CONSCIOUSNESS AND THE VOICES OF THE MIND

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Born in West Newton, Massachusetts, Julian Jaynes did his undergraduate work at Harvard and McGill and received both master's and doctoral degrees in psychology from Yale. While the Psychology Department at Princeton, which he joined in 1964, is still his academic base, Dr. Jaynes has had numerous positions as Visiting Lecturer or Scholar in Residence in departments of philosophy, English, and archeology and in numerous medical schools.

Starting out as a traditional comparative psychobiologist, his approach was to chart the evolution of consciousness by studying learning and brain function in various species, from the protozoa to worms, reptiles, and cats. Finding this approach unsatisfactory, he changed course and has more recently examined consciousness through historical analysis, introspection, and the study of language and metaphor.

Dr. Jaynes has published widely, his earlier work being on topics such as imprinting in birds and the neural mediation of mating behaviour in cats. His more recent work culminated in 1976 in his book The Origins of Consciousness in the Breakdown of the Bicameral Mind. *Elaborating upon this book are numerous more recent articles published in a diversity of journals such as* The History of Ideas, Art World, *and* The Behavioral and Brain Sciences.

Few problems have had as interesting an intellectual trajectory through history as that of the mind and its place in nature. Before 1859, the year that Darwin and Wallace independently proposed natural selection as the basis of evolution, this issue was known as the mind/body problem with its various and sometimes ponderous solutions. But after that pivotal date, it came to be known as the problem of consciousness and its origin in evolution.

Now the first thing I wish to stress this afternoon is this problem. It is easy for the average layman to understand. But paradoxically, for philosophers, psychologists, and neurophysiologists, who have been so used to a different kind of thinking, it is a difficult thing. What we have to explain is the contrast, so obvious to a child, between all the inner covert world of imaginings and memories and thoughts and the external public world around us. The theory of evolution beautifully explains the anatomy of species, but *how* out of mere matter, mere molecules, mutations, anatomies, can you get this rich inner experience that is always accompanying us during the day and in our dreams at night? That is the problem we will consider in this symposium.

Previous Solutions

Previous solutions have been illusory. One of the most difficult but historically interesting (associated with philosophers such as Perry, 1912, or Whitehead, 1925) was a vague analogy that came to be called neo-realism. It seemed to be saying that because interacting matter could be reduced to mathematical relationships, in some ways like our own perceptions and interpersonal relationships, therefore consciousness originates in matter itself. Unfortunately, this much too abstract notion is having a bit of a renaissance today in a different way with some physicists because of some of the astonishing results in quantum physics (e.g., Wigner, 1972).

Another more popular solution was due to Darwin himself. In the last paragraph of *The Origin of Species* (Darwin, 1859), he implies that God created mind and body in the first primitive organisms and then both evolved in parallel together. But this sunk the problem in metaphysics, and it was soon realized that there should be some criterion of consciousness. It seemed obvious in the empiricist climate of the time that this was learning. So the question became: when did learning originate in evolution? Many people don't realize that the reason so many psychologists were studying animal learning, like maze-learning in rats, in the first two decades of this century, was to study animal consciousness on a primitive level and so trace out its evolution. As Dr. Witelson pointed out in her thoughtful introduction, this was indeed the focus of my early work for many years, but which I now see has nothing to do with con-

sciousness. This error, I think, comes from John Locke and empiricism: The mind is a space where we have free ideas somehow floating around and that is consciousness. And when we perceive things in contiguity or contrast or some of the other so-called laws of association, their corresponding ideas stick together. Therefore, if you can show learning in an animal, you are showing the association of ideas which means consciousness. This is muddy thinking. I will be returning to this error in a moment.

Then, of course, there were other solutions — the helpless spectator theory of Huxley (1896), that consciousness just watched behaviour and could do nothing. But if that is true, why is it there at all? And so there followed emergent evolution, which was meant to save us from such a pessimistic view. It was most fully developed by Lloyd Morgan (1923), although the idea goes back to the 19th century. A simple example is water: If you take hydrogen and oxygen you can't derive the wetness of water from either. Wetness is an emergent. Similarly, when in evolution there is a certain amount of brain tissue, particularly cortical tissue, then suddenly you get consciousness. Consciousness is an emergent, underived from anything before. It is unfortunate that this vague and vacuous idea is also having a renaissance in the writings of some neuroscientists today. On analysis, it generates no hypotheses and tells us nothing about any processes involved. Emergent evolution is a label that bandages our ignorance.

What I shall now present is a different kind of solution and one that has surprised me in the wealth of specific and testable hypotheses which it generates, and surprised me in the directions into which my work has been forced. But first we must face squarely the question of what is consciousness. And as a preface to that, I will first outline a few things that consciousness is not.

What Consciousness Is Not

First, consciousness is not *all* of mentality. You know this perfectly well. There are so many things that the nervous system does automatically for us. All the variety of perceptual constancies — for example, size, brightness, colour, shape, which our nervous systems preserve under widely varying environmental changes of light, distance, angle of regard, or even our own moving about in which objects retain their same position, called location constancy — all done without any help from introspective consciousness.

So with another large class of activities that can be called *preoptive*, such as how we sit, walk, and move. All these are done without consciousness, unless we decide to be conscious of them — the preoptive nature of consciousness. Even in speaking, the role of consciousness is more *interpolative* than any constant companion to my words. I am not now consciously entering my lexical storehouse and consciously selecting items to string on these syntactic structures. Instead, I have what can best be described as intentions of certain meanings, what I call *structions*, and then linguistic habit patterns which take over without further input from my consciousness. Similarly, in hearing someone speak, what are you, the listeners, conscious of? If it were the flow of phonemes or even the next level up of morphemes or even words, you would not be understanding what I am intending.

Consciousness is sometimes confused even with simple sense perception. Historically, we inferred and abstracted ideas of sense perception from a realization of our sense organs, and then, because of prior assumptions about mind and matter or soul and body, we believed these processes to be due to consciousness — which they are not. If any of you still think that consciousness is a necessary part of sense perception, then I think you are forced to follow a path to a *reductio ad absurdum*: you would then have to say that since all animals have sense perception, all are conscious, and so on back through the evolutionary tree even to one-celled protozoa because they react to external stimuli, or one-celled plants like the alga chlamydomonas with its visual system analogous to ours, and thence to even the amoeboid white cells of the blood since they sense bacteria and devour them. They too would be conscious. And to say that there are ten thousand conscious beings per cubic millimetre of blood whirling around in the roller-coaster of the vascular system in each of us here this afternoon is a position few would wish to defend.

That consciousness is in everything we do is an illusion. Suppose you asked a flashlight in a completely dark room to turn itself on and to look around and see if there were any light — the flashlight as it looked around would of course see light everywhere and come to the conclusion that the room was brilliantly lit when in fact it was mostly just the opposite. So with consciousness. We have an illusion that it is all mentality. If you

look back into the struggles with this problem in the 19th century and early 20th century, this is indeed the error that trapped people into so much of the difficulty, and still does.

Second, consciousness does not copy experience. This further error about consciousness stems from the beginning of empiricism when Locke (1690) spoke of the mind's "white paper, void of all characters, without any ideas" (*Essay* II, 1.2) on which experience is copied. Had the camera been around at the time, I suggest Locke would have used it instead of blank paper as his foundational metaphor. In experience, we take successive pictures of the world, immerse them in the developer of reflection, and watch concepts, memories, and all our mental furnishings come into existence.

But that consciousness does not copy experience can be shown very easily: (a) by examining the absence of memories that we should have if consciousness did copy experience, such as knowing what letters go with what numbers on telephones — although we have stared at the matter thousands of times, most of us cannot say — and countless other examples; or (b) by examining the memories we have and noting that they are not structured the way we experienced them, such as thinking of the last time you were in swimming — to take an example from Donald Hebb (1961). Most people, instead of thinking of the complicated visual, thermal, proprioceptive, respiratory experience as it actually was, tend to see themselves swimming from another point of view — a bird's-eye view perhaps — something of course they have never experienced at all. The conscious memory does not copy experience but reconstructs it as a must-have-been. This view is similar to some of the recent constructivist theories of memory.

Third, consciousness is not necessary for learning — which I referred to a moment ago as the mistake I laboured under for so long. If we look at the most primitive kinds of learning, such as Pavlovian conditioning, it occurs in preparations such as the hind leg of a beheaded cockroach for which no one would think that consciousness is plausible. And in humans not only does consciousness not assist in acquisition of conditional responses, it destroys conditioning once the human being is conscious of the contigencies (Razran, 1971).

Learning motor skills seems to happen without much consciousness as well. This was studied extensively in the 1920s in relation to telegraphy, stenography, and the like, occupations which were very important back then. The learning seemed to the subjects to be "organic" — that was one of their words. They were surprised that consciousness did not seem to enter into this learning the way they expected it might.

A more complicated kind of learning is instrumental learning, or operant conditioning, or we would call it learning solutions to problems. This is the old psychological problem called learning without awareness. Psychologists will remember the Greenspoon effect (Greenspoon, 1955) and some of the studies on the instrumental learning of little muscular movements without consciousness (Hefferline, Keenan, & Harford, 1959), and many others. It is more problematical than I can go into here, but I think that we can show that instrumental learning can occur without consciousness.

This is not to say that consciousness does not play a role in these different types of human learning. It does, as in decisions as to what to learn, or making rules of how to learn better, or consciously verbalizing aspects of a task. But this is not the learning itself. And my point is that consciousness is not necessary for learning to occur.

