

Ibn Sina's Preliminary Interpretation of the Philosophy of Mind and its Genetic Origin with a Focus on the Unique Mediating Role of the Active Intellect

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Abstract

Philosophy of mind is one of the tremendous axes of philosophy that dedicated to the study of a wide spectrum of conceptual and metaphysical issues regarding categories of mind, soul, representation, intentionality, thinking, consciousness, self-consciousness. Moreover, from a historical perspective, this term can be traced back to the ancient Egyptian philosophy, which based on the heart as the seat of thought, emotion, and memory rejecting the brain as the center of cognitive function. While, in Greek philosophy, the term was associated with the writing of Plato and Aristotle, both of whom put forward theories of the human person and made distinct proposals dedicated to understanding and analyzing the nature of the soul and its characteristics. The pioneers of rationalism in European philosophy are Rene Descartes (1596-1650), Baruch Spinoza (1632-1677), and Gottfried Wilhelm (1646-1761).

It is worth noting that the first primitive seeds that embody the initial implicit concepts of genetics came to us from the depths of the centuries through the imagination of Ibn Sina almost ten centuries ago. In his pioneering manuscript, "Treatise on Cardiac drugs," Ibn Sina presented a unique text that reinforced his absolute faith in the theory of divine creation. The soul, according to Ibn Sina was created by God of gentle "subtle/fine/delicate" mixtures "chromosomes/genes that encode intelligence/thought), while the body was created of dense mixtures "chromosomes/genes that encode the body organs).

According to Ibn Sina's philosophy, there is no separation between the soul and the intellect; the theoretical intellect, in particular, is the essence of the soul. Together, they form a duality in which the mind is the active core of the soul, but in the same time the mind is also subject to its creative influence and divine commands.

The philosophical notion of mind/body dualism denotes either that mental phenomena are non-physical or that the mind and body are distinct and separable. Thus, it encompasses a set of views about the relationship between mind and body (brain), as well as between subject and object. Therefore, the logical question that imposes itself to understand and explain this duality is: How does "the mental" interact with "the physical"? This question and its answer represent the main focus and the original material of this article.

In contrast to all philosophies that affirmed the property of contradiction in the duality of mental and physical substances, we understand this duality as two complementary, not contradictory, entities. Each provides a reason for the existence of the other within a functional, interconnected, dialectical relationship overseen by the Creator. This duality is a natural, real, and undeniable. "Can we use our minds to deny our own minds", as the great Descartes expressed it with utmost sincerity?

Additionally, can we ask a hypothetical question about a certain and self-evident truth embedded in man itself? Isn't man the greatest, most conclusive, tangible proof of the success of the interaction between mind and brain, regardless of whether this human being is a physical creature or a divine creation.

Immanuel Kant contributed to solving the mystery of how theoretical and practical intellects communicate by assuming the existence of a “practical principle” within the theoretical (pure) mind itself, which represents the will which leads to convert the practical mind into an effective one. We believe that Kant's contribution represents a huge intellectual leap in an attempt to fill the interpretive gap regarding the nature and the method of communication between the theoretical mind and its practical counterpart. Then, according to Ibn Sina, mind represents the conscious thinking faculty of the soul, and together they form a single, integrated unit from the first moment of creation.

Keywords: Ibn Sina, Descartes, Mind/Body Dualism, Theoretical and Practical Intellects, Active intellect - Philosophy, Faculties “Genes” of Intelligence

1. Introduction

The philosophy of mind did not begin with Ibn Sina, nor did end after him rather; it began long before him with the ancient Egyptian, ancient Chinese, burgeoning Greek philosophies, and after him, with the flourished European Renaissance through the contributions of Rene Descartes, Immanuel Kant, and others. Regarding, the philosophy of mind in ancient Egyptian Philosophy, it was based on the heart as the seat of thought, emotion, and memory, rejecting the brain as the center of cognitive function. While ancient Egyptians had a thorough understanding of neurology, their view of the mind was very different from that modern psychology, they had a *polypsychic* view, believing that a person's essence (soul) composed of multiple parts that of the point of death would become separate entities, which are: Ren (name), Ba (personality), the Ka (vital essence), the *shadow* (spiritual companion) and the *Akh* (intellect) were the five principal elements which the ancient Egyptians considered necessary to make up a complete personality.

Relative to the afterlife, *Akh* (intellect) represented the deceased, who was transfigured and often identified with light. It was associated with thought, but not as an action of the mind; rather, it was intellect as a living entity [1].

The duality of heart and mind in the ancient Egyptian philosophy is based on two clear philosophical truths, the first is, the notion that the “heart over the brain”, in their belief, the *Ib* (heart) represents the seat of intelligence, containing all thought, and intentions. During mummification, it was preserved, while the brain was discarded. The second is the notion of “multi- part soul”, indicating that the ancient Egyptians did not view the mind as a single entity, but as a pluralistic unity, meaning that the mind is part of the soul or one of its components [2,3].

