**Substantial motion, 400 years of wishful thinking!**

Abstract

The concept of Substantial motion (حركت جوهرى) is fundamentally flawed and severely muddled. Aristotle and Mulla Sadra’s conception of motion, substance (جوهر) and substantial form صورت نوعيه)) were all based on a severe misunderstanding of nature as later was established by the scientists and philosophers that came after them. Here, by recalling the established facts of modern science, particularly the universally accepted scientific fact that, properties of objects are reducible to the motion of their electrons and there’s no such thing as ‘substantial form’ much less substance, the author puts an end to a 400-year-old glorious error called ‘substantial motion’. Naturally any attempt to reconcile the paradigms of modern physics with Aristotle/Sadra paradigms of form/matter and substance/accidents, and to try to draw parallel between the two and revive their philosophy would be an exercise in futility.

Keywords: Mulla Sadra, substantial form (صورت نوعيه), substantial motion (حركت جوهرى), substance (جوهر), accident (عرض)

Substantial motion for four centuries has been hailed as a crowning achievement of Mullå Sadra (1571-1636). See (Soroush 1977), (Dinani 2013), (Nasr 2006). Some even have compared that achievement to monumental achievements in science like Newton’s theory of gravitation or Einstein’s theory of relativity (Soroush 1977). In his own opinion and those of his followers the insight of motion in substance was instrumental in solving many a perennial philosophical problems and paradoxes such as relation between God and cosmos, mind-body problem, eschatology, etc.

In this work, after four hundred long years of praise and tribute and untold number of books and articles devoted to the discussion of motion in substance and its implications, and many doctoral degrees awarded for its study, the author unequivocally refutes the idea based on a simple analysis of ‘substantial form’ and recalling of basic, long established, uncontroversial scientific evidence and facts. In the end it will become clear that the lasting of such patently false notion was for nothing but the result of mass hysteria and emulation in place of critical thinking and investigation. As far as the author is aware this is the first serious critique of Sadra’s philosophy which questions its whole paradigm instead of criticisms that have been traditionally leveled against it within same paradigm. Here, instead of repeating the old, tired and ineffectual criticisms of the past scholars regarding minor details of his work the author fundamentally questions and rejects the entirety of the paradigm that has risen to such misconceived concepts and notions.

Substantial motion

What is this substantial motion that has been praised by Islamic scholars for centuries and has been the source of inspiration and admiration for many Persian and Muslim philosophers since Mulla Sadra. Motion in substance introduced by Sadra was an extension of the motion in accidents (attributes of objects) introduced by Aristotle (384-322 BC). In the words of Hossein Nasr, a renown Persian philosopher:

“Instead of positing existents with permanent substances in which only accidents could undergo motion in the classical philosophical sense or asserting the existence of immutable atoms as in classical atomism, Mulla Sadra saw the whole world of nature as partaking in a transformation that affects the very substance of things. He saw the world of corporeal existence, and of course not the immutable intelligible world, as being like a long caravan moving from the lowly state of material existence to the Empyrean.” (Nasr 2006, p. 231)

Aristotle maintained the motion can happen in only four out of nine categories of accidents: quantity, quality, location and orientation (Russel, 1945). On the other hand, Aristotle and followers of his school like Avicenna (Ibn Sina) (980-1037CE) believed that motion in substance is not possible because otherwise there’s nothing to preserve the identity of the object during the motion and as such motion would be meaningless. It’s important to realize the substance Mullå Sadra believed to be in motion is ‘substantial form’ or ‘nature’ of the entity. Mullå Sadra in agreement with Aristotle maintained that accidents (attributes) of an entity like, color, taste etc. are caused by its nature (substantial form). However, Sadra made the leap that based on the cause-effect law, if accidents which are the effects, change, then the cause also must change and hence change or motion in substance or substantial form (nature) to be exact. It needs to be reminded that the substance cannot be perceived by senses and so is its motion. It’s even harder to imagine what kind of motion it can have and so it’s an incoherent notion, because the kind of motions we are familiar with are all motions in accidents like change in its location or color etc. As we will see in the next section the notion of ‘substantial form’ or nature, introduced by Aristotle and embraced by scholastics has long been refuted by science and so attribution of motion to it is not unlike praising the garment of the naked emperor!