One could here bring up the well-known phenomenon of the automatization of habit; for when this happens to us, it seems that the task has required consciousness at the beginning; but as the habit is perfected, consciousness eases away and the task is performed effortlessly. This same smoothing out and increased rapidity of performance of a habit with practice is universal among all animals that learn. Generally, in this ubiquitous phenomenon, it is not necessarily or basically the lapsing of consciousness with improved performance so much as the lapsing of forced attention to components of the task. And attention, specifically external attention, which is the focusing of sense perception, is not necessarily conscious. Take two coins in either hand, and toss them across each other until you learn to catch each with the opposite hand. This is a task that will take somewhere between 15 and 20 trials to learn. And if you wish to try this this evening, and monitor your consciousness while you are doing so, you will find that consciousness has little to do with the learning that seems to go on mechanically. You might be conscious of something about your clumsiness, or the silliness of what you are doing as you keep picking the coins up from the floor, until, at the point of

success, your consciousness is somewhat surprised and even proud of your superior dexterity. It is the attention which has changed. Automatization is a diminution of attention, not of consciousness.

The fourth thing for which consciousness is not necessary, and it may seem rather paradoxical, is thinking or reasoning. Here we are getting into perhaps the major problem in this area: the definition of our terms, particularly terms such as thinking and reasoning. If we take the simplest definition of thinking, I think we can show indeed that consciousness is not necessary for it. This concerns one of the forgotten experiments of psychology. It is indeed so simple to us today that it seems silly. And yet to me it is as important in the history of psychology as the very complicated Michelson-Morley experiment is in the history of physics (Swenson, 1972). As the latter showed that the aether did not exist, setting the stage for relativity theory, so the experiment I am about to describe showed that thinking is not conscious, setting the stage for the kind of theorizing I am describing here.

The experiment I refer to was first done in 1901 by Karl Marbe, a graduate student at Würzberg (Marbe, 1901) back in a scientific world when consciousness was being intensively studied for the first time. Using his professors as subjects, each of whom had had extensive experience of experiments in introspection, he asked them to make a simple judgement between two identical-looking weights as to which was the heavier. Against the background of the experimental psychology of the time, the result was astonishing. There was no conscious content for the actual judgement itself, although such a judgement was embedded in the consciousness of the problem, its materials, and technique.

So began what came to be called the Würzburg School of Imageless Thought, which led through experiments by Ach, Watt, Kulpe, and others (see the discussions by Boring, 1929, Humphrey, 1951, or Murray, 1983) to concepts such as set, *aufgabe*, and determining tendency — which I have renamed *structions*. Structions are like instructions given to the nervous system, that, when presented with the materials to work on, result in the answer automatically without any conscious thinking or reasoning. And this phenomenon applies to most of our activities, from such simplicities as judging weights to solving problems to scientific and philosophical activity. Consciousness studies a problem and prepares it as a struction, a process which may result in a sudden appearance of the solution as if out of nowhere. During World War II, British physicists used to say that they no longer made their discoveries in the laboratory; they had their three B's where their discoveries were made — the bath, the bed, and the bus. And, as I have mentioned earlier, this process on a smaller scale is going on in me at present as I am speaking: my words are as if chosen for me by my nervous system after giving it the struction of my intended meaning.

Finally, in this list of misconceptions about consciousness, a word about its location. Most people, with possibly the present company excepted, who have thought long about the problem and so placed it 'out there' in the intellectual domain, tend to think of their consciousness, much as Descartes, Locke, and Hume did, as a space usually located inside their heads. Particularly when we make eye-to-eye contact, we tend to — in a subliminal way — infer such space in others. There is of course no such space whatever. The space of consciousness, which I shall hereafter call *mind-space*, is a functional space that has no location except as we assign one to it. To think of our consciousness as inside our heads, as reflected in and learned from our words like introspection or internalization, is a very natural but arbitrary thing to do. I certainly do not mean to say that consciousness is separate from the brain; by the assumptions of natural science, it is not. But we use our brains in riding bicycles, and yet no one considers that the location of bicycle riding is inside our heads. The phenomenal location of consciousness is arbitrary.

To sum up so far, we have shown that consciousness is not all mentality, not necessary for sensation or perception, that it is not a copy of experience, nor necessary for learning, nor even necessary for thinking and reasoning, and has only an arbitrary and functional location. As a prelude to what I am to say later, I wish you to consider that there could have been at one time human beings who did most of the things we do — speak, understand, perceive, solve problems — but who were without consciousness. I think this is a very important possibility.

So far this is almost going back to a radical behaviourist position. But what then is consciousness, since I regard it as an irreducible fact that my introspections, retrospections, and imaginations do indeed exist? My procedure here will be to outline in a somewhat terse fash-

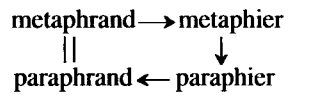
ion a theory of consciousness and then to explain it in various ways.

What Consciousness Is

Subjective conscious mind is an analog of what we call the real world. It is built up with a vocabulary or lexical field whose terms are all metaphors or analogs of behaviour in the physical world. Its reality is of the same order as mathematics. It allows us to short-cut behavioural processes and arrive at more adequate decisions. Like mathematics, it is an operator rather than a thing or a repository. And it is intimately bound with volition and decision.

Consider the language we use to describe conscious processes. The most prominent group of words used to describe mental events are visual. We 'see' solutions to problems, the best of which may be 'brilliant' or 'clear' or possibly 'dull', 'fuzzy', 'obscure'. These words are all metaphors, and the mind-space to which they apply is generated by metaphors of actual space. In that space we can 'approach' a problem, perhaps from some 'viewpoint', and 'grapple' with its difficulties. Every word we use to refer to mental events is a metaphor or analog of something in the behavioural world. And the adjectives that we use to describe physical behaviour in real space are analogically taken over to describe mental behaviour in mind-space. We speak of the conscious mind as being 'quick' or 'slow', or of somebody being 'nimble-witted' or 'strong-minded' or 'weak-minded' or 'broad-minded' or 'deep' or 'open' or 'narrow-minded'. And so like a real space, something can be at the 'back' of our mind, or in the 'inner recesses' or 'beyond' our minds. But, you will remind me, metaphor is a mere comparison and cannot make new entities like consciousness. A proper analysis of metaphor shows quite the opposite. In every metaphor there are at least two terms, the thing we are trying to express in words, the *metaphrand*, and the term produced by a struction to do so, the *metaphier*. These are similar to what Richards (1936) called the tenor and the vehicle, terms more suitable to poetry than to psychological analysis. I have chosen metaphrand and metaphier instead to have more of the connotation of an operator by echoing the arithmetic terms of multiplicand and multiplier. If I say the ship plows the sea, the metaphrand is the way the bow goes through the water and the metaphier is a plow.

As a more relevant example, suppose a person, back in the time at the formation of our mental vocabulary, has been trying to solve some problem or to learn how to perform some task. To express his success, he might suddenly exclaim (in his own language), aha! I 'see' the solution. 'See' is the metaphier, drawn from the physical behaviour from the physical world, that is applied to this otherwise inexpressible mental occurrence, the metaphrand. But metaphiers usually have associations called *paraphiers* that project back into the metaphrand as what are called *paraphrands* and, indeed, create new entities. The word 'see' has associations of seeing in the physical world and therefore of space, and this space then becomes a paraphrand as it is united with this inferred mental event called the metaphrand.



In this way the spatial quality of the world around us is being driven into the psychological fact of solving a problem (which as I indicated needs no consciousness). And it is this associated spatial quality that, as a result of the language used to describe such psychological events, becomes, with constant repetition, this spatial quality of our consciousness or mind-space. This mind-space I regard as the primary feature of consciousness. It is the space which you preoptively are introspecting on at this very moment.

But who does the 'seeing'? Who does the introspecting? Here we introduce analogy, which differs from metaphor in that the similarity is between relationships rather than between things or actions. As the body with its sense organs (referred to as I) is to physical seeing, so there develops automatically an *analog 'I'* to relate to this mental kind of 'seeing' in mind-space. The analog 'I' is the second most important feature of consciousness. It is not to be confused with the self, which is an object of consciousness in later development. The analog 'I' is contentless, related I think to Kant's (1781) transcendental ego. As the bodily I can move about in its environment looking at this or that, so the analog 'I' learns to 'move about' in mind-space concentrating on one thing or another. If you 'saw' yourself swimming in our earlier example, it was your analog 'I' that was doing the 'seeing'.

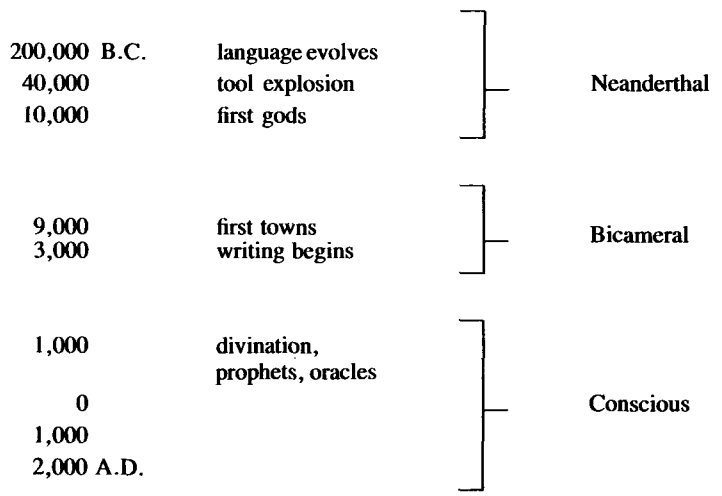
A third feature of consciousness is *narratization*, the analogic simulation of actual behaviour. It is an obvious aspect of consciousness which seems to have escaped previous synchronic discussions of consciousness. Consciousness is constantly fitting things into a story, putting a before and an after around any event. This feature is an analog of our physical selves moving about through a physical world with its spatial successiveness which becomes the successiveness of time in mind-space. And this results in the conscious conception of time which is a *spatialized time* in which we locate events and indeed our lives. It is impossible to be conscious of time in any other way than as a space.