This unique Pharaonic duality between heart and mind is perhaps the oldest duality in the history of the human philosophy.

Ancient Chinese philosophy of mind (6th-2nd century BCE) rejects a strict dualism of mind and body, focusing instead on “heart – mind) as the central, embodied organ of both cognition and emotion. Chinese philosophy is famous for being moral and political thought. Topics in philosophy of mind are, in this sense, relatively marginal aspects of Chinese philosophy. However, ancient Chinese thinkers have made tremendous contribution by

developing distinctive concepts such as xin (heart-mind), qing (emotion), which play outstanding roles in their account of moral epistemology and ethics [4-7].

The term can be also traced back to its association with the writing of Plato and Aristotle, both of whom put forward theories of the human person, and made distinct proposals dedicated to understanding and analyzing the nature of the soul and its characteristics [8].

Mind/body dualism denotes either that mental phenomena are non-physical or that the mind and body are distinct and separable. Thus, it encompasses a set of views about the relationship between mind and matter, as well as between subject and object, and is contrasted with other positions, such as physicalism and enactivism, in the mind/body problem [9,10].

Aristotle adopted Plato's understanding and belief that among all plants and animals souls, humans possess the faculty of reason that is unique to them only. For Aristotle, the first two souls, based on the body, perish when the living organism dies, whereas there remains an immortal and perpetual intellectual part of mind [11,12]. For Plato, however, the soul was not dependent on the physical body; he believed in metempsychosis, the migration of the soul to a new physical body [13].

Descartes' argues that mind is indivisible and body is divisible. Dualism is the theory that the mental and the physical are in some sense, radically different kinds of thing [14]. The conceptual key to Descartes philosophy lies in two complementary revolutionary hypotheses. First, Descartes argues that, cogito ergo sum (I think therefore, I am). Second, he argued that you cannot deny the existence of your mind while using your mind to deny it.

We believe that this revolutionary content in Descartes's thought during his time (1596-1650), was a shining beacon that clearly represented the first final certainty and as such we have to be careful in its interpretation as well as in deciding its position in the Cartesian philosophy, which tends to equate the soul to the mind [15]. This Cartesian conclusion about the integrative relationship between the soul and the mind is very close to the philosophy of Ibn Sina, who interpreted this relationship as if the mind especially pure intellect (theoretical intellect), were the essence of the soul as its guiding, and thinking intellect.

Moreover, Descartes argued that the natures of mind and body are completely different from one another and each could exist by itself. Then a major question arises, how can these two structures with different causally interact in order to give rise to a human being with voluntary bodily motion and sensation? [16].

According to Thomas Aquinas, substance dualism distinguishes itself from Cartesian substance dualism by denying that the body and soul are different substances. Instead, a person is composed of only one substance the soul while the body is considered an ensouled physical structure. Accordingly, Aquinas's dualism is not a dualism of two separable substances. There is only one substance, meaning that soul, and body is ensouled biological and physical structure that depends on the soul for its existence [17].

Ibn Sina's dualism focused primarily on the body/soul dualism with a clear and undeniable bias toward the soul dominance over the body to achieve its perfection. Similarly, he followed the same path with regard to the dualism of body/ mind, where he insisted on that the intellect initially needs the body in order to acquire those potential intelligible that allow it to perform its proper activity and so perfect itself. Thus, while we should not identify ourselves with our body, our initial dependence and indeed ultimate management of the body are crucial to our flourishing as humans (Psychology, IV.5, 221.12–223.10. [18].

2. An Authentic Approach to the Article's Material

2.1. An Authentic Approach to Ibn Sina's Thought: The Notion/Theory of the "Two Eyes and the Two Faculties"

In Ibn Sina's comprehensive philosophy, the soul cannot be separated from the mind. Together, they form a duality in which the mind is the active core of the soul, but in the same time (body/ brain) is also subject to the creative influence and divine commands of the soul. This sacred duality results in precise cooperation in the consciousness and destiny of the living being. The mechanism of this duality to achieve its divine spiritual and secular biological goals is based on the genius concept of Ibn Sina, who says: "the soul, as it overlooks and connects two completely different worlds (immaterial realm world and material realm world) by means of two faculties, a theoretical faculty (*immaterial realm of intelligible*) that is the one "eye" that the soul possesses for connection to the side above it. (This faculty may apply to the gentle "subtle/fine" mixtures/or genes of intelligence in our understanding), and a practical faculty (*material realm of the body*) that is the other "eye" that the soul possesses for connection to the side below it. (This faculty may apply to the "dense mixtures/or genes of somatic cells formation and regulation) [19].

