



CAN A MACHINE HAVE A SOUL?

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The author demonstrates that there is probably no such thing as an immortal soul or spirit. This result suggests that a conscious machine or android should have just as many rights as a human. It also raises the policy question of what should be done about the large numbers of people throughout the world who believe in an immortal soul.

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As technology advances to the apparently inexorable drumbeat of Moore's Law, many of us envision a future with machine consciousness of various sorts. We also talk of transferring human consciousness into machines, and of the blending of machine and human consciousness¹.

This raises the question of whether a machine can have a soul. However, if we want to know whether a machine can have a soul, we need to ask whether there is such a thing as the "soul." I am not talking about souls in a metaphorical sense, as the "essence" of a person, I am talking about "the spiritual or immaterial part of a human being or animal, regarded as immortal²." Of course, if there is such a thing as an immortal soul, is it even necessary to use technology to extend life, to enhance humans, or to perform a mind transference? Won't we all be (somehow) reincarnated or transported to heaven? Won't mind transference into an android body or cyberspace merely interfere with this "natural" and "divine" process?

I am amazed by the number of people I talk with, who are quite well educated in the sciences and mathematics, who believe in the idea of an immortal soul. But perhaps I should not

¹ Kurzweil, R. (2005) *The Singularity is Near*, Viking.

² "Soul," *New Oxford American Dictionary*. Version 2.2.3.

be too amazed, as I was one of these people until I did some serious research on the topic. This article will summarize some of my research findings.

Every culture seems to believe in the existence of disembodied entities that can exist after death. Since belief in these hypothetical entities is so widespread among the cultures of Earth, it is sometimes deduced that there must be some factual basis to these entities. However, it is a logical mistake to deduce this, as there could very well be *another* factor that is causing each culture to believe in spirits or souls.

For example, in the book, *The Invention of God: The Origins of Religious and Scientific Thought*, I searched for the common ancestor of mythology, religion, and science³. I suggest that the “soul” was invented by early humans to explain what today we call oxygen, but what these ancients called by various others names such as: Soul, Psyche, Qi, Reiki, Prana, Ruach, and Ba.

I proposed that by making certain observations, these early humans were logically led to the belief in “souls” and “spirits.” These observations were:

- 1. When certain solid objects such as a log, a dead animal, or even a dead human were consumed by fire, all that was left was a few bone fragments and ashes. (See photo.)*
- 2. When someone died, they stopped breathing, and, conversely, when someone stopped breathing, they died.*
- 3. Dead animals and plants seemed to disappear (today we call it decomposing).*



*Credit: Cremated human remains, Wikipedia.
Photo by Nabokov*

³ Lauritzen, B. (2011). *The Invention of God: The Natural Origins of Mythology and Religion*. Street Write. Retrieved from http://www.amazon.com/Invention-God-Natural-Mythology-Religion/dp/0978754336/ref=tmm_pap_title_0.

In order to understand the significance of this better, we should put ourselves in the position of an early hominid, someone who knows nothing about atomic theory.

Let us imagine ourselves in Africa around 100,000 years ago ...

Let us imagine two friends: Ayo and Obi. Let us imagine that while out hunting one day Obi is seriously wounded and the red liquid slowly drains out of him. As it does, Ayo sees him become increasingly lifeless, and less and less like the old Obi. He happens to be lying on a rocky mesa and the red liquid pools. Obi is now completely motionless. Obi has been a companion to Ayo for many years, and out of grief and shock, Ayo does not leave just yet. Ayo finds it hard to even imagine life without Obi by his side.

Ayo stares at the red liquid that has poured out of Obi onto the rocky ledge. Over the next few hours, *it slowly disappears into the air*, leaving behind only a red stain. Later that day Ayo starts to trudge slowly back to the base camp. Ayo has seen this sort of thing before in others. Ayo also has butchered many small animals. But never has a loss like this occurred to him from such a close friend.

Ayo has thought about this before, and now after some additional thought (and with help from the elders of the tribe), Ayo concludes that *that-which-makes-one-move* left Obi's body as red-liquid. Then, the *that-which-makes-one-move* left the red-liquid and went into the air. Obi's *that-which-makes-one-move* now exists for Ayo as an invisible entity in the air, a "disembodied spirit."