There are other features of consciousness which I shall simply mention: *concentration*, the 'inner' analog of external perceptual attention; *suppression*, by which we stop being conscious of annoying thoughts, the analog of turning away from annoyances in the physical world; *excerption*, the analog of how we sense only one aspect of a thing at a time; and *consilience*, the analog of perceptual assimilation; and others. In no way is my list meant to be exhaustive. The essential rule here is that no operation goes on in consciousness that was not in behaviour first. All of these are learned analogs of external behaviour.

Psychologists are sometimes justly accused of the habit of reinventing the wheel and making it square and then calling it a first approximation. I would demur from agreement that this is true in the development that I have just outlined, but I would indeed like to call it a first approximation. Consciousness is not a simple matter and it should not be spoken of as if it were. Nor have I mentioned the different modes of narratization in consciousness such as verbal, perceptual, bodily, or musical, all of which seem quite distinct with properties of their own. But it is enough, I think, to allow us to go back to the evolutionary problem as I stated it in the beginning and which has caused so much trouble in biology, psychology, and philosophy.

When did all this 'inner' world begin? Here we arrive at the most important watershed in our discussion. Saying that consciousness is developed out of language means that everybody from Darwin on, including myself in earlier years, was wrong in trying to trace out the origin of consciousness biologically or neurophysiologically. It means we have to look at human history after language has evolved and ask when in history did an analog 'I' narratizing in a mind-space begin.

When did language evolve? Elsewhere (Jaynes, 1976a) I have outlined ideas of how language could have evolved from call modification, which has been called the 'Wahee, Wahoo model' and is at present in competition with several others (Maxwell, 1984). But such theorizing points to the late Pleistocene or Neanderthal era on several grounds: (1) such a period coincides with an evolutionary pressure over the last glacial period for verbal communication in the hunting of large animals; (2) it coincides with the astonishing development of the particular areas of the brain involved in language; and (3), what is unique in this theory, it corresponds to the archeological record of an explosion of tool artifacts, for we know that language is not just communication, but also acts like an organ of



perception, directing attention and holding attention on a particular object or task, making advanced tool-making possible. This dating means that language is no older than 50,000 years, which means that consciousness developed sometime between that date and the present (see chart on previous page).

It is fortunate for this problem that by 3000 B.C., human beings have learned the remarkable ability of writing. It is therefore obvious that our first step should be to look at the early writings of mankind to see if there is evidence of an analog 'I' narratizing in a mind-space. The first writing is in hieroglyphics and cuneiform, both very difficult to translate, especially when they refer to anything psychological. And therefore we should go to a language with which we have some continuity, and that is of course Greek. The earliest Greek text of sufficient size to test our question is the Iliad. Are the characters in the Iliad narratizing with an analog 'I' in a mind-space and making decisions in this way?

The Bicameral Mind

First, let me make a few generalizations about the Iliad. To me and to roughly half of classicists, it is oral poetry, originally spoken and composed at the same time by a long succession of *aoidoi* or bards. As such, it contains many incongruities. Even after it was written down in about 800 B.C., perhaps by someone named Homer, it had many interpolations added to it even centuries later. So there are many exceptions to what I am about to say, such as the long speech of Nestor in Book XI for example, or the rhetorical reply of Achilles to Odysseus in Book IX.

But if you take the generally accepted oldest parts of the Iliad and ask, "Is there evidence of consciousness?", the answer, I think, is no. People are not sitting down and making decisions. No one is. No one is introspecting. No one is even reminiscing. It is a very different kind of world.

Then, who makes the decisions? Whenever a significant choice is to be made, a voice comes in telling people what to do. These voices are always and immediately obeyed. These voices are called gods. To me this is the origin of gods. I regard them as auditory hallucinations similar to, although not precisely the same as, the voices heard by Joan of Arc or William Blake. Or similar to the voices that modern schizophrenics hear. Similar perhaps to the voices that some of you may have heard. While it is regarded as a very significant symptom in the diagnosis of schizophrenia, auditory hallucinations also occur in some form at some time in about half the general population (Posey & Losch, 1983). I have also corresponded with or interviewed people who are completely normal in function but who suddenly have a period of hearing extensive verbal hallucinations, usually of a religious sort. Verbal hallucinations are common today, but in early civilization I suggest that they were universal.

This mentality in early times, as in the Iliad, is what is called the *bicameral mind* on the metaphier of a bicameral legislature. It simply means that human mentality at this time was in two parts, a decision-making part and a follower part, and neither part was conscious in the sense in which I have described consciousness. And I would like to remind you here of the rather long critique of consciousness with which I began my talk, which demonstrated that human beings can speak and understand, learn, solve problems, and do much that we do but without being conscious. So could bicameral man. In his everyday life he was a creature of habit, but when some problem arose that needed a new decision or a more complicated solution than habit could provide, that decision stress was sufficient to instigate an auditory hallucination. Because such individuals had no mind-space in which to question or rebel, such voices had to be obeyed.

But why is there such a mentality as a bicameral mind? Let us go back to the beginning of civilization in several sites in the Near East around 9000 B.C. It is concomitant with the beginning of agriculture. The reason the bicameral mind may have existed at this particular time is because of the evolutionary pressures for a new kind of social control to move from small hunter-gatherer groupings to large agriculture-based towns or cities. The bicameral mentality could do this since it enabled a large group to carry around with them the directions of the chief or king as verbal hallucinations, instead of the chieftain having to be present at all times. I think that verbal hallucinations had evolved along with the evolution of language during the Neanderthal era as aids to attention and perseverance in tasks, but then became the way of ruling larger groups.

It can easily be inferred that human beings with such a mentality had to exist in a special

kind of society, one rigidly ordered in strict hierarchies with strict expectancies organized into the mind so that such hallucinations preserved the social fabric. And such was definitely the case. Bicameral kingdoms were all hierarchical theocracies, with a god, often an idol, at their head from whom hallucinations seemed to come, or, more rarely, with a human being who was divine and whose actual voice was heard in hallucinations.

Such civilizations start in various sites in the Near East and then spread into Egypt, later from Egypt into the Kush in southern Sudan and then into central Africa; while in the other geographical direction, they spread into Anatolia, Crete, Greece; and then into India and southern Russia; and then into the Malay Peninsula, where the ruins of another civilization have just been discovered in northern Thailand; then later into China. A millennium later, a series of civilizations begin in Mesoamerica leading up to the Aztec, and then partly independently and partly by diffusion another series of civilizations in the Andean highlands leading up to the Inca. And wherever we look there is some kind of evidence of what I am calling the bicameral mind. Every ancient historian would agree that all of these early civilizations are thoroughly religious, heavily dependent on gods and idols.

Where writing exists after 3000 B.C., we can see these bicameral civilizations much more clearly. In Mesopotamia the head of state was a wooden statue—wooden so it could be carried about—with jewels in its eyes, perfumed, richly raimented, imbedded in ritual, seated behind a large table (perhaps the origin of our altars) in the *gigunu*, which was a large hall in the bottom of a ziggurat. What we might call the king was really the first steward of this statue god. Cuneiform texts literally describe how people came to the idol-statues, asked them questions, and received directions from them. Just why the minds (or brains) of bicameral people needed such external props as idols for their voices is a question difficult to answer, but I suspect it had to do with the necessary differentiation of one god from another.

I also want to mention that the evidence from written texts, personal idols, cylinder seals, and the construction of personal names suggests that every person had a personal god. In Mesopotamia, it was his *ili*, which in Hebrew is perhaps from the same root as Eli and Elhohim. In Egypt, the personal god which had the same function was called a *ka*, a word which has been an enigma in Egyptology until now.

In connection with the personal god, it is possible to suggest that a part of our innate bicameral heritage is the modern phenomenon of the 'imaginary' playmate. According to my own research as well as other data (Singer & Singer, 1984), it occurs in at least one-third of modern children between the ages of 2 and 5 years, and is believed now to involve very real verbal hallucinations. In the rare cases where the imaginary playmate lasts beyond the juvenile period, it too grows up with the child and begins telling him or her what to do in times of stress. It is therefore possible that this is how the personal god started in bicameral times, the imaginary playmate growing up with the person in a society of expectancies that constantly encouraged the child to hear voices and to continue to do so.

This, then, is the bicameral mind. I have not had time to discuss the variations between various bicameral theocracies, but all were based on strict and stable hierarchies as I have stressed. At least some of such civilizations could be compared to nests of social insects, where instead of the social control being by pheromones from a queen insect, it was by hallucinatory directions from an idol. Everything went like clockwork providing there was no real catastrophe or problem.

The Breakdown of the Bicameral Mind

But such a system is obviously precarious. The huge success of such agricultural bicameral civilizations inevitably leads to overpopulation and complexity, and given a time of social and political instability, bicamerality can break down like a house of cards. Some civilizations broke down frequently, as among the Mayans on this continent. A temple complex and city would be built up, last a few centuries, and then be completely abandoned, presumably because as the society became more and more populous, the voices did not agree anymore. Then after a few centuries as tribal bands, they would somehow get together again and another temple complex would be built up. This is why we find so many of these temple complexes that show evidence of their people suddenly leaving them.