The terms gentle "subtle/fine" mixtures and dense mixtures firstly appear in Ibn Sina's manuscript of "A Treatise on Cardiac Drugs" where he states: "God Almighty created the soul of gentle "subtle/ fine" mixtures, as He Almighty created the body of dense mixtures so that the ratio of the soul to the finest mixtures is equal to the ratio of the body to the density of the mixtures". We have explained in details this theory and confirmed that is meant by gentle "subtle/fine/delicate" mixtures are the genes of intelligence,

thought and consciousness, while the dense mixtures mean the genes responsible for the formation and regulation of the somatic cells [20].

Then, the soul which created of the gentle "subtle/fine" mixtures (chromosomes), that suit it's spiritually and transparency nature, looks out upon the highest, sacred realm with one eye, which is the "theoretical intellect", and looks down with a second eye to the body, which is the "practical intellect". In conclusion, it seems that Ibn Sina embodied in this theory three interconnected dualities: the first is the soul/ mind duality, the second is the structural chromosomal duality, and the third, is the two faculties (theoretical and practical intellects).

2.2. An Authentic Approach to the Contribution of European Philosophers

Almost, five centuries after Ibn Sina's era, one of the most important philosophers of Europe appeared, who presented a unique rational approach in his formulations, intellectual, and philosophical contents, namely Rene' Descartes, who was known as father of modern Western philosophy, and one of the most prominent Rationalist philosopher. Descartes method of doubt should not be confused with skepticism. He is not asserting that whatever can be doubted is false, but he is only supposing it to be false. He believed that clear and distinct perceptions were a mark of truth. Descartes' metaphysics focused on the basic structure of reality, including the mind-body relationship. According Descartes 'dualism is the theory that the mental and the physical or mind and body (brain) are in some sense, radically different kinds of thing. Cartesians tend to equate the soul to the mind [15]. This Cartesian legacy of analysis is somewhat close to, but not identical with, Ibn Sina's concept, who considered the intellect to be the essence of the soul, not equal to it as Descartes asserted.

According to Descartes's definition of the material substance, it is substance that possesses the quality of spatial extensions, while mental substance possesses the quality of thought (consciousness, feelings, imagination, belief, desire). In conclusion, this view holds that there is no spatially extended substance that thinks, nor a thinking substance that extends. His argument is that consciousness is the essence of the mind is that we are always in a state of awareness and our existence is non-existent if we lose this awareness. This means that the truth of man revolves around his human essence as a thinking being and that his existence, movement, and the whole of his being are existentially linked to this truth [15].

Thomas Aquinas's dualism is a type of dualism derived from the views of Thomas Aquinas. Aristotelians and Aquinas sometimes suggest that their hylomorphic position is not a version of dualism but rather a version of materialism. Although their view is not a Cartesian content of dualism, it is clear from a consideration of how the human soul differs from the soul of plants and animals (at least on the Aquinas's variation of hylomorphism) that the view does amount to a kind of dualism. Aquinas's dualism or hylomorphic dualism as it has variously been called [21].

Furthermore, the Aquinas's substance dualism has been defended by other philosophers, as follows: Aquinas's substance dualism is distinguished from Cartesian substance dualism by its denial of the difference between body and soul on the basis that man is composed of one substance, which is the soul, while the body is considered an ensouled physical structure. J. P. Moreland has commented [16,17].

Moreover, Occasionalism is a philosophical doctrine based on the principle of causality. Its content is that created substances cannot be considered efficient causes of events. This is because all events are subject to the theory of divine creation, meaning that they are taken to be caused directly by God Almighty. From this perspective, it is not the case that the first event causes God to cause the second event: rather, God first caused one and then caused the other, because, God Almighty is the cause of all causes, and He Almighty chose to regulate such behavior in accordance with general laws of nature. Some of its most prominent historical exponents have been, Ibn Sina, Al-Farabi, Al-Ghazali, Louis de la Forge, Arnold Geulinx, and Nicolas Malebranche [22].

The concept of intentionality is of particular importance in dispelling the absolute bias of the concept of dualism because it simply frees us from the necessity of separating between body and mind or between (thinking and acting). So the validity of this theory lies in its belief that everything is connected in the sense that all acts of consciousness are actually connected to the world through their intentional relationship to an object in the world. Consciousness (mind stuff) is not a free-floating realm of thoughts and ideas contained within the physical vessel of our bodies but is something turned out in the world in an intentional relationship [23].

Two terms in phenomenology that relate directly to the notion of intentionality, they are noema (the object of consciousness) and noesis (the manner in which one is aware of the object of consciousness). In very simple terms, noema refers to what of experience and noesis to how it is experienced. [24].

