

## **Ibn Khaldūn and the theory of evolution**

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### **Abstract:**

The theory of evolution appeared in the mid-nineteenth century after Darwin published his book "the Origin of Species", which included an explanation for the origin and diversity of creatures, based on some biological principles, such as the common origin of species, organic differentiation, the contribution of the environment, and then the inheritance of acquired characteristics. Despite the existence of efforts prior to Darwin's work that paved the way for the theory, including Islamic works such as what Ibn Khaldūn mentioned in his introduction (Muqaddimah).

The addition that this research provides is that there is an overlooked Islamic contribution in the theory of evolution, which was started in a simple way by the Ikhwan al-Safa group, then the philosopher Maskawayh, then the geographer al-Qazwīnī, Then Ibn Khaldūn refined it, with unambiguous logic about the existence of a class hierarchy among creatures, and organic transformation and ascension, In completing this research paper, he relied on the historical method, and the most important results reached were that Ibn Khaldūn had the lead in establishing the general principle of the theory of evolution.

**Keywords:** Theory of evolution, Darwin, Ibn Khaldūn, Species.

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### **Introduction:**

The theory of evolution appeared on the scientific scene in the mid-nineteenth century, following the publication of Darwin's book «the Origin of Species», as an attempt to explain the origin of creation and the current multiplicity of species, Since that date, this theory has been the subject of controversy and debate among General public and scientists in particular, Some of them accepted it completely, because it provides the final answer to many historical biological problems, and there are those who had partial reservations about it because they found in its partial principles unjustified scientific gaps, through which doubt creeps in, and there is a wide spectrum that rejected it on a purely religious basis, as their interpretation clashes with the interpretation that it decided.

Ironically, although this theory is purely Western, and Muslims see it as a clear contradiction to their religious beliefs, there are clear indications of it in Arab works dating back to the era of Islamic scientific brilliance, the most prominent of which was what Ibn Khaldun mentioned in his introduction, did Ibn Khaldūn have the lead in establishing the theory of evolution, even in its general concept?

This research paper will seek to answer the problem offered, the possible hypotheses of which are that there is a precedence of Ibn Khaldūn in inventing the theory of evolution, and that Western scientists have overlooked this, or that his Speech are merely general words, poorly understood.

The objectives of the research are summarized in providing a historical overview of the development of the theory of evolution over time, reviewing all the theories and proposals that paved the way for it until the era of Darwin, then explaining the concept of the theory of evolution and its pillars, highlighting Highlight Darwin's addition, then discussing Ibn Khaldun's statements

on the subject, and the scientific evaluation of his sayings, and this is through employing the historical method, based on three pillars: collecting the scientific historical source material that has a direct relationship to the research, represented in a number of manuscripts of Ibn Khaldūn's Introduction (Muqaddimah) with different annotations, and a significant number of scientific works that dealt with the theory of evolution, including the original sources, then the second pillar, which is examining those sources, criticizing them and proving their validity, and extracting what is important to the research paper from them, and the final step is the historical reconstruction according to the results obtained from the process of criticizing the primary sources.

During the process of preparing the research, we did not find any previous studies that specifically and directly addressed the subject, except for a comment in the margin, in one of the copies of the Muqaddimah to the Ibn Khaldūn's book *Al-Ibar*, from the copy annotated by Dr. Alī Abd al-Wahid Wāfi, who was unique in his correct reading of the speech, and his brief reference to the issue, confirming Khaldūn's precedence.

### 1- A historical overview of the theory of evolution:

The theory of evolution was born with the publication of Charles Darwin's book «The Origin of Species» in 1859 AD, but like any scientific theory, it has developed over time, based on previous foundations, even if these were just simple primitive Preliminaries, the connection between which is not clearly apparent, The Voyage of the Beagle, which set sail on 27 December 1831 from Devonport, southwest England, was intended to study the geology and biology of some islands and coasts in the southern hemisphere (DARWIN, 1909b: 11). This was the event and experiment that made a major and powerful contribution to crystallizing Darwin's ideas and pushing them to the edge to produce his famous theory (DARWIN, 1909a: 05).

From the depths of ancient history, we find in the ancient Greek heritage the first explanations about the origin of life and creatures, as the philosopher (Antaximander)<sup>1</sup> wrote: The emergence of terrestrial organisms is due to the influence of the sun on the earth. The latter was muddy and wet, and under the influence of the sun's rays, bubbles emerged from it and the first animals were born. Because they were random, ugly, and surrounded by a thick crust that prevented them from vitality, reproduction, and movement, new creatures emerged from them under the influence of the sun that were more regular, After that, man was initially created inside the bodies of fish animals called (Censorinus), due to his inability to adapt and his need to depend on them for food. Then, over time and increasing drought, he was able to become independent and adapt. His existence was also subject to fluctuations and developments. At first, he was poor in appearance and incomplete in structure, and after several stages and times, he obtained his final form (KAHN, 1960: 109, 110).