In Egypt we find that the bicameral mind broke down between what is called the Old Kingdom and the Middle Kingdom, and then again between the Middle and the New Kingdom. The

evidence for these dark, chaotic periods is in the hieroglyphic writings after they occurred.

But in Mesopotamia, which was the most stable civilization in the world, there does not seem to have been a breakdown until around 1400 B.C. In the graphics of the period, gods are no longer depicted. In some instances kings beg in front of empty gods' thrones — nothing like that had ever occurred before. Another line of evidence is in the cuneiform literature. There is an epic called the Epic of Tikulti-Ninurta where for the first time in history, gods are spoken of as forsaking human beings. The greatest literature of the period, which is possibly the origin of the Book of Job, is the *Ludlul Bel Nemequi*, the first readable lines of which translate as:

> My god has forsaken me and disappeared,
> My goddess has failed me and keeps at a distance,
> The good angel who walked beside me has departed.

How similar to some of our Hebrew Psalms — Psalm 42, for example.

The reasons for this breakdown are several. The success of bicameral civilizations leads to overpopulation — as I have mentioned, and as is described in texts from the period. There are various huge catastrophes such as the Thera eruption, which is well known and may be the origin of Plato's myth of Atlantis. The ensuing *tsunami* crushed all the bicameral kingdoms around that part of the Mediterranean. Entire nations were destroyed or dislodged, resulting in large migrations of people invading other countries, looking for 'promised lands', a place to settle down with their gods again and start another bicameral civilization. One of the reasons that we still have problems in this area of the world, I think, goes right back to this chaotic time.

Another cause is writing itself, because once something is written you can turn away from it and it has no more power over you, in contrast to an auditory hallucination which you cannot shut out. Writing, particularly as used extensively in Hammurabi's hegemony, weakened the power of the auditory directions. The spread of writing, the complexities of overpopulation, and the chaos of huge migrations as one population invaded others: these are the obvious causes. And in this breakdown, various things started to happen, including I think the beginning of consciousness.

The immediate results of this loss of hallucinated voices giving directions are several and new in world history. The idea of heaven as where the gods have gone; the idea of genii or angels as messengers between heaven and earth; the idea of evil gods such as demons — all are new phenomena. By 1000 B.C., people in Babylon were walking around draped with amulets and charms which they wore to protect themselves from a huge variety of demons. Such charms have been found archeologically in the thousands dating from this period.

The Beginning of Consciousness

And then came the development of a new way of making decisions, a kind of proto-consciousness. All significant decisions previously had been based on the bicameral mind. But after its breakdown, after the hallucinated voices no longer told people what to do, there seem to have developed various other ways of discerning messages from the gods to make decisions. We call these methods divination. Throwing of lots, the simplist kind; putting oil on water and reading its patterns; dice; the movements of smoke; a priest whispering a prayer into a sacrificial animal, sacrificing it, and then looking at its internal organs to find out what the god intends. All of these were extensively and officially practised. And then the method of divination that is still around, astrology. It is remarkable to go back and read the cuneiform letters of kings to their astrologers and diviners of around 1000 B.C. (Pfeiffer, 1935). These cruel Assyrian tyrants, who are depicted in their bas-reliefs as grappling with lions and engaging in fierce lion hunts, are, in their letters, meek and frightened people. They don't know what to do. Astrologers tell them, "You cannot move out of your house for five days"; "You must not eat this"; "You should not wear clothes today" — extraordinary strictures that official diviners would interpret as what the gods meant. It is interesting to note that not only has astrology lasted, but it is being followed by more people at present than ever before.

If we now move over to Greece just following the period I have been referring to in Mesopotamia, we can trace the bicameral mind as shown in the Linear B Tablets, then going through the Iliad, the Odyssey, through the lyric and elegiac poetry of the next two centuries, as in Sappho and Archilochus, until we get to Solon in 600 B.C. Solon is the first person who seems like us, who talks about the mind in the same way we

might. He is the person who said "Know thyself," although sometimes that's given to the Delphic Oracle. How can you know yourself unless you have an analog 'I' narratizing in a mind-space and reminiscing or having episodic memory about what you have been doing and who you are? In Greece, then, one can see in detail the invention and learning of consciousness on the basis of metaphor and analogy (as I have described above) by tracing out through these writings the change in words like *phrenes*, *kardia*, *psyche* (what I have called "preconscious hypostacies") from objective referents to mental functions.

The same kind of development has been studied in ancient China by Michael Carr of the University of Otaru. Comparing the four successive parts of the most ancient collection of texts, the *Shijing*, he found the same internalization process for such words as *Xin*, until they become the concept of mind or consciousness in China (Carr, 1983).

Another area of the world during this period where we can see this rise of consciousness is more familiar to most of you. This is among peoples who may have been refugees from the Thera eruption. The word for refugees in Akkad, the ancient language of Babylon, is the word *khabiru*, and this becomes our word Hebrew. The story of the Hebrews, or really one branch of the Hebrews, is told in what we call the Hebrew Testament or the Old Testament.

Those of you who know biblical scholarship will know that the Hebrew Testament is a patchwork of things put together around 600 B.C. — the date keeps coming forward. Using it as evidence is therefore something of a problem. But there are several ways of entering this mosaic of much-edited texts to test the theory, and here I shall mention only one. If we take the purer books, those that are not patchwork but are singly authored and that can be clearly and firmly dated, and compare the oldest with the most recent, such a comparison should reflect the differences in mentality we are referring to. The oldest of them is the Book of Amos, dating from about 800 B.C., and the most recent is the Book of Ecclesiastes, which comes from about 200 B.C.

I suspect that such prophets as Amos were those left-over bicameral or semi-bicameral persons in the conscious era who heard and could relay the voice of Yahweh with convincing authenticity, and who were therefore highly prized in their societies as reaching back to the secure authoritarian ways of the lost bicameral kingdom. Amos is not a wise old man but a shepherd boy brought in from the fields of Tekoa. Probably much of his life has been spent in the fields listening to older shepherds glorying in tales of Yahweh. Asked if he is a prophet, he does not even know what the word means. But periodically he bursts forth with "Thus sayest the Lord," as the King James Bible translates it, and out pours some of the most powerful passages in Jewish history with such an authenticity that he is always surrounded by scribes taking down his words.

Ecclesiastes is just the opposite. He begins by saying that "I *saw* in my heart that wisdom excelleth folly . . . " (2:13) — a metaphoric use of 'see'. Spatialized time is something that I have not dwelt upon, but I suggest it is one of the hallmarks of consciousness. We cannot think consciously of time apart from making a space out of it. And this is very much in evidence in Ecclesiastes as, for example, in that oft-quoted but still beautiful hymn to time that begins the third chapter: "For everything there is a season, and a time for every matter under heaven, a time to be born, and a time to die" and so on, with times like spaces for everything. Historically, we could go further into the New Testament and note the even greater importance of conscious internalization and changing behaviour from within in contrast to Mosaic law that shaped behaviour from without.

Four Ideas

I can sum up what I have said so far as three major ideas about the origin of consciousness. The first concerns the nature of consciousness itself and that it arises from the power of language to make metaphors and analogies. The second idea is the hypothesis of the bicameral mind, an early type of mentality. I think the evidence for its existence is unmistakable. Apart from this idea, there is the problem of explaining the origin of gods, the origin of religion and the huge, strange pageant of religious practices in the back corridors of time that is so apparent with a psychological study of history. The bicameral mind offers a possibility to tie it all together and to provide a rationale for it. The third idea is that consciousness followed the bicameral mind. I have placed the date somewhere between 1400 B.C. and 600 B.C. This is a long period

and that date may have to be adjusted. But I believe this to be a good approximation.

I would add here that there is a weak form of the theory. It says that consciousness could have begun shortly after the beginning of language or perhaps at certain times and places. After all, people could create metaphors at the beginning of oral language — that is how language grew. Consciousness could have originated in exactly the same way as I have described, and existed for a time in parallel with the bicameral mind. Then the bicameral mind is sloughed off at approximately 1000 B.C. for the reasons I have suggested, leaving consciousness to come into its own. This would provide easy *ad hoc* explanations for highly developed cultures such as Sumer which otherwise are a challenge to bicameral theory. But I do not choose to hold this weak theory because it is almost unfalsifiable. I think we should have a hypothesis that can be disproved by evidence if we are going to call it a scientific hypothesis. Also, the strong theory has a vigorous explanatory power in understanding many historical phenomena of the transition period. Further, I do not see why there would be a need for consciousness alongside of the bicameral mind if the latter made the decisions.

A fourth idea that I shall end with is a neurological model for the bicameral mind. I want to stress, however, that it is not at all a necessary part of the theory I have presented. Since the bicameral mind was so important in history, responsible for civilization, what could have been going on in the brain? The proper strategy in trying to answer such a question is to take the simplest idea and set about to disprove it. If it is disproved, you then go on to something more complicated.

The simplest idea, obvious I think to anyone, would involve the two cerebral hemispheres. Perhaps in ancient peoples — to put it in a popular fashion — the right hemisphere was "talking" to the left, and this was the bicameral mind. Could it be that the reason that speech and language function are usually just in the areas of the left hemisphere in today's people was because the corresponding areas of the right hemisphere once had another function? That is a somewhat questionable way to say it, because there are other reasons for the lateralization of function. But on the other hand, it raises issues that I like. What *is* an auditory hallucination? Why is it ubiquitous? Why present in civilizations all over the world?

