

## EVOLUTION AND STRUCTURE OF CONSCIOUSNESS

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**Keywords:** awareness, consciousness, dynamic center, dynamic unity, knowing, me-as-center, me-as-periphery, Zen

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### Summary

Consciousness, what it is, and how it interacts with matter, whether it is amenable to study using the traditional scientific methods, whether it is to be found only in human beings or whether it is a basic component of the world, and whether machines are conscious, are now serious questions in the West. The following article discusses the question of consciousness using three critical questions: Does consciousness evolve and if so how? How do mind and matter interact? Is the current scientific method too restrictive for the study of conscience?

The article is divided into two parts. The first part deals with the question raised in the introduction: “Is the ruling paradigm of science too restrictive for an adequate study of consciousness and does it need revision.” After the shortcomings of the paradigm have been exposed, the article goes on to develop a new logic of ambiguity that subsumes classical logic as well as the “logic of nature” introduced by Neils Bohr. Bohr developed this logic of complementarities in an attempt to cope with the wave-particle phenomenon of quantum mechanics, which violates the basic logical principle of non-contradiction. This logic of ambiguity is then applied to the age-old problem of mind-body interaction.

In the second part of the article the evolution of consciousness is traced from “knowing-being” through different levels of awareness to human consciousness. By doing this one can reveal the structure of consciousness. The origin of emotions, which are seen to be arranged along two scales, is shown. What is known as “me,” as well as the relation “me and you” that Martin Buber discusses in his book *I and Thou*, is shown to come into being with the viewpoint. Finally, because “me” is preverbal it is suggested it is present in all organisms that have the ability to focus attention and perceive, whereas “I,” because it is dependent upon language, is a property of human beings alone.

## 1. Introduction

Consciousness has been studied through the ages and four different approaches have been adopted: moral, that is consciousness of right and wrong; philosophical and metaphysical, in which consciousness has been studied as an aspect of the universe as a whole; social or class consciousness; and finally consciousness as awareness and attention.

Wilhelm Wundt (1832–1920) was the first psychologist to make a scientific laboratory study of psychological states. Francis Galton (1822–1911) set the stage for future scientific study in the laboratory by excluding introspection as a valid approach. Sigmund Freud (1856–1939) contrasted the conscious to the unconscious and brought attention to the importance of unconscious influences. Ivan Pavlov (1849–1896), for whom consciousness was “the secondary signaling system,” felt that consciousness is derived from cultural determinism and is dependent upon language and symbolic knowledge. Sir John C. Eccles (1903–1997) studied the brain as the neurophysiological basis of consciousness and ego. The behaviorists, headed by John Watson and J.B. Skinner, have contended that consciousness is an unnecessary postulate and only behavior can be scientifically studied. The neurophysiologists, who seek highly specialized regions of the brain to account for consciousness and its correlates, continue this trend of downgrading the importance of consciousness.

All these approaches follow the Western scientific method of breaking a problem into its elements and then studying these elements in the hope of reconstituting the whole from them. The Gestalt psychologists, on the other hand, felt that the Gestalt, or the perception of the whole, was not simply a sum of its parts and so introduced the study of the Gestalt as a legitimate psychological discipline.

Possibly the most thoroughgoing of the modern attempts to come to terms with consciousness is the phenomenology of Edmund Husserl (1859–1938).

In 1992, in the introduction to the special edition of the *American Scientist* on mind and brain, John Horgan, a senior writer with the journal, gave emphasis to the problem of consciousness saying that it is crucial but overlooked by scientists. He said that consciousness is the most elusive and inescapable of all phenomena, and then went on to say that this is a problem that so far “seems to have been ducked by most scientists who simply assume that mind is the outcome of complexity. The alternative seems to be an unacceptable dualism in which the mind and matter are two different stuffs and, therefore, presumably forever running parallel tracks.” Nobel Prize winner Francis Crick and his co-author Christof Koch went further in this issue and said that the relationship of body and mind is the “overwhelming question in neurobiology today.” In recent years, seminars and conferences have been conducted, and numerous articles and books have been written, yet for all the debate very little progress has been made. While advances have been made in psychology and neuroscience, the problem of consciousness is like a morass in which the more one struggles the deeper one sinks.

