

# History of Islam

An encyclopedia of Islamic history

## Tasawwuf (Sufism) and Quantum Physics

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Tasawwuf (commonly known as Sufism) and quantum theory have several things in common. For example, Sufis and physicists have very similar views of the world. In contrast to the West's mechanistic worldview, Sufis consider all things and events perceived by the senses as interrelated and connected, different aspects or manifestations of the same ultimate reality. For them, enlightenment is the experience of becoming aware of all things' unity and mutual interrelation, transcending the notion of an isolated individual self, and identifying themselves with the ultimate reality.

An exact science is expressed in the highly sophisticated language of mathematics, whereas Sufism is based on meditation and insists that the Sufi insight cannot be verbalized. Reality, as experienced by Sufis, is completely indeterminate and undifferentiated. They do not see the intellect as their source of knowledge, but merely use it to analyze and interpret their personal experience.

The parallel between scientific experiments and Sufi experiences may seem surprising due to the very different nature of observation. Physicists perform experiments involving elaborate teamwork and highly sophisticated technology; Sufis obtain their knowledge purely through introspection, without machinery, and in the privacy of dhikr (meditation). Repeating an experiment in elementary particle physics requires many years of training; deep Sufi experience generally requires many years of training under an experienced master. The complexity and efficiency of the physicist's technical apparatus is matched, if not surpassed, by the Sufi's consciousness, both physical and spiritual, while in deep dhikr. Thus scientists and Sufis have developed highly sophisticated methods of observing nature that are inaccessible to the layperson.

### **Dhikr**

Dhikr seeks to silence the mind and shift awareness from the rational to the intuitive mode of consciousness. This is achieved by concentrating on one item, like breathing or focusing on the sound of Allah or la ilaha illa Allah. Even prayer, which is considered dhikr to silence the mind, leads to feelings of peace and serenity that are characteristic of dhikr's more static forms. These skills are used to develop the meditative mode of consciousness.

In dhikr, the mind is emptied of all thoughts and concepts and thus prepared to function for long periods through its intuitive mode. When the rational mind is silenced, the intuitive mode produces an extraordinary awareness, for the environment is experienced without the filter of conceptual thinking.

This meditative state's main characteristic is the experience of oneness with the surrounding environment, a state of consciousness in which fragmentation ceases and fades into undifferentiated unity.

### **Insight into reality**

Sufism is based on direct insights into the nature of reality; physics is based on observing natural phenomena in scientific experiments. In physics, models and theories are approximate and basic to modern scientific research. Thus Einstein's aphorism: "As far as the laws of mathematics refer to reality, they are not certain; as far as they are certain, they do not refer to reality" (1) whenever the intellect analyzes the essential nature of things, it must seem absurd or paradoxical. Sufis have always recognized this, but it has recently become a problem in science.

A great variety of natural phenomena belong to the scientist's macroscopic environment and thus to the realm of their sensory experience. Since their language, images and intellectual concepts are abstracted from this very experience, they are limited to describing natural phenomena. But since the atomic and subatomic worlds lie beyond our sensory perception, knowledge of them is no longer derived from direct sensory experience. Thus our ordinary language, with its images from the world of the senses, is no longer adequate to describe the observed phenomena.

As we penetrate deeper into nature, we have to abandon more of the images and concepts of ordinary language. By probing inside the atom and investigating its structure, science transcended the limits of our sensory imagination and thus could no longer rely with absolute certainty on logic and common sense. Quantum physics provided scientists with the first glimpses of the essential nature of things. Like Sufis, physicists now deal with a nonsensory experience of reality and encounter the paradoxical aspects of this experience. As a result, the models and images of modern physics are akin to those of the Sufis.

### **The problem of communication**

Scientists realized that our common language cannot describe atomic and subatomic reality. With the advent of relativity and quantum mechanics in physics, it became clear that this new knowledge transcends classical logic and cannot be described in ordinary language. Sufis have always realized that reality transcends ordinary language and were not afraid to go beyond logic and common concepts. The problem of language faced by both Sufis and physicists is the same: Both want to communicate their knowledge, but when they do so with words their statements are paradoxical and full of logical contradictions.