If we assume that back in bicameral times all admonitory information was being processed in some proportion of the billions of neurons of the right hemisphere, and there stored, particularly in what corresponds to Wernicke's area in the posterior temporal lobe, until it needed to be accessed, how do such complicated processed admonitions get transferred across the cerebral commissures to the left or dominant hemisphere? And what if, as I have supposed (Jaynes, 1976b), the far, far fewer fibres of the anterior commissure that connects regions of the two temporal gyri are the ones involved? And in fact, recent experimental evidence with monkeys indicates that intercommunication of major parts of the temporal lobes is via the anterior commissure (Jouandet, Garey, & Lipp, 1984). The transfer of such information would be more efficiently done if it were put into some kind of code. And what better code is there than human language? So, would it not be interesting if indeed what might correspond to Wernicke's area in the right temporal lobe might be the area that was involved in storing up admonitory information, processing it in such a way that it produced answers to problems and decisions (which is what the bicameral mind is), and then used the code of language to get it across to the left hemisphere, the hemisphere that speaks, obeys, and manages behaviour?

At the time that I was thinking in this primitive fashion, in the early 1960s, there was little interest in the right hemisphere. Even as late as 1964, some leading neuroscientists were saying that the right hemisphere did nothing, suggesting it was like a spare tire. But since then we have seen an explosion of findings about right hemisphere function, leading, I am afraid, to a popularization that verges on some of the shrill excesses of similar discussions of asymmetrical hemisphere function in the latter part of the 19th century (see Harrington, 1985) and also in the 20th century (see Segalowitz, 1983).

But the main results, even conservatively treated, are generally in agreement with what we might expect to find in the right hemisphere on the basis of the bicameral hypothesis. The most significant such finding is that the right hemisphere is the hemisphere which processes information in a synthetic manner. It is now well known from many studies that the right hemisphere is far superior to the left in fitting together block designs (Kohs Block Design Test), parts of faces, or musical chords (see Bryden, 1982;

Segalowitz, 1983). The chief function of the admonitory gods was indeed that of fitting people and functions into these societies. I am suggesting that much of the difference we can observe today between hemisphere function can be seen as echoing the differences between the two sides of the bicameral mind.

In summary, I would like to again repeat these four ideas or modules of the theory I have presented. First is the nature of consciousness and its origin in language, which can be empirically studied in the learning of consciousness in children, as well as in the study of changes of consciousness in recent history. The second idea is the bicameral mind, which can be studied directly in ancient texts and indirectly in modern schizophrenia. Third is the idea that consciousness followed bicamerality, which can be studied in the artifacts and texts of history. And the fourth is that the neurological model for the bicameral mind is related to the two hemispheres. And this can be studied in laterality differences today.

What I have tried to present to you is a long and complicated story. It leaves us with a different view of human nature. It suggests that what civilized us all is a mentality that we no longer have, in which we heard voices called gods. Remnants of this are all around us in our own lives, in our present-day religions and needs for religion, in the hallucinations heard particularly in psychosis, in our search for certainty, in our problems of identity. And we are still in the arduous process of adjusting to our new mentality of consciousness. The final thought I will close with is that all of this that is most human about us, this consciousness, this artificial space we imagine in other people and in ourselves, this living within our reminiscences, plans, and imaginings, all of this is indeed only 3,000 years old.

And that, ladies and gentlemen, is less than 100 generations. And from that I think we can conclude that we are all still very young. Thank you very much.

(From audience): I would just like to raise a terminological question. Do you make any essential difference between the word "consciousness" and the word "self-consciousness"?

Jaynes: Absolutely. Consciousness should not be equated with self-consciousness.There are at least three senses of the term. Self-consciousness has a trivial sense of embarrassment, or fear of what others may think of you, which I am sure is not what you mean. A second and most important sense is the consciousness of self as in answering the question "Who am I?" The self is the answer. It is an entity or structure of attributes given by our culture and imbedded in our language that is learned into our personal history which we infer from two sources: what other people tell us we are and what we infer from our own behaviour. Many recent experiments in social psychology provide evidence for this statement. The self is not in any sense the analog 'I' which is contentless. The self is an object of consciousness, not consciousness itself. As such, the self is not a stable construction, but changes dramatically through history and among nations, as well as in child development and even over the course of a day, depending on one's excerpts and how one narratizes them.

But here, as in many topics relating to mind, we must carefully locate those fuzzy areas of polyreferential confusion where what seems to be the same word is used to denote two or more quite different referents. Thus self properly is the psychological self I have just described. But the word is also used in trivial reflexive senses as when we say "the word itself" or say that "a fly washes itself." And an extenison of that usage occurs when we say we see ourselves in a mirror. We don't. We see and recognize our bodies or our faces, not our selves. When pigeons (Epstein, Lanza, & Skinner, 1981) or chimpanzees (Gallup, 1970) are taught to recognize their bodies (note how much easier it would be to say "themselves" and how erroneous!) in mirrors, it has nothing to do with consciousness or self-awareness in its human sense. When such a chimp, because of its mirror training, rubs off a spot on its head it has seen in the mirror, it may be no different essentially from rubbing off a spot on its arm without a mirror (see Jaynes, 1978).

There is a third sense of self-consciousness that occurs mostly in philosophical discussions and is a rather musty way of indicating self-observation of our own thinking or introspection. Such introspection is one type of narratization in which consciousness — and you remember I called it an operator as in mathematics — is operating twice. We are conscious of our own consciousness. Consider a schoolboy taking an exam fantasizing a romantic daydream about a girl across the aisle. Then when someone makes a noise, perhaps, or he notices a physiological reaction incongruous with the situation, he suddenly realizes he is daydreaming and must stop and return to the exam if he is to pass. Here is consciousness operating twice. From the schoolboy's point of view, it can be diagrammed as:

$$\text{'I'} \longrightarrow \text{(me and girl together)}$$

which changes to:

$$\text{'I'} \longrightarrow [\text{'I'} \longrightarrow \text{(me and girl together)}]$$

and so ceases, where 'I' in single quotes always stands for the analog 'I' and the arrows for those analog abilities designated as narratization.

It is an extremely functional process, making us able to prevent ourselves from being commandeered by fantasy — as happens in dreams. Conscious processes and content are introspectable (which is being conscious of our own consciousness), and even sometimes introspection itself (which is being conscious of being conscious of being conscious). As such, introspection can be used as a denotative definition of consciousness, that is, a definition by pointing at it. But we must not make the mistake of thinking that all consciousness is introspective because it is introspectable.

Is there a more objective way of pointing out consciousness?

Jaynes: Right now let us take any ten people out there on the street and ask them when they next hear a clock strike to tell us all what they had been thinking of in the previous minute. The resulting reports are the basic material of consciousness and what we are trying to understand. That is bedrock and an objective denotative definition of consciousness. It is an experiment I do with my class each year.

I think this is a related question. Some people would say that consciousness is all awareness, while you are just talking about self-awareness. Could you comment?

Jaynes: *Awareness*, like the word *experience*, is an extremely slippery word that immediately confounds attention, perception, and consciousness, and by doing so buries the problem all over again in a morass of undefinitions. It stealthily crept into our descriptions of behaviour more and more during the behaviouristic era as a rather sly surrogate for the deposed and banished consciousness, and has been causing multireferential havoc ever since. It is interesting that in the midst of that era, Webster's *Collegiate Dictionary* (5th ed., p. 215) tried to distinguish between consciousness and awareness by saying that consciousness "applies primarily to that which is felt within oneself," while awareness "applies to that which is perceived as without." I would be happy to agree with that if others would as well and stick to that

distinction. But too often awareness slides around everywhere and takes on associations of internality, which confuses it again with consciousness. I therefore try to avoid the term. There is nothing that the word awareness can refer to that cannot be expressed in more precise terms. And we should do so.

Now, back to the question. Am I just talking about self-awareness? The more precise term here is self-consciousness, which I think is what you mean. The question then becomes similar to the last part of the first question where I noted that all consciousness, while being phenomenally located internally, is not self-consciousness. I can be worried about what my young daughter is doing staying out after midnight again. That is certainly consciousness, certainly narratizing in mind-space, and I think of it as going on in me — even though such phenomenal location is arbitrary — but I can't see how that could be called self-consciousness or self-awareness.

Now, as to those who wish to call consciousness all awareness, what could that mean? Probably consciousness as I have described it plus all sense perception. This is very deceptive, and it gets back to the question I mentioned in my talk: Is sense perception consciousness?

First of all, consciousness is not necessary for sense perception. We must be crystal clear about that. You can notice this in your everyday life, all the countless things you do when you are thinking of something else, very obviously being guided by hosts of perceptions. And if you do still hold that consciousness is necessary for perception, you will have to carry it over into animal behaviour and down the evolutionary tree — as I meant to emphasize in my lecture — until you will have to impute consciousness to protozoa, since they react to objects and so have sense perceptions, and so to the white blood cells circulating right now in your body. To me that is a *reductio ad absurdum*.

Second, while sense perception is not due to consciousness, we are of course conscious of what we perceive. Consciousness, this narratizing in a mind-space, would be useless otherwise. I perceive the blackboard. So can an animal. But I can be conscious of the blackboard as I perceive it, a kind of extra dimension that a sub-human animal does not have. But that is a poor example. It is difficult to hold one's consciousness steadily on a perception — like a Zen meditation discipline. If I try to keep conscious of the blackboard, I lose it quickly: I start narratizing around it, noting its location, thinking of what is written on it, remembering other blackboards, wondering how it's made nowadays, and so forth. What is more, I think I can be conscious of the blackboard more easily by closing my eyes. Perception often can be slightly inhibiting to consciousness.

