

DIALECTIC UNITY OF CORPUSCULAR AND WAVE PROPERTIES IN SENSE ORGANS

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Abstract. *In the article, the development of modern science and technology is directly related to the success of the development of physics and related sciences, including biology, psychology, geography, and biophysics. To prepare students for life and develop their interest in science, the school physics course reflects the system of knowledge that shows students general concepts, laws, processes, interrelationships, their interaction and enrichment of each other. According to the classification of world sciences based on certain circumstances, all the objective conditions and conditions are sufficient for the connection of psychology and physics to occupy an influential place in this system. In particular, as a result of the interaction of substances entering the biosphere, the formation of a certain spatial area, the accumulation of which has a creative effect on the organs of the human body, emergencies occur, discoveries occur, and the strengthening of mental states in the form of intuitive (Latin *intueri* means meticulousness, attentiveness or inner sensitivity) is manifested. The dialectical unity of the corpuscular and wave properties of our sense organs is demonstrated in the article in an intelligible way of reflecting the nature of physical phenomena and laws. From the perspective of quantum physics, it can be said that all things are made of energy and have corpuscular and wave properties. Therefore, human sense organs - eyes, ears, smell, taste, and body receive and collect information related to both particles and waves. As long as the society exists, the question of acquiring new information about the morals, intelligence, high feelings, virtues, abilities and potential of the person who is the driving force of its power, the creator of material and spiritual products, will never lose its position. For the same reason, the human personality, its maturity, and internal and external factors affecting it, the role of activity, determination and aspiration in the 21st century needs to be researched.*

Keywords: *intuition, physics, quantum, eye, nose, wave, corpuscle, dualism, intuitive.*

INTRODUCTION

Both the development of intellectuality and the education of the best qualities of a person can be realised in school as a result of looking at the mental capabilities of students with confidence, respecting their personalities and creating the necessary conditions for the formation of interest in science in students. For this reason, the focus of science teachers on interdisciplinary communication is an important factor in overcoming these problems.

The means that connect us with the outside world are the senses. Therefore, intuition is the source of all knowledge. Objects (objects) in the external world are the cause and object of our sensations. It turns out that these sense organs of ours have the property of corpuscular and wave function. As a result of the interconnection of psychology and physics, we can illustrate that our sense organs have corpuscular and wave function characteristics. The science of psychology emerged based on natural sciences and philosophy, and it has not yet been determined whether it will be included in the ranks of humanities or natural sciences, but despite this, it can be called the product of the combination of information and laws collected in both areas.

MATERIALS AND RESULTS

As an example, we are talking about our two sense organs, the eye and the sense of smell. Let's look at the example of the eye first. In the course of physics, the understanding of the sensitivity of the human eye to light is given. A person perceives light when the light-sensitive elements of the retina are exposed to electromagnetic rays in the wavelength range from 760 to 380 nm. The retina is about 0.5 mm thick and consists of several layers. The optic nerve contains light-sensing cells, called rods and cones, based on their shape. The last net sheath of the blood vessel close to the sheath is composed of pigment cells. The total number of sausages is $7 \cdot 10^6$, and the number of rods is much less than $100 \cdot 10^6$. The rods are concentrated in the central part of the retina in the yellow spot and especially in its recess, and the rods are located in the peripheral parts of the retina. The light affects the receptor cells and causes photochemical reactions in them, as a result of which impulses of excitement appear in the cells, which pass along the nerve paths to the brain and the sensation of vision is formed. In the centre of the retina - the yellow spot, there is a centre called the fovea, its surface is about 0.5 mm^2 , and its field of view is equal to 1 degree. The centre of the fovea is the clearest point of vision, where there are dots. It aims the eye at this fovea to see the object. If the fovea is damaged, then you cannot distinguish one object from another. The periphery of the fovea is surrounded by the peripheral area. The outer part of the periphery is mainly composed of points called rods, which are designed to receive a holistic view of substances. The fovea sends the information it receives to the left hemisphere of the brain, where it is processed rationally. The periphery sends information to the right hemisphere of the brain for intuitive processing. All human sensory organs have such a dual nature, and all received information is processed by the central nervous system and stored in the brain in the form of some quantum particles. These quantum particles are the memory bank of the human mind. They program and control the events that occur in human life.

Now we will find the answer to the question of how our sensory organ, called the nose, works.

According to current information, odour dispersants emit and absorb radiation with a wavelength of 1 to 100 microns. At a moderate temperature, the human body absorbs and emits waves in the range of 4-20 microns, and the most important electromagnetic waves have a wavelength of 8 to 14 microns, and their spectrum corresponds to the infrared region of the electromagnetic scale. Interestingly, infrared and ultraviolet rays can also be used to extinguish the effects of fragrances. UV light kills many odours and can be used to remove unwanted odours from the air. Odors can affect the human nose in a corpuscular or waveform. This is confirmed by many experiments performed by scientists, and by quoting some experiments, we prove that our sense of smell has a corpuscular-wave nature.

Mills and Beck conducted the following experiment. On one side of the wall of the box, they installed a light filter that only transmits infrared light. They put some honey in the box sealed the box and took it to the forest where the bee hives were placed. Before long, the honeybees were building a light filter. Why? According to the experimenters, the "radar" part of the honey bee's olfactory organ captures the infrared light characteristic of honey and sends it to the olfactory organ where it is processed. It is impossible to explain this experience in any other way if we take into account that not a single molecule of honey can escape from inside the hermetically sealed box.