Traditionally, post-behaviorist philosophy of mind and cognitive science has preceded on the assumption that intentionality and phenomenology can most profitably be treated independently or separately from one another. This may be because intentionality is thought to be significantly more tractable than phenomenology; or because a "divide and conquer" strategy in general is more efficient in dealing with difficult-to-understand phenomena; or because the two are metaphysically quite distinct, even if there is a realm in which they are coinstantiated [25].

3. Interpretation and Discussion

3.1. The Legacy of Ibn Sina's Philosophy of Mind and Its Genetic Origin

3.1.1. The Genetic Origin of the Mind

Ibn Sina was a polymath whose profound contributions spanned numerous disciplines, most notably philosophy and medicine. His medical scholarly works, in particular, "The Canon of Medicine"

he was able to incorporate his own empirical observations and scientific experimentations in a comprehensive thematic unity. His philosophical works, conversely, delved into the intricacies of the human soul and its journey towards intellectual perfection and ultimate happiness. However, beyond these well-documented fields, Ibn Sina also made significant, albeit less explored, contributions to what would now be termed the philosophy of mind, intertwining medical, philosophical, and psychological insights to offer a unique perspective on the human psyche [26,27].

In his unique manuscript, "Treatise on Cardiac Drugs" Ibn Sina stated that: "*God Almighty created the left cavity of the two heart cavities to be a repository "chamber" for the soul and a source of its permanent validity. Almighty God has created the soul of gentle "subtle/ fine/ and delicate" mixtures (Akhlate in Arabic/ chromosomes in modern terms) *, just as He has Almighty created the body of dense mixtures, so that the ratio of the soul to the finest (elite) mixtures is equivalent to the ratio of the body to the density of the mixtures*" [28].

*** (the text in brackets is the interpretation and clarification of the author)**

God Almighty created the soul of the gentle "subtle/fine/delicate" mixtures (Chromosomes/genes of intelligence, just as He Almighty has created the body of dense mixtures, likewise, these mixtures can be assumed to be the genes responsible for the encoding and regulation of the somatic cells. Then, Ibn Sina ended his paragraph by saying that: "*the ratio of the soul to gentle "subtle/ fine" mixtures is equal to the ratio of the body to the density of the mixtures*". To explain this phrase from the perspective of the divine creation theory, we say that the unity of creation process based on the principle of the perfection and integration, and that when God created and proportioned His creation, He Almighty made a delicate balance between the components and elements of the construction of His creation, such the balance between the faculties of the soul and the faculties of the body is proportional and equal, as a result, the perfection of the divine creation comes. In addition, the equality ratio between gentle "subtle/fine" mixtures and dense mixtures can be explained biologically and genetically as follows: the soul is blood according to Ibn Sina, since it is responsible for the activity and efficiency of all organs of the body, it must necessarily reach every cell of the different body organs so that these organs achieve the quality of life and perform their function, and at the same time achieve the soul's desired perfection. Then, all of the above can be expressed in the language of our time as genetic compatibility between gentle mixtures of the soul (genes of intelligence) and dense mixtures of the body organs (genes that encode and regulate the somatic cells) to achieve their perfection not only for humans but also for all creatures in the universe.

Ibn Sina in this innovative perception uses the word "soul" to mean blood, which is one of the synonymous meanings of the soul in the Arabic language, according to dictionary of "Lesan El-Arab [29]. But it is worth noting that the association of the concept of the soul with blood was first rooted in the philosophy of the ancient

Egyptians [30].

Since the main topic of this article is the philosophy of mind, and its genetic origin, it is appropriate for us to ask where these gentle mixtures came from, what their identity is, and what their relationship is to the mind?. Ibn Sina in his manuscript answers these questions with clarity, saying: *“Just as the mixtures (chromosomes), when mixed together in the essence (zygote), produce organs with a special structure (admixture/genotype/temperament in modern terms), meaning that the gentle mixtures (as a plural form) produce a specific spiritual code with a very special specific nature and information (genetic codes) that suit their spiritual function, and likewise the dense mixtures produce completely different specific organs with a special specific structures (genetic codes) that suit their biological functions. Then continuing his analysis Ibn Sina says: “Each organ has a special structure (Mazaj - in Arabic/genotype in modern terms) * [31], which is the result of specific mixtures (genetic alleles) in the essence (zygote), but this special structure (genotype), develops because of the numbers of mixtures (genetic alleles) and the form of their structure (phenotype).*

(The text in italics is the original literal/verbatim words of Ibn Sina).

