



Profound, deep, extraordinary minds: Vital attributes of human knowledge

Susie Michailidis* and Paata Kervalishvili

Euro Mediterranean Academy of Arts and Sciences

“The Energy of Mind is the Essence of Life.”

Aristotle

“It is the Power of the Mind to be unconquerable.”

Seneca

Profound, Deep, Extraordinary Minds. But what do we mean by using these words? Depending on whom one asks, the question is either the most thoughtful question of human intellectual existence or else nothing more than a senseless appeal built on conceptual confusion. It is often asked with transcendent, spiritual, psychological, philosophical, scientific or religious assumptions. The expression “Deep minds” has been used to voice questions and concerns about central aspects of human knowledge. Since the dawn of human civilization, history has witnessed the emergence of some truly great minds who have left behind a deep-rooted mark. Outstanding figures across the fields of science, mathematics, philosophy, art and literature have enriched human intellectual history in myriad ways. While some of these great minds have simplified our lives by developing useful technology, some others have contributed to medical science, enabling us to live healthier lives. And we also have to credit the great minds for helping to pursue answers to questions about life. Focusing only on the Western intellectual tradition brought about by people such as Plato, Aristotle, Descartes, Spinoza, Nietzsche and Einstein, just to mention some, and understanding this intellectual tradition, is to only get *half* of the story. Just as important, and just as valid a contribution to philosophy, is the Eastern intellectual tradition. Eastern philosophy is *also* the product of thousands of years of thought and was *also* built up by a distinct group of brilliant thinkers. Their ideas demonstrate fascinating, wholly different ways of approaching, understanding and solving the same fundamental questions that concerned the West’s greatest thinkers, such as:

- the existence of God
- the meaning of life
- the nature of truth and reality
- the organization of government and society
- the significance of suffering, and the roots of a well-lived life.

To explore Eastern perspectives on these issues is to embark on an illuminating journey into the heart of grand,

but often unfamiliar, civilizations. It’s also a thought-provoking way to understand the surprising connexions and differences between East and West, and to strengthen one’s knowledge of cultures that play increasingly important rôles in our globalized 21st-century world.

Why should we base our theories about the mind on the knowledge of how the brain functions? Why shouldn’t we study the mind as philosophers and scientists did for centuries, by introspecting to find out how we ourselves think and then asking other people questions to find out how they think? Or if we want to be more scientific, and we can figure out how to make a computer do what human beings do, why not assume that the way the computer does it is the way humans do it, too?

Thus, who exactly are the greatest profound minds and how do their brains function? While there are probably too many to count, there can be a focus on several major figures who have had the greatest impact on intellectual history, and whose influence has often extended beyond cultural borders.

The profound minds who have been included in this essay will present a basic understanding of the scholarly history of mind. Many of the great minds, their lives and views had just as profound an influence on the course of knowledge development and on interest in the function of mind and brain.

There are many good reasons to learn about the brain. The brain controls all human beings’ thoughts, emotions, and actions. The marvel of this extraordinary three-pound organ is fascinating. As neuroanatomist Santiago Ramón y Cajal remarked, “The brain is a world consisting of a number of unexplored continents and great stretches of unknown territory” [1]. The brain is responsible for everything human beings have done in the past, everything they are doing right now, and everything that they will do in the future. Reading, writing, remembering, crying, laughing, running, talking—all are examples of the brain at work. The brain receives information from the outside world and from inside the body; it must understand this information and send signals

* Corresponding author. E-mail: michailidiss@webster.edu

to muscles, organs and glands to control what the body does. The human body is made up of millions of millions of cells.¹ Cells in the nervous system act as the body's communication system, sending information from place to place to coordinate the body's actions. The nervous system has two main types of cells: nerve cells (neurons) and glial cells (glia). Neurons carry messages to other neurons, muscles, organs or glands. The human brain has approximately 100,000 million neurons.² Glial cells support the brain and bring nutrients to neurons; the brain has at least ten times more glial cells than nerve cells. How the brain learns the environment is a complicated, in some ways paradoxical process that reveals much about several important issues in neuroscience like: What is the relation between the brain's fixed, inherited characteristics and its flexibility, its capacity to change, adapt and develop? To what extent are certain cognitive functions localized in particular cortical areas, and to what extent is brain functioning distributed over different regions that reciprocally interact and are malleably configured? How is the brain organized? Is it as a computer with the central administrator, or a parallel processing network, or a chaotic, unstable array of ever-changing interactions?