In Aristotle's<sup>2</sup> book «Physics or Natural Hearing» we find some of the first historical indications of the principles of the theory of evolution and biological adaptation, and of the influence of the environment on biological organs, despite the simplicity and generality of the argument. When He says:

«So what hinders the different parts of the body from having this merely accidental relation in nature? As the teeth, for example, grow by necessity, the front ones sharp, adapted for dividing, and the grinders flat, and serviceable for masticating the food; since they were not made for the sake of this, but it was the result of accident. And in like manner as to the other parts in which there appears to exist an adaptation to an end. Whosoever, therefore, all things together (that is all the parts of one whole) happened like as if they were made for the sake of

<sup>1</sup>. Antiximander (610-546 BC), a Greek philosopher of the Milesian school, from the pre-Aristotelian era, was a student of Thales and is considered the first Greek philosopher to write down philosophy (MARCO, 1996:37-68).

<sup>2</sup>. Aristotle (384-322 BC), one of the greatest philosophers of Greece, was a student of Plato and a teacher of Alexander the Great. He founded the Lyceum or the Peripatetic School. He had theories and contributions in thought, politics, ethics, metaphysics, physics, biology, poetry, and language (BADAWI, 1943: 03-53).

something, these were preserved, having been appropriately constituted by an internal spontaneity; and whatsoever things were not thus constituted, perished, and still perish» (ARISTOTLE, 2005 : 37,38)

We find in the Arab heritage Signals and hints about the process of creation, and the hierarchy of beings and their differentiation, It was contained in the writings of the Ikhwan al- safa<sup>3</sup>, In the tenth letter of the Divine and Legal Sciences, it comes:

«As for the creatures, which are its particles, they are minerals, plants, and animals. They have a system and arrangement connected between their ends and their beginnings, like the arrangement of the spheres, The explanation for this is that minerals are connected at the beginning to the soil and at the end to the plant, and the plant is also connected at the end to the animal, and the animal is connected at the end to the human being» (IKHWAN AL-SAFA, 1985: 277, 278).

Ikhwan al safa show with explanations and evidence how the genus of wild plants such as the Cryptogam and the truffle is the first rank of plants, As a result, it does not have leaves or roots, and it arises from the soil as minerals are formed, The last rank of plants is the palm, Which has some primitive animal characteristics such as the sexual differentiation of its individuals, some of them are males and some are females, and after the palm tree comes the first and lowest ranks of animals, which are represented by some types of worms such as snails, which are not distinguished from plants except by movement and the presence of one sense, which is touch. (IKHWAN AL-SAFA, 1985: 277, 278).

Then the message states:

«We have shown in what we have described the form of the animal rank that follows the plant rank, so we want to mention and explain the animal rank that adjacent to humanity, We say that the rank of animality, which is attached to the rank of humanity, is not from one aspect, but from several aspects. This is because the rank of humanity, because it is the source of virtues and the fountainhead of merits, is not represented by one type of animal, but by several types. Some of them are close to the rank of humanity in the form of physicality, such as the monkey, and some in psychological morals, such as the horse.» (IKHWAN AL-SAFA, 1985: 280).

We find in the book of Ahmad ibn Muhammad Maskawayh<sup>4</sup>, (Al-Fawz Al-Asghar), which he devoted to discussing philosophical issues related to the Creator, existence, and man, more precise and clear words in this context. He says in the chapter he devoted to talking about prophecies:

«The first effect that appeared in our world from the center after the first mingling of the elements was the effect of the movement of the soul in the plant, and that is because it was distinguished from inanimate objects by movement and nourishment, and the plant has different levels with regard to this effect, until it reaches the vine and the palm tree, and when it reaches that it becomes in the highest horizon of the plant, and it becomes such that if it increases its acceptance of this effect, it no longer has the form of the plant, and then it accepts the form of the animal» (MASKAWAYH, 1914: 78, 79).

<sup>3</sup> . Ikhwan al-Safa: A group of Muslim philosophers from the third century AH/tenth century AD who appeared in Basra, Iraq. Their approach was based on reconciling Islamic beliefs with the scientific and philosophical facts that were prevalent in that era. They recorded their ideas in a number of letters, amounting to 52 letters (GHALIB, 1989: 15-29).

<sup>4</sup> . Abū Alī Ahmad ibn Muhammad ibn Yaqūb, nicknamed Maskawayh (320-421 AH/932-1030 AD), a Persian historian, writer, philosopher, and chemist from the Rayy city. He was a Zoroastrian and then converted to Islam. He has many works, such as “The Experiences of Nations” in history and «Al-Fāwz Al-Akbār and Al-Asghār» in ethics (Al-HAMAWI, 1993: 493-499).

Abū Alī Maskawayh continues his interpretation of the form of life's ascending position in creatures, mentioning that the first ascension of the plant from its position is when it is uprooted from the ground and does not need to grow roots, and this animal rank is weak due to the weakness of the effect of the sense in it, and its reliance on one sense, which is touch, and it appears in shells and snails, then another ascension occurs and worms and butterflies appear, then ants and bees appear, then creation and its characteristics improve and strengthen, and from it emerges the animal with complete senses, which contains many types and ranks, then it ascends and approaches the last ranks of beasts and becomes in its highest horizon and in the first ranks of man, and here Maskawayh says:

«And this rank, although it is noble, is lowly and far from the rank of man, and it is the ranks of apes and similar animals that are close to man in the creation of humanity, and there is nothing between them and him except the little, that if he exceeds it he becomes a human, and if he reaches it his stature is erect, and appears in him the power of distinguishing things and being guided to knowledge, and the effect of the soul is strengthened in him and he accepts discipline» (MASKAWAYH, 1914: 78, 82).

