Books

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REFLECTIONS ON JULIAN JAYNES'S THE ORIGIN OF CONSCIOUSNESS IN THE BREAKDOWN OF THE BICAMERAL MIND: An Essay Review

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ARISTOTLE DEFINED MAN as the living being who has "logos." This definition has become canonical in the statement that man is the "animal rational," a creature distinguished from all others by his capacity for thought. Although the word "logos" embodies the concept of thought, its primary meaning is language. (1) If Aristotle believed man's uniqueness lay in his ability to create language, Western philosophy did not consider this a central issue in its explorations of human awareness. Neither has language been a primary focus in psychology's old debate over the nature of consciousness. This may be changing, however, for Julian Jaynes, a psychologist with a strong philosophical bent, has drawn language into the center of the consciousness controversy with *The Origin of Consciousness in the Breakdown of the Bicameral Mind*. (2) In this beautifully written and carefully documented book, Jaynes suggests that man's uniqueness lies not only in his ability to create language but in the profound effect language has had on man. However, before considering this work, I want to try placing in perspective the issues with which it deals.

Our semantic heritage includes among its memorabilia of meanings a record of man's attempts to describe his experience of "being." For

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centuries theologians talked about the "soul" and philosophers pondered the nature of consciousness. Plato's concept of immaterial "ideas" as true reality blossomed into dualism with the Cartesian distinction between mind and matter. The roots of this dichotomy lay deep in man's tendency to mistake symbols for things. Abstract ideas become reified in their symbolic representations and words create an aura of certainty that obscures the elusiveness of certain concepts. When science began to consider the nature of self-perception, caution had to be exercised in the choice of terms used to describe "inner" reality.

In the late eighteen hundreds, psychology, heralded by William James as the "science of mind," (3) inherited from philosophy the problem of man's awareness of his awareness. As this new discipline struggled for respectability it adopted the predominantly mechanistic paradigm of the age and as a first order of business set about sharpening fuzzy concepts and discarding from its workshop linguistic tools which seemed inappropriate for prying out "final" answers. The elusive concept of "soul" was among the first semantic casualties of scientific scrutiny. James noted the explanatory inadequacy of this traditional religious term in one of his early essays, and the "associationist" school, strongly influenced by the logical positivists, created what was known as a "psychology without a soul". (4) But having adeptly disposed of the human soul, psychology was confronted with another slippery concept: consciousness. As students of the nervous system probed the mechanisms "thought" to underlie consciousness, they were as unable to explain consciousness as the philosophers who preceded them had been.

Toward the middle of our present century, the behaviorists, under the tutelage of John Watson, solved the problem of consciousness by ignoring it. In an effort to demonstrate their kinship to "hard" scientists, they emphasized only what was objective and measurable. This approach resulted in great success and led to the announcement by B. F. Skinner, today's leading proponent of behaviorism, that the concept of an "inner self," an "autonomous man," is being abolished. In his controversial book, *Beyond Freedom and Dignity*, (5) Skinner says the picture which emerges from a scientific analysis of man has consciousness reduced to a repertoire of behavior. (6)

Long before Skinner proclaimed the death of "dualism" and buried the cherished concepts of freedom and dignity beneath reams of data on reinforcement contingencies, the materialists in the field, with their tendency to account for everything on physical grounds, had been countered by men like Carl Gustav Jung who, in *Modern Man in Search of a Soul*, (7) argued persuasively for keeping the "psyche" in

psychology. Other influential works, some from outside the field, helped to keep the controversy burning. A distinguished palaeontologist, Pierre Teilhard de Chardin, in *The Phenomenon of Man*, (8) traced the story of life as a movement of consciousness veiled by morphology. He defined consciousness as every form of "interior perception" imaginable from the most rudimentary, in Archeozoic slime, to the human phenomenon of self-reflection. He used the word "consciousness" interchangeably with expressions such as "soul," "spirit," and "mind," all of which were seen as aspects of the "noosphere" moving inexorably toward the "super-consciousness" of its "omega point."

Teilhard de Chardin's teleological masterpiece was more theistic than scientific in its orientation and conclusions. Like most other books on consciousness, recently emerging from all quarters of the literary landscape, it is dismissed by the adherents of behaviorism because it harbors the enemy of inadequately defined terms. (9) Robert Ornstein, in his popular book, *The Psychology of Consciousness*, (10) has candidly noted that many of his readers may end up unsure and a bit confused about what consciousness is. The question, he says, is usually ruled out from scientific inquiry for it does not seem to be fully answerable in reasonable terms. It is like asking "What is God?" or "What is life?"