Another question is: How is the brain related to the mind? Do *minds* work like computers? Can science's new knowledge about the brain tell us anything of importance about the way the minds work? How can a three-pound mass of tiny jelly-like blobs connected by vast numbers of microscopic filaments³ be the basis of all human beings' thoughts, feelings, memories, hopes, intentions, knowledge? Will all the new knowledge scientists gain about our brains enable them to read our minds with electronic devices? Modern theories of mind and brain did not emerge from nowhere. What contemporary scholars indicate about the mind and brain goes back to a long tradition of Greek and Roman antiquity.

Nous, (Greek: "mind" or "intellect") in philosophy, is the faculty of intellectual apprehension and of intuitive thought. Used in a narrower sense, it is distinguished from discursive thought and applies to the apprehension of eternal intelligible substances and first principles. It is sometimes identified with the highest or divine intellect. It is always difficult to find an English word to represent *nous*. The standard dictionary translation is "mind", but this does not have the correct connotation, particularly when the word is used in a religious sense. Mathematics,

the world of ideas, and all thought about what is not sensible, have for Pythagoras, Plato and Plotinus something divine; they constitute the activity of *nous*, or at least the nearest approach to its activity that we can conceive [2]. On the other hand the prime mover of the contemporary concept of mind is the ancient Greek idea of soul (*psyche*), which was originally used to mark the difference between things that are alive and things that are dead.

From Homer to the end of the fifth century BCE, the word "soul" undergoes remarkable semantic expansion, in the course of which it comes to be natural not only to speak of soul as what distinguishes the living from the dead and (not the same distinction) the animate from the inanimate, but also to attribute to the soul a wide variety of activities and responses, cognitive as well as emotional, and to think of it as the bearer of such virtues as courage, temperance and justice. As a result of these developments, the language made available something that Homeric Greek lacked, a distinction between body and soul. Theoretically it was associated with breath (*pneuma*), related to different states of consciousness. The soul is composed of extremely light and tenuous matter, variously identified with pure and "breathable" elements such as air, according to Thales.

Starting with Plato (c. 428–348 or 347 BCE), philosophers began to ask more sophisticated questions about how one can feel, think, possess knowledge and choose rightly. Plato divided the soul in terms of its capacities, producing the first faculty psychology in the Western tradition. Plato came close to advancing a dualist account like that of Descartes later. In the *Phaedo*, he took immortality to be an essential feature of the soul, so that "mortal soul" is a contradiction in terms, as "when death comes to a man, the mortal part of him dies, but the immortal part retires at the approach of death and escapes unharmed and indestructible" (Plato 106e⁴). A soul, immortal by definition, has more in common with what is cosmic and divine than with anything in the visible realm—such as its own body, for example—which is why Plato shows little interest in exploring its everyday operations. The soul's union with the body is not its natural state; in fact, the whole point of philosophy is to prepare the soul for its release from the "prison" of the body (Plato 80c–84b) [3].

The soul, as Plato envisions it in the *Phaedo*, is crucially characterized by *cognitive and intellectual*

¹ Some estimates put it at 30 billion (3×10^{13}) (or 30 trillion in US usage), excluding the comparable, probably someone greater, number of bacteria in the gastrointestinal tract.

² 100 billion in US usage.

³ Each neuron has an average of more than 1000 connexions to other neurons.

⁴ Alphanumeric reference to paragraphs in [3].

features: it is something that reasons, more or less well depending on the extent to which it is disturbed or distracted by the body and the senses; something that regulates and controls the body and its desires and affections, “especially if it is a wise soul” (94b), presumably in a way that involves, and renders effective, judgments about what it is best to do, and how it is best to behave; and something that has, as the kind of adornment that is truly appropriate to it, virtues such as temperance, justice and courage (114e,f). However, it should be clear that the soul, as it is thought of here, is not simply the mind, as we conceive of it. It is both broader and narrower than that. It is broader in that Plato evidently retains the traditional idea of soul as distinguishing the animate from the inanimate. Two of the four main lines of argument for the immortality of the soul rely not on cognitive or indeed specifically psychological features of the soul, but simply on the familiar connexion between soul and life.