### **The duality of light**

In quantum physics, many paradoxical situations are connected with light's dual nature or, more generally, with electromagnetic radiation. Light produces interference phenomena, which is associated with waves of light. This is observed when two sources of light are used, for the end result is bright and dim patterns of light. On the other hand, electromagnetic radiation also produces the photoelectric effect: when short wave length light (e.g., ultraviolet light, x-rays, or gamma rays) strike the surface of some metals, they can knock off electrons from the surface. Therefore, the surface must consist of moving particles.

In the early stages of quantum theory, physicists were puzzled by how electromagnetic radiation could consist of particles (entities confined to a very small volume) and waves (which spread over a large area in space) simultaneously. Neither language nor imagination could deal very well with this kind of

reality.

Sufism has developed several ways of dealing with reality's paradoxical aspects. The works of Attar (d.1299), Hafiz (14th century), Ibn al-Arabi (d. 1240), Rumi (d. 1273), Basmati (d. 875), and others are full of intriguing contradictions. Furthermore, their compact, powerful, and extremely poetic language is meant to throw the reader's mind off its familiar tracks of logical reasoning. Heisenberg once asked Bohr: "Can nature possibly be so absurd as it seemed to us in these atomic experiments (2)

Our sensory experiences, whose realm is the macroscopic world, allow us to draw images and intellectual concepts and express them in a language. This language was sufficient and adequate for describing natural phenomena. The Newtonian mechanistic model of the universe described the macroscopic world. In the twentieth century, physicists verified the existence of atoms and subatomic particles, the ultimate building blocks of nature, through experimentation. As these particles are beyond our sensory perceptions, our knowledge of them is no longer derived from direct sensory experience. Thus we face the problems mentioned earlier when dealing with the essential nature of things.

### **Modern physics**

Sufis say that the direct mystical experience of reality is a momentous event that shakes the very foundations of one's worldview, that it is the most startling event that can happen in the realm of human consciousness, and that it upsets every form of standardized experience. Some Sufis describe it as "the bottom of a pail breaking through".

Physicists in the early part of the twentieth century felt much the same way when this new atomic reality shook their worldview's foundations. They described it in terms that often were very similar to those used by Sufis. Thus Heisenberg wrote: "Recent developments in modern physics can only be understood when one realizes that here the foundations of physics have started moving; and that this motion has caused the feeling that the ground would be cut from science."

The discoveries of modern physics necessitated profound changes in such concepts as space, time, matter, object, and cause and effect. Since such concepts are so basic to our way of experiencing the world, those physicists who were forced to change them felt something of a shock. Out of these changes, a new and radically different worldview was born and continues to be formulated. Quantum theory implies the essential interconnectedness of nature, thus forcing us to see the universe not as a collection of physical objects but as a complicated web of relations between the various parts of a unified whole. This is how Sufis experience the world.

### **Space-time**

Sufis seem to attain nonordinary states of consciousness that allow them to transcend the three-dimensional world of everyday life and experience a higher, multidimensional reality. In relativistic physics, if one can visualize the four-dimensional space-time reality, there would be nothing paradoxical at all. Sufis have notions of space and time that are very similar to those implied by relativity theory.

In Sufism, there seems to be a strong intuition for the "space-time" character of reality. Sufis experience a state of complete dissolution in which there is no distinction between mind and body, subject and object. In a state of pure experience, there is no space without time and no time without space, for they are interpenetrating. Physicists base their notion of space-time on scientific experiments, whereas Sufis base it on Sufism.

Modern physics relativistic models and theories illustrate the two basic elements of Sufis worldview: the universal oneness and intrinsically dynamic character. Space is curved to different degrees, and time flows at different rates in different parts of the universe. As our notions of a three-dimensional Euclidean space and time's linear flow are limited to our ordinary experience of the physical world, they have to be abandoned when we extend this experience.

Sufis talk of extending their experience of the world in higher states of consciousness, and affirm that these states involve a radically different experience of space and time. They emphasize that they go beyond ordinary three-dimensional space in meditation, and, even more forcefully, that they transcend the ordinary awareness of time. Instead of a linear succession of instants, they experience an infinite, timeless, and yet dynamic present. The spiritual world contains no time divisions such as past, present, and future, for they have contracted themselves into a single moment of the present, where life quivers in its true sense.

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