

## *If – Fallacies in Arguments for “Immortal Souls”*

Dear: You probably don't remember, but I sure do. You were visiting for a week when you were 13, and on the day when your nearest age sister was turning 9, you were sitting beside me on the bench-swing (on the patio) while she was sitting on my lap. I was commenting on her beautiful hands – and yes, once again, I was teasing. I told her that I'd like to have her hands, pretended to put them on my wrists, and commented on how nice they'd then look. But your sister said that her hands would look silly on my wrists; so, of course I suggested that I'd expect to get her arms as well. You said that her arms would look silly coming out from my shoulders; so, of course I said that I'd expect to get her shoulders, too. And so on it went, until you finally objected: “It would be silly if her soul was in your body.” Oh, I certainly agree, Dear – but I suppressed the response that I wanted to make and will try to make in this chapter.

Child! Talk about silly! Have you ever stopped to think about the idea of ‘souls’? Have you ever thought about where you got the idea? Have you ever thought about where your parents got the idea? Have you ever investigated the origin of the idea? Have you ever thought about the problem of thinking only about thoughts? Have you ever considered applying your old mantra: “**Show me the data**”?! How about a new mantra: **How can the idea be tested??**

And yes, Dear, of course I know at least one source of your idea of “immortal souls.” I'll quote from a web page of the LDS Church.<sup>1</sup>

### **Death is another beginning**

From an earthly perspective death looks like an end. But it is really a beginning, just as birth is. It is a step forward in Heavenly Father's plan.

At death, your spirit leaves your body and moves on to the spirit world. This is a place of learning and preparation.

After a time, your body and your spirit will be reunited, never again to be separated. This is called resurrection. It is a gift to every person who ever lived, made possible by the death and Resurrection of Jesus Christ.

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<sup>1</sup> At <http://www.mormon.org/learn/0,8672,1144-1,00.html> .

### The eternal nature of God's children

Life does not begin at birth, nor does it end at death.

You are a child of God with a divine nature and a divine destiny. You lived with Him as a spirit before you were born. God sent you to Earth to receive a body and gain the experiences you need to return to Him.

If you are to return to live with Him eternally, you must keep His commandments, accept Jesus Christ's Atonement, and follow His example while you are on Earth.

Sooner or later your life on Earth will end, and you will die. But because Jesus Christ conquered death, your spirit and your body will be reunited, never to be separated again. Then, if you have done what you came to Earth to do, you can return to live with your Heavenly Father.

But I repeat: Have you ever thought about the problem of thinking only about thoughts? Have you ever considered applying your old mantra: "Show me the data"?! How about a new mantra: How can the idea be tested??

To try to get you to start thinking about answers to such questions, first consider Webster's definitions of 'soul':

1. an entity which is regarded as being the immortal or spiritual part of the person and, though having no physical or material reality, is credited with the function of thinking and willing, and hence determining all behavior
2. the moral or emotional nature of man
3. spiritual or emotional warmth, force, etc., or evidence of this {a cold painting, without *soul*}
4. vital or essential part, quality, or principle {"brevity is the *soul* of wit"}
5. the person who leads or dominates; central figure {Daniel Boone, *soul* of the frontier}
6. embodiment; personification {the very *soul* of kindness}
7. a person {a town of 1,000 *souls*}
8. the spirit of a dead person, thought of as separate from the body and leading an existence of its own.

From these definitions, you can see two different groups of ideas covered by the same word, 'soul' – and of course this duality can cause confusion. To try to decrease the confusion, let me add adjectives. Thus, I'll use the expression "immortal soul" to summarize the first group of ideas (covered in definitions #1 and #8) and use the expression "mortal soul" (or similar) to summarize the second group of ideas (covered in definition #2 through #7). Other authors call them "Soul One" and "Soul Two", respectively.

Now, I have no complaint, of course, with the idea of “mortal soul” (“Soul Two”, i.e., definitions #2 through #7, using ‘soul’ to mean ‘essence’, or similar), but I’m essentially certain that, because of her indoctrination ever since she was a baby, a certain 13-year old was talking about my “immortal soul” (“Soul One”, i.e., definitions #1 or #8) when complaining that it would be silly if my ‘soul’ were in her sister’s body – and “you bet” I have complaints with youngsters being indoctrinated with such silliness!

To see the basis of my complaints, consider again Webster’s #1 and #8 definitions of [immortal] ‘soul’ (“Soul One”).

1. an entity which is regarded as being the immortal or spiritual part of the person and, though having no physical or material reality, is credited with the function of thinking and willing, and hence determining all behavior...
8. the spirit of a dead person, thought of as separate from the body and leading an existence of its own.

I dare you to try to make sense of such silliness!

First, look at definition #8: “the spirit of a dead person, thought of as separate from the body and leading an existence of its own.” That definition is amazingly similar to the first two definitions Webster gives for ‘ghost’: “1. originally, the spirit or soul... 2. the supposed disembodied spirit of a dead person...” Do my poor grandchildren really believe in ghosts? I’m sorry, but it’s horrible that any child is indoctrinated with idiotic ideas about ghosts and goblins and ghoulish things that supposedly roam “the spirit world”. How stupid – how cruel – can people get?! And the answer is “obviously worse than that”, because ever since my grandchildren were babies, they’ve have been taught that they possessed a ghost within themselves, i.e., their “immortal souls” – a silly idea that (as I’ll show you in **Ix**) was first conceived by savages, more than 10,000 years ago.