Plato, in his later works, expressed the idea that the soul plays a major rôle in moral conflict and human action. From the fact that one can be affected by two or more desires simultaneously, he assumes that the soul cannot be unitary, since it is impossible for the same thing to act in opposite ways at the same time. In the *Republic* he identifies three different parts of the soul—reason (*nous*), passion (*thumos*), and desire/wish (*epithumia*)—and posits these as the source of conflicting wishes (IV, 439d–e). Reason rules over the soul with wisdom, but opposed to it is desire, the irrational part of the soul “with which it loves, hungers, thirsts, and feels the flutter and titillation of other desires” (439d). Reason and desire would remain in unending combat but for the intervention of passion, the “spirited” part of the soul that helps reason overcome desires. Plato elevates rationality to the dominant position in the soul and, conversely, the denigration of desire as an irrational force that threatens to destroy our well-being. In the *Phaedrus*, Plato likens reason to a charioteer trying to control two horses: a good horse (passion), who “needs no whip” because he is driven by the command of reason alone; and a bad horse (desire), who is hard to control and who would run the chariot into the ditch if left unchecked (253d–254e). Plato saw no compensatory value for the emotions in human moral life, though anger, at least, could sometimes be placed in the service of reason.

Erick Raphael Jiménez writes about Aristotle’s view of mind (*nous*) [4]: He translates the Greek *nous* as “mind” on the grounds that other translations, such as “intellect”, portray *nous* as a faculty. Mind, for Aristotle, is not a given faculty, but rather a state of intellectual achievement, which refers to past success: coming to

understand what is the case, “hitting upon the truth”. We attain intellectual achievement, according to Aristotle, not by luck or inspiration, but through “research”. Broadly speaking, Aristotelian research is the attempt to find explanations. Thus having a mind, for Aristotle, means possessing the level and kind of insight afforded by progress and success in explanation.

Jiménez rejects this portrayal, however: *nous* is “not simply a naturally given faculty for the perception of a certain sort of perceptible” (p. 16), and “not possessed simply ‘by nature’” (p. 44). On the contrary, Jiménez holds—as his book’s first main thesis—that mind is “a virtue/excellence rather than a natural capacity” (p. 7), “a state of intellectual excellence, and not a potentiality like sensation” (p. 33). *Nous* is attained through actively coming to understand: “Mind and understanding are not potentialities predating their development; they are habits earned through learning and discovery” (p. 29; cf. pp. 30–31). In articulating this, what he calls his “actuality-first” account of *nous* (p. 8),^{1Q}

Close readings of *De Anima* III and other Aristotelian texts convey what Aristotle says, *nous* (*qua* virtue) is an excellence of the authoritatively rational part of the soul discussed in *Nicomachean Ethics* I.7 and I.13, *Eudemian Ethics* II.1, and *Politics* VII.14.^{2Q} Such is the part of the soul, Aristotle says, to which the various intellectual virtues pertain (EN^{3Q} I.13, 1103a3–10; VI.1, 1139a5–17). The intellectual excellences are states in virtue, of which this^{4Q} authoritatively rational part (in its practical and theoretical dimensions) functions well in attaining truth (EN VI.2, 1139b12–13). But then we face the question of accounting for this authoritatively rational part, which Aristotle *does* seem to portray as a natural faculty. The *Eudemian Ethics*, for instance, shares *Nicomachean Ethics* VI’s treatise on the intellectual virtues. And in *Eudemian Ethics* II.1, Aristotle recognizes that talk of “parts” of the soul is controversial; hence, he clarifies that by “parts” he means *powers* (*dunameis*) of the soul (1219b32–36). This rational part, then, would seem to be that power of the soul by which the soul thinks. But “that portion of the soul by which” the soul thinks is just how Aristotle describes *nous* (*De Anima* III.4, 429a10–11; cf. 429a23). If so, then Aristotle would seem to view *nous* not only as an intellectual virtue; he would also seem to identify *nous* (in a different sense) as a psychic faculty; i.e., as that power of the soul whose function is attaining truth [5].