One reason for so little progress is given by Crick and Koch: “Until quite recently most cognitive scientists ignored consciousness, as did all neuroscientists. The problem was felt to be either purely ‘philosophical’ or too elusive to study experimentally. It would not have been easy for a neuroscientist to get a grant just to study consciousness.”

One of the greatest obstacles is the inability to decide whether there is any consciousness to study. Many scientists in the neuroscientific field believe that consciousness is at best an epiphenomenon of brain activity. Thus in the special edition of the *Scientific American*, of 12 articles on the mind-body relation, 11 took it for granted that consciousness and brain are generally synonymous.

There are roughly four schools of thought in consciousness study. The first contends that consciousness is an unnecessary postulate and so science would be better off ignoring the idea altogether. The second believes that while consciousness is a product of the brain it warrants some attention. A third school feels that consciousness is an attribute of being human and deserves to be studied in its own right. A fourth school attributes consciousness to other life forms as well as to humans.

It is ironic that while most scientists deny consciousness even to humans, a growing body of scientists claims that computers have consciousness. A further irony is that in the field of quantum mechanics it is generally agreed that consciousness is a requirement for there to be a universe at all.

Crick and Koch, in the above-mentioned article, suggest that “radically new” concepts may be needed to resolve the body-mind problem, and cited the new modifications of scientific thinking, forced on us by quantum mechanics, as an instance of science having to yield to a new way of thinking. Possibly the greatest obstacle in the way of progress in this and allied fields may well be the ruling paradigm that determines what is acceptable as a scientific enquiry and method. Is it too restricted, and should a new paradigm, or a considerable enlargement of the existing paradigm, be found? If yes,

then probably any innovation will have to come from outside the scientific community. Few scientists will be ready to risk their scientific reputation in such an unpopular and risky endeavor.

Most often, when consciousness is studied, it is assumed that it somehow appears whole, either in the primates and human beings or in human beings alone. Although a number of field studies on animals now suggest that other animals have some degree of consciousness, it is still rare to encounter the idea that consciousness has evolved. It is assumed, moreover, that if consciousness has evolved this evolution is the result of an increase in the complexity of organization of the organism. No consideration, except perhaps fleetingly in the work of Teilhard de Chardin, is given to the possibility that consciousness evolves according to the dictates of its own intrinsic nature.

The question “What is consciousness?” has recently been divided into what could be called the *easy* questions and the *hard* question. The easy questions concern *functioning* of consciousness including perception, memory, language, and so on. The hard question concerns consciousness itself. These two questions can be separated only in theory. In the East a metaphor of a stone dog is given. One can look at the *form* of the dog—its color shape, and size—or one can look at the *substance* of which the dog is made. The easy question would concern the first aspects; the hard question concerns the substance of which the dog is made. Although it is legitimate to make this distinction, obviously one cannot have the dog without the stone and conversely. In what follows I shall be concerned with the evolution of the substance of consciousness. We cannot separate this evolution from the intrinsic nature of consciousness and if we wish to study the one we must also study the other.

The question of the interaction between body and mind has been debated for years. Ever since Descartes separated the world into two fundamentally different substances—*res extensa* and *res cogitans*, a matter substance and a mind substance—whether, and if so how, they interact has been a question that has haunted philosophy.

Although this article is on consciousness we must first point out that the current scientific method is too restrictive for the study of consciousness. The scientific method currently used is too limited for an adequate study of consciousness. It suffers from three important limitations. The objective viewpoint that is basic to this method excludes observers and their consciousness yet this consciousness is the very subject of investigation. The analytical method of reducing a whole into its constituent parts and studying these parts in isolation is not suitable for the study of consciousness. The dualistic logic, which is the basis of scientific thinking, forces investigators into making inappropriate choices.

These limitations have also been encountered in quantum physics, which is at the leading edge of the study of the physical world, and we shall be benefiting from some of the conclusions that physicists have arrived at to overcome these limitations.

