



## STUDYING THE CHARACTERISTICS OF INTUITION AND SYNERGIES IN SCIENTIFIC KNOWLEDGE

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### Abstract:

This article reflects the scientific basis of intuition in the world of science, synergetic analysis, the place of memory and attention, balanced connections between the conscious and the unconscious.

**Keywords:** cognition, scientific cognition, intuitive cognition, synergetics, scientific thinking, memory, attention, imagination and imagination.

### Introduction

Man has always sought to know the structure of the universe, the laws of development of things and events in it. In the process of knowing, there are cases when a person unexpectedly, by chance, needs to make a quick decision in a situation where information is limited, he makes his decision "as if he sensed it in advance", "as if it should be done exactly like this". One of these states is what we call intuition.

Intuition is a unique way of generating true knowledge, a complex phenomenon of cognition. In science, the mechanism of intuitive knowledge was not known for a long time. Because of this, various views, approaches, and theories about intuition have appeared. Different views, different approaches, and different doctrines appeared about intuitive knowing. Some have deified intuitive knowledge and expressed the opinion that it is characteristic only of great and classical people, while others put forward views that it is characteristic only of the creative process, that is, the process of scientific discoveries, inventions and artistic creativity. From their point of view, intuitive knowledge is a transition from an old idea to a new idea in the creative process, that is, a leap. According to another group of researchers, intuition is related to creativity, intuition is the birth of a new idea. In fact, intuition is related to the creative activity of a person, which happens when a researcher or creator is completely occupied with something, when a new idea suddenly comes to his mind. Intuitive cognition is actually an aspect of the human cognitive process, that is, it is not only characteristic of the creative process, but also characteristic of the normal everyday practical cognitive activity of a person. Intuitive cognition is closely related to other forms of human cognition and complements them.<sup>1</sup>

### Materials and Methods

Pythagoras (576-496), one of the ancient Greek philosophers who first thought about the role of numbers in the world of thought, is directly related to the theory of knowledge. Pythagoras knows that

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<sup>1</sup>Erkin Yusupov. Philosophy. The second edition of the "Teacher" publishing house was completed in 2005, page 408.



the basis of the universe is numbers, so he connects his knowledge with these numbers.<sup>2</sup> So, according to Pythagoras, existence is numbers, we need to understand the essence of numbers in order to know the essence of existence. In our opinion, the totality of things and events in existence has its own specific form, characteristics, signs, and quantity, and it should be said that the quality of things and events is determined due to the quantity in a certain sense. This situation is known to us as the law of reciprocal transition of quantitative changes to qualitative changes, that is, one of the laws of dialectics. This law "reveals the most general way of development of nature, society and thinking"<sup>3</sup>. At the moment, quantity and quality are one of the philosophical categories that provide comprehensive knowledge about the interrelationships of things and events.

As we know, knowing the world is a complex and exciting process. One of the problems that have interested philosophers since time immemorial has been questions such as knowing the universe, whether it is possible to know it, and if possible, to what extent a person can know it. In understanding the universe, scientists initially paid more attention to emotional cognition and mental cognition. They believed that through emotional and mental cognition, the essence of things and events, their interdependence, and different characteristics can be understood.

In our opinion, the mental activity of a person has a complex process, in which the first simple ideas about the world give rise to the process of knowing, the way of thinking. The development of the cognitive process depends on a change in the way of thinking. Increasing changes in the way of thinking determines that the cognitive process has a certain stage. The stages of the cognitive process are formed in the developed new way of thinking. It can be said that the process of thinking is important in the process of knowing. While the process of knowing is relatively slow and continuous, the process of thinking has a complex structure like discontinuities and jumps. Thinking about thinking acquires the character of integrity, harmony. The emergence of a new thinking process in the human mind is expressed in intuitive thinking. Intuition acts as a turning point in the human mind, a necessary link in the chain of development. Therefore, the dependence of the cognitive process on the way of thinking is of great importance for scientific knowledge and practical activity. It allows us to correctly understand the development process of the objective world, to have a comprehensive knowledge of things and events, to understand intuitive thinking and to use it in the further development of society.