Maskawayh has similar words in his book (Tahdhib al-Akhlaq wa-Tahir al-Araq), in which he says:

“Then it becomes from this level to the level of the animal, which imitates the human being of its own accord and resembles him without instruction, like monkeys and the like. This is the limit of the animal's horizon, which if it exceeds it and accepts a small increase, it leaves its horizon and becomes within the horizon of the human being” (MASKAWAYH, 1908: 58).

After Maskawayh, Zakariya Al-Qazwīnī<sup>5</sup>, who lived during the seventh century AH, wrote:

“And the squeezer, what is brought to the interior of the earth from rainwater and mixes with the earthly parts and thickens and is ripened by the heat extracted from the depths of the earth, so it becomes the material for plants, minerals and animals. They are connected to each other, in a wondrous arrangement and a wonderful system, exalted by their Creator. The first ranks of these beings are soil and the last ranks are a pure angelic soul, For minerals are connected first to soil or water and last to plants, and plants are connected first to minerals and last to animals, and animals are connected first to plants and last to humans” (AL-QAZWINI, 2000: 173).

In the West, many historians of nature and the theory of evolution consider that the works of the French naturalist Buffon<sup>6</sup> contributed significantly and scientifically to the emergence of the era of thinking about the origin of species, In the West, many historians of nature and the theory of evolution consider that the works of the French naturalist Georges-Louis Buffon contributed significantly and scientifically to the emergence of the era of thinking about the origin of species, despite what he described as inconsistency and lack of courage to decide on the issue, and submission to traditional societal intellectual sediments and his disregard for causes and mechanisms (SAINT HILAIRE, 1854: 383-391).

Lamarck<sup>7</sup> is almost considered the actual pioneer of the theory of evolution, not through his precedence and chronological advance over Darwin, but also through the valuable theories he established and the laws he deduced, which controls the process of evolution. He was the first to

<sup>5</sup> . Zakariya bin Muhammad al-Qazwīnī (605-682 AH/1203-1283 AD), a Muslim scholar, historian, and judge who was born in the Hijaz and lived in Qazvin. He excelled in geography, physics, and zoology (AL-QAZWINI, 2000: 05).

<sup>6</sup> . Georges Louis Leclerc de Buffon (1707-1788 AD), French biologist, natural historian, and mathematician, he was one of the symbols of the Enlightenment era, a colleague of Voltaire and many intellectuals, he wrote the encyclopedia of natural history (DAVID, 2007: 1057-1061).

<sup>7</sup> . Jean Baptiste Antoine de Lamarck (1744-1829 AD), a French military man, biologist, and academic, and one of the early supporters of the theory of evolution. He had an effective contribution to the laws that controlled the process of evolution. He has important works such as «The Philosophy of Zoology» (LAMARCK, 1914 : XVII-XXII)

openly rebel against the prevailing traditional theory about the origin of creation and the way it occurred. He published his first works in 1801 AD, through some articles, and then he established the issue more in 1809 AD, through his book (The Philosophy of Zoology) (SAINT HILAIRE, 1854: 405).

Lamarck advocated through his works the theory of the evolution of current creatures from morphologically different ancestors, and developed a coherent scientific theory that explains this evolution and the mechanism of its occurrence. This theory is based on a set of principles: the first is biological movement and the lack of stability; this means that organic creatures, like inorganic beings, undergo constant changes in their structure, Second: the direction of movement always moves from a simple form to a complex form. Third: biological change and transformation occur gradually and very slowly, over long and extended periods, which is difficult to observe, and is indicated by these difficulties in distinguishing between similar species. Fourth: the surrounding environment is what plays the role of the catalyst for this evolution through the adaptation factor that is imposed on organisms to ensure their survival (SAINT HILAIRE, 1854: 405).

To explain the practical mechanism of this evolution, Lamarck established two important laws: the first: the law of use and disuse, which is that any biological organ in the organism's body that is not used gradually atrophies and is dispensed with, and any organ that is used permanently grows and develops. The second: the law of inheritance of acquired characteristics, which is that any outward characteristic that the organism acquires as a result of the influence of the environment, such as the black color of the skin as a result of the influence of sunlight, after hundreds of successive generations, becomes an innate acquisition that is passed on to the children even if they are not exposed to the same environment (LAMARCK, 1914:19-173).

In the period extending between the emergence of Lamarck's ideas at the beginning of the nineteenth century and the year 1859 AD, the date of the publication of Darwin's book (The Origin of Species), many works and publications followed, all of which dealt with the issue of biological evolution, It paved the way well for Darwin to present his theory more accurately, so Dr. W. C. Wells<sup>8</sup> authored a research paper in 1813 AD, then a book was published in 1818 AD after his death, in which he acknowledged the principle of natural selection, but in a general and non-comprehensive manner (DARWIN, 1909a: 11-19).