 Substance & accident

The Aristotle’s paradigm of substance vs accidents was one of his many misconceptions that lasted for centuries and unfortunately was accepted and proliferated among the Islamic philosophers to this day. This dichotomy is fundamentally flawed and a wrong way to understand and analyze the world. Among the many criticisms leveled at the concept of substance this one is quite telling:

"Substance in a word is metaphysical mistake, due to transference to the world structure, the structure of sentences composed of a subject and a predicate."(Russel, 1945, p. 202)

This is a clear example of a fly trapped in the bottle (Wittgenstein 1953) that is in need of someone to show it the way out. A prime example of how misunderstanding and misuse of language (Wittgenstein 1921) can cause philosophical confusion. The concept of accidents is also heavily criticized as it is wrong in so many ways. Qualities of objects arise from the mind not the objects themselves. As the saying goes: there were no colors before there were brains!

“Thus, the bodies are perceived as with qualities which in reality do not belong to them, qualities, which in fact are purely the offspring of the mind. Thus, nature gets credit which should in truth be reserved for ourselves; rose for its scent: the nightingale for its song: and the sun for its radiance. The poets are entirely mistaken. They should address the lyrics themselves and should turn them into odes of self-congratulation on the excellency of the human mind. Nature is a dull affair, soundless, scentless, colorless, merely the hurrying of material, endless and meaningless (Whitehead 1929, P. ?)

Another way of stating it is that a single atom has no color, no taste, no smell etc. So, the paradigm of substance vs accidents (attributes) is plagued by multitude of problems.

 Substantial form

 Aristotle thought that properties of entities are rooted in and caused by what he considered to be their nature or form/substantial form. In other words, every object can be analyzed to have a form and a matter, and it’s the form of objects not their matter that is the source of their properties. This form itself is a substance not accident. Stone falls because its nature causes it to move toward the center of the Earth. Fire by nature however tends to elevate. Substantial form was an irreducible concept:

“Natural philosophy is ultimately grounded in irreducible tendencies, bodies have to behave one way or another, as embodied in their substantial forms. Some bodies naturally fall, and others naturally rise, some are naturally cold, and others are naturally hot; some are naturally dry and others naturally wet. For the mechanist, though, the world is a machine all the way down.” (Garber 2002, p.?)

As one can see these antiquated notions have long been debunked and discarded by scientists like Galileo, Descartes, Newton and those who came after them. Earlier scientists rejected the paradigm of substantial form and replaced it with mechanical paradigm of the universe. Newton laws of motion famously regard that a stone is pulled toward the Earth by force of gravity and an object in motion keeps moving unless something changes its motion with force. As you see, the notion of ‘substantial form’ has been totally discarded, removed and forgotten by scientists for five centuries and the fact that Iran’s philosophy and humanity departments are still awarding doctorate degrees based on research in such patently false ideas is a scandal.

The mechanical model that came to replace ‘substantial form’ early in modern scientific era is explained as follows:

“… so-called “mechanical philosophy” – mechanical science in modern terminology. This doctrine, originating with Galileo and his contemporaries, held that the world is a machine, operating by mechanical principles, much like the remarkable devices that were being constructed by skilled artisans of the day and that stimulated the scientific imagination much as computers do today; devices with gears, levers, and other mechanical components, interacting through direct contact with no mysterious forces relating them. The doctrine held that the entire world is similar: it could in principle be constructed by a skilled artisan and was in fact created by a super-skilled artisan. The doctrine was intended to replace the resort to “occult properties” on the part of the neoscholastics: their appeal to mysterious sympathies and antipathies, to forms flitting through the air as the means of perception, the idea that rocks fall and steam rises because they are moving to their natural place, and similar notions that were mocked by the new science.” (Chomsky 2014).

Clearly modern physics early on since in its inception rejected the notion of substantial form as something occult and irreducible responsible for properties of objects. As science progressed it became clearer that properties of objects arise from their atomic structures which ultimately is reducible to motion of their electrons. Electrons themselves have no color, taste or even definite position. Although their attributes of mass, charge, spin etc. may not be further reducible but those attributes are far from the substance/accident paradigm of Aristotle. Indeed, those properties and attributes are relational and are defined only in relation to other entities and have little to do with essentialism of Aristotle and Sadra. Equivalence of mass and energy introduced by Einstein, wave-Particle duality of quantum mechanics and string theory have brought us even further away from insights of Aristotle and Sadra and to think of objects in terms of substance and accidents can only be fashionable in places that are centuries behind and oblivious to scientific and philosophical developments.