The article is divided into two parts: the first addresses the questions of the interaction between body and mind and whether the current scientific method is too restrictive for

the study of consciousness; the second part is concerned with the question "What is consciousness?"

## **2. Part One**

Four quite different views are possible in considering consciousness, and classical logic insists that we choose one or other of these and reject the rest. However, each is valid in its own right and integrity must prevent us from choosing one and rejecting the rest. This means that we must first find a way to overcome this limitation. Let us first give the four alternative viewpoints.

### **2.1. Four Ways of Viewing Mind and Matter**

Traditionally, mind and matter are opposed; this is made obvious with the two major ways, the materialist and the idealist, by which the world is viewed. The materialist view is that, at best, mind is a byproduct of matter, although many materialists prefer to dispense with mind altogether. The idealist view is that matter is a product of mind. Some physicists are of this opinion. Originally, the materialist view of the world was just that, a view. Materialists view the world objectively "from outside," which is to say they view the world as a collection of objects or things. Idealism also is a view; idealists view the world "from inside." This is somewhat analogous to seeing a house from outside and from inside. Anyone can view the world in these two ways. However, these two ways have been reified and now are no longer considered to be the ways things are *seen* to be, but the way things *are*.

It has become the fashion to think that this "mind-matter" duality was an invention of Descartes. However, Descartes simply reformulated an age-old belief in a soul and body. All religions have the belief that human beings have immortal and mortal aspects. What has happened in the West is that the soul has been reduced to mind and the mind has been further reduced to a ghost in the machine. Now the ghost is being expelled.

For Descartes the world was dual, and the two substances *res extensa* and *res cogitans* had the same status. From this a third view of the world has grown up, the view that these two substances run on parallel but independent paths. The fourth view is the "common sense view." Most people feel that they have, or are, the mind and have, or are, the body and that these two interact with each other. However, it was also a view held by Wilder Penfield, the well-known neurologist in his book *Mystery of the Mind* published in 1978. He believed that a special part of the brain made this interaction possible.

The four viewpoints then are: materialism, idealism, parallelism, and interactionism. Classical logic insists that only one of these can be correct and the other viewpoints should be discarded.

### **2.2. Knowing-Being**

The words mind and matter are somewhat loaded and capable of different interpretations. Therefore, instead I shall use the words "knowing" for mind and "being"

for matter. From a common sense point of view the world *is*, whatever else we can say about it. Furthermore, from this same point of view we *know* the world is, whatever else we can say about experience. Two different philosophies have developed around these two: epistemology and ontology. The debate between the materialist and idealist views has continued for centuries in many different forms in the West and in the East, and we must now accept that neither camp can be logically refuted. Each is a whole and self-consistent view of the world. Influences other than logical reason determine whether one is a materialist or an idealist.

One cannot help thinking of the judge who listened to the defense and said, “Yes, you are right.” She then listened to the prosecution and said, “Yes you are right.” The clerk of the court leapt up flustered and said, “But, your honor, they both can’t be right.” The judge turned to him and said, “Yes, you are right.”

### 2.3. A Metaphor

Let me use an illustration as a metaphor for the discussion that goes on between materialists and idealists. It must be remembered that I use the illustration simply to help explain a point of view. I did not use it to develop that point of view.



Figure 1. Old/young woman

In the illustration in Figure 1 we can see a young woman and an old woman. Let us suppose the old woman is a materialist and the young woman is an idealist. We can see that each is a self-consistent whole and independent of the other. If we must choose one or the other as the true picture, which one must we choose? R.D. Laing, the psychiatrist, commented thus on this illustration in his well-known book *The Divided Self*: “. . . the same thing, seen from different points of view, gives rise to two entirely different descriptions, and the descriptions give rise to two entirely different theories, and the

theories result in two entirely different sets of action.” On the next page he says: “There is no dualism in the sense of the coexistence of two different essences or substances there in the object, psyche and soma [knowing and being]: there are two different experiential Gestalts: person and organism.”