Pythagoras was right about the reasoning that numbers depend on existence, development, knowledge. Realizing the essence of things and phenomena creates an opportunity to understand not only their qualitative and quantitative characteristics, but also the mutual dialectical relationship between them, as mentioned above. In nature and society, as a whole, things and phenomena exist because of each other, this process finds its expression in the dialectical relationship between them. We will consider the reasoning as an example in the opinions given by Pythagoras. According to him, "point" is number

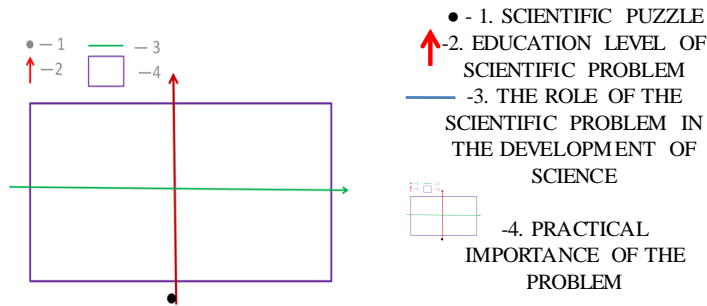
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<sup>2</sup> Asmus V.F. Ancient philosophy: 3rd ed. - M.: Higher school., 1999. P. 13.

<sup>3</sup>Philosophy: an encyclopedic dictionary/ Institute of Philosophy and Law named after I. Muminov, FA of the Russian Federation. -T.: "National Encyclopedia of Uzbekistan" State Scientific Publishing House, 2010. -P 196



one, number two is "straight line", number three is "plane" and finally number four is "whole body".<sup>4</sup> The idea can be illustrated by the following diagram:



It can be said that the totality of information about the object in the cognitive process enables the formation of intuitive thinking. In Pythagoras' views, we can see that intuition is connected with rational thinking.

As for the importance of mathematics in the cognitive process, the French scientist, philosopher, one of the founders of geometry, René Descartes (1596-1650) in his work "Observations on Method" believed that mathematical knowledge is characteristic of the human mind and nature, such knowledge is the most basic knowledge.<sup>5</sup> Also, scientists working in the field of mathematics pay special attention to the concept of intuition. In particular, the direction of intuitionism was formed in modern mathematics. This direction was founded by German philosopher I. Kant, French mathematician and philosopher Henri Poincaré and Dutch mathematician L. Brouwer<sup>6</sup>. It is known that many wonderful discoveries were made intuitively in modern epistemology and science, especially in mathematics, chemistry, and theoretical physics. Henri Poincaré, Jacques Adamard, Leon Brauer, German Weyl and others cannot imagine mathematical creativity without intuition. An important branch of modern geometry "geometric intuition" of its founder A. Poincaré played a major role in the emergence of \*tautology<sup>7</sup>. Poincaré puts forward the basic concepts of tautology on the basis of intuitively obvious ideas. Henri Poincaré believes that innovation is created through intuition, that mathematical ideas are not derived from earlier mathematical ideas. In addition to logical proofs in mathematics, Poincaré

<sup>4</sup>VA Kanke. Philosophy. Historical and systematic course. – M; izd "Logos" 1999 . Article p. 21

<sup>5</sup>J. Tulenov, S. Valieva. Methodology of scientific creation (methodical manual) - Tashkent.: "TDPU" 2008, - P 21

<sup>6</sup>Alekseev P.V., Panin A.V. Philosophy: Textbook, Second edition, revised and supplemented - M.: "Prospect" 1998 . - p.321.