I think I agree that consciousness and perception should be separated and that they have been squeezed together by many psychologists. But why do you think this is so?

Jaynes: There are several reasons. The simplest is that consciousness as I said is an analog of external perception and so is easily mistaken for perception. After all, it is mapped onto sense perception almost as its template. We can 'perceive' an idea or a subtlety using the same word as perceiving a tree. Sharing the same terminology, it is no wonder the two kinds of perception are confused.

Another reason is that even the casual use of mental words inappropriately can produce convictions in us that are quite mistaken, and this goes on non-consciously. If a boxer is knocked out, we might say, lacking a better word, that he is knocked unconscious. This automatically and irrationally gets us to assume that everything before the punch was conscious — which we know is untrue. It's as if having a blackout in a city means that everything in the city is white. We should say the boxer is knocked unreactive or senseless.

Language also plays this trick on us when we try to describe animal behaviour. If a moth keeps flying into that light up there, and someone asks us, "Is the moth aware of the light?", we might say "Yes," lacking a better word. The moth is aware of the light, which translates for some people into consciousness, spiralling us back into the same confusion. The proper description is that the moth flies into the light and nothing more. No projected internality, please. It is reflex machinery.

And a further reason is strictly academic history. So-called experimental psychology was begun in Germany by physicists and physiologists who were strict metaphysical dualists (even if some of them called themselves pan-psychists) and who knew and cared nothing about the evolutionary problem or animal behaviour or human behaviour for that matter. Their perspective is therefore very distorted. Fechner, a physicist, is an excellent example. By studying just-noticeable differences in stimulus intensity, pitch, or brightness, he thought he was studying the elements of consciousness and so relating the universe of mind and the universe of matter, as in the famous Weber-Fechner Law. And this led into what William James — whose emphasis you remember was so opposite, on the *stream* of consciousness — called the dreary wasteland of psychophysics. Even today some students of perception suppose they are studying consciousness when they are simply studying perception — which we share with all animals.

Some modern philosophers make that mistake as well.

Jaynes: I imagine it is because of the artificial analytic traditions begun in 1920 by two Cambridge friends, G.E. Moore (1922) and Bertrand Russell, about what used to be called sense data: consciousness sits in its space in the head waiting to be fed sense data through

the apertures of the sense organs. When Russell (1921, 1927), looking for an example of consciousness, simply says, "I see a table," that is a highly artificial choice, and really incorrect reporting. It is not "I see a table" but his knowing he sees a table that is what he is really meaning. It is his consciousness of seeing a table that he is talking about, not the bare perception. This can be diagrammed thus:

'I' —→ I see a table

Russell thought his consciousness was the second term alone, where really it was both. He was being conscious of the perception as part of an argument. Russell should have selected a more ethologically valid example that was really true of his consciousness, that had really happened, such as "I think I will rewrite the *Principia* now that Whitehead's dead," or "How can I afford the alimony for another Lady Russell?" He would then have come to other conclusions. Such examples are consciousness in action. "I see a table" is not.

Let me give another hypothetical example from our ten subjects out there in the street. Suppose one of our subjects was hurrying to an intersection just as the light turned red against her. Her consciousness indeed would have recognized she had to stop at the red light. If she crossed she would be jay-walking, which is wrong. And she remembers she is a good person. Except she shouldn't have stopped for that fudge sundae — and with walnuts on top too! And now she might be late getting home, because there goes the clock, and now invalided Cousin Sally will be worrying I've been in an accident. Punishment for breaking my diet. I'm sure the police have made this particular red light longer than it used to be, probably just to be mean to me — and to poor Cousin Sally. Oh! There it turns green. Nothing less than all that and more.

And so if a psychologist or a philosopher comes along and says consciousness is awareness or sensation, and "seeing the red light" is a good example of consciousness, it is as absurd as saying a B-flat is a good example of a symphony. Seeing a red light cues consciousness; the sensation is a node between one conscious string and another.

I hope some of you will try that experiment tomorrow of monitoring your consciousness when you hear a clock strike. See if you have just been thinking of a perception.

I could add that even Watson and the early behaviourists would agree with my point here. In saying that consciousness does not exist, they certainly did not mean sense perception.

Are you a behaviourist in animal behaviour?

Jaynes: I am a strict behaviourist up to 1000 B.C. when consciousness develops in the one species that has a syntactic language, namely, ourselves.

Was there humour in the bicameral period?

Jaynes: There was jeering at individuals who do something different from expectation in the bicameral world, shaming them. It is a method of social control that has its parallel in other social mammals' ostracism of an aberrant member of the group or as children on a playground may mock a child who is different. It is not humour in our sense. It is usually cruel and it is usually excluding somebody from the group. The theory I am working on is that this is what humour grew out of as human beings became conscious. We today have clowns and comics who almost always are portraying people we don't respect for various reasons. We are really excluding such portrayals from ourselves as we laugh at them, and we like to do this in a group, suggesting its ancient innate origin of social ostracism. But I haven't traced it out with any thoroughness. It is an excellent problem for research.

Did everyone hear the gods?

Jaynes: Yes, I think so. Except possibly the deaf. But deaf bicameral people may have had visual hallucinations of gods directing them by gesture, even as modern deaf schizophrenics often do (Rainer, Abdullah, & Altshuler, 1970).

But perhaps you meant to ask if it wasn't just the leaders that heard the gods. The literary data that we have historically is indeed mostly about leaders or important people. But there are other kinds of evidence that show that everyone heard gods. Idols used to facilitate hallucinations were everywhere and of all sizes, not just in palaces and temples. Ordinary people had idols, and idols were buried with them. In some excavations of cities, every family dwelling had a shrine. Thousands of cylinder seals from many sites in Mesopotamia show a person being led by his personal god into the presence of a higher god. Then we have the names of ordinary people that have the name of their god imbedded into their name. *Kainesut*, which translates as "the King is my *ka*," is an Egyptian common name that in bicameral theory means "I hear the King telling me what to do." I think everybody fitted into these hierarchical, tightly knit organizations because everybody did indeed hear voices that controlled them.

Did the role of conscience change between the bicameral period and consciousness?

Jaynes: In one sense, the bicameral mind was conscience, hearing what to do from gods, but the idea of conscience today is like a faint and wayward echo of it. I have been surprised recently to find that conscience in this sense is a relatively modern notion, having been begun, I think, by Thomas Aquinas in the 13th century as practical moral reasoning, and then heavily emphasized by Calvin in the 16th century as an innate subjective mode of moral revelation. In the 17th century, the King James translators of the New Testament, no

doubt influenced by Calvin, translate *Suneidesis* as "conscience" when it should probably be "consciousness." But it is not until the beginning of Romanticism with Rousseau that "conscience" becomes "divine instinct" and "the voice of the soul." It is interesting that this occurs just as poetry is beginning to turn back to some bicameral-like admirations (see Weissman, 1979, 1982).

I remember as a young boy asking my mother how I could tell the difference between right and wrong. She told me softly to listen to my conscience. I tried but nothing ever happened. I concluded that either I was too wicked to have a conscience or too good to need one. I have been wavering between these two positions ever since.

Was there any difference in moral development in the bicameral mind?

Jaynes: I think you are saying it too weakly. There is no such thing as morality in the bicameral world. Ethics and morality are things that we have to learn in our societies to replace the dictates of the gods. The first replacement for the gods in holding a society together, however, was sheer legality without real morality. A work by the early sophist Antiphon even says that laws and customs are to be obeyed only when disobedience is liable to be detected. It would be contrary to nature (*physis* as distinguished from *nomos* or convention) not to injure someone if you would benefit thereby and would not be caught (see Field, 1930). The idea of a morality apart from legality only begins to appear in Greece in the 5th century B.C., as in Sophocles' *Antigone*, and then of course in the Socratic *Dialogues* with sudden and tremendous sophistication. But because there is no universal natural basis for morality in large conscious civilizations, because we cannot derive any *ought* from a scientific study of what is, we commonly return to our bicameral heritage for our authorization, basing our ethics on the writings of the last people to hear bicameral voices, such as the Bible in Judeo-Christian societies or the Koran in Islam.

Do you consider any possibilities of nutritional effects resulting in changes of consciousness that came about around the agricultural period?

Jaynes: Is there a nutritional determination of some of these changes in mentality? I know that there are several theories about specific geographic areas, but I suspect they are promoted by a tendency we all have to wish simple materialistic determinations rather than complex cultural ones. Materialistic determinations only seem simpler, but they really are not. And the evidence for them is usually weak and local. They could not explain the geographically extensive changes I have been referring to.

However, you did phrase your question as if to entertain the possibility that in the change from a hunting and gathering economy to agriculture back around 9000 B.C., there may have been nutritional changes — more carbohydrates perhaps — or ergot on cereals — that could produce more hallucinatory activity. I am sceptical, but it should be investigated. If schizophrenic patients have more carbohydrates in their diet, do they tend to hallucinate more? And conversely, would such patients be helped by being on an all-meat diet? I don't know.

How about the pyramids of Egypt? Surely the pharaohs who built them as their tombs were thinking ahead to their afterlife, and that would be consciousness.