Coming from the theories of Plato and Aristotle, the first thing that might strike us about the theories of soul adopted by the two dominant Hellenistic schools, Epicurus’ Garden and the Stoa, is the doctrine, shared by both, that the soul is corporeal. In the Epicurean tradition

the word “soul” is sometimes used in the broad meaning, viz. as what animates living things (e.g., Diogenes of Oenoanda, fr. 37 Smith), but the focus of interest, so far as the soul is concerned, is very much on the mental functions of cognition, emotion and desire. A view that is common in the tradition and that very probably goes back to the founder is that the soul is a composite of two parts; one rational, the other nonrational. The rational part, which Lucretius calls mind [*animus*], is the origin of emotion and impulse, and it is also where (no doubt among other operations) concepts are applied and beliefs formed, and where evidence is assessed and inferences are made. The nonrational part of the soul, which in Lucretius is somewhat confusingly called soul [*anima*], is responsible for receiving sense-impressions, all of which are true according to Epicurus. The noteworthy viewpoint is the Stoic theory that the mind of an adult human being is a single item, without parts, that is rational all the way down. According to the Stoic theory, there are eight parts⁵⁰ of the soul, the “commanding faculty” [*hêgemonikon*] or mind, the five senses, voice and (certain aspects of) reproduction. The mind, which is located at the heart, is a centre that controls the other soul-parts as well as the body, and receives and processes information supplied by the subordinate parts. The minds of nonhuman animals and of nonadult humans have faculties only of impression and impulse. Achieving adulthood, for humans, involves gaining assent and reason. Reason (it would seem) makes assent possible, in that it enables the subject to assent to or withhold assent from impressions, and it transforms mere impressions and mere impulses, such as other animals experience, into rational impressions and rational impulses. The rationality of an impression consists in its being articulated in terms of concepts, possession of which is constitutive of having reason; the rationality of an impulse consists in the fact that it is generated or constituted by a voluntary act of assent of the mind to a suitable practical (impulsive) impression—the impression, for instance, that something within view would be nice to eat. Thus, depending on the type of impression assented to, assent generates or constitutes belief (or knowledge) concerning some matter of fact, or an impulse to act in some way or other.

Mediaeval thinkers were also interested in the concept of mind. In the Middle Ages, as in other periods, thought took many written forms, from encyclopaedias and compendia to monographs and short essays, from poetic, allegorical and novelistic presentations to texts based directly on school and university practice. But there is one scholarly form that was used centrally but has lost its importance in modern times: the commentary. Whereas scholars now, at least in the analytic tradition,

think of their subject as made up of *problems*, which are tackled using what others have said and are saying as aids, mediaeval philosophizing was frequently based on *texts*. The practice of interpretation frequently led to new thinking, related only tangentially to the text under discussion.

The central texts for commentary in the Greek, Latin and Jewish branches and among Arabic philosophers up to the 12th century were Aristotle’s. The Byzantine philosophers used them in the original, Latin and Arabic philosophers in translation, and the Hebrew-writing Jewish philosophers usually indirectly, via epitomes and paraphrase commentaries translated from Arabic. No other ancient philosopher’s texts received anything remotely near this level of attention (although various works of Boethius received multiple commentaries in the Latin tradition).

Three philosophers, St Augustine, Pseudo-Dionysius and St Thomas Aquinas, provided significant contributions to thought during the Middle Ages. Two aspects shaped mediaeval thinking about the mind or soul. The first is religious doctrine. The idea that God created the world from nothing is absent from ancient Greek philosophy, but standard in the mediaeval thought of all three monotheistic traditions: Christian, Islamic and Jewish. In the Western or Christian tradition, it was expressed in terms of providence, the idea that creation is a product of God’s wisdom and goodness, and that this is manifested in the orderly structure of the universe all the way down to its smallest details. Needless to say, it would have struck an ancient Greek philosopher as absurd that something could be made from nothing, or that a divinity—especially an omnipotent divinity—would care what happens to beings less powerful than it. These doctrines changed the way the mind was understood, granting pride of place to the human soul and human modes of cognition. Since humans are made in God’s image (Gen. 1:26), their own nature must in some way reflect the divine. The second factor is simply physical access to ancient texts, which became more and more difficult in the West until direct knowledge of most Greek sources was lost for nearly six centuries.

The theory of mind that medieval philosophers inherited from Augustine is predicated on the thesis that the human mind, in its nature and in its functioning, bears the image of the divine Trinity. This thesis, which Augustine develops at length in the latter books of his *De trinitate* [6], has at its core a picture of human intellect and human thought as essentially self-reflexive. Indeed, in the Augustinian picture, this self-reflexivity is the very locus of mind’s trinitarian structure. And this is because, in Augustine’s view, the human mind (*mens*) is such that

it bears a threefold relation to itself: “it always remembers itself, always understands itself, and always loves itself” [7]. For Augustine, the human mind is the main expression of the truth of Genesis 1:26, and the doctrine of the Trinity provides the mode of resemblance. Just as God is three persons (Father, Son and Spirit) in one being, so the mind is three aspects or activities in one substance: “Since then these three, memory, understanding, will, are not three lives but one life, nor three minds but one mind, it follows certainly that neither are they three substances but one substance” (*De trinitate* X, 11.18). Augustine also thought that because it is immediately present to itself, the mind knows itself and that, in knowing itself, it knows God as well. There are remarkable similarities between Augustine’s argument that a man who knows he is alive cannot be deceived about this fact [8].