<sup>7</sup>Poincaré A. Science and hypothesis. - M.: Znanie, 1994. p. 56.



calls intuition by summarizing knowledge and advancing new synthetic considerations and ideas<sup>8</sup>. In our view, intuition is a cognitive process that is formed in the system of generalization of certain ideas. L. Brauer connected all his hopes in the field of mathematics not only with logic, but with intuition. "In his mathematical work, he declared intuition to be the only source of mathematics, the basis of rigorous justification of mathematics, and the criterion of the truth of mathematical theories."<sup>9</sup> In addition, many great mathematicians have paid attention to the creative role of symbols in mathematical knowledge. The great German mathematician Felix Klein humorously described the power of mathematical symbols as "The pen is stronger than a man."<sup>10</sup>. By this he meant that one can understand one's thoughts in the form of symbols using pen and paper in order to discover new truths with the help of symbols. The great physicist Heinrich Hertz said about Maxwell's classical equations of electrodynamics: "While studying this wonderful theory, from time to time the mathematical formulas seem to have a soul and intelligence, they seem smarter than us, even their author." said<sup>11</sup>. It can be said that numbers, signs and symbols, mathematical thinking are important in the formation of intuitive thinking. The Greek philosopher Heraclitus (530-470) notes that the problem of intuition has a social nature. He calls the wise men in the society "the chosen ones": "They stand out from the crowd, have sharp eyes and divine intuition."<sup>12</sup> In this opinion, we come to the opinion of Heraclitus that a person with intuitive thinking can be wise and he can lead a society wisely. One of the famous representatives of Islamic philosophy and jurisprudence who supported the ideas of Heraclitus, Maulana Muhammad Qazi, emphasized the need for the ruler to be able to foresee the events and incidents that may occur in the society and to be able to understand the dangerous problems for the people in advance. "Ingenuity is shown as one of the ten qualities that a ruler must have."<sup>13</sup> Also, Abu Nasr Farabi, one of the thinkers who expressed his moral and political views about man, his essence, role in society, goals and tasks in the philosophical teachings of Central Asian thinkers, in his treatise entitled "The people of the noble city", Abu Nasr Farabi, in his treatise "The people of the noble city" should fulfill the intuition that is considered a spiritual phenomenon also offers intuitive ability as one of the ten requirements. Here, intuition can happen in the management of society, while science and reason are powerless to regulate events, the manager's intuitive ability makes it possible to find a solution to any problem. Pharoabi evaluates the higher stage of knowledge as intellectual, that is, logical knowledge, and intuition as logical. Therefore, in the process of classifying sciences, he evaluates the science of logic as the art of thinking correctly and compares it to the science of grammar: just as

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<sup>8</sup> Poincaré A. Oh science. - M.: Nauka, 1983. p. 101.

\* Tautology is the expression of the same meaning with two concepts or phrases.

<sup>9</sup> That source.-P.100.

<sup>10</sup> I. Saifnazarov. G. Nikitchenko, B. Kosimov. Methodology of scientific creation, "New generation" - Vol.: 2004 p. 141

<sup>11</sup> D. Maxwell. Article and speech. M., 1968 C 367

<sup>12</sup> D.V. Jokhadze. The main stages in the development of ancient philosophy. M.: Publishing house "Science" - 1997. pp. 18-19.

<sup>13</sup>Philosophy short explanatory dictionary/ Authors: M.N.Abdullaeva, M.Abdurashidov, U.Abilov -T.: "Sharq", 2004.- B.165.



grammar ensures the correctness of human speech, logic ensures the correctness of thought"<sup>14</sup>. According to Farabi, human activity is characterized by comparison, politics, activity and foresight of events. According to Farabi, knowledge consists of the reflection and expression of things and events in the human senses and mind, real objects that exist outside of a person affect a person and create their own images in him, and due to this process, a person acquires knowledge about the substances and accidents that surround him. The initial information comes to a person from the outside - through the senses, then memory and imagination come into play. The highest level of knowledge, according to Pharoah, is rational thinking. When the senses reflect the qualities and characteristics of things, the mind penetrates into their essence. "The mind is capable of knowing what is hidden behind the color,"<sup>15</sup> he says. Knowing takes place in two stages—emotional and mental knowing. "Mental power" represents the mental reflection of things in existence. According to the scientist, after learning the essence and causes of things on earth, a person begins to seek to know the heavenly bodies and their forms, and at this last stage, he merges with the universe, which shows its influence on a person, and acquires the quality of eternity.