Jaynes: This is what is called the presentist fallacy. You are phrasing the situation as if ancient Egyptians were like ourselves. They were not. The pharaohs of 2500 B.C. did not build the pyramids for themselves. You must remember that the volition of a bicameral person was his auditory hallucination or god, and so the volition of each pharaoh was Osiris, the chief god, who was his *ka* or bicameral voice. Osiris commands the building of the pyramids to his glory in the same way that a millennium later Yahweh with great architectural detail commands Moses to build an ark and a tabernacle to his glory (Exodus 25–27), or as the Greek earth goddess, Demeter, commands that a temple be built at Eleusis to her glory (Homeric Hymn to Demeter, lines 271 ff.), or in many other examples. In Egypt, however, when the pharaoh dies — as we would call the process — he is absorbed into his *ka* and then both are absorbed into Osiris as is depicted many times on funerary walls — even perhaps as Jesus after his resurrection is absorbed into the unified Trinity (Jaynes, 1979).

What about pain? Pain is certainly conscious and ancient people and animals surely feel pain!

Jaynes: Most pain theorists today agree that there are two fundamental types of pain in ourselves, variously called acute and chronic, nocioceptive and operant, or sensory and functional. In our work this same distinction is between sensory pain with its associated pain behaviours and conscious pain (Jaynes, 1985), and they follow each other in history. Animals and bicameral people just have the former; we always have a combination of both. We have sensory pain and also are conscious of it, fear it, recruit it, extend it out, amplify it with our conscious concern, interact with it, re-enact it. Using this distinction, one can enter into a greater understanding of many human pain phenomena such as the effectiveness of placebos, some phantom limb pain, and chronic pain for which no neural basis can be found. Pain in ourselves is always a complex interaction between the physical stimulus that causes pain behaviour and the conscious reactive component to it which we might call the conscious suffering.

Are there any matriarchal societies in early civilization?

Jaynes: There is no clear evidence of matriarchies in early civilizations of the Near East at least. In our research the more common thing is a world ruled mostly by female gods and masculine hearers of those gods. I suspect this is because children were brought up almost exclusively by women. That is what the Iliad is. Evidence for this bicameral gender arrangement goes back to the Hacilar and Catal Huyuk cultures in Anatolia of about 6000 B.C., with their pudgy and strange idols of what are often called mother goddesses. But there is no evidence that these were matriarchies on the human level. There were, of course, several ruling Queens of Egypt, such as Hatshepsut, but I don't think that makes a matriarchy any more than it does today in the British Commonwealth because a woman is head of state.

Before a child can use language, does this mean that the child is not conscious?

Jaynes: Yes. The idea of consciousness that I have just presented should be tested out in child development. My students and I are trying to do that at Princeton. One needs language for consciousness. We think consciousness is learned by children between two and a half and five or six years in what we can call the verbal surround, or the verbal community as B.F. Skinner calls it. It is an aspect of learning to speak. Mental words are out there as part of the culture and part of the family. A child fits himself into these words and uses them even before he knows the meaning of them. A mother is constantly instilling the seeds of consciousness in a two- and three-year-old, telling the child to stop and think, asking him "What shall we do today?" or "Do you remember when we did such and such or were somewhere?" And all this while metaphor and analogy are hard at work. There are many different ways that different children come to this, but indeed I would say that children without some kind of language are not conscious.

If you ask a person what he was thinking about yesterday, would this be something that did not ever happen in the bicameral world?

Jaynes: It would not happen in the bicameral world. Supposing I asked you what you were thinking of five minutes ago, I think you would find it difficult to reply. You have to tag these things in the time domain to remember them. There was not any such thing in the bicameral world, no spatialized time in which we locate lives and actions. This idea of reminiscent memory, what Tulving (1983) calls episodic memory, is built on consciousness. You don't find a bicameral Achilles saying things like "When I was a child" or "Back in Greece what did I do at this time?" or anything of that sort. The bicameral world goes on in a relatively continual present.

I should add that of course bicameral people knew, *non-consciously knew*, where they were, had come from, and were going, and what they were doing over a short time frame. So does a dog or a pigeon over a short time. Otherwise no behaviour could be completed. This particular time frame is what William James and others have called the specious present (James, 1890, pp. 609ff.). That is a much more primitive type of immediate and non-conscious retention which all vertebrates and many invertebrates have as well, and appears to be very carefully evolved to vary for particular behaviours.

Now add to that for bicameral man the use of language as a retention device. Having verbal formulae or rote epithets, such as "the war-loving Danaans" or "the horse-taming Trojans" or "much-enduring godlike Odysseus" (all examples from the Iliad) for peoples, persons, places, or gods, gave him a much greater capacity for these immediate knowledges by cuing off these verbal associations.

The bicameral epics themselves, composed by formulae and by rote from generation to generation, can be viewed as retention devices and a huge step toward episodic or reminiscent memory. But it is only with consciousness, of course, with its spatialized time in which events can be located, that we achieve remembering in its full sense.

In the model here, does one side of the brain have the attributes of consciousness, since it is making the decisions in terms of the voices of the gods sending it over to the left side?

Jaynes: Narratization, but not with an analog 'I', seems to have taken place in the right hemisphere, since I have assumed the early epic narratives are right hemispheric (Jaynes, 1976b). Therefore some of the attributes of consciousness begin, if this model is correct, in the right hemisphere. That is a very perceptive question and one which needs to be explored, particularly in relation to the previous question.

Do you think there might not be some sculptors, painters, and particularly composers who would dispute the idea that language is required for consciousness?

Jaynes: The assumption of your question, I think, is that consciousness is necessary for art and music. I don't think so. There was a great deal of art and music in the non-conscious bicameral world, all originated by those neural organizations and resulting cognitions called gods. Texts specifically refer to gods dictating how idols are to be carved or buildings built. Look at the meticulous detail that Yahweh goes into in building the ark or the tabernacle in Exodus that I just mentioned. If you talk to composers and painters today, and I have on these matters, many of them don't have the feeling that consciousness is doing the composing or painting any more than consciousness is giving me the words I am presently speaking. As I mentioned in my talk, I am narratizing an intention in con-

sciousness, what I have called a struction, and then the words just come. So in artistic expression of any kind. I have just received a letter from a contemporary composer who asked me if he is schizophrenic because he simply hears his music and transcribes it.

That isn't quite what I meant. I meant that consciousness doesn't seem to be all language.

Jaynes: I understand you now. Yes, the content of consciousness is far from being all language. You or I can right now imagine a triangle in mind-space, colour it red, and even slowly turn it around in our consciousness. There is nothing linguistic in that. But it takes language to get us there, to set it up in our imagination. I did not mean that everything in consciousness is made up of language. Language creates a mind-space on the basis of metaphor and analogy in which you are 'seeing' the triangle, as well as the analog 'I' which is doing the 'seeing'. The particular things you are conscious of, music, sculpture, triangles, are often not linguistic at all.

Why in some cases does the right hemisphere say good things and sometimes bad things?

Jaynes: In schizophrenia, which I suggest is a partial relapse to the bicameral mind but mixed with a great deal of stress, some patients hear good voices, but the majority today hear condemnatory harsh voices. One hospitalized 40-year-old patient whom I interviewed and who will probably remain hospitalized the rest of his life, hears all day the Queen of Heaven in a rose garden, constantly telling him what a good boy he is; he is extremely gentle and constantly smiling. While another, a former parochial high school principal, heard a deep voice associated as God telling him how unworthy and sinful he is and to fall down and break his teeth and sometimes not break his teeth (he came to the hospital with broken teeth). We suspect of course that the difference perhaps is due to a doting mother in the first case and a punishing, inconsistent father in the second. But we do not know, and the problem should be possible to research.

How do you define thought and feeling?

Jaynes: Both of these terms are polyreferential, as are most words for mental acts. I would like to use "thought" just for consciousness, for what we are doing in consciousness at any time. But usually this involves a non-conscious substrate that is solving structions on an almost continuous basis. Most people would call that thinking. I use thought loosely and not as a technical term.

"Feeling," however, I do try to use technically — by which I mean with a precise referent. And perhaps I shouldn't because it has several other referents, the most prominent of which have to do with touching and believing, which I feel are entirely separate. In a theory of emotions that I have proposed elsewhere (Jaynes, 1982), I suggest that we, like other mammals, start with a complex of evolved basic affects that, with the advent of consciousness, become the basis of our feelings. That is, a feeling is the consciousness of an affect, thus stretching it out in time and making it difficult to get rid of. So around 700 B.C. in Greece shame becomes guilt; fear, anxiety; anger, hatred; and so on. And, as I mentioned before, pain becomes suffering. The evidence for these changes is in the dramatic transformations of behaviour and customs in the first millennium B.C. This is what I have called the two-tiered theory of emotions.

You said — this was in connection with imaginary playmates — that the bicameral mind was innate. Why then aren't we all bicameral?

Jaynes: Innate does not mean inevitable. It means an inborn potentiality that can be made actual in a particular environment. It is the distinction between genotype and phenotype. The social, verbal, behavioural environment of a child today and the peer pressure to be and think like other children does not encourage or reward a child in a bicameral direction. Back before 1000 B.C., that social, verbal, behavioural environment plus peer pressure would encourage the child's imaginary playmate towards the status of a personal god and a full-fledged bicameral mind.

To say this another way: A child from bicameral times brought up in our culture would be normally conscious, while a modern child if brought up in the Ur of 3000 B.C. under the sovereignty of Marduk in his *giginu* in the great ziggurat would be bicameral.

I still can't believe all this, saying that ancient people are not conscious like we are. How can you prove it?

Jaynes: There are really two questions there. First is the difficulty of believing ancient people were not conscious. I certainly understand the problem, which is why in my book I call it "preposterous" (Jaynes, 1976b, p. 84), for so it seems at first. The reason it seems preposterous is because of all the everyday functioning we have packed into our concept of consciousness, thinking of it as all perception, all mentality. That is why I spent so long at the beginning in trying to straighten out the term to its true and original meaning.