The most influential theory of thought in the thirteenth century goes back to Aristotle and has its foremost mediaeval defender in Thomas Aquinas. The greatest non-Christian influence on Aquinas came from Aristotle, and (as noted above) both Ibn Rushd (a Muslim) and Maimonides (a Jew) exerted significant influences over him as well. The theory rests on viewing mental representations or intelligible species, as Aquinas calls them, as sameness of form.

The explanation for why thoughts are about something, exhibit intentionality, or represent is that the form of the object thought about is in the mind of the thinker. According to a popular metaphor, thinking something, on this view, is being the object thought about in the sense that the intellect becomes the object or takes on its form. Following Aristotle in *De anima* III.4, Aquinas argues that the mind or the intellective part of the soul has no nature or, rather, it is nothing before it thinks of something. The active intellect abstracts the intelligible species from the sensitive species in the internal senses and places it in the potential intellect. Aquinas is here very close to the view we saw [Avicenna](#)^{6Q} defend above. The species actualizes the potential intellect as a form actualizes a potency. The intelligible species in the potential intellect constitutes the thought. The intellect is immaterial, according to Aquinas, and since he also famously thinks that matter is the principle of individuation, the intelligible species in the potential intellect is not individual, but universal. This is why Aquinas holds that a thought is always universal. [\(Sandford\)](#)^{7Q}

Many later philosophers in early Modern times—most notably Descartes—have been so impressed by the differences between what we sense when we observe the “outside” world and what we sense when we turn “inward” to discover what is in our minds that they are

convinced that the “outer” and the “inner” constitute two totally separate “worlds”. This is the dualist approach—the belief that mind and body are two totally different aspects of existence. Dualists believe that since the brain is a physical entity it has nothing to teach us about the nonphysical mind. And because most dualists do not distinguish between the contents of our thoughts and the processes of our thinking, they believe nothing we can learn about the brain will ever be able to explain how our minds work. Monists, on the other hand, believe that the mind and the brain are one and the same, looked at from two different aspects, so that advances in the study of the brain will eventually teach us all we need to know about the workings of the mind. Many of them also do not make the distinction between the contents of the thoughts and the processes of thinking, and they believe that there is nothing about the mind that would remain unknown if there is enough knowledge about the brain. This distinction seems crucial to contemporary scholars as they believe that there is a great deal about how the minds work, about the processes of thinking, and by studying the workings of the brain^{8Q}. The contents of the minds, on the other hand, will always need to be studied separately. In other words, while the mental level of explanation of the cognitive processes can usefully be anchored in the physical level of explanation, there is no point in trying to explain particular pieces of knowledge or belief in this way.

The famous mind–body problem had its origins in Descartes’ conclusion that mind and body are really distinct. The core of the difficulty lies in the claim that the respective natures of mind and body are completely different and, in some way, opposite from one another. According to this account, the mind is an entirely immaterial thing without any extension in it whatsoever and, conversely, the body is an entirely material thing without any thinking in it at all. One of the deepest and most lasting legacies of Descartes’ thought is his idea that mind and body are really distinct—a thesis now called “mind–body dualism”. He reaches this conclusion by arguing that the nature of the mind (that is, a thinking, nonextended thing) is completely different from that of the body (that is, an extended, nonthinking thing), and therefore it is possible for one to exist without the other. This argument gives rise to the famous problem of mind–body causal interaction still debated today: how can the mind cause some of our bodily limbs to move (for example, raising one’s hand to ask a question), and how can the body’s sense organs cause sensations in the mind when their natures are completely different?