In 1828, Geoffroy Saint Hilaire<sup>9</sup> published, Expressing his disbelief in the stability of the forms of beings since their first creation, and that the species currently existing are only forms that have evolved from previous models. In 1826, the Scottish professor Robert Grant<sup>10</sup> published a study on sponges, in which he confirmed that changes, improvements, and the emergence of new species occurred during the process of succession of generations (GRANT, 1826: 121-140). In the following years, works appeared, such as the works of Isidore Geoffroy Saint Hilaire in 1850, Herbert Spencer in 1858, and then Professor Thomas Henry Huxley<sup>11</sup> in 1859. 1859 AD, and all of them proceeded in the context of emphasizing the fact that biological evolution of organisms occurred and paved the way well for what Darwin would present (DARWIN, 2005: 32-35) (DARWIN, 1909a: 11-19).

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<sup>8</sup> . William Charles Wells, (1557-1817), American military, physician, and biologist, who is credited with inventing the idea of natural selection (WELLS, 1818a: VII-LI).

<sup>9</sup> . Etienne Geoffroy Saint-Hilaire (1772-1844), a French naturalist, was a colleague of Lamarck and participated with him in developing the theories of evolution, and he had a special contribution in this field (SAINT HILAIRE, 1854: 412-420).

<sup>10</sup> . Robert Edmund Grant (1794-1874) Scottish anatomist and vertebrate biologist (ASHWORTH, 2022).

<sup>11</sup> . Thomas Huxley (1825-1895), British biologist, anthropologist, and anatomist, and a defender of the theory of evolution (HUXLEY, 1901)

## 2- Charles Darwin's works :

Charles Darwin's well-off family circumstances influenced his upbringing. His father, a wealthy doctor, wanted him to study medicine. He briefly joined the University of Edinburgh in Scotland, but he quickly abandoned his medical studies and turned to collect samples of shells, insects, birds, and stones. His family intervened again and directed him to study theology at the prestigious University of Cambridge in 1828. There, he satisfied his appetite for nature and natural history by reading most of the well-known works of that era by famous scientists. He met the famous botanist John S Henslow<sup>12</sup>, who brought him closer to him and nominated him for the famous Beagle voyage, after his friend, Captain Robert Fitzroy<sup>13</sup> of the British Royal Navy, asked him to recommend a natural history student from Cambridge University to accompany the ship on its scientific exploratory voyage around the world in 1831 (ABDU AL-'ALIM, 2018: 59-61).

The Beagle voyage, as previously mentioned, with its five years, a third of which he spent on the southwestern islands, observing the types and species of animals and recording their morphological and biological differences, was a great opportunity for Darwin to develop and deepen his view of the origin of organisms and the way in which they descended from the first lineages to contemporary species, all through the thousands of specimens he observed and studied, and the tons of bones and animal and plant remains that he collected and stored on the ship, or sent through various ports on the way to his university in England (ABDU AL-'ALIM, 2018: 62), and also through devoting himself to reading important books on biology, geology and natural history during the long years of the voyage, such as Charles Lyell's<sup>14</sup> book (Essentials of Stratigraphy), and Darwin would record his observations and conclusions on a daily basis about the species and organisms he observed (Darwin, 2016: 13-17).

During this voyage, Darwin asked many questions and tried to find the appropriate answer to them. If each animal species was created alone in one place, then what created the same being in distant regions and islands separated by vast seas and oceans? In addition, why are there these differences in morphology between the same type of animal, which comes to adapt to the type of environment and food (ABDU AL-'ALIM, 2018: 63, 64).

After the Beagle voyage returned home in July 1837, Darwin devoted his time to studying his specimens and formulating his views on what he had seen. He began to discuss the ideas of the sequence and evolution of creation and the influence of the environment on that, and the mechanisms through which that diversity in creation occurred. He immersed himself in studying zoology and the layers of the earth. After several years, the foundations of an integrated theory began to crystallize in his mind in light of his field results and the rest of the studies that began to emerge and be published. By 1844, his vision was complete and he finished drafting his theory of evolution. He wrote a will to publish it in the event of his death, especially with the symptoms of a tropical disease that had crept up on him during his voyage (DARWIN, 2005: 67).

However, he needed additional years to get rid of his doubts and hesitations, and he would have spent more time had it not been for the scientific developments that had occurred. His research was nearing completion in 1859, and he did not think that he had reached conclusive results yet. However, he found himself compelled to publish a summary of it, driven to do so by special

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<sup>12</sup> . John Stephens Henslow (1796-1861), a British mathematician, geologist, and botanist, wrote several important works on botany, and was credited with nominating Darwin for the Beagle voyage (GARDENERS, 1861).

<sup>13</sup> . Robert FitzRoy (1805-1865), English naval officer, meteorologist, hydrologist, and governor of New Zealand. (PAUL & STENHOUSE & SPENCER, 2013).

<sup>14</sup> . Charles Lyell (1797-1875), Scottish lawyer and geologist, author of Principles of Geology, inventor of the theory of the instability of the Earth's surface, and credited with establishing geological periodization (WOOL, 2001: 385, 386)

circumstances, because Mr. Wallace<sup>15</sup>, who was at that time studying the natural history of the Malay Archipelago, had reached almost the same general conclusions that Darwin had reached about the origin of living species. In 1858, he sent him a memorandum on this subject with a request that he send it to Sir Charles Lyell. Sir Lyell and Dr. Hooker were both aware of Darwin's research, and the latter had read a draft of it in 1844. They thought it would be good to publish, along with Mr. Wallace's memorandum, some summaries of his manuscripts. (DARWIN, 1909a:21).