This wonderful text means that each organ has a specific structure that result from specific chromosomes in the zygote and develops according to the number of genetic alleles which constitute the “genotype” and its shape the “phenotype”. In fact, Ibn Sina did not know in his era almost ten centuries ago, that his term (Akhlat - ظلال خ - mixtures) are chromosomes, nor did he know that gentle “subtle/fine” mixtures are the genes of intelligence and knowledge. Despite, with his unique scientific intuition, he was able to realize what we have discovered after these long centuries, and he was the first to understand it and point it out to us. Therefore, we can conclude that Ibn Sina’s notion of gentle “subtle/fine” mixtures are the preliminary notion of genes of intelligence, knowledge, thinking, and consciousness and all of them together form what we called the mind/intellect.

*** (The words in brackets are in illustrative form and indicate the author’s interpretation).**

3.1.2. Ibn Sina’s Unique Vision of The Philosophy of Mind/Body Dualism

In our belief, the term “duality”, represents a continuous, dynamic and interactive movement of evolution through the interaction between its two parts. This evolutionary interaction inevitably results in a new development, either in the form of an intellectual principle/idea or a new biological, and/ or physical product. Simply put, duality is a theory of integration- not contradiction- that leads to evolution. The term can also be understood as a faithful translation of the concept of “process and becoming”. It occurs within the human body and also in the vast universe, as if it is a truth of the unity of existence and creation.

In contrast to all philosophies that affirmed the property of contradiction in the duality of mental and physical substances, we understand this duality as two complementary, not contradictory, entities. Quite the opposite, each of them provides a reason for the existence of the other within a functional, interconnected, dialectical relationship overseen by the Creator. This duality is a natural, real, and undeniable.

Creating a contradiction between the material and spiritual dualities, especially, with regard to the duality of soul/body, as well as in the duality of mind/brain is tantamount to denying the unity of existence and the divine creation philosophy. Therefore, when some contemporary purely materialistic philosophies were imposed it as a form of contradiction rather than integration, they have plunged human thought into a state of confusion and ambiguity. This is because the relationship between the mind, whatever its definition, and body, whatever its type (whether a whole body, as in the duality of the soul and body, or a part of the body, as in the duality of mind and brain), this relationship is complementary and not contradictory duality, as evidenced by the fact that we as humans possess this truth, through it we live, and develop our lives.

Ibn Sina’s dualism of the soul/body is based on the premise that the soul is the capital notion in his philosophy, and the body is nothing but a means to achieve the perfection and brilliance of the soul. In this respect, the term “soul” for Ibn Sina never comes separately from the concept of the mind (intellect) “*Aql*” in Arabic, that because the mind is the active essence of the soul, and it acts as the complementary part of the divine code of the soul. So they together represent the eternal union of the divine creation theory [32].

In the current article, we have reviewed a sufficient number of hypotheses that dealt with the idea or theory of the mind/body duality and despite the similarities and differences between all these theories, the fundamental question for all these theories remained the same, which is:

How does the mind which is, “the mental substance” interact with the brain, which is, “the physical substance”?

The answer rests in a simple but ingenious formulation by Ibn Sina that explains the essential meaning, philosophically and scientifically, of all possible dualities (mental/physical), and the most important of which, but not limited to, are the duality of the soul/body and mind/brain.

- **Ibn Sina stated that:**

1st- The human intellect is an immaterial substance; therefore, it cannot be achieved by itself, but through a body (brain) that acts as a custodian for it, and prepares it to intellectually perceive the full range of intelligible objects.

2nd- The body acts as an occasioning cause for the origination of

the human intellect, while the production of a new substance is ultimately due to the Giver of forms, God, the Self-sufficient Cause. Such production requires the initial preparation of the material to provide a suitable subject for the new species form [19].

According to Ibn Sina, the human intellect consists of two parts: the first is the (theoretical intellect/pure intellect – (ض حم ل ق ع ل ا –), which is responsible for producing thought, awareness, and knowledge. It is capable of deriving inspiration and revelation from the Creator, thereby revealing the universal laws that govern the universe. It then uses these laws to produce specialized theories for developing the human life. The second intellect is the “practical intellect” (*aql mustafad* – (د ا ف ت س م ل ا ل ق ع ل ا –), which directly applies these theories to reality in a continuous and ever-evolving dialectic, in addition to its pivotal role in being responsible for the functions of somatic cell genes and ensuring their efficiency.

The method of communication between the two intellects, which we have called “the physic - spiritual link code”, we will discuss in detail in the following paragraphs.

For more evidence and proof, it goes without saying that Ibn Sina is very interested with the human’s knowledge of material things, which are considered the primary or to be precise, the first things known by us. Accordingly, he assumed that the essences of the material things are only potentially intelligible, and as such they must be free of the particularizing accidents that follow upon their existing in the matter. Only when they are considered without any particularity, and so are taken as universal, can the intellect conceptualize the essences of material things [18].