If one feels that the behaviorists, by refusing to consider what they have termed "mentalisms," have narrowed the range of their questions to the trivial and pinholed the perspectives from which legitimate problems can be approached (11); if one feels that somewhere there must be a more satisfying answer to the age-old question, "What is consciousness?", then perhaps a more radical approach to the problem is required—an approach that will at least provide a testable guess to stand on.

Gardner Murphy once observed that what psychology needed was more "outrageous" hypotheses. Julian Jaynes, in a breakthrough of bold conjectures, has provided just such an outrageous hypothesis. In fact, Jaynes's extraordinary thesis is much more than a hypothesis, for as he develops his ideas the reader begins to sense a theory of monumental dimensions unfolding. It is a theory that could alter our view of consciousness, revise our conception of the history of mankind, and lay bare the human dilemma in all its existential wonder.

Unaccompanied by Jaynes's arguments and evidence, a brief explanation of his thesis is inadequate. However, bearing the dangers of oversimplification in mind, we can say that Jaynes believes consciousness to be a relatively recent linguistic development which, in the Western world, made its appearance on the stage of history around

1000 B.C. Prior to that time, he contends, man's activities were largely dictated by auditory hallucinations which originated in the right hemisphere of the brain and were acted on by the left hemisphere; hence the term "bicameral" (as in two legislative chambers). Jaynes argues that the hallucinations of the right hemisphere, interpreted by the ancients as "voices of the gods," occurred in situations of decision-making stress and, like the instincts which guided us in the green forest of our past, they directed and reinforced responses that provided stability and enhanced the chances of success for nature's new experiment with symbol-making creatures. (12)

As Jaynes meticulously develops each of his ideas and buttresses them with scholarly citations, he audaciously ventures into neurophysiology, anthropology, classical literature, psychopathology, ancient history, general semantics, art and poetry. Stunned by these interdisciplinary incursions, some critics have accused him of sampling selectively, choosing only those bits of evidence that fit his theory. Though academics and specialists couched in the traditions of their long cultivated domains will not be easily persuaded by Jaynes's revolutionary views, his compelling arguments and impressive documentation raise new questions that will undoubtedly stir up dust in many fields. As well as being a maverick thinker, Jaynes has a genius for exposition. The clarity of his writing is never dimmed by its scholarly strictures. The book opens with lyrical prose, is laced throughout with grace and wit, and words its way to a final crescendo in a concluding chapter that is brilliantly perceptive and deeply moving.

Who is Julian Jaynes? And what possible support can be found for his radical views?

Jaynes is a lecturer in the history of psychology at Princeton. He studied philosophy and literature at Harvard and McGill and spent ten years as a research assistant at Yale. He never completed the formal requirements for the Ph.D., and is harshly critical of doctoral programs in which students are indoctrinated into the prejudices of their professors and given degrees for unoriginal research. The reason for his criticism may stem from the fact that he was once part of one of the major schools of behaviorism, where his interest in questions regarding the nature and origin of consciousness was not considered legitimate, and where he found text after text that attempted to hide such unwanted problems from the student's view. Undaunted by his training, he has continued to seek answers to questions regarding

> this world of unseen visions and heard silences, this unsubstantial country of the mind . . . A whole kingdom where each of us reigns reclusively

> alone . . . A hidden hermitage . . . An introcosm . . . This consciousness that is myself of selves, that is everything, and yet nothing at all—What is it? And where did it come from? And why?(13)

Unlike most other authors dealing with consciousness, Jaynes does not take this concept for granted. In an early chapter of his book he adroitly exposes what he considers to be the inadequacies of traditional concepts of consciousness and provides his readers with a detailed and comprehensive definition of his own.

There is nothing in consciousness that is not an analogue of something that was in behavior first, said John Locke in one of his essays. (14) Jaynes agrees. He contends that consciousness is the creation of an "analogue world" that parallels the behavioral world, even as the world of mathematics parallels the world of quantities of things. It is a metaphor-generated model of the world in which events are narrated within a dimension of "mind space." It is the invention of an analogue "I" and analogue "others" interacting in this analogue world of the mind. For Jaynes, consciousness is not an emergent property of brain function yet to be identified by neuro-scientists. It is instead a product of language development, an artifact of man's symbolic universe.