Darwin included the details of his theory in his book (*The Origin of Species*), which was published in November 1859 AD, and in it he established the field conclusions that he reached, after years of his extensive research, and it almost represented a summary of most of the previous concepts related to the theory of evolution, and its pillars were represented in:

First: The common origin of organisms, the descent of current species from previous races that differed from them, and the error of the theory that says that each species was created uniquely (DARWIN, 1909a: 24).

Second: The vitality of the structure of organisms and their non-stagnation, meaning that there is a permanent and gradual evolution in the form and structure of organic creatures, which Darwin initially called (transformation or differentiation), and he devoted the first chapter of his book to it, and in it he spoke about the influences that lead to the occurrence of differentiation, such as the environment, food, as well as behavior and the degree of use of the organs (DARWIN, 1909a: 58-75).

Third: The principle of the struggle for survival, which is a principle agreed upon by biologists, and its reason is that the Earth's resources are limited compared to the numbers of living Creatures if their reproduction is unleashed, so many natural determinants and obstacles intervene to limit the number of organisms and curb its increase and keep it stable, including predators and the surrounding natural conditions (DARWIN, 1909a: 76-92).

Fourth: Natural selection and survival of the fittest, which is that the extermination practiced by natural factors on individuals of the species to achieve the process of biological and environmental balance, does not occur randomly, but is governed by laws and controls. Everyone struggles to survive, but this is only destined for those who meet the conditions for survival, and they are the individuals whose bodies show greater resistance, and possess more capable organs than others. Over time, the fittest and strongest individuals accumulate and the weak become extinct, and thus their characteristics develop and become stronger through successive cross for thousands of generations, and what is called "divergence of character" arises, which is the emergence of new varieties and then new species (DARWIN, 1909a: 93-144).

Fifth: The inheritance of acquired characteristics, which is the principle established before it, and which Darwin emphasized in his book *The Origin of Species* (DARWIN, 1909a: 29-30).

Darwin emphasized in the introduction to his book that his work was an incomplete summary, and that it might contain errors in terms of induction and reasoning, and he promised to publish other works more supported by evidence (DARWIN, 1909a: 56). He even included in it the opposing arguments and objections recorded against the theory, and he confined his observations and conclusions to animal species, avoiding discussing man, which he postponed until his later book (*Descent of Man and Selection in Relation to sex*) which he wrote in 1871 (DARWIN, 2005: 69).

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<sup>15</sup> . Alfred Russel Wallace (1823-1913), a British naturalist, biologist, geographer and explorer, studied species on some islands and rivers, and had the same contribution as Darwin in developing the theory of evolution (SMITH, 2004: 46-54).

It is worth noting that when Darwin returned to discuss the origin of man in his book (*Descent of Man and Selection in Relation to sex*), he made him a type of mammal and linked him to ancestors who preceded him at a lower level, similar to him in general morphology, and although he discussed the similarities between him and monkeys, he did not say that he descended directly from a monkey, but rather considered that monkeys could be lineages that descended from the same ancestor with man (DARWIN, 1889: 146-151). This theory was elaborated and established more than Darwin by the scientist Ernst Haeckel<sup>16</sup> in his book (*The Riddle of the World*), which he wrote in 1899 AD (HAECKLE, 1934).

### 3- Ibn Khaldūn's views on the effect of the environment on the differentiation of creatures:

In his third introduction to the book *The Muqaddimah*, and regarding the effect of air on the colors and conditions of people, Ibn Khaldūn mentions words in many places, explaining the relationship between nature and creatures and between them and people, and he emphasizes the effect of the environment and food on the Physical characteristics of people (IBN KHALDUN, 2001: 103).

In his discussion of the geographical area that lies in the middle of the earth and is located within the Mediterranean Sea, he says:

« Everything that is formed in these three intermediate regions is characterized by moderation, and Its human inhabitants are moderate in body, color, morals and religions, even prophecies are found mostly in them, and we have not come across any news of a mission in the southern or northern regions, and that is because the prophets and messengers are characterized by the most perfect type in their creation and morals» (IBN KHALDUN, 2001: 103).

Ibn Khaldūn goes on to emphasize the existence of physical differences between people depending on the environment in which they live. He mentions that many of the Sudanese who belong to the first geographical region (according to his classification), in addition to the Slavs, live in caves and eat grass. They are savages who are not domesticated, and they eat each other. The reason for this is their lack of moderation, which brings their temperaments and behaviors closer to those of wild animals and distances them from humanity (IBN KHALDUN, 2001: 104).

Ibn Khaldūn shows the effect of the environment and climate on the physical characteristics of humans, rejecting the common myths about the origin of the differences between humans:

« Some genealogists who have no knowledge of the nature of beings have imagined that the blacks are the descendants of Hām, son of Noah, and were distinguished by their black color, due to a supplication he received from his father, the effect of which was evident in his color. In saying that blackness is attributed to Ham, there is neglect of the nature of heat and cold and their effect on the air and what is formed in it of animals. This color included the people of the first and second regions from the temperament of their air for the double heat in the south, for the sun Their perpendicularity twice a year, one close to the other, so the Perpendicularity was prolonged in all seasons, so the light increased because of it, and the intense heat was persistent upon them, and their skins blackened.» (IBN KHALDUN, 2001: 105).