Thus, in Ayo's proto-science-religion, he puts together the picture (which was correct) that this red liquid was necessary for life. Ayo gives it a name, perhaps simply the *red-life-liquid*, and teaches its power to his children, eventually along with methods to stop the flow of blood during an injury.

Ayo has seen water mysteriously disappear into the air. He has seen heated water on a cold morning form a white mist that rises into the air and disappears. He does not know about "evaporation." He only knows that the *red-life-liquid*, that allows him to run, jump and procreate, can disappear into thin air like water

...
He deduces (correctly) that there is *something mysterious in the air* that gives animals life. He perhaps names it *invisible-and-formless-life-giver-in-the-air*. He also deduces (incorrectly, possibly out of grief) that this *invisible-and-formless-life-giver-in-the-air* is a self-organized personal unit. He calls it Obi's *invisible-and-formless-life-giver-in-the-air*. Later, this is shortened to Obi's "spirit" (or any number of different names depending on the culture).

When a new baby is born, he concludes that its *invisible-and-formless-life-giver-in-the-air* enters the baby. But where does it come from? He concludes that it comes from an ancestor or some greater invisible life-giver. (Perhaps he calls it the *Great-Spirit-Maker*, or simply the *Great Spirit*.)⁴

⁴ Lauritzen, p. 87.

If you saw all this happening, you, like Ayo, not knowing atomic theory, would have been convinced there was something invisible in the air that could give substance and life under the right conditions, and you would try to name it.

Even if someone died naturally, his or her body would decompose, and once again, it would appear to disappear into the air. For example, examine the photograph of the decomposing pig.



Decomposing pig. Photo credit Wikipedia.

So the early humans thought there were ghosts and spirits living in the air. They didn't want a ghost angry with them, so they would kill and burn animals, including humans in some cases, in other words, make a sacrifice, to feed these ghosts and spirits. *Sacrifice* has the root as *sacer*, meaning sacred⁵.



*Celtic sacrificial rock. Wikipedia.
Photo Credit Inge-Lyubov*

Or, they would burn parts of nice smelling plants (burn incense) and/or leave money or flowers to keep the ghosts and spirits happy. Even today people practice these rituals. A church altar (see photo), where the bread and wine are made sacred, derives from a sacrificial rock. The word *altar* originally meant in Hebrew: mizbe'ah, "a place of slaughter or sacrifice"⁶.

⁵ Online Etymology Dictionary. Retrieved from www.etymonline.com.

⁶ "Altar." *Encyclopaedia Biblica: A Critical Dictionary of the Literary, Political and Religion History, the Archeology, Geography and Natural History of the Bible*. Edited by Cheyne, T.K. and Black, J.S. (1899). Retrieved from http://en.wikisource.org/wiki/Encyclopaedia_Biblica.



*Altar of Santa Cecilia, Wikipedia.
Photo credit: Magnus Manske*

How did oxygen get discovered? Only relatively recently, in the long history of hominids, have we discovered the nature of the “mysterious” substance in the air that gives life and energy. In the second century BCE, a Greek, Philo of Byzantium, did experiments with an inverted glass (cupping glass) and candle flames and water, and found that the water rose in the glass when the candle burned⁷.

⁷ West, J. B. (2005). Robert Boyle’s landmark book of 1660 with the first experiments on rarified air. *Journal of Applied Physiology* 98 (1): 31–39. Retrieved from <http://jap.physiology.org/content/98/1/31.full?ck=nck>.



*Philo's experiment inspired other investigators.
A diagram from Pneumatics by Hero of Alexandria.
Photo credit: Wikipedia.*

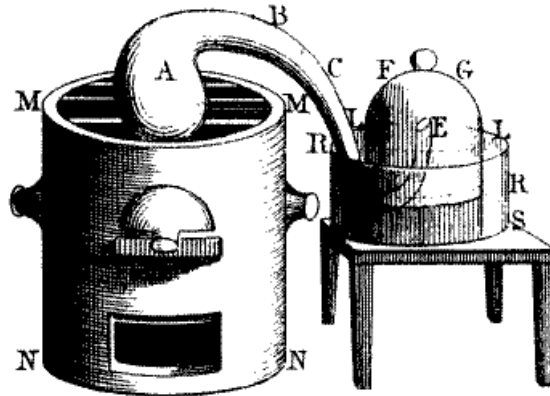


Painting of Experiment 41. Photo credit: Wikipedia.