Ignoring Jaynes's definition of consciousness, some critics have attempted to discredit his theory by noting that recent experiments indicate chimpanzees can recognize their own images, and that reflecting surfaces, evidently used as mirrors, have been found among the artifacts of civilizations that Jaynes placed in his "unconscious" bicameral era. (15) However, by Jaynes's definition, consciousness is more than recognition and reaction to stimuli such as one's own reflection in a mirror. He even presents convincing arguments to show that consciousness is not necessary for such activities as learning, thinking, and problem-solving, all of which occur to varying degrees in nonhuman species of animals. He also points out that we live out a good part of our daily lives by habit, perceiving and performing automatically, like bicameral man, with little need for reflective consciousness.

But Jaynes's special and restricted definition of the term "consciousness" is often confusing. In everyday usage, lack of consciousness usually implies a total absence of mental function as opposed to a lack of self-reflectivity. We have to keep reminding ourselves that he is not equating consciousness with the waking brain. (16) A different title would have helped: *The Origin of Subjectivity . . .* or perhaps *The Origin of Introspection . . .* However, such titles would not have helped Jaynes make his point—a point of both agreement and difference with the behaviorist view that consciousness is nonexistent. The behaviorists have spent half a century running

countless numbers of rats through countless miles of mazes; when they say "consciousness does not exist," Jaynes gives them their due—for rats and other animals. But what Jaynes objects to is what Arthur Koestler calls the "ratomorphic" view of *man*. (17) For Jaynes, the human species is different. Man is unique. For him consciousness *does* exist. It is the very real heritage of a long history of language development. Hence the title of Jaynes's book.

If Jaynes is the first to suggest that consciousness is the symbol-based ability for subjectivity, he is certainly not the first to note the recency of man's capacity for self-reflection. The philosopher Ernst Cassirer states that the concept of "being" appears to belong to a relatively late period of language development and that the denotation of the "I" in the course of language-making had to be derived slowly and stepwise from concrete, purely sensory beginnings. (18) Cassirer says that the chasm between specific perceptions and general concepts is so great that it could have been bridged only by language itself preparing and inducing the process without man's conscious awareness. (19) Like Cassirer, Jaynes emphasizes the role of language as an organ of perception in the gradual increase of man's capacity for self-reflection. He believes consciousness is dependent on the ability to create metaphor. By metaphor he means the use of a word for one thing to describe another, because of some similarity that seems to exist between them or their relationships. The verb *to be*, he tells us, was generated by such a metaphor. It evolved from the Sanskrit *bhu*, "to grow." "Abstract words," he says, "are ancient coins whose concrete images in the busy give-and-take of talk have worn away with use".(20)

Susanne Langer notes in her discussion of language that all abstract words are probably "faded metaphors," and before the process of "fading" occurred, language could not render a situation without a demonstrative indication of it in present experience. (21) What Jaynes seems to be saying is that bicameral man, in his primitive stage of language development, did not have adequate symbolic referents to translate impinging sense data into subjective consciousness. Shackled by this dependence on the concrete, our bicameral forebears had yet to discover or consciously exploit the double level of metaphor. In the magic of make-believe, myth and reality were inextricably fused and would not emerge as distinctive features of mind in the Western world until the birth of philosophy, which interestingly enough occurred in the middle of the first millenium B.C.—well after the time Jaynes sets for the beginning of the breakdown of the bicameral mind.

Bicameral man, according to Jaynes, in addition to lacking a subjective consciousness, had a unique split in mental function similar to that exhibited by schizophrenics today. In his description of schizo-

phrenia and the auditory hallucinations that characterize this disorder, Jaynes notes that patients' descriptions of their "voices," which often utter authoritative commands, are similar to the descriptions of the "voices of the gods" that directed the activities in Homer's *Iliad*. Could it be, Jaynes asks, that the frequent references to "the voices of gods" that continually recur in the *Iliad* and other ancient writings were not, as is commonly thought, simply a poetic device used to enhance the narrative drama (a technique which, he notes, is out of keeping with the literal texture of these narratives)? Could it be that men of those times, like schizophrenics today, actually hallucinated the "divine voices" that directed their activities? Jaynes thinks they did.