The cold and lack of sunlight do the opposite of what the heat and abundance of light do. He says about the effect of the climate of the northern regions on the characteristics of their inhabitants: “The cold is intense in all seasons, so the colors of its people turn white and they end up with a Reddish. This is followed by what the temperament of extreme cold requires, such as blue eyes, white skin, and coarse hair” (IBN KHALDUN, 2001: 105).

<sup>16</sup> . Ernst Haeckel (1834-1919), a German philosopher and biologist, developed Darwin's theory, in its aspect related to the emergence and evolution of man (LEVIT & KUTSCHERA & HOSSFELD, 2019).

Ibn Khaldun emphasizes the effect of the gradual climate on changing acquired characteristics, and the inheritance of this through the generations:

« We find that among the Sudanese, the people of the south live in the moderate quarter or the seventh quarter that tends toward whiteness, so the colors of their offspring gradually whiten with the days, and vice versa, among those of the people of the north who live in the south, so the colors of their offspring blacken, and in this is evidence that color is dependent on the temperament of the air»(IBN KHALDUN, 2001: 107).

Ibn Khaldūn uses verses of poetry by Ibn Sina describing the change in moral characteristics due to climate:

Negroes have heat, changed the bodies\* \* until it covered their skins with blackness

The Slavs acquired whiteness\* \* until their skins became Whit.

In addition to the effect of the environment and climate, Ibn Khaldūn talks about the effect of the type of food on acquired physical characteristics, saying:

« However, you find that these people who lack grains and Fat from the deserts are in a better state in their bodies and morals than the people of the hills who are immersed in life. Their colors are purer, their bodies are cleaner, their forms are more perfect and better, their morals are further from deviation, and their minds are more penetrating in knowledge and perceptions. Consider this in the animals of the desert and places of drought, such as gazelles, ostriches, oryx, giraffes, wild donkeys, and cows, along with their counterparts from the animals of the hills and fertile pastures. How do you find a great difference between them in the purity of their skin, the beauty of their splendor, their forms, the harmony of their members, and the sharpness of their perceptions?» (IBN KHALDUN, 2001: 110).

#### 4- Ibn Khaldūn's thesis on the evolution of beings:

More than just general talk about the effect of the environment and food on the characteristics of organisms, Ibn Khaldūn goes beyond that to something more serious, as he talks about the transition and evolution that occurs between species. He says in his sixth introduction of the first chapter of his famous Muqaddimah, which appeared under the title “about the types of human who perceive by nature or training”:

«I know, may God guide you and me, that we see this world with all its creatures in a form of order and perfection, and the connection of causes to effects, and the connection of universes to universes, and the transformation of some beings into others, its wonders do not end in that and its goals do not end, and begin from that with the tangible, corporeal world, and first the world of the observable elements, how it progresses upward from the earth to water, then air, then to fire, connected to each other, and each one of them is ready to transform into what follows it, ascending and descending, and the ascending one of them is more subtle than the one before it until it ends in the world of the spheres, and it is more subtle than all, in layers connected to each other.» (IBN KHALDUN, 2001: 120).

Ibn Khaldūn then adds with more precise and clear words:

« Then look at the world of creation, how it began with minerals, then plants, then animals in a wonderful form of gradation. The last horizon of minerals is connected to the first horizon of plants, such as grasses and seedless plants. The last horizon of plants, such as palm trees and grapevines, is connected to the first horizon of animals, such as snails and shells, and they only have the power of touch. The meaning of the connection in these components is that the last horizon of them is prepared with a strange readiness (some versions: close) to become the first horizon of the one after it. The world of animals expanded and its types multiplied. The animal world expanded and its species multiplied, and ended with gradually formation. Until he reached the man, the owner of thought and vision, rising to him from the world of apes (القردة) (in some versions, (القدرة) the ability) (IBN KHALDUN, 2014: 411), in which sense and perception are combined and do not end with vision and thought actuality. This was the first horizon of man» (IBN KHALDUN, 2001: 120, 121).

Among the notes recorded about Ibn Khaldūn's words is that all the annotated versions of the Muqaddimah mentioned the word (قدرة) monkeys, which appears in the sentence as (قدرة) ability, except for the version annotated by (Dr. Abd al-Wahid Wāfi)<sup>17</sup>, and the correct logical thing that matches the context of the speech and fulfills the intended meaning is what the latter mentioned (monkeys), and as he said, the versions that mentioned this word as (ability) committed a heinous distortion that changed the meaning of the phrase, and took it out of its context and stripped it of its meaning, and caused a great precedent to be hidden, and he is right in that, as the one who ponders the context of the speech will confirm that the intended word is (monkeys) (IBN KHALDUN, 2014: 411).

##### 5- The scientific value of Ibn Khaldūn's speech:

Ibn Khaldūn's words about the influence of climate and food on the organic structure of living creatures agree with the words of the pioneers of the theory of evolution and precede them. In William Wells' letter «An Account of a Female of the White Race of Mankind, Part of Whose Skin Resembles that of A Negro» (WELLS, 1818b: 425-439), which he wrote in 1813, he talks about the effect of the sun on human skin, which causes its color to gradually change. He says:

«The blackness of the skin in Negroes is no proof of their forming a different species of men from the white race. When a white man is much exposed to the action of the sun, his skin becomes more or less brown, and as the intensity of this colour, after equal degrees of exposure, is generally, proportional to the heat of the climate, it has hence been supposed, that the color of the Negroes derived from a very great degree of the same cause.» (WELLS, 1818b: 431).