In another experiment, waterfowl were placed in a hermetically sealed cage. The side of the cage is made of brominated potassium glass, through which only infrared light passes. When air was blown from a tube behind the crystal, 15% of the waterfowl vibrated their whiskers (radar). When an odorous oil was introduced into a room surrounded by worm-ants, 24% of the shrews activated their whiskers. However, when the odorous substance is injected directly into the water bodies, 26% of them perceive the smell. The authors explain the results of these experiments as follows. Insects have a long wavy mustache on the outside, which acts as an antenna. The antenna is not for smelling, but for "feeling". When insects smell, their whiskers are excited and they perceive different smells through it. When a cat's whiskers are partially or completely cut off, its sense of smell is partially or completely lost. A scientist, poet, and philosopher who lived 2000 years ago, said that there are small grooves of different sizes and shapes in the nasal cavity, which are similar to the grooves in the retina of the eye. One of Deer's ideas was that the five different shaped grooves in the nose were adapted to receive five different smells. These scent types are camphor, musk, floral, peppermint and ethereal. For a molecule of an aromatic substance to enter the groove, the configuration and architecture of the molecule must match. When the molecule enters the groove, the smell is felt. Thus, the great doctrine of Lucretius Carus about the sense of smell has been confirmed by modern science. In addition to the five olfactory grooves, there are two olfactory organs. One of them is intended for a sharp (spicy) smell, and the other for a foul smell. However, the recognition of these smells is not determined by the shape of the grooves but by the type of electrical charges covered at the end of the olfactory nerves and the relationship between them.

The information received by the olfactory organ is divided into corpuscular and wave senses, respectively, and converted into electrical impulses through special receptors, and the waveforms are sent to the right hemisphere of the brain for intuitive transport, and the odours carried by molecules are sent to the left hemisphere of the brain for rational analysis. Our other sense organs also work according to corpuscular-wave dualism. In people with high intelligence, the operations performed in the left and right hemispheres of the brain (consciousness, thinking) are highly developed, and at the same time, information exchange can occur between these hemispheres, and then conclusions can be drawn.

CONCLUSION

Thus, the information coming from the external inner world is received through the receptors connected to the aspiration or sensitive neurons. Each receptor receives one type of energy: the eye receptor is designed for light electromagnetic waves, the ear receptor for sounds, and the skin receptor for mechanical or temperature stimuli. Nerve impulses appear under the influence of stimulation. A nerve impulse moving along the auditory nerve is biophysically no different from nerve impulses sent to the brain by the eye, smell, or tactile receptors. These impulses go to specific centres of the brain through their paths. The energy received from all sense organs is ultimately converted into a stream of nerve impulses and adapted for decoding. Then it is stored in memory. Sensation is transforming "external" impact energy into a fact of consciousness. It is very difficult to answer the question of how the energy of external influence becomes a factor of consciousness. We are sure that the way to answer this question should be sought at the border of quantum physics and psychology. Currently, many physicists, physiologists, psychologists and major scientists are dealing with this issue. We believe that the human brain is based on classical and quantum computing, with simple mental operations

performed in the left hemisphere of the brain, and intuitive thinking in the quantum computer located in the right side of the brain. A classical computer works on a sequential algorithm, and a quantum computer works on a parallel computing computer.

In general, due to the influence of the external environment, a worldview is formed in the human mind, and several imagination systems are created. However, it is not always possible to apply the ideas created by recording the world through human senses (impression) to the microcosm. In other words, a dialectical unity of wave and corpuscular properties is observed in electromagnetic radiation. However, these characteristics appear based on certain regularities. The human problem is sharply distinguished from other categories of humanities due to its age-old relevance and will continue to have the same high influence in the socio-historical development of man.

REFERENCES

1. Abdullaev, OG , Tashmirzaev, Yu.U. , Mirzaev, TS , Umarov, AV
2. Mathematical simulation of the process of curing auto-filler based on unsaturated polyester resin, 2023, 401, 05038
3. Umarov, A , Abdurakhmanov, U , Rakhimova, Y , ... Saidkulov, D, Boymuratov, F.
4. Study of the electro and thermophysical properties of composite ceramic materials containing nickel nanoparticles, 2023, 410, 02060
5. Variability of integration approaches in continuity and coherence of education. A collection of scientific and methodical articles. -Tashkent, "Publishing Year", 2019
6. Kasimov A, Dzhorakulov A, Physics course Mechanics, Tashkent, "Uzbekistan" publishing house, 1994
7. Ahmadjonov O, Physics course. -Tashkent, publishing house, 1985. Innovation technologies in the context of concentric education, a collection of scientific and methodical articles. - Tashkent "New edition" 2017.
8. L.S. Zhdanov, G.L. Zhdanov, Physics for secondary special educational institutions, Tashkent "Teacher", 1994.
9. Innovative pedagogical technologies in the continuous education system, Collection of articles, Tashkent "Extremum press" publishing house, 2010
10. Bekjanov. R, Einstein and the theory of relativity
11. Ahmadjonov O, Physics course. -Tashkent, "Teacher" publishing house, 1989
12. Normurodov. O, Turdikulov. E, "Learning Elements of Biophysics at School" - Tashkent "Teacher" 1991
13. Bekjonov.R, "In the world of Einstein" - Tashkent, "FAN" publishing house, 1986