The area of the brain he suggests is responsible for these auditory hallucinations is an area in the right hemisphere that corresponds to Wernicke's speech area in the left. Since its function is not known, it has been referred to as a "silent area." Jaynes notes that most important sensory and motor functions are represented in both cerebral hemsipheres. Speech, however, is limited in most of us to the left hemisphere of the brain. Jaynes contends that in bicameral man this served to free the right hemisphere for the activities of storing up admonitory experiences, processing information unconsciously, and then transmitting directives to the left hemisphere in the form of auditory hallucinations which the ancients perceived as "voices of the gods." As evidence, he cites the experiments of Wilder Penfield, a noted brain surgeon, who found that when he electrically stimulated this "silent area" during brain operations, his patients often had the sensation of hearing voices.(22)

Jaynes argues that bicameral man had a poorly developed sense of linear time and was incapable of reflecting on his past or contemplating his future. He supports this by noting the absence of any evidence for self-reflection and inner-direction in ancient theocratic societies. He believes that the activities of bicameral man were governed mostly by habit and that when novel situations occurred, for which habit would not suffice, auditory hallucinations provided direction. These hallucinations were probably initiated by decision-making stress, and their content reflected an unconscious processing of information that emerged in the remembered voices of deceased parents, tribal leaders, or kings. The effectiveness of the hallucinated words in governing bicameral activities resulted from their being perceived as commands of "gods."

Jaynes's attraction to this explanation may have been enhanced by his once having had an auditory hallucination (an experience described in his book). He cites studies which have shown that such hallucinations are not uncommon among normal people. Like Jaynes, a surprising number of non-psychotic individuals in the populations

studied recalled having had one or more auditory hallucinations. In most cases, the voices were perceived as originating from an external location and were convincingly real. Recently, a friend whose daughter had just died of leukemia told me that his teenage son was troubled because he "still heard his sister talking to him."(23) Jaynes argues that such hallucinations were common in the early history of civilization and that they provided the very roots of religious thought.

According to historians of antiquity, religion seems to have had its origin in the worship of the dead and the belief that the dead had become "gods" who continued to take part in human affairs.(24) If men of ancient times lacked the linguistic tools for memory and reflection, it seems unlikely that such practices as the veneration of ancestors would ever have originated without some powerful and tangible reminder of the deceased. Auditory hallucinations would certainly have provided such reminders.

Auditory hallucinations could also have influenced the ancients as they fashioned their stories of creation. Cassirer notes that in all mythical cosmogonies as far back as they can be traced, the "word" is a primary force in which all being and doing originate. In almost all great religions the "word" is venerated as the instrument of creation and "gods" were said to convey their commands in the spoken word. (25) "In the beginning was the Word, and the Word was with God, and the Word was God," writes Saint John of the Gospels.(26) What, asks Cassirer, gives the "word" this extraordinary religious character? The interlocking relationship between language and religion cannot be due to mere chance.(27) Certainly Jaynes's hypothesis provides a plausible explanation.

Though the idea of a society of unconscious men dependent on habit and auditory hallucinations for direction is conceivable, one would suspect that if bicameral man ever existed, he could be found today. Certainly people representative of various stages of man's history, from as far back as the stone age, have been identified and studied by anthropologists. Have no bicameral cultures been discovered? It is possible that when researchers begin to collect new kinds of data or look at old data in a new way, they may find tribes or societies that fit quite well within the Jaynesian concept of bicamerality. If not, perhaps it can be demonstrated that language-based consciousness developed throughout the world at a much more rapid rate than technological achievement.

The breakdown of the bicameral mind, Jaynes tells us, occurred when it no longer enhanced the group's survival potential. He suggests this happened rather suddenly, in the Mediterranean area, sometime after 1400 B.C.(28) At that time, Western civilizations were thrown into turmoil by the devastations resulting from a series of widespread

geological upheavals that produced volcanic outbursts and a sinking of Mediterranean land masses. The survivors of tidal waves and poisonous vapors from eruptions, such as occurred on the Minoan island of Thera, were suddenly refugees. As neighbor invaded neighbor there was anarchy and chaos and the "voices" of familiar "gods" were of little assistance in the social disruptions that occurred in these centuries. It was during this time, says Jaynes, that self-conscious actions and reflective judgment attained a new survival value. The future of the race was now in the hands of those who were able to think for themselves, a new man with cunning and the ability to employ deceit in treacherous situations unfamiliar to the more stable bicameral societies.