Here is a painting (from the 1760s) of a famous experiment by Robert Boyle (from the 1660s). “Experiment 41” was a demonstration of the reliance of living creatures on air for their survival. Boyle placed a large variety of different creatures, including birds, mice, eels, snails

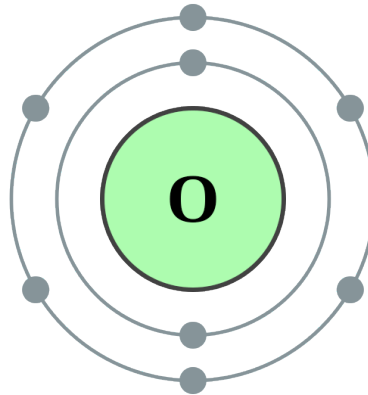
and flies, in the vessel of the pump and studied their reactions as the air was removed⁸. In the painting, you can see the dead bird and the various reactions of the spectators.

In 1777, Lavoisier showed that ordinary air was made of two main different parts (nitrogen and oxygen).



Hand sketch engraving made by Madame Lavoisier in the 18th century of some of Lavoisier's equipment. Credit Madame Lavoisier, Wikipedia.

Then in 1869, Mendeleev discovered the cyclical pattern of the elements and published his first table of elements, including oxygen. Modern atomic theory was developed in the years afterwards, with contributions from many people, and we now know that oxygen is the eighth element of the 118 elements.



Electron Shell configuration of oxygen with eight electrons (eight protons not shown). Image by Greg Robson, Wikipedia.

This is just a brief history of oxygen which you can find in much more detail in Wikipedia and elsewhere. The subject is a fascinating one, and a modern book on the topic “oxygen” would be well worth writing. *However, such a book should include the ancient search for oxygen and how this gave rise to the ideas of the “spirit” and the “soul,” and to some degree, religion.* For some reason, this connection between oxygen and the “soul” or “spirit” has been missed by modern scholars and philosophers of religion⁹.

⁸ “Oxygen,” Wikipedia. Retrieved from <http://en.wikipedia.org/wiki/Oxygen>.

⁹ See, for example, these books and others:

The early humans were right in a certain sense. Living things are made up of 65% oxygen. After that we are made of 19% carbon, 9% hydrogen, 3% nitrogen and 4% other elements. If we were made of iron we would weight about 1300 pounds. So, although we sometimes feel heavy when we are tired, we are much lighter than iron.

In addition to observing 1) burning bodies, 2) blood evaporation, and 3) decomposition, early humans also observed:

- 4) liquid lava turning into solid stone, and later soil (easily seen on successive lava flows on the Big Island of Hawaii);
- 5) water disappearing (evaporating) into air; and
- 6) air turning into water (rain).

Based on all these observations most cultures came up with the model of *fire-earth-air-water*. Firey lava could be changed into earth. Wood from the earth could be changed, via fire, into air. Water could be changed into air (via fire and atomic evaporation, we now know). From the air came water (as rain). This model was a primitve chemistry, which, over thousands of years, culminated in the modern cyclical (or periodic) array of the elements.

In the future, an enhanced human or artificial intelligence may devise an even more comprehensive scheme, which is more accurate than ours, in the same degree as ours is more accuate than fire-earth-air-water.

Alchemy	Chemistry	Future Chemistry
fire-earth-air-water	about 118 elements in the atomic array (Periodic Table)	?

Now, here is an interesting question. Most children today are taught about oxygen and the other elements. Yet many of them grow up to believe in ghosts, spirits, and an afterlife. Why is this? A few possibilities come to mind.

1. Unenlightened rulers may desire to have an ignorant populace that believes in an afterlife. Perhaps this populace will be more satisfied with a meager existence if they think that there will be a beautiful “afterlife.”