To say this another way, we tend to infer that anything that acts like us is conscious because the inference of consciousness in others is so habitual, going on not only in all our social life but in consciousness itself as we narratize about our relationships. It is very difficult to suspend that habit of projecting consciousness in thinking about ancient civilizations or even in animals close to us or even in newborn infants.

The second question was how can it be proved. To stretch a comparison, I can imagine someone back in 1859 complaining to Darwin that it is preposterous to say that species were created by chance and natural

selection without any purpose whatever. Look at all the evidence for the purposiveness of God's creation — everywhere! It can't be chance and selection. How can you prove it?

The answer in both cases, evolutionary theory and bicameral theory, is to try to state the hypothesis as clearly and factually as you can, and then evaluate how the data, all the data you can find, may fit in. For evolutionary theory, we look at the fossil record and current situations of speciation where we can observe them; for bicameral theory, we look at ancient texts and artifacts and current mental phenomena as they may be illuminated by the theory. In both cases the theory must explain the data more completely and parsimoniously than any alternative.

Do you think you have done that?

Jaynes: I know of no alternative of equal explanatory power that maps on to all the evidence. But it is only a beginning. I know there will have to be adjustments and revisions. There is so much left to do. So much more sheer theoretical analysis of consciousness itself, particularly of narratization that covers so much so thinly, so much more accurate translations of ancient texts, so much in studying the development of consciousness in children, a taboo subject for so long, or the variety of mentalities in hunter-gatherer groups, all of whom have partly learned consciousness by now in their contacts with civilizations. But I think it is an opening in the right direction into which psychology should go.

How did you come to this theory?

Jaynes: How do I narratize my arrival at these views? As one who had gone down many blind alleys in search of the origin of consciousness in lower species with simpler nervous systems, until I realized more and more that I — and most others who had preceded me on such a quest — were confused in a way we did not understand. So I decided to change directions and attempt to trace back in human history the mind-body problem as a way of alleviating that confusion. I traced it back until it disappeared in some of the works ascribed to Aristotle, then in some of the pre-Socratics, and then vanished in the Iliad. What did that mean? I then felt for a long time like someone in a dark room, stumbling about, bumping into strange unrecognized objects while feeling for a light switch or chain, not even knowing if there was a light. And then it happened and the light went on. Consciousness is learned on the basis of language, and right at that time — at least in the strong form of the theory. And so many things were suddenly clear. It was not biologically evolved. Other ideas about the metaphoric nature of consciousness, which I had been harbouring for a long time, joined up with that and the theory began.

What are dreams in this theory?

Jaynes: Dreams are consciousness operating primarily on neural reactivations primarily during REM (rapid eye movement) sleep. (And let us remember that the presence of REM does not necessarily indicate dreaming.) The same features of consciousness that function in waking life function in dreams as well: narratization, the analog 'I', mind-space, excerption, and particularly that feature of consciousness not so noticeable when awake because it's so automatic, consilience (what I call in my book conciliation — consilience is Whewell's, 1858, better term for my intended meaning of mental processes that make things compatible with each other). Consilience is the conscious analog of perceptual assimilations where ambiguity is made to conform to some previously learned schema. Consilience is in mind-space what narratization is in mind-time, making things compatible with each other.

The neural reactivations which are narratized and consiliated into dreams are instigated by excitation from the pontine region of the brain stem — as is now well known (Hobson & McCarley, 1977). They are usually related to recent events or recent conscious thoughts or feelings, some by chance neural causation, others by association, some utterly inconsequential as a shiny colour or an abstract spatial relationship, perhaps others through our conscious concerns of what has happened or might happen, sometimes in a jumble, sometimes not depending on one's physiological state. These occur together with internal (posture, blood flow, visceral, etc.) and external stimuli (temperature, light, sounds, etc.) impinging on the sleeper — what in the older dream literature was called 'incorporation'. Consciousness tries to narratize and consiliate it all together into a story.

An example: Suppose among these reactivations you have independently an apple, a seashore, a straw hat: you will consiliate and narratize them together (even as you probably did as you were conscious of them as I said them) so that you dream you are walking along a beach in a straw hat eating an apple. Now add in the external stimulus of cold because your blankets have fallen off, and you may then notice in your dream that you are naked. Rationalization (in its old-fashioned sense of simply making things reasonable) is a kind of narratization and occurs in dreams as well. So you rationalize your sudden nakedness by realizing in your dream that you are going swimming. Or if you have some sudden stomach indigestion, as you swim in your dream, the ocean may suddenly roughen with turbulence. But then add in a spontaneous reactivation of something really disparate such as a calculus of metaphor you were trying to invent on a blackboard last night, and if this can't be consiliated or narratized into what has gone before, the scene of the dream abruptly changes perhaps to a classroom and you are having a new dream. So dreams are fashioned by

consciousness and change when consilience becomes impossible. Sometimes we may have very bizarre consiliations, as with a feeling and a quite inappropriate scene or activity making a dream that makes no sense and often can't be reported.

Then you don't believe in dream interpretation?

Jaynes: Occasionally some ongoing concern or anxiety can be teased out from the tangle of dream ingredients, sometimes with striking imagery, but it is usually something you have been conscious of the day before. Such imagery thus symbolizes a problem and can help keep one's concentration upon it. Apart from that, dreams have no necessary interpretation, but they can be and are being used projectively as Rorschach cards in therapy. And it can be an interesting game for anyone to try to sort out the particular elements which were consiliated and narratized into their various origins in recent conscious experience.

What about animal dreams?

Jaynes: They are not dreams in our sense. What you see in the fluttering paws and mouth of a sleeping dog are pure reactivations instigated as before by the giant pontine cells but without consciousness, without any consilience or narratization with an analog 'I' — or perhaps I should say analog 'Fido'. Even the well-known experiment of lesioning parts of a cat's pontine brain stem, so that the usual REM sleep muscle inhibition does not occur (Hendricks, Bowker, & Morrison, 1977), does not result in these animals' "acting out their dreams" as is commonly said, but in acting out their stereotyped reactivations — if that is how to express it.

Can introspection occur in dreams?

Jaynes: Sometimes, yes. Such occasions are what are called "lucid dreams."

But if dreams are consciousness and consciousness only began about 1000 B.C., then no one should have dreamt before that time.

Jaynes: No one did dream before that time in the way that you and I do. Let's look at the data. In the Iliad there are four dreams, although they are not called that: there is no word for them in the Iliad. The most important one is at the beginning of Book II, important because it renews the Trojan War. Agamemnon is asleep in his tent. Presumably, he is in REM sleep. In comes Oneiros, a god messenger from Zeus, whose name comes to mean "dream" in later Greek. Oneiros appears as the much admired Nestor, "stands at his head," tells Agamemnon he is asleep in his bed, and then proceeds to deliver his message, and departs, after which Agamemnon awakes, arises, and tells the others. Agamemnon never thinks he's anywhere else except on his bed or doing anything except sleeping. He can't because he is not conscious, which is what he would have to be to dream himself somewhere else (translocative) and doing something else (vicarial) as we do in our dreams. It is what we call a bicameral dream, similar to what goes on in the waking mentality of ancient times. Such dreams are very rare today but they occasionally occur with profound effects. Descartes had one and it changed his life.

All four dreams in the Iliad are of this type. If we go over to the Hebrew world, the famous Jacob's Ladder Dream is a bicameral dream (Genesis 28:10–22). Jacob's dream takes place exactly where he is sleeping and he does nothing except hear Yahweh at the top of probably a ziggurat rather than a ladder, with angels streaming up and down its steps, as Yahweh renews the covenant with him. So sure is he that the dream happened where he was sleeping that he annoints the place as Beth-El, place or house of God. Three other dreams are mentioned prior to this in the early chapters of Genesis and they are all bicameral. The Joseph stories that follow, according to modern scholars (Redford, 1970), come from around 700 years later and they are not bicameral.

In the cuneiform literature, we have dreams going back to 2500 B.C. and in hieroglyphics back to the dream of Djoser in 2650 B.C. All are bicameral with one possible exception where the translation is in question.

Going the other direction in time, dreams after the Iliad rapidly become first vicarial, the person's analog 'I' in his dream doing something other than sleeping, and then translocative, that is, they take place somewhere other than where the person is sleeping. All of us today have vicarial translocative dreams, which are consciousness operating primarily during REM sleep.

I regard this development, this definite historical change in the nature of dreams, as one of the great confirmations of the strong form of the central hypothesis of the origin of consciousness in the breakdown of the bicameral mind.

Does this theory relate to therapy in any way?

Jaynes: I think there are some obvious inferences to be made. As for schizophrenia, the theory of the bicameral mind in simplified form is at present being taught to hallucinating patients in several clinics both here and abroad. It relieves a great deal of the associated distress of "being crazy" by getting the patient to realize that many of his or her symptoms are a relapse to an older mentality that was perfectly normal at one time but no longer works.

In the treatment of neuroses, the theory provides a strong theoretical framework for such consciousness-changing procedures as the cognitive therapies of Beck (1976) or Meichenbaum (1977), reframing or restructuring, the use of guided imagery, paradoxical therapy, and various visualizing practices. Most of what are diagnosed as neurotic behaviours are, of course, disorders of consciousness, or more specifi-

cally of narratization and excerption. Therefore, narratization and excerption must be retrained for the patient to obtain relief. Such renarratization is actually what is going on in most therapy, even in analysis of either the Freudian or Jungian variety. And it does not matter whether or not the renarratization is existentially veridical so long as it is believed and redirects behaviour into more adaptive modes.