Even before the geological disasters occurred, Jaynes notes, the auditory authority of the "gods" had already begun to be eroded by the pressures of increased population, trade, and the success of writing during the second millenium B.C. Edmund Carpenter and Marshall McLuhan have pointed out that the binding power of the acoustic word, which even today is so strong in many preliterate cultures that the eye is subservient to the ear, was annulled by the magic of writing.(29) Jaynes notes that when the commands of "gods" or the directives of kings were incised into clay tablets or stone, they could be dealt with by man's own efforts or ignored in a way that the ubiquitous auditory hallucinations could not.

McLuhan, commenting on *The Origin of Consciousness in the Breakdown of the Bicameral Mind,* accuses Jaynes of failing to give adequate emphasis not only to the role writing played in the transition to consciousness, but also to the fact that phonetic literacy fosters the sense of lineal or sequential space and time. The advent of literacy, McLuhan claims, created an environment that gave dominance to the logical and visual left hemisphere.(30) Though Jaynes does note the "tremendous importance" of writing in the breakdown of the bicameral voices, he does not fully develop the interrelationship between writing and consciousness, nor does he discuss the role of phonetic literacy in the development of a new dimension of space and time, though he sees this development as important in the origin of consciousness.

Support for the bicameral hypothesis, Jaynes tells us, comes from man's earliest recorded literature, with its absence of subjectivity and its depiction of action and external events. He devotes a whole chapter to the *Iliad,* which he views as an excellent example of bicameral mentality. An astonishingly different mentality is found in the *Odyssey,* which Jaynes believes was written several centuries later. The Odyssean theme of homeless wanderings and enslavements, where the

"gods" are often superceded by human initiative and time acquires a new dimension, describes, according to Jaynes, the beginning of the bicameral breakdown. Odysseus seems to be the hero of a new consciousness, and the *Odyssey* can be read as the story of man's voyage to the self.

Literature in other cultures reflects a similar transition. In China, subjectivity blossoms with the teachings of Confucius, and in India the change from bicamerality is reflected in the differences between early Vedic literature, which was said to be dictated by the "gods," and the later and more subjective Upanishads. However, Jaynes believes that no literature records the birth pangs of consciousness at such length or with such fullness as the Judeo-Christian scriptures. He notes that Hebrew history, as recorded in the Old Testament, moves from bicameral prophets who proclaimed "thus spake the Lord" to the self-reflective contemplations found in books of later origin such as *Ecclesiastes*.

Jaynes finds evidence for bicamerality in early references to poetry in Greek literature, where the relationship between the poets and that special group of divinities known as the muses appears to be the same as the relationship between the oracles and the "gods" who were believed to speak through them. These trance oracles, who for centuries hallucinated their pronouncements for men of both high and low estate, appear to have been a bridge between individuals who could no longer hear the "voices" of their "gods" and the divine dictums they still desired. The wandering bards or poets also depended on trance hallucinations as they narrated past events in rhythmical metered verse. Their "inspired" stories were considered to be "divine speech" originating from the muses who were said to be the daughters of Mnemosyne, the female Titan whose name later became our word for memory. Even as late as Plato's time, poetry was referred to as "divine madness." Using a Jaynesian approach to view the mind's remarkable ability for unconscious processing of information, one might speculate that the insights and intuitions which underlie most creativity and discovery in both the arts and sciences are echoes of bicamerality, "divine dictums" no longer packaged in hallucinatory wrappings.(31)

The bicameral paradigm seems to throw light on a number of anomalies that have never quite resolved themselves in scientific theory. Jaynes devotes whole sections of his book to what he considers to be contemporary vestiges of bicamerality, such as modern day "spiritualist mediums," automatic writing, glossolalia, schizophrenia, and hypnosis. In hypnosis, for example, the subject's uncritical and illogical obedience to the commands and expectations of the hypnotist

is quite similar to the situation Jaynes claims to have existed between bicameral man and his "gods."

Jaynes marshals an impressive array of evidence to support the explanatory power of his bicameral paradigm for the whole contour of history as well. He tells us that the long trek from the oracles and prophets through centuries of superstitions and "isms," including the pilgrimage of science in its search for final answers, can all be viewed as attempts to regain the "divine" certainty which was lost when the "voices of the gods" fell silent and were supplanted by the privacy and aloneness of conscious introspection.