This is the essence of Ibn Khaldun's talk about the gradual change in skin color among humans, resulting from the influence of sunlight, temperature and the extent of exposure to them, and denying that this is the result of inheriting the feature from an ancient ancestor who was created with that trait.

We find a similarity between the words of Ibn Khaldūn and Wells, about the change in skin color according to the change in location, which is called «adaptation or acclimatization»; Ibn Khaldūn mentions, as previously presented, that the colours of those who live in regions with a moderate, non-hot climate, from the people of Sudan and the south, gradually whiten over time, and vice versa. Those from the north who live in the south, the colours of their descendants darken, and in that is evidence that colour is dependent on the type of climate (IBN KHALDUN, 2001: 107). While Wells says: «In like manner, that part of the original stock of the human race, which proceeded to the colder regions of the earth, would in process of time become white, if they were not originally so» (WELLS, 1818b: 436).

Almost it is the same explanation as Charles Darwin, based on a series of observations and studies of species and varieties, which led to the establishment of the concept of (adaptation), which is an integral part of the process of evolution and its practical mechanism. Since it is known that there is an adaptation occurring between the varieties and the environment in which they live, because it is very common for different species of the same type to inhabit hot and cold homelands, and since the species belonging to the same variety have descended from one parent model, Darwin concludes that adaptation must have occurred through a long series of descendants (DARWIN, 1909a:152).

Ibn Khaldūn and Willis agree on the effect of the environment on the level of mental maturity. Ibn Khaldun states that the Sudanese, as well as the Slavs, are savages who live in caves and eat grass. They eat each other because of their distance from moderation, which makes their thinking and behavior closer to animals than to humanity (IBN KHALDUN, 2001: 104).

Wells also links the influence of the environment to the mental state of human beings, as the present outward appearance is seen not only as a sign, but as a cause of the state of deterioration, by

<sup>17</sup> . Alī Abd al-Wahid Wāfi (1901-1991 AD), an Egyptian researcher, writer and linguist, one of the pioneers of Arab sociology, made a significant contribution to the annotation of the Arab heritage (WAFI, 2004: 243-247).

preventing the mental faculties, in some unknown way, from developing properly. African Negroes have been slaves in all ages; as are Negroes in the eastern seas. (WELLS, 1818b: 439).

The difference we find in the words of the two men is that Wells denies the inheritance of acquired traits, as it appears: "A white man, whose colour has turned brown by the rays of the sun, begets white children like the children of another man of the same race, whose skin colour has never changed" (WELLS, 1818b: 431). His view here is limited to observing one or two generations, while it is understood from Ibn Khaldūn's words, without providing an explanation or interpretation of the mechanism, that there is an inheritance of traits: "And all of these change in the offspring and should not continue" (IBN KHALDUN, 2001: 107). His words agree with the constants of the theory of evolution today, even if he based them on the general conclusion.

As for the effect of the environment and food on the differentiation of species, we saw Ibn Khaldūn's talk about the effect of that on desert animals and dry habitats, such as gazelles, ostriches, oryx, giraffes, zebras, and cows, with their counterparts from the hill animals and fertile pastures, how you find a great difference between them in the purity of their bodies, the beauty of their shape, the proportion of their organs, and the strength of their perceptions (IBN KHALDUN, 2001: 110).

In this context, we find in Darwin's words:

«It is very difficult to decide how far changed conditions, such as of climate, food, &c, have acted in a definite manner. There is reason to believe that in the course of time the effects have been greater than can be proved by clear evidence, but we may safely conclude that the innumerable complex co-adaptations of structure, which we see throughout nature between various organic beings, cannot be attributed simply to such action. In the following cases the conditions seem to have produced some slight definite effect: E. Forbes<sup>18</sup> asserts that shells at their southern limit, and when living in shallow water, are more brightly coloured than those of the same species from further north or from a greater depth ; but this certainly does not always hold good. Mr. Gould<sup>19</sup> believes that birds of the same species are more brightly coloured under a clear atmosphere, than when living near the coast or on islands; and Wollaston is convinced that residence near the sea affects the colours of insects. Moquin-Tandon<sup>20</sup> gives a list of plants which, when growing near the sea-shore, have their leaves in some degree fleshy, though not elsewhere fleshy.» (DARWIN, 1909a:146).

As for the process of differentiation of organic beings over time, or what is known as evolution or ascension, Ibn Khaldūn's words, in terms of the principle that determines the occurrence of the process, seem to precede the Theses of all European evolutionary scholars by several centuries, and what they added was the scientific explanation of the biological mechanisms by which evolution is accomplished (IBN KHALDUN, 2014: 411).