One of the Greek philosophers, Plato (428-347), who called Heraclitus' "World of Virtue and Beauty" the "World of Ideas", said: "The process of human knowledge is a complex process that exists independently of the conditions of time and the changes of existence."<sup>16</sup> - puts forward the opinion. This idea can be found in the concept of philosophical intuition of the French philosopher, winner of the Nobel Prize in literature, Henri Bergson. According to him, "With the help of intuition, the philosopher penetrates into the essence of the subject of research, philosophical intuition is a specific internal impulse that creates a philosophical system independent of time and space"<sup>17</sup>. In our opinion, we can see a situation related to human memory, attention, and understanding in the process of cognition. The following thought of Plato continues this reasoning. "In the process of knowing, a person strives towards the beginning, not the end."<sup>18</sup> Focusing on the importance of memory in the process of cognition, it is the mental process of remembering and, when necessary, retrieving perceived objects and events or past experiences.<sup>19</sup> At the same time, Plato also expresses thoughts about the human psyche: "There are some strange desires hidden inside the human psyche, which manifest themselves in dreams."<sup>20</sup> In our view, concepts such as understanding, imagination, memory, attention, insight form emotional and intellectual cognition in the process of cognition, and it is directly related to the

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<sup>14</sup> Khairullaev.M.M. Abu Nasr Farabi (a brief essay on his life and work, teachings). Tashkent - "Uzfanakadnashr" 1961 58 pages

<sup>15</sup>Pharoah about mental processes and education. M. Khairullaev. Tashkent - "Teacher" publishing house - 1967, 24 pages

<sup>16</sup> Asmus V.F. Ancient Philosophy: -3rd ed. - M.: Higher school., 1999 . articles p.146-147.

<sup>17</sup>Bergson A. Creative evolution. M.-SP. 1914 P 159

<sup>18</sup>Bergson A. Creative evolution. M.-SP. 1914 P 148.

<sup>19</sup>Philosophical encyclopedic dictionary / Institute of philosophy and law named after I. Muminov FA, OzR. -T.: "National Encyclopedia of Uzbekistan" State Scientific Publishing House, 2010. -P 294

<sup>20</sup>V.A.Kanke. Philosophy. Historical and systematic course. – M; ed. "Logos" 1999 . article p. 33.



psyche of a person and is manifested as a result of finding a solution to a problem in the unconscious, that is, in a dream. The human spiritual world has a special place in the process of cognition; the solution of the problem in the dream, the unexpected appearance of a new idea in the unconscious is a clear proof of this. As we know, in the history of mankind, there are many examples of scientists, designers and artists making new discoveries in their field. In particular, the Russian scientist D. I. Mendeleev worked three days and three nights while compiling the periodic table of elements, but he could not complete this task. After that, the tired scientist falls asleep on his desk, and in his dream he sees a table of these elements arranged in an orderly manner.

## **Conclusion:**

According to the sources, "Intuition is not a principled deviation from ordinary ways of perceiving reality, it is a legal form related to the logical form and practice of the occurrence of these ordinary ways. "Suddenly" noticing the truth is based on accumulated experience, previously formed knowledge. "<sup>21</sup> At the same time, "experience" is directly related to the concept of imagination. We can cite the following examples: I. Newton's "Law of universal gravitation" was decided as a result of an apple falling on his head.

## **Consideration**

Isaac Newton (1642-1727) English physicist, mathematician, mechanic and astronomer, one of the founders of classical physics. Author of the fundamental work "Mathematical Principles of Natural Philosophy", in which he presented the law of universal gravitation and the three laws of mechanics. Developed integral and differential calculus, color theory. In spite of the fact that the discoveries of Galileo, Copernicus and Kepler were known at that time, the science and philosophy of Cambridge University were taught based on Aristotle's teachings. Newton read a lot, he was interested in all the innovations in the world of astronomy, mathematics, phonetics and optics. The young man even studied music theory, in general, everything that was new to him and that he could think of. In 1664, Isaac Newton began to work independently. He identified the main problems of man and nature. In the same year, the student's biography changed after the talented mathematician Isaac Barrow appeared in the life of the teacher of the mathematics department of the university. After some time, Barrow became Newton's teacher and part-time one of the scientist's few friends. Through Barrow, Newton's love for mathematics increased, he began to study this subject seriously. Soon he could be proud of his first discovery in the field of mathematics - the rational exponential binomial decomposition. As a result, Isaac discovered the corpuscular model of light, which determined a stream of particles flying out of the light source and moving in a straight line to the nearest obstacle. This model was far from objective at that time, but became the basis for classical physics. With its help, modern concepts of the physics of phenomena were formed later. William Stukeley, an antiquarian historian and archaeologist of the