According to Jaynes, man is still undergoing his metamorphosis to self-awareness, and where the wings of consciousness will bear him is unsure. Unlike Teilhard de Chardin, Jaynes does not indulge in teleological speculations. He is content to trace the development of consciousness from the bicameral era to the present, where he abandons us at the growing edge of this great transition, to contemplate our destiny.

Some readers, seeking to confirm a more mystical concept of man, will undoubtedly be discomfited by the fact that Jaynes, in limiting consciousness to a symbolic internalization of behavior repertoires, seems to be only a step away from Skinner; and others, who are in search of a "soul," will be disturbed by the theological implications of bicamerality. However, Jaynes's work, while failing to flatter our vanity, demands our attention, as it cannot be faulted for fuzzy concepts or vague speculation. His ideas are presented with clarity and backed up with evidence. Though some critics have suggested that his book be read as "science fiction," the hypotheses it sets forth are framed with a specificity that makes possible their confirmation or refutation.

Karl Popper, a leading philosopher of science, contends that the demarcation criterion that distinguishes science from non- science is "falsifiability."(32) If this is so, Jaynes's theory is eminently scientific, for it is deliberately and precisely structured with the falsifiability or testability of each hypothesis in mind. For example, if archeological evidence can be found that indicates subjectivity existed prior to 1000 B.C., or if neurological studies demonstrate that schizophrenic hallucinations do not originate in the right hemisphere, then some of Jaynes's hypotheses will have to be revised.

Whatever the eventual outcome of investigations fostered by these bold conjectures, the heuristic nature of this outrageous theory will undoubtedly result in important new research. For this reason alone, Jaynes's linguistic theory of consciousness and the bicameral hypothesis can be considered significant contributions to man's age-old quest for answers to one of the greatest riddles of cosmology.

NOTES AND REFERENCES

1. Hans-Georg Gadamer, *Philosophical Hermeneutics* (Berkeley: University of California Press, 1976), pp. 59-62.
2. Julian Jaynes, *The Origin of Consciousness in the Breakdown of the Bicameral Mind* (Boston: Houghton Mifflin Company, 1977).
3. William James, *The Principles of Psychology* (1890), I, 1-8 (New York: Dover, 1950).
4. Ibid., p. 1-2.
5. B. F. Skinner, *Beyond Freedom and Dignity* (New York: Bantam/Vintage, 1971), Chapter 9, "What is Man?".
6. The explanatory power of the behaviorists' stimulus-response model was brought into question with the publication of *Plans and the Structure of Behavior* (New York: Henry Holt and Company, Inc., 1960). The authors, George Miller, Eugene Galanter, and Karl Pribram, who had all been in the behaviorist camp, where consciousness is either ignored or denied, initiated what has come to be known as the "cognitive revolution" by suggesting that purposive behavior is guided by a plan. Their work is considered one of the most important recent breakthroughs in the understanding of behavior.
7. Carl Gustav Jung, *Modern Man in Search of a Soul* (New York: Harcourt, Brace & World Inc., 1933).
8. Pierre Teilhard de Chardin, *The Phenomenon of Man* (New York: Harper & Row Publishers, 1959).
9. In their recent book, *The Self and its Brain* (New York: Springer International, 1977), Sir Karl Popper and Sir John Eccles argue that the self-conscious mind is an independent entity, and that the unity of conscious experience comes not from neurological synthesis but from the integrating character of the self-conscious mind. In their rejection of materialism, the authors revive the ancient mind-body conundrum, and in their dictum against reductionism there is a ring of nostalgia for the human soul. However, in their method of arguing for dualism, or "psychophysical interactionism," these eminent scholars do not attempt to define terms, for they believe every definition must make essential use of undefined terms and that meaning should not be allowed to dominate discussion as it so often does in contemporary philosophical writing. In their preface, the authors state that what they "are interested in is not the meaning of terms but the truth of theories; and this truth," they say, "is largely independent of the terminology used."
10. Robert E. Ornstein, *The Psychology of Consciousness* (San Francisco: W. H. Freeman and Company, 1972).
11. Thomas S. Kuhn, in *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962), notes that in "normal science" phenomena that do not fit into the paradigm are often not seen at all (p. 24). The paradigm is a criterion for choosing the questions that will be asked, the problems that will be admitted and those which will be rejected (p. 37).
12. For Jaynes's views regarding the evolution of language prior to the development of consciousness, see Julian Jaynes, "The Evolution of Language in the Late Pleistocene," *Annals of the New York Academy of Science,* 1976, Vol. 280, pp. 312-325.