Once again, we would like to emphasize that the strictness of belief in the theory of divine creation is always behind Ibn Sina’s deep understanding of the fixed eternity relationship between what is mental/rational (immaterial) and what material is, and that together they represent a structural and functional interconnection unity based on the fact that the cosmogony unfolding of the universe from the perfect being, (God, The First Cause) tacks place through the process of divine emanation according to Ibn Sina. Additionally, they together complete embodiment of the philosophy of total perfection that Ibn Sina devised, such that it is impossible to imagine their separation ever before death.

In the second paragraph of his interpretation, Ibn Sina focused on the Creator alone being able to create all forms “Giver of forms” in its absolute sense. Then Ibn Sina returned and emphasized the uniqueness of the species, such that each species has its own genetic makeup that distinguishes it from others. Meaning that the unity of divine creation has determined that plant, animal, and human creatures differ from one another. Rather, divine wisdom has allocated to each creature a unique genetic makeup that no one else possesses.

It is certainly useful to add that Ibn Sina, in his interpretation of the meaning of the temperament (genotype) said that: *the human species has a wide-range temperament (genotype) * that are*

*specific to its species (genetic compatibility), and that within the normal range of this temperament there are sub temperaments for races and populations. Even within a population, each individual has a unique temperament (specific unique genotype) that differs from that of another individual. The boundaries of a temperament (genotype) are always in relation to a related group and never as an absolute; the human species has its own temperament in comparison to other species; the same is true for members within a population of the same species or for an organ. 3rd Lesson of the 1st book of the *Al-Canun fi al-Tibb*”: Avicenna’s Medicine [33]. All the terms and concepts that Ibn Sina elucidated and explained in this chapter are genetic terms par excellence.*

(The words in brackets are in illustrative form and indicate the author’s interpretation) *

(*The text in italics is the original literal/verbatim words of Ibn Sina*).

In order for the soul to achieve its intellectual and molar perfection, Ibn Sina considered two aspects for the soul: one regulates and stimulates body (brain) and is affected by it, and is called practical intellect. The other one, by connecting to the upper world (active intellect) receives the form and perception which is called conceptual intellect. This interpretation reinforces the theory we have called the theory of “two faculties and two eyes”. This theory, in the consciousness and thought of Ibn Sina, has a general scope that applies to the duality soul and body, and a deeper scope that relates to the duality of mind/ brain, both of which constitute the highest and most accurate representation of the notion and mechanism of the interaction between mental and physical substances.

As we mentioned previously, the human intellect is the essence of the soul, and they are of the same identity being of an immaterial substance; therefore, the human intellect cannot be achieved by itself, but through a body (brain) that acts as a custodian for it, and prepares it to intellectually perceive the full range of intelligible objects. Then, how does the theoretical intellect convert/switch the ideas and visions it derives from the universe into the practical intellect through the mediation of active intellect (Aql fa’al) where the outcome gained is real-life facts and effective living in reality, that the role of active intellect is giving rise to the existence of the sublunary world and its contents. Herein is the philosophical and scientific value of Ibn Sina’s thought, who devised this ingenious mechanism, which can be summarized as follows:

Ibn Sina proposed a model for the interaction mechanism. He first discusses the mechanism of how mind affects the brain, and then he explains how under this mechanism the brain function can affect the mind. Regarding the structure of the brain, Ibn Sina proposed that the internal senses are organized in three ventricles of the brain, with each ventricle containing two senses, with receptive and retentive capacities respectively [34]. The first pair of senses is located in the front ventricle of the brain, and includes the common sense and (one aspect of) the imaginative faculty. Then, the common sense coordinates the impressions received by

the individual senses, to produce a unified picture of a sensible object. This includes, as Aristotle said, impressions that are related incidentally to the object, a phenomenon that links memory of past sensible impressions to a current sense [35].

The next pair of the internal senses is located in the middle ventricle, these senses consist of the faculty of Estimation, which means delusion/imagination, it pronounce “*wahm*” in Arabic, and the second, chameleon type faculty which functions both imaginary (in animal and human), and rationally (in human alone). This sense is also called the “imagination” and pronounce *al-mutakhayyilah* (مَلَي خَيَال in Arabic). However, when this faculty deals with specific material concepts, Ibn Sina calls it the thinking faculty or “cogitative faculty”.

Unlike Averroes (Ibn Rushd), Ibn Sina did not limit the use of the concept of imagination “*wahm*” to animals only, but he designed his vision on a broad scale that includes logical and physical subjects. He believed estimation grasps the core characteristic of every discrete physical object, and what is this characteristic that distinguishes it from every other object [36]. This formula reflects Ibn Sina’s deep belief in the theory of individuality, which has a genetic notion par excellence, and we have presented in the preceding lines his words what embodies this concept: “*Even within a population, each individual has a unique temperament (specific unique genotype) that differs from that of another individual*” [33].