While many philosophers after Descartes took up the issues related to consciousness left by him, one

possible exception is Spinoza, whose theory of mind is thoroughly *representational*. The mental consists simply in representational content, for Spinoza. In *Ethics* 2p7, he argues that “the order and connexion of ideas is the same as the order and connexion of things”, which is to say that for each extended object, there is a parallel idea. This is called mind–body parallelism, from which Spinoza was able to develop his theory of mind: “The first thing that constitutes the actual being of a human mind is nothing but the idea of a singular thing which actually exists” (2p11). Each mind is itself an idea with a particular object—in the case of human beings, the mind is the idea of its body, and whatever happens in the body will be represented in the mind (as Spinoza argues in 2p12 and 2p13) [9].

The mind is a particular idea that represents a singular object, namely, the body to which it is parallel. This is a fully representational theory of mind, and anything else that can be inferred from the mind will have its parallel in the body that it represents.

The intentionality of thought is the primary pivot on which everything else turns for Spinoza’s theory of mind. Intentionality is the power of minds and mental states to be about, to represent, or to stand for, things, properties and states of affairs. To say of an individual’s mental states that they have intentionality is to say that they are mental representations or that they have contents. There are suggestions in Spinoza’s *Ethics* about some representations of which we are unaware. At the end of the *Ethics*, Spinoza describes the “wise man” as the one who is “conscious of himself, and of God, and of things” (5p42s), the clear implication being that those who aren’t wise *fail* to be conscious of themselves, God, or things, even if these things are present to mind through a mental representation. And so, it seems that Spinoza needs an account of consciousness that does not extend to every mental representation (or, at the very least, not to the same degree) [10].

There is an opinion about the mind and the brain that takes it for granted that the human mind is inseparable from the human body. Those who advocate this try to understand the functioning of the mind based on how the brain operates. This scientific paradigm of concepts has led to the construction of new theories and models of the mind, which are variously known as connexionist theories, or neural network models, or theories of parallel distributed processing (PDP). Although some of the ideas on which these new theories are based have been around for over a century, the detailed working out of these models began only in the 1970s [11].

These ideas are known as connexionist theories because they claim that mental processes and

capacities—how humans perceive what is out there in the world; how knowledge about these things is organized; how all this information is combined to draw new conclusions; how the decision what to do next in order to get what is wanted—can be explained on the basis of what is known about the multiple interconnexions between the neurons (nerve cells) in the brain. They are called neural network models because they present detailed computer models of how interconnected units can work together to form networks analogous to those in the brain. And they are called theories of parallel distributed processing because they claim that a variety of mental operations are carried out at the same time, in parallel, and that these operations are distributed over large numbers of units rather than occurring within individual units separately. How are the mind and the brain related? The connexionist view is based on the idea that there can be different levels of explanation for talking about the same thing. The concept of levels of explanation is well known in such disciplines as physics. Similarly, *there are both a mental and a physical level of explanation for talking about human mental functions*. When we use the word “mind”, we are on the mental level of explanation. The use of the word “brain” is on the physical level of explanation.

In the field of perception almost all scientists use the physical level of explanation in trying to understand the mental one. At least part of the explanation of the way we see requires an understanding of how the brain processes the signals coming in from our eyes. In contrast, many scientists working in the field of the higher mental processes—cognitive scientists, who study such topics as memory, language processes and the organization of concepts—claim that the mental level of explanation can proceed independently of the physical level. Most of them agree that *the mind is inseparable from the brain*, but they do not believe that it is necessary to ground the mental level of explanation in the physical one. Some cognitive scientists also claim that mental explanations of cognitive processes should be the same whether the processes are taking place in a human or a computer; for example these researchers are often called students of artificial intelligence, or AI for short [12].

In contrast, connexionists believe that it is helpful to make use of our knowledge about the physical workings of the brain in our explanations of cognitive processes. The connexionist level of explanation may be thought of as a third level, intermediate between the mental and the physical ones. It is not identical to the physical level because it does not talk about individual nerve cells firing, and it is not concerned with the physical layout of the various parts of the brain. It is not identical to the mental

level because it does not talk about our concepts, say, as abstract things that could be found in any entity that is able to process information. Rather, connexionists propose a description of mental processes that takes account of the physical structure of the brain and its interactions with its environment.

Connexionists' explanations of mental processes are thus based on what we know about brain processes in much the same way as physicists' explanations of the different properties of wood and glass tables are based on the atomic composition of these materials. There is a very great difference between our ability to know what we are thinking and our ability to understand how this thinking takes place. We are aware mainly of the contents of our thoughts because this is the knowledge we need in order to be able to function. I need to know that the object I am looking at is an apple in order to know that I should pick it and eat it rather than the leaf next to it [13].