His words are clear about this gradation and ascension in beings, but as it appears from the above, he is not the first Muslim scholar to say this. Rather, the Ikhwan al-Safa, Maskawayh, and al-Qazwīnī preceded him in establishing the principle of the hierarchy of beings and their distinction from one another in terms of attributes and characteristics, ascending, using almost the same words: The minerals are connected at the beginning to the earth and at the end to the plant, and the plant is also connected at the end to the animal, and the animal is connected at the end to the human being.» However, what distinguished Ibn Khaldūn's words were two things:

<sup>18</sup> . Edward Forbes (1815-1854), British naturalist, he has works and theories on the geographical distribution of plants and animals (WILSON, GEIKIE, 1861)

<sup>19</sup> . Thomas Vernon Wollaston (1822-1878), a British naturalist, who made trips to the islands and studied insects, refrained from supporting Darwin's theory for religious reasons (MACHADO & WOLLASTON, 2006).

<sup>20</sup> . Alfred Moquin-Tandon (1804-1863) was a naturalist and specialist in plants and marine life, and he has important studies and publications in this field (NICOLI & QUILICI, 1964: 227-232).

First: The division and arrangement of living beings by those who preceded him was based on the proportion of vital characteristics in each being, and the capabilities and senses it has, which the Ikhwan al-Safa, for example, called «psychological ethics» and Maskawayh called «honor» However, Ibn Khaldūn focuses on the gradation in the «world of creation» that is, in the physical structure, and makes man the pinnacle of that gradation of creation, with monkeys coming under him (IBN KHALDUN, 2014: 410-412).

Second: And most importantly, Ibn Khaldūn approved the principle of transformation between beings, which no one had done before him, with clear terms, such as: «the transformation of some existing things into others» «how it gradually ascends from earth to water, then fire, connected to each other, and each one of them is ready to transform into what follows it» and he explains further: «The meaning of connection in these components is that the last horizon of them is ready, with the near readiness, to become the first horizon of the one after it» (IBN KHALDUN, 2014: 410).

In another place in his Muqaddimah, in (Chapter Five of the Sixth Section), Ibn Khaldūn returns to establish this principle, and speaks with complete clarity, saying:

«All existence in its simple and complex worlds is arranged in a natural order from above to below, all connected in an Uninterrupted connection. The selves at the end of each horizon of the worlds are prepared to turn into the self that is adjacent to them from below and above, in a natural preparation, as in the simple physical elements, and as in the palm tree and the vine from the end of the plant horizon with the snail and the shell from the animal horizon, and as in the monkeys in which intelligence and perception have been combined with the human being who possesses thought and foresight, this preparation that is on both sides of each horizon of the worlds is the meaning of the connection in them» (IBN KHALDUN, 2014: 922, 923).

### **Conclusion:**

At the end of this research paper, which sought to shed light on the Islamic precedence in the theory of evolution, and Ibn Khaldūn's contribution to establishing it five centuries before Lamarck, Darwin, and Wallace became aware of it, even in its initial aspect and general summary, we arrive at a group of results that represent the pillars of the research.

The theory of evolution was not one hundred percent the product of Darwin's ideas, but on the Western level, it is the result of half a century of efforts and studies, preceded by Darwin by many biologists and naturalists, who put forward theories such as evolution and natural selection. These theories were subject to development and revision and paved the way largely for Darwin's work.

Darwin's efforts came after an important five-year scientific voyage aboard the British Navy ship Beagle, in which he recorded important field notes about life and species across the shores and islands of the southern hemisphere. During this voyage, he became aware of the differences between species and varieties, which are imposed by environmental conditions and nutritional needs.

Darwin was not the first to formulate the theory of evolution, as it had been discussed and studied before him, but his efforts focused on developing logical scientific theories that explain the mechanism and causes of evolution, which he accomplished by explaining how differentiation occurs over time between species, and inventing principles such as: the role of the struggle for survival in natural selection, the role of use and disuse, in the development of organs, the inheritance of acquired characteristics, and other scientific theories, which he accompanied with pictures, drawings, and evidence inspired by his study.

There are documented scientific evidences proving that many Muslim scholars acknowledged the principle of evolution before Darwin. There are words from the Ikhwan al-safa in their tenth epistle, which acknowledge the principle of the hierarchy of beings and their advancement from one another in terms of status. There are talk from Maskawayh, who lived at the end of the fourth century and the beginning of the fifth century AH, and from al- Qazwīnī, who lived in the seventh century AH, which go into greater detail about the connections between beings and the connection of each class to the next, in a quasi-statement of the principle of evolution.

Although Ibn Khaldun undoubtedly quoted from the words of his predecessors among the Muslim scholars, he included in his *Muqaddimah* his own vision of the issue, and added important talk to it. He spoke clearly about two principles: the first is the effect of climate on the characteristics of human beings, and about the change of those characteristics with the change of place, which indicates the occurrence of evolution, or its first stage, «the adaptation». The second is evolution itself, by speaking about the existence of classes of beings that differ from the lowest to the highest in composition and structure, and the occurrence of transformation and transition between them from one class to another.

This research paper proves Ibn Khaldun's precedence, firstly in his report on the effect of the environment and climate on the occurrence of organic differentiation and adaptation of organisms, and secondly his precedence in inventing the theory of the evolution of organisms as a general principle, without detailing the vital organic mechanisms for its occurrence, which required the results of subsequent centuries of studies, works and biological, anatomical and natural achievements. This work also opens the door to future works that delve into the Islamic scientific heritage, searching for many overlooked scientific precedents and breakthroughs, with an eye to contemporary understanding, analysis and interpretation.

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