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<sup>21</sup>Spirituality: an explanatory dictionary of the main concepts/ Academy of State and Society Construction under the President of the Republic of Uzbekistan, National Society of Philosophers of Uzbekistan, editorial board: Kh. Sultanov et al.: compiler and editor-in-chief K. Nazarov. - T.: Gafur Ghulam publishing house, 2009. P.221.



time, describes the events of April (April 15, 1726) with his friend Newton: "I visited Mr. Isaac Newton... and spent the whole day with him. The weather was good, and after lunch we sat in the garden under the apple trees and drank tea. Among other things, he told me that it was in the same circumstances that he first understood the nature of attraction of matter - with an apple falling from a tree. "Why does this apple always fall perpendicular to the ground? Why doesn't it fly up or down sideways or diagonally?"<sup>22</sup> - says Newton. And I found out that in Newton's mind there were ideas that predict that the force of gravity decreases with the height of the object and changes inversely proportional to the square of the distance between the object and the center of the earth. The results of these calculations, as he perceived, converged almost perfectly. He also suggested that such gravity could be the cause of other orbital motions and called it "universal gravitation".

Aristotle calls intuition a sum of ready knowledge. In his opinion, such knowledge does not need any analysis, they cannot be questioned<sup>23</sup>. So, we come to the conclusion that the intuition meant by Aristotle is the product of ready knowledge, the highest stage of knowledge.

## Summary

First of all, it can be understood from the philosophical views of Pythagoras that number, number - their addition and subtraction, multiplication creates the formation of the first thought process in the human worldview. The views of Pythagoras reflected the integrity of the process of knowledge. Meanwhile, philosophers such as Pythagoras, Plato and Aristotle mean holistic wisdom when they say "philosophy". Regarding number, numbers, "Plato hangs the inscription on the facade of his philosophical school: "He who does not know mathematics should not enter my presence." **Mathematics teaches a person to think philosophically.** As he teaches people to know from a small point to the infinite universe, he forms knowledge by putting the dialectical relationship of order and chaos in the world into a whole system. From this point of view, we can give the following formula for this conclusion:

***Numbers+thinking=intuition forms a synergistic state.***

**Secondly**, the role of intuition in social life is clearly reflected in the views of Heraclitus. The philosopher assumes that the ruling ruler knows the various processes occurring or may occur in the society and the problems that arise as a result of the interaction of these processes and has a holistic knowledge of the society. In this opinion, we can see that **intuition forms in a person not only predictability, but also high moral qualities** . It is known that ethics is a social phenomenon, a social problem includes natural-scientific problems, and the following formula is derived from it:

***Social thinking + moral thinking = the strategic position of social life has been formed.***

**Thirdly**. In the thoughts of Empedocles, Al-Kindi and B. Spinoza, we can observe the issues of body and soul. As we know, man is a biosocial being. It is known from history that initially material need resulted in material production as a result of material appropriation. Later, spiritual production arose in people due to the first simple ideas about the world and mental work. Man has become a force that

<sup>22</sup>Isaac Newton. Mathematical natural philosophy . M.: Nauka - Izd-vo Akademii nauk SSSR, 1989.- 211 p.

<sup>23</sup>Aristotle. Metaphysics. Hair. v 4-x t. Mysl. 1976. T.1. P. 122.



produces material and spiritual blessings at the same time. In this case, we can see the harmony of body and soul in a person. As an example, we can take a work of art, which motivates a person to act both physically and mentally. **In the process of knowing, we can** say that the movement from emotional knowledge to mental knowledge or, on the contrary, from mental knowledge to emotional knowledge makes it possible to form intuitive knowledge, and we give the following formula:

***Body + soul = intuition .***

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