind-dust' we read,

If evolution is to work smoothly, consciousness in some shape must have been present at the very origin of things. . . .we find that the more clear-sighted evolutionary philosophers are beginning to posit it there. Each atom of the nebula, they suppose, must have had an aboriginal atom of consciousness linked with it; and, just as the material atoms have formed bodies and brains by massing themselves together, so the mental atoms. . . have fused into those larger consciousnesses which we know in ourselves and suppose to exist in our fellow-animals.

The trouble is that one could say the same thing about living matter – just fill in 'life' for 'consciousness.' Arguments for a life essence were common in James' day and well into the twentieth century, before biochemistry came of age. Almost no one believes them today. If we think of life as some indivisible essence it may seem right that it would exist to a tiny degree in every atom and molecule, but with a better understanding of carbon molecules this aura of reasonableness simply fades away. In just the same way, if we think of consciousness as some unanalyzable 'essence' we can make the beguiling leap of logic that everything must be conscious to some degree. But the more we learn about what neurons are doing to make conscious experience possible, the harder it is to believe in panpsychism. Consciousness is first of all a major biological adaptation.

Panpsychism is not testable today, and remains extrascientific. Science thrives on testable questions. By mixing good science with hotly debated metaphysics, James cast doubt on the very foundations of the new psychology.

By the end of the chapter James has rediscovered the soul.

Many readers have certainly been saying to themselves for the last few pages: 'Why on earth doesn't the poor man say the soul and be done with it?' . . . all the arguments (made here) are also arguments for (the soul). . . I confess, therefore, that to posit a soul influenced in some mysterious way by the brain-states and responding to them by conscious affections of its own, seems to me the line of least logical resistance. . .

And with a flourish he concluded:

nature in her unfathomable designs has mixed us of clay and flame, of brain and mind. . . the two things hang indubitably together and determine each other's being, but how or why, no mortal may ever know.

Summary and Conclusions

William James summarized an extraordinary century of discovery in the 1400 pages of his *Principles* of 1890. Almost all his empirical phenomena are still well-validated today. But he became ensnared in mind–body issues, which were not testable or solvable in his time. Because he was deeply involved in nineteenth century debates about free will and personal meaning, it was not possible for James to fully separate his role as an empiricist from his other identity as a metaphysician. As the most famous advocate of philosophical pragmatism, James is still well known in philosophy today. But in the sciences, his contributions were lost during the behaviorist era, and are poorly understood even today, because of retrospective misunderstandings of his many empirical observations about conscious functions. The role of fringe consciousness is one example of a first-rate

empirical discovery that has been well-validated by modern research, but which is still not widely understood as an entire separate category of mental life. Thus we still have a great deal to learn from James' *Principles* of 1890.

See also: Neuroscience of Volition and Action; Philosophical Accounts of Self-Awareness and Introspection; Self: Personal Identity; Self: The Unity of Self, Self-Consistency.

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Biographical Sketch



Bernard J. Baars is former senior research fellow in theoretical neurobiology at the Neurosciences Institute in San Diego (www.nsi.edu). His PhD is in cognitive psychology from UCLA. He is interested in human language, the brain basis of consciousness, volition, and a variety of related topics including the history of scientific studies of consciousness, and neuroethics. Baars pioneered a cognitive theory of consciousness called Global Workspace Theory, which is widely cited in scientific and philosophical sources. Together with William P. Banks, Baars has edited the journal *Consciousness and Cognition* for more than

fifteen years (from Academic Press/Elsevier). With Nicole M. Gage, Baars has written an introductory text for cognitive neuroscience, called *Cognition, Brain and Consciousness: An Introduction to Cognitive Neuroscience*. (Baars and Gage, Eds. San Diego; Elsevier/Academic Press, 2007). Baars was founding president of the Association for the Scientific Study of Consciousness and has an ongoing research collaboration for large-scale cognitive modeling with professor Stan Franklin (University of Memphis, Institute for Intelligent Systems).

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