 Evidence to the contrary

In this section the author would like to discuss other observations and scientific facts that are in an obvious and embarrassing way in irreconcilable conflict with the concept of motion in substance and the implications that follow from it.

If as Sadra believed and is trumpeted by his devotees for past four hundred years, motion in substance is so pervasive and has the whole material world restless and moving toward ascendency as stated in:

"Sadra's philosophy is characterized by a profound emphasis on the dynamic nature of existence and the continuous process of substantial motion, which allows for the realization of potentialities and the attainment of higher degrees of being (Nasr, 1976, P. 212).”

Or in:

"Mulla Sadra's ontology is not a metaphysics of static essences, but rather a metaphysics of constant becoming and movement, with the doctrine of substantial motion at its core (Nasr, 1989, p.97).”

Then why on a planet like Mars or other planets in the solar system let alone the whole observable universe we see nothing but radioactive dust and gas swirling in empty space for eons and not ‘moving from the lowly state of material existence’?! These renowned scholars didn’t bother raising their heads and notice none of these baseless notions about universal change and evolution and ascendency they attribute to the cosmos exist anywhere else in the known universe. Of course, Aristotle and Sadra believed that terrestrial objects are made of four elements, air, fire, water and earth, and extraterrestrial objects are made of a different element, ether. But we have known for at least a century that planets and stars are made of the same elements as those on the Earth. Why then there has been no motion toward perfection and an actualization anywhere else in the cosmos? It’s clear that Sadra and his followers baselessly extrapolated their Earthly observation to the whole cosmos by just relying on their limited, local and parochial observations on the part of the Earth they lived, during the epoch they lived. Although Aristotle and Sadra can be forgiven for their lack of access to the new discoveries and data, but for contemporary philosophers to repeat those claims in light of discoveries of past decades is unacceptable.

Sadra’s followers today proudly proclaim he gave us a profound notion of motion that goes beyond properties of objects and encompasses the innermost aspect of their existence, and nothing can escape its reach, and nothing is exempted from this caravan in ascending motion towards perfection. I hope the previous discussion has convinced the reader that those claims don’t hold any water and have no meaning and fall way short of modern physics' assertion that even a vacuum is buzzing with energy and is in ceaseless creation and motion.

* 1.

 Further discussion

In this section the author would like to point out some more aspects and implications of substantial motion which are against our scientific understanding or plainly have been refuted by such understanding. As related earlier in this work, understanding of Aristotle and Sadra differ paradigmatically with modern physics and naturally comparing their implications is not without problem.

Motion is relative.

We know since Galileo that motion is relative. To say something is moving is meaningless unless one defines a frame of reference. In other words, absolute motion is meaningless. So, to claim nature or substance of an entity is the cause of its motion is an incoherent notion. Because something may be in motion relative to something but at same time be stationary relative to something else. So, to attribute motion to nature of a thing, is to consider motion absolute and independent of a frame of reference which is a wrong view. So, when Soroush (Soroush 1977) says every moving object owes its motion to itself, he is violating the most fundamental principle of physics since Galileo.

Vacuum energy

As demonstrated above (Nasr 1976) and as maintained by other followers of Sadra, substantial motion makes the whole existence dynamic and does not limit motion to the properties/accidents of objects. Sadra’s followers consider the inclusive and penetrating notion of motion in substance that nothing can escape its reach, a very important and profound finding. But that’s only profound until one realizes that from the viewpoint of modern physics not only existence and matter is fully dynamic, even the vacuum itself is dynamic and a buzz with energy and motion. Vacuum contrary to Aristotle not only is not impossible but is filled with energy. Heisenberg uncertainty principle implies an incessant creation and annihilation of particles, and anti-particles in vacuum. In the words of Nima Hamed Arkani the prominent Iranian physicist:

“One of the startling general predictions of quantum field theory is the existence of anti-particles such as the positron, which has the same properties as the electron but the opposite electric charge. This prediction has another striking consequence: namely, that even the vacuum has structure and dynamics (Arkani 2012).”