2. The simplicity and attractiveness of false immortality may allow it to supplant scientific knowledge. It takes a good deal of education to really understand atomic theory (the

Dennett, D. (2006). *Breaking the Spell*. New York: Viking.

Dawkins, R. (2006). *The God Delusion*. London: Bantam Press.

Sagan, C. (2006). *The Varieties of Scientific Experience*. New York: Penguin.

Shermer, M. (2007). *Why People Believe Weird Things*. Souvenir Press.

Harris, S. (2005). *Letter to a Christian Nation*. W. W. Norton.

118 elements and how these elements are put together by way of electrons, protons, and neutrons.) Knowledge of atomic theory also uses up valuable brain storage area. A simpler model, consisting merely of ghosts, spirits, souls, and a heaven (or, for example, Santa Clause) uses much less storage space, and although inaccurate, allows this storage space to be used for other things.

3. The brain has no sensory nerve endings within itself. In other words, it senses the body and a large part of the world outside the body, but it does not sense itself. You can operate on the brain with the patient wide-awake with no anesthesia. We feel, in our heads, somehow separate from the rest of the universe.

4. Our Paleolithic brains are rather small, compared what is predicted for future computational systems. These Small Brains were perhaps good enough for surviving in small hunter-gatherer nomadic tribes in which we lived for hundreds of thousands of years. They helped us to find mates, food, shelter, form social alliances and avoid predators¹⁰. With the development of writing systems, we were able to off-load a large amount of cognitive material. It is highly doubtful that atomic theory could have been developed without writing. Writing allowed accurate record keeping so that experiments could be performed. Imagine trying to learn or do chemistry without writing! Our minds have become extended thanks to writing, and even further extended thanks to the Internet.

Anyway, these are a few possibilities that come to mind. We can expand this last possibility into the Small Brain Theory of Religion. What I mean is that we still have the same basic cognitive structure from Paleolithic times. For example, we still crave sugary and fatty foods. These cravings had strong survival value during Paleolithic times when sugary and fatty foods were scarce. Those who survived had the instinct to seek out these foods and we are their descendants. Nowadays, when we can easily mass-produce sugar and fat, this instinct can work against us. Likewise, I think we crave spirits, souls, angels, and gods. These entities match our default cognitive capabilities, that is, our Small Brains without writing or scientific education.

Perhaps the analogy can be taken too far. After all, we need the natural sugars in fresh fruits and the essential oils in nuts and seeds. Perhaps what we really crave is Mother Nature: the stars, the sun, vast canyons, great waterfalls, rivers, oceans and mountains. After all, these were the inspiration for the original gods and spirits, which now have been largely supplanted by manufactured man-gods.

Getting back to the original question: Can a machine have a soul? Of course, there may be some mysterious energy that we know nothing about. However if we apply Occam's razor, I think we can see that we have a simple theory that covers all the facts: the "soul" and "spirit" are convenient terms invented by early humans who knew nothing about atomic theory. The "soul" and "spirit" probably do not exist except perhaps in this ordinary sense: "a person's moral or emotional nature or sense of identity"¹¹.

¹⁰ Pinker, S. (1997). *How the Mind Works*. Norton.

¹¹ Supra at 2.

A policy question remains. If there is no immortal soul, what should be done about all the people who believe in one? Will they interfere with technological progress, human enhancement, and machine consciousness? Should they be educated with the likely fact that early humans invented the idea of the “soul” and “spirit” in their search to understand what we today call oxygen, with the view that they will better accept human technological enhancement and/or machine consciousness? Should they be allowed to persist in their probable delusional thinking, in the view that it might somehow help them to temporarily survive, and to also keep the social order?

I am in favor of widespread education. After all, we may be competing in the galaxy with alien life forms that have no interest in our survival. We also face possible extinction from various other sources¹². A widespread, robust understanding of atomic theory and how it undermines the idea of an immortal soul can probably free many people from primitive superstitious thinking, increase the scientific literacy of humanity, and allow for a greater chance of long-term survival of humanity and enhanced humanity.

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¹² Bostrom, N. Various videos and papers. Retrieved from https://www.youtube.com/watch?v=Yej4nuBUt_s.