3.2. The Legacy of the European Philosophy of Mind (Descartes is a Model)

Before proceeding further, and to delve deeper to connect the ideas with their meanings, we must necessarily remember Descartes’s theory of “the efficient causation of the mind/brain interaction”: Descartes supposes that the immaterial, thinking mind and the material, non-thinking body (brain) interact by means of efficient causation that the mind causes events in the body (brain). In this respect we coined the term “*physic- spiritual link code*” to explain and simplify the reference to the nature of the reaction between mind and brain. According to Ibn Sina, since the mind and soul are of immaterial eternal origin nature, then, the interaction between mind and brain acquires a dualistic character, and the closest description of it is “*physic- spiritual link code*”. This link is perhaps the objective equivalent of Descartes’s term of “the efficient causation of the mind/brain interaction”. We assume, that the shared legacy of Ibn Sina and Descartes in the field of the philosophy of mind was similar in more than one idea, but at this moment it appeared identical and complementarity, as if what Ibn Sina postulated in his time the term of (the active intellect) was completed by Descartes, who offered the explanation several centuries later, describing the “active intellect” as the efficient causation that the mind causes events in the brain.

Regarding to this “*physic-spiritual link code*”, it is very important to add that, Immanuel Kant assumed that the theoretical (pure) reason can contain within itself a “practical principle” that is capable of determining the will by which practical laws (the activity of practical reason) are realized. Otherwise (meaning the

absence of this practical principle), all practical laws become mere axioms. We believe that Kant’s contribution represents a huge intellectual leap in an attempt to fill the interpretive gap regarding the nature and method of communication between the theoretical mind and its practical counterpart. This is because, if the practical laws (the activity of practical reason) become mere axioms, and the will is absent, then man becomes a mere mechanical being, because the will is an essential part of the mind’s constitution, and its absence means that the mind loses its basic function of control, command, awareness, and guidance, which are the essence of man as God Almighty, intended him to be.

In this respect, since philosophy (as a soft self-science) does not provide final answers, but rather generates new questions about the old ones in a wonderful dialectic cycle. Then, this philosophy, sometimes relies on the physical sciences (as a solid objective-science) to replace it in providing the final answer. In our case, biologists, neurobiologists, and geneticists are taking on the challenge to solving this problem. Some of them have assumed that the center of communication between the theoretical and practical intellects is the “pineal gland”, which described as the “Seat of the Soul” by Rene’ Descartes and it is located in the center of the brain. To determine the essence of matter, Descartes starts as usual with the cognitive aspect of the question, asking in what way a human mind comes to know material things. In Descartes’s mechanist physiology, the brain has a power of encoding the different stimuli it receives either from the mind or from the body, connecting them to particular positions of the ‘pineal gland’, but this power is necessarily limited, as proved by the case of “Chiliagon” [37]. The main function of the pineal gland is to receive information about the state of the light-dark cycle from the environment and convey this information by the production and secretion of the hormone melatonin. The rhythm of melatonin production is internally generated and controlled by interacting networks of clock genes in the bilateral SCN [38].

Light exposure is the most important factor related to pineal gland function and melatonin secretion. A single daily light pulse of suitable intensity and duration in otherwise constant darkness is enough to phase shift and to synchronize the melatonin rhythm to 24h [39].

Therefore, can the pineal gland, with its structure, location, and function, be considered the “practical principle” explained by Kant? If so, we must conduct further research not only into the relation of the pineal gland to the mind as the “practical principal”, but within a broader vision of the relationship of the brain itself (as physical substance) to the mind itself (as immaterial notion), and how and when each of them perceived its other half [40].

It is very important to add that Ibn Sina, before everyone else, recognized and proposed the term “active intellect” to express this elusive interaction between mind and brain. The evidence is that Ibn Sina in his book “Psychology” volume 5 discussed the very activity of the human intellect itself: “what is required for this activity, and how it occurs. More specifically, he addresses how

our material intellect (may be the pineal gland, or any other organ) emerges from a state of potentially knowing certain thing, to a state of actually known those things. This emergence, according to him requires a separate intellect that is always actual and never potential [18]. This actual and never potential intellect was nothing but the “active intellect”, which is pronounced in Arabic as *aql fa’al* and it, is active because it simply has the awareness and will.

Regarding Descartes’s philosophical theory of the senses, he formulated and presented it in his own words as follows,” The senses present me with knowledge over which I have not the slightest control and which in fact imposes itself upon me with great vividness, to the point of making me think that it comes from external cause which is different from me as a thinking being. They deceive me above all by presenting to my mind things that are false or non-existent. But the senses also deceive me with regard to those sensations that would seem to originate from our own body [37].