Clearly compared to teachings of quantum mechanics, substantial motion is not such a radical viewpoint. This notion of vacuum energy is proven experimentally by Casimir effect. The Casimir effect is a phenomenon of the attraction between two conducting plates held near each other in vacuum.

Second law of thermodynamics

Another aspect of substantial motion that is being emphasized by Islamic scholars like Nasr and Soroush is realization of potentialities and attainment of higher degrees of being. This notion that motion is a process of going from potentialities to actualities is an Aristotelian notion which is at odds with basic understanding of physics. A very well-established law of physics, the second law of thermodynamics maintains the tendency of any closed system is to go toward disorder:

"The deep structure of change is decay.... All change...arises from an underlying collapse into chaos...what may appear to us to be motive, and purpose is in fact ultimately motiveless, purposeless decay. What decays is not the quantity but the quality of energy ... The quality of energy is like a slowly unwinding spring. The quality spontaneously declines, and the spring of the universe unwinds. The quality spontaneously degrades, and the spontaneity of the degradation derived the independent processes webbed around and within us (Atkins, 1994, p. 21).”

The scientific view expressed here not only refutes Aristotelian notion that motion goes from potentiality to actuality and attainment of perfection it also rejects his notion of final cause and purpose in natural motions.

Mind-body problem

The dualistic doctrine of mind/soul and body as separate substances is rejected by science and hardly has any advocates in philosophy nowadays. Sadra believed the soul starts as matter but through motion in substance achieves transcendence and becomes nonmaterial. Persian philosophers (Soroush 1977), (Nasr 2006) ، (Dinani 2013), proudly proclaim that Sadra by introducing motion in substance single handedly and heroically solved the mystery of mind-body problem. Considering the previous discussions, it becomes clear that this is just another case of severe misunderstanding and wishful thinking.

Conclusion

In reading the work of some philosophers particularly some of the well-known Persian philosophers, ancient and new, one can’t help but be reminded of what once Maynard Keynes said of Friedrich Hayek’s ideas: “It is an extraordinary example of how, starting with a mistake, a remorseless logician can end in Bedlam.” Most of traditional Persian metaphysics is indeed a futile exercise in logic, wrapped around itself, detached from reality (unbeknown to them), often initiated from a wrong premise and misunderstanding. Consider the notion of accident in metaphysics. As discussed above this is a misconceived notion based on poor understanding of nature. But nonetheless it has a definition, and inferences can be drawn from that definition which are logically sound. So, starting with the definition of accident which has no connection to reality, by sound logical inferences you can raise a scaffolding which is logically sound but is built on a blunder. Perhaps it is best described in: “The propositions of philosophy are not factual but linguistic in character - that is they do not describe the behavior of physical, or even mental objects, they express definitions, or the formal consequences of the definitions. Accordingly, we may say that is a department of logic. For we shall see that the characteristic mark of a purely logical inquiry is that it is concerned with the formal consequences of our definitions and not with questions of empirical fact.” (Ayer, Language, Truth & Logic 1952, 57)

So, Aristotle, Sadra and alike were all remorseless logicians whose points of departures were mistake in understanding the nature. In jargons of mathematics, they made a system which all inferences and theorems could be correct, but their axioms were flawed. Sound syllogisms on flawed premises. Of course, in their case axioms were supposedly rooted in reality, not abstract definitions like mathematics. Same applies to the notion of God. As soon as you imagine/define a perfect being you can go on ad nauseam talking about its attributes and implications like omnipotence and omniscience, etc. which all are true based on the definition but yet the question of existence of what you have imagined/defined remains. So having seen the shaky foundations of the concepts of motion, substance, substantial motion, etc. in Sadra’s philosophy and the decisive refutation of these notions and the paradigm they come from, the only worthy question that remains is why and how these notions have survived in Persian/Islamic philosophy for four hundred years and are still being taught in Iran and few other places. While such ideas, considering lack of communication and access to the advances made in scientific understanding elsewhere, could be considered noble and interesting in their own time, to continue paddling them around today in twenty first century is just an indication of blind servitude to tradition and poverty of philosophy in Iran and lack of regard for free and critical inquiry. Indeed, since Sadra, Persian philosophy has been mostly footnotes to his philosophy.

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