#### **2.4. A Logic of Ambiguity**

This same impasse has been encountered in quantum physics in which matter is seen to be simultaneously a wave and a particle. Because of this impasse, Neils Bohr recognized that classical logic could no longer be used as a logic for quantum mechanics and suggested a new principle of *complementarity* to replace classical logic. His notion of the “complementary” was, it seems, based on the complementary nature of yin and yang, whose symbol was part of his coat of arms.

Nadeau and Kafatos in their book *The Non-Local Universe* give the requirements for the usefulness and necessity of the logical framework of Bohr’s complementarity: “(1) when the theory consists of two individually complete constructs; (2) when the constructs preclude one another in a description of the unique physical description to which they both apply; and (3) when both constitute a complete description of that situation.”

As we can see, all these conditions apply both to the illustration of the old/young woman and to the materialist and idealist views of the world. Therefore, the principle of complementarity would qualify as the appropriate logic to discuss both. I should like to go further than Bohr and introduce *a logic of ambiguity* to discuss consciousness and its relation to matter. This logic would include, but go beyond, Bohr’s complementarity and fulfill the requirements set out by Nadeau and Kafatos, for usefulness and necessity. It is, however, a mistake to call it a logic of complementarity. Yin and yang are complements. Each needs the other for completeness. This is true, say, of a nut and a bolt; these are complements. However, a wave and a particle are not complements, each is complete in itself; neither needs the other for its completeness. In the same way the old and the young woman are not complements; each is a self-consistent whole and does not need the other for completeness.

In his book *Ecology of Mind* Gregory Bateson discusses schizophrenia and suggests that basic to schizophrenia is a *double bind*. A double bind is of the order you are damned if you do and damned if you do not. He uses a Zen koan to illustrate his point. “A Zen master held up a stick and said, ‘Do not call this a stick! What is it?’” We must answer, but we cannot answer. Bateson said further that the double bind underlies such activities as humor, art, and poetry. We could say of the illustration that simultaneously it is and is not a young woman. We could, however, say the illustration is a young/old woman. Where (/) means an ambiguous relation, and where this ambiguous relation has the characteristics of a double bind.

Similarly, we could say that the mind and body stand in an ambiguous relation with each other. Materialism and idealism also, because they both give complete accounts of the situation, are ambiguous and have the characteristics of a double bind in that if one is true the other is not and conversely.

## 2.5. The Logic of Ambiguity and Classical Logic

If we accept Bohr's solution of complementarity then two independent logics will be necessary: a logic of complementarity and classical logic. This is so because some physicists believe that the discoveries of quantum mechanics do not apply to the "macro" world. Therefore, two worlds exist: one ruled by the laws of quantum mechanics and the other ruled by the laws of classical or Newtonian physics. The first would be understandable by the principles of complementarity but the other would need the principles of classical logic. This view creates a new imponderable. How does the macro world interact with the micro world? With the logic of ambiguity this problem falls away. One logic alone would be necessary because, as we shall see, classical logic forms a necessary part of it. This extension of the logic of complementarity is a further reason for changing its name from a logic of complementarity to a logic of ambiguity. The logic of ambiguity will be important in a moment when we come to discuss consciousness specifically.

## 2.6. Unity

Before going on, it is first necessary to show why it is said that classical logic forms part of the logic of ambiguity.

Let us again use the illustration in Figure 1 as a metaphor to help this clarification. Besides seeing the illustration as a young or old woman, we can also see it simply as a *black and white field*. As a black and white field the illustration has no ambiguity; it is one, unity. Furthermore, if we see the black and white field, we no longer see a young or an old woman; if we see a young woman we do not see a black and white field. Thus, a further ambiguity is revealed: one black and white field/(young/old woman). If we can consider knowing and being as the basic ambiguity we now can formulate the ambiguity as one/(knowing/being). If we spell the ambiguity out fully it will read *there is an ambiguity one face of which says there is no ambiguity, the other face of which says there is an ambiguity*.

