**The Theory of Dualism**

**1. Descartes**

The philosophy of dualism has been around for a long time, and it still permeates much of our everyday beliefs. One of the most famous dualists was the seventeenth-century philosopher Rene Descartes. His particular philosophy is referred to as substance dualism because he believed that the universe consisted of two different kinds of substances that he termed *res extensa* (extended things, physical things) and *res cogitans* (thinking things). The set of thinking things does not exist in space and time as we know it, but are separate, irreducible and exist after the body is completely gone. Basically, he was attempting to explain the religious concept of the soul. He then went on to postulate that the mind interacts with the body in the pineal gland to control the bodies actions and receive sensory input. This, Like most other things that Descartes wrote, was quickly proven wrong by the biologists at the time. The pineal gland is not critical to the functioning of the human body. There is also another form of this philosophy called property dualism. Property dualists do not believe that there are two different types of substances in the universe, they believe there are two completely separate processes, the mental and the physical. These processes are co-located in our bodies. However, this idea is really not much different from Descartes substance dualism, and the same arguments against it work for this also. Both forms of dualism see the mental as completely separate from the physical universe.

**2. Problems With Dualism**

The idea of dualism does not fit in very well with the modern scientific view of the universe. It has a number of properties that make it highly dubious. Some of the arguments are given below.

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| **2.1 Conservation of Energy**Dualism would seem to violate the physical laws of conservation of energy and momentum. The principle says that the total amount of energy (mass included) in a closed system (a system where no energy flows in or out) is constant. The kinetic (movement) energy of a moving vehicle comes from the chemical energy stored in the fuel. It is argued that if the soul exists and it can affect the body then it must be able to create new energy to move the body. But this violates the conservation principle.

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| If Descartes is right that a nonphysical mind can cause the body to move, for example, we decide to go to a concert and go, then physical energy must increase in and around our body, since we get up and go to the concert. In order, however, for physical energy to increase in any system, it has to have been transferred from some other physical system. But the mind, according to Descartes, is not a physical system and therefore it does not have any energy to transfer. The mind cannot account for the fact that our body ends up at the concert.**(Owen Flanagan, *The Science of the Mind*)**[**2.1.1**](http://www.mindcreators.com/TextReferences.htm#TR_2_1_1)  |

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| The chief drawback of dualism is its failure to account adequately for mental causation. If the mind is nonphysical, it has no position in physical space. How, then, can a mental cause give rise to a behavioral effect that has a position in space? To put it another way, how can the nonphysical give rise to the physical without violating the laws of the conservation of mass, of energy and of momentum? **(Jerry Fodor, *The Mind-Body Problem*)**[**2.1.2**](http://www.mindcreators.com/TextReferences.htm#TR_2_1_2)  |

One possible counter-argument to this could be that the mind simply converts energy from one form to another in order to move the body.**2.2 Mind-Body Interaction**This still leaves the huge problem of how does the non-physical mind interact with the body at all? Descartes original suggestion that this interaction took place in the pineal gland was proven false. But even then he never even attempted to explain *how* it interacts. He simply fell back on faith and said it was God's design. This idea of mind-body interaction was further attacked later with Flourens ablation experiments on animals. He discovered specific regions of animal brains were directly responsible for bodily functions by removing those brain regions (ablation). This quickly led to the discovery of the regions of the brain responsible for control of heart rate, breathing, movement, and visual and auditory reflexes. This work was later expanded by Penfield who performed electrical stimulation of patients undergoing brain surgery. By applying a small electrical current to different regions of the human brain he was able to directly move patients limbs without their conscious volition. He also was able to evoke pain, pleasure, feelings of touch and smell, and elicited the vivid recall of memories. If the mind is truly a non-physical entity, and the brain simply a conduit, then how can you explain the ability to elicit these mental properties and behaviors through purely physical means?  |

**3. Is the theory of Dualism Proven Wrong?**

The arguments presented in section two are extremely damaging to the philosophical ideal of substance dualism. However, they do not categorically prove that it is wrong. The fact that substance dualism cannot explain mind-body interaction is by itself not a sufficient reason to reject the theory. The dualists could simply argue that we do not yet know enough about how the universe works in order to understand this interaction. Also, they may simply attempt to state that this thinking substance is a fact and believe it through faith. However, at that point they are simply believing in religion instead of practicing science. Simply stating that dualism is correct because they believe it is, or the bible says we have souls, is a dead end and can lead to no new information or discoveries. It has the remote possibility of being true, but as a scientist I must attempt to formulate and test theories based on empirical evidence. And all evidence to date points to the fact that the mind is a physical process of the brain and a thinking substance does not exist. Less than a hundred years ago one of the most heated debates in science pitted vitalists against materialists. Vitalists believed that living matter had some type of vital spirit that animated it, and without that spirit it was non-living. As our understanding of biology increased we learned of the cell and its incredible details, and suddenly it was no longer such a mystery as to what constituted life. Gaining knowledge of how the cell worked effectively settled this argument. It is my belief that as science gets a deeper and deeper understanding of how the brain works and forms the mind then it will also settle this similar argument of dualism