4. Conclusion

- We owe a debt to Ibn Sina, or rather to his genius and unique scientific intuition, as he was the first to grasp the principles of genetics. Perhaps the most prominent evidence supporting this conclusion is found in the terms temperament (genotype), gentle mixtures, and dense mixtures, as we have explained in this text.
- We have strived to offer a new interpretation of the concept of duality for the first time, based on considering the relationship between its two sides as a fraternal, supportive, and dialectical relationship, and never an antagonistic one.
- Through the scientific and historical narrative of the term “philosophy of mind,” it is evident that Ibn Sina partially adopted the view held by ancient Egyptian, Chinese, and Greek civilizations that the heart/soul, not the mind, is the seat of intelligence, unlike modern Western civilization.
- According to Ibn Sina's philosophy, there is no separation between the soul and the intellect; the theoretical intellect, in particular, is the essence of the soul. Together, they form a duality in which the mind is the active core of the soul, but in the same time the mind is also subject to its creative influence and divine commands.
- The method of communication/interaction between the theoretical mind and its practical counterpart is achieved through the “practical principle”, according to Immanuel Kant, or the “efficient causation that mind causes events in brain”, according to Descartes, or the “active intellect” according to Ibn Sina. Given the unique, creative, and functional role of this interaction, we refer to call it “physic-spiritual link code” a name perfectly suited to its role and function.

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Appendix 1

Exploring the linguistic and philosophical value of the terms “gentle mixtures” and “dense mixtures” from a particular perspective of aesthetics of the Arabic language and its eloquent, inspiring rhetoric in Ibn Sina’s context

Ibn Sina formulated most of his works in Arabic, which was not his native language, but he was able to assimilate it and master its linguistic structure, literary, and rhetorical aspects with deep understanding. Ibn Sina’s manuscript, “Treatise on Cardiac Drugs” is one of his most important works. Despite its small size it accurately summarizes his philosophical and medical views. Ibn Sina dedicated, at the beginning of the manuscript, seven chapters out of eighteen chapters to presenting a profound philosophical vision on the issue of divine creation, which represents for him the main and solid foundation for all his encyclopedic works, whether in philosophy or in medicine, are the monumental works that have immortalized his name forever. Ibn Sina stated that: “God Almighty created the soul of gentle “subtle/ fine” mixtures, as He Almighty created the body of dense mixtures”. In this context, word “gentle” is equivalent to the Arabic word (في ظل), and word dense is equivalent to the Arabic word (في ثقل)

These two words in Arabic, when pronounced consecutively, create a stunning musical effect; moreover, they represent two fundamental types of Arabic rhetoric, as follows:

The first is called: Antithesis: which is a rhetorical term that means combining a word and its opposite to strengthen and clarify the meaning. It is one of the semantic rhetorical embellishments. This term comes in two types: positive (the word and its opposite) or negative (the word and its negation).

The second is called: Imperfect rhyme, which is a case of two words sounding alike but having different meaning. It is a rhetorical device that creates musical effect pleasing to ear and delightful to the soul [41]. This concerns the aesthetics of language and its meanings; however, the use of this poetic language to describe a scientific fact or a hypothetical one with scientific content is what deserves attention. Scientifically, there is no such thing as “gentle mixtures” and/or “dense mixtures”. The term “mixtures” * in this context refers to the chromosomes, which carry the genes that encode for the traits and functions of a living organism. Therefore, we are talking about codes for specific and rigid genetic traits. How did Ibn Sina express his concept in this unique way? This is where philosophy comes in. *We used the term mixtures instead of the Greek term humors [42].

According to Ibn Sina, the soul connects the theoretical intellect (immaterial realm of intelligible) to the practical intellect (material realm of the body), this connection is the first and crucial step towards achieving the perfection of the soul. The first side of this equation “theoretical intellect” represents the faculty by which the soul possesses for connection to the side above it by means of gentle “subtle/fine” mixtures/genes of intelligence. While, “practical intellect” represents the faculty by which the soul possesses for connection to the side below it by means of dense mixtures/genes of somatic cells (body organs). This delicate spiritual balance between what ascends to heaven (gentle/fine/subtle mixtures) and what descends to the earth (dense mixtures) inevitably points to the paradoxical nature of both soul and body. Herein, Ibn Sina’s exquisite imagination is revealed in this formulation of the terms “the gentle” and “the dense”, a poetic expression that carries a powerful metaphorical comparison that deeply affects the conscience and also stimulates the mind to manage all this dialectic between language, philosophy, and science as if they were intertwined, cooperative, and interactive sister facts to reinforce the process of the soul perfection.

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