13. Jaynes, *Origin*, p. 1.
14. John Locke, *An Essay Concerning the Understanding, Knowledge, Opinion and Assent* (Draft B), B. Rand ed. (Cambridge: Harvard University Press, 1951), II, pp. i-23.
15. Marcel Kinsbourne, "Bicameral Man and the Narcissan Conspiracy," *Contemporary Psychology*, November 1977, 22:11, pp. 801-802.
16. I am grateful to Dr. George Weller, a psychologist at New York's Montefiore Hospital, for pointing out the possibility of a neurological basis for self-recognition that is not linguistic. There are certain cases of brain damage (anosognosia) where the patient has lost use of limbs and is unable to recognize his dysfunctioning member as part of his own body. Even individuals who are blind may lack awareness of their loss of sight.
17. Arthur Koestler, *The Ghost in the Machine* (London: Hutchinson, 1967), pp. 15-18. At the same time, the attribution of consciousness to animals has been called an anthropomorphic fallacy. The debate over the issue of animal consciousness was recently revived with Donald R. Griffin's *The Question of Animal Awareness: Evolutionary Continuity of Mental Experiences* (New York: Rockefeller University Press, 1976). Griffin believes communication is the key to consciousness, and notes that many species of animals, from the honeybee to the chimpanzee, communicate in much finer grain messages than we give them credit for. According to Griffin, animals are conscious, and the difference between human awareness and animal awareness is quantitative, not qualitative.
18. Ernst Cassirer, *Language and Myth* (New York: Dover Publications Inc., 1946) pp. 74-76.
19. Ibid., p. 16.
20. Jaynes, *Origin*, p. 51.
21. Susanne K. Langer, *Philosophy in a New Key* (Cambridge: Harvard University Press, 1942), p. 140.
22. For an overview of Penfield's work, see R. Freedman and J. Morriss, *The Brains of Animals and Man* (New York: Holiday House, Inc., 1972), pp. 52-54, 114-116.
23. Eric Lindermann, in his study of acute grief, has noted the tendency for hallucinatory experiences among surviving family members of the deceased. See Lindermann's "Symptomatology and Management of Acute Grief," *American Journal of Psychiatry*, 101 (September 1944), pp. 141-148.
24. Fustel de Coulange, *The Ancient City* (New York: Doubleday/Anchor Books), translation by W. Small, 1873, Ch. 1.
25. Cassirer, pp. 44-62.
26. The Gospel According to Saint John, Chapter 1, verse 1, (King James Version).
27. Cassirer, p. 55.
28. Jaynes believes the advance to consciousness occurred quite late in some cultures outside of this area. He suggests that the Incas may have been a bicameral society at the time of their conquest by Pizarro. He provides evidence for this by noting the conquistadors reported that the Devil himself spoke to the Incas out of the mouths of their statues. The great ease with which the empire was conquered, Jaynes says, was perhaps due to the superiority consciousness gave its plunderers.

29. Edmund Carpenter and Marshall McLuhan, *Explorations in Communication* (Boston: Beacon Press, 1960), pp. 65, 69.
30. Marshall McLuhan, Review of *The Origin of Consciousness in The Breakdown of the Bicameral Mind,* available from Centre for Culture and Technology, University of Toronto, Canada, pp. 1, 3.
31. Jaynes points out that "the picture of a scientist sitting down with his problems and using conscious induction and deduction is as mythical as a unicorn." Einstein's greatest ideas came to him quite suddenly. He once told a friend that he had to be careful as he shaved each morning lest he cut himself with surprise at a new discovery. Michael Polanyi, a well known philosopher of science and a professor of physical chemistry, has emphasized the importance of "personal knowledge," derived from unconscious processing of information. "All the efforts of the discoverer are but preparations for the main event of discovery, which eventually takes place," says Polanyi, "by a process of spontaneous mental reorganization uncontrolled by conscious effort." *Science, Faith and Society* (Chicago: University of Chicago Press, 1946), p. 34.
32. Karl R. Popper, *Objective Knowledge* (Oxford: Clarendon Press, 1972), p. 1-31.