However, the face that says there is no ambiguity, which is the face of unity, is itself not unambiguous. As we are aware, classical logic specifically rejects ambiguity with the principle of non-contradiction—A cannot be both B and not B—and with the principle of the excluded middle—either B or not B. Anthony Flew, in his book *Thinking about Thinking*, wrote: "To tolerate contradiction is to be indifferent to truth." Furthermore, the first principle of classical logic, the principle of identity, is a principle of unity.

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Teilhard de Chardin P. (1959). *The Phenomenon of Man*. London: Fount Paperbacks. [A parallel study to this article in which de Chardin discusses, among other things, the relation of consciousness to matter and the development of consciousness itself. He suggests an “Omega point” around which the noosphere will be integrated in the future.]

## Biographical Sketch

**Albert Low** is a teacher and the director of the Montreal Zen Centre. He was born in England in 1928, and has a B.A. in philosophy and psychology. From 1954 to 1963 he was personnel executive and then senior personnel manager for The Central News Agency in South Africa but left South Africa because of the politics of the country. From 1963 to 1976 he was personnel executive for the Union Gas Company in southwest Ontario, Canada and during this time lectured extensively on management, creativity, and organization development to promote creativity. He developed salary administrations systems for company personnel, including senior management, and was also responsible for organizational development; he developed new ways of thinking about organization.

Albert Low retired from business in 1976 to devote himself full time to the practice and dissemination of Zen. He was on the staff of the Rochester Zen Centre as editor of the center’s magazine from 1976 to 1979, then went to Montreal as director and teacher in 1979. He began Zen practice in 1961 after a number of years of theoretical interest and became a student of *roshi* Philip Kapleau in 1966. He completed formal training in 1986 and at that time received full transmission as a Zen teacher. The center now has over 200 members, many of whom live in the United States and some of whom live outside Canada. The center has affiliates in Kingston, Quebec City, Ottawa, and Granby. Albert Low gives frequent workshops in Montreal and elsewhere in Canada, as well as in France, where he has also given retreats. He has made many radio broadcasts and a number of TV interviews in Quebec and also in Paris. Albert Low is the author of the following books, all of which, except for the Spanish version of *Zen and Creative Management*, are currently in print.

*Zen and Creative Management* (Anchor Press; Playboy Press; Charles E. Tuttle); *El Zen y la direcccion de empresas* (Ediciones Aura); *The Iron Cow of Zen* (Theosophical Publishing House; Charles E. Tuttle); *A Vaca de Ferro do Zen* (Bodigaya Brazilia, 1998); *Invitation To Practice Zen* (Charles E. Tuttle, 1989); *Une Invitation À La Pratique Du Zen* (Libre Expression); *La Pratique du Zen* (Editions Dangles); *Introduccion al la pratique del Zen* (Editorial Kairos); *Convite a Prática do Zen* (Shishil Editora Braslia); *Le Rêve du Papillon* (Libre Expression); *The Butterfly's Dream* (Charles E. Tuttle); *The World A Gateway: Commentaries on the Mumonkan* (Charles E. Tuttle); *Je Ne Suis Pas Un Être Humain* (du Mortagne); *Wo bist du, wenn ein Vogelsing? Kommentaire zum Mumonkan* (Theseus Verlag); *To Know Yourself* (Charles E. Tuttle); *Se connaît c'est s'oublier* (Editions Relié); *A Pratica do Zen E O Conhecimento de si Mesmo*; *Creating Consciousness* (White Cloud Press); *Créer la Conscience* (Relier Press); *Zen and the Sutras* (Charles E. Tuttle); *Aux sources du Zen* (Relier). Albert Low contributed an article to "Master Hakuin's Gateway To Freedom" (*Zen Tradition and Transition: A Source Book by Contemporary Zen Masters and Scholars*, ed. K. Kraft), and to *The Power of Prayer* (New World Library Novato) and *Regen uber den Kiefern* published by Mayer publications. He is a regular contributor to the Paris-based magazine *3ième Millénaire*, and he has translated *Let Go!* (Allen and Unwin; Samuel Weiser) and *Zen Keys* (Anchor).