But our minds at some point, perhaps at the time of the Greek philosophers, began to consider the way they themselves work. As human beings, we cannot be satisfied with just knowing facts about the world "outside" ourselves. We want to understand how we think and how we come to know what we know. The world "inside" our heads seems very different from the world "outside", and we long to find out how it operates. But since we are not built to be able to get at this knowledge directly, we have sought all sorts of indirect ways of finding it out [14].

What about consciousness? The idea that there is no hierarchy in the mind is very similar to a notion expounded by Daniel Dennett [15]. In his book, Dennett demonstrates that there is no one part of the brain in which consciousness is "located", because all the various parts work together to produce our conscious experiences. The connexionist theories fit in well with Dennett's ideas. However, they centre on specific areas of the brain, how they are organized internally, and how they interact with other specific areas. They have not yet reached the point where they can come to grips with the interplay of processes occurring in many parts of the brain that probably underlies consciousness. It is very likely, nevertheless, that one day connexionism will have something interesting to say about consciousness. There might be agreement with Dennett that the concept of consciousness is not a particularly useful one for understanding the mind.

Western philosophy is a vast intellectual tradition; it is the product of thousands of years of revolutionary thought built up by a rich collection of brilliant minds. This

essay introduces key aspects of the human context in which the question is asked. The work then investigates ideas that illuminate what profound minds mean in the contexts of sense-making, purpose and significance. The essay presents just a short journey through some of the sophistications about inquisitive minds and the ideas of the human brain and the human mind. As this field is still new and in the process of development, some of what is written here will doubtless go out of date as new theories and models are developed. Yet the basic understanding of this way of thinking should be useful in attempts to follow new developments in the field. This essay concurs with our previous one [16] in presenting an approach, a way of thinking, rather than a list of facts, to provide an underpinning for learning more about this paradigm.

References

1. Breedlove, B. Unexplored continents and great stretches of unknown territory. *Emerging Infectious Diseases* **23** (2017) 1052–1053.
2. Russell, B. *A History of Western Philosophy*. New York: Simon & Schuster (1967).
3. *The Collected Dialogues of Plato*. (eds E. Hamilton & H. Cairns). New York: Pantheon (1961).
4. Jiménez, E.R. *Aristotle's Concept of Mind*. Cambridge: University Press (2017).
5. *The Complete Works of Aristotle: The revised Oxford translation*. (ed. J. Barnes). Princeton: University Press (1984).
6. *De trinitate* **14.9. The Trinity**⁹⁰ (ed. J.E. Rotelle, tr. E. Hill). Hyde Park, NY: New City Press (1991).
7. O'Daly, G. *Augustine's Philosophy of Mind*. Berkeley: University of California Press (1987).
8. *De trinitate* **XV, 12.21.**¹⁰⁰ *The Essential Augustine*. (ed. V.J. Bourke). New York: New American Publishing (1964).
9. Baruch Spinoza: The complete works (ed. M.L. Morgan, tr. S. Shirley). Indianapolis: Hackett (2002).
10. *The Collected Works of Spinoza* (vol. 1) (tr. E. Curley). Princeton: Press (1986).
11. Goldblum, N. *The Brain-Shaped Mind: What the brain can tell us about the mind*. Cambridge: University Press (2004).
12. Dreyfus, H.L. *What Computers Can't Do: The limits of Artificial Intelligence* (2nd edn). New York: Harper & Row (1979).
13. Bechtel, W. and Abrahamsen, A. *Connectionism and the Mind: An introduction to parallel processing in networks*. Cambridge, Mass.: Basil Blackwell (1991).
14. Rumelhart, D. and McClelland, J. *Parallel Distributed Processing: Explorations in the microstructure of cognition*. Cambridge, Mass.: MIT Press (1986).
15. Dennett, D. *Consciousness Explained*. Boston, Mass.: Little, Brown (1991).
16. Michailidis, S. and Kervalishvili, P. Beautiful minds. *Nanotechnol Perceptions* **18** (2022) 202–210.

Dear Authors,

Please answer Editor-in-Chief's questions (Qs):

1Q: sentence incomplete.

2Q: please check preceding sentence.

3Q: ?

4Q: "this" is ambiguous .

5Q: seems to be a contradiction with partless/without parts.

6Q: check — not mentioned?

7Q: should this be a reference?

8Q: sentence seems incomplete.

9Q: check.

10Q: check.