But let me move on to examining details of Webster’s definition #1 for [immortal] ‘soul’: “an entity which is regarded as being... *immortal*...” Hello? Immortal? I challenge you, Dear, to find a single shred of data that supports the notion that anything (but anything!) in this universe is “immortal” – including the universe itself! Primitive people thought (and still think!) that stars are “immortal”, but surely you know from your studies (of data!) that even stars progress through their “life cycles”.

Of course it's claimed that gods are immortal, but after kindly supplying even the tiniest crumb of data that any god ever existed, then please kindly supply a shred of data that such (nonexistent) "beings" are "immortal". As someone else joked, "[All gods were immortal](#)"!

But let me continue with Webster's #1 definition of 'soul': "[an entity which is regarded as being \*the immortal or spiritual part of the person...\*](#)" Hello? Pray tell what part of a person is "immortal or spiritual"? A part of a person is a spirit (like a ghost?!)? Based on what data? And that ghostly part of each person lives forever? Do tell? Based on what data? How can that speculation be tested? A test that can be performed only by dead people is rather useless for people who are alive – and sane.

Yet, Dear, I'd grant you that if you discover something truly astounding (for example, maybe how to "manufacture" worm holes, so that people could travel through space-time to other galaxies) or create something truly astounding (for example, maybe a virtually endless, pollution-free energy source or a poem that stirs more emotion than any other poem ever written), then your name would reverberate through the future for many generations. And after your name had been forgotten, then still your accomplishment – your "essence" – could live on: think of those who first controlled fire, domesticated cattle, created the wheel, invented writing, paper, printing, the internet, conceived the use of the zero, invented the microscope, telescope... figured out principles of motion, gravity, electromagnetism, quantum mechanics... and think of those now working to cure cancer, defeat the "killer virus", deflect or destroy the "apocalyptic asteroid".

Thereby, in a restricted sense of the word 'spirit' or even [mortal] 'soul' ("Soul Two") your 'essence' (your accomplishment) would continue after you died. But this idea of 'spirit' or 'soul' (meaning 'essence' or similar) is dramatically different from "[an entity which is regarded as being \*the immortal or spiritual part of the person...\*](#)" Let me put it this way: if a person produces nothing of value for other humans, then when that person dies, all data support the idea that the essence of such a person also dies.

But Webster gives more for the definition of [immortal] 'soul': "[an entity which is regarded as being the immortal or spiritual part of the person and, though \*having no physical or material reality...\*](#)" Hello? A person's [immortal] 'soul' has "no physical or material reality"?

Dear: I challenge you to find the smallest crumb of data that supports the concept of existence of anything in this entire universe that has “no physical or material reality”.

In the case of Webster’s definition of [immortal] ‘soul’ (and Pope John Paul’s similarly dumb idea about ‘God’), I can give both Webster and the Pope sufficient rope to hang themselves on the idea that [immortal] souls and gods are nothing but ideas (i.e., [immortal] souls and gods can be said to have a “mental reality”), but even ideas have a “physical or material reality” – in the sense that they’re electrochemical signals in our brains. And actually, I wouldn’t be surprised if someday (possibly during this century), scientists will be able not only to “see” (on various types of electronic “brain scanners”) specific ideas (such as ideas of [immortal] souls and gods) but also may be able even to send such signals into people’s brains – and even better, remove them!!

Of course I agree that such capabilities would be potentially extremely dangerous. I can imagine some cleric musing:

“Hmm... of late, our revenue is falling. People are delinquent in their tithes. Apparently our old method of indoctrinating children with our religious balderdash isn’t working nearly so well as it used to. So let’s set up our new Electronic Indoctrination Device (EID) on the street corner and zap every passerby with fervent belief in Allah.”

Of course, at the next street corner, similar schemers would be using their EID’s to zap people with belief in Jesus or Joseph Smith or whomever. All of which then leads me to an obvious suggestion: Dear, if you’d like to make a fortune, then invest in devices that may look like ordinary hats but that protect the wearer from being zapped by stupid religious ideas!

But let me try to get back to reality. What I hope you’re beginning to see, Dear, is that the idea of [immortal] ‘soul’ is just that: an idea! So are Superman, Batman, and all gods ever concocted. There’s zero data to support the notion that such “things” exist as anything but ideas. It’s all a game of pretend: when you’re preparing to go to the dance, pretend that you’re Cinderella; when you’re preparing to go to church, pretend that you have an “immortal soul”; but when you’re finished pretending, how about getting back to reality?!

And yet, there's still more nonsense in Webster's definition of [immortal] 'soul': "an entity which is regarded as being the immortal or spiritual part of the person and, though having no physical or material reality, is *credited with the function of thinking and willing, and hence determining all behavior.*" Hello? Pray tell how does something "having no physical or material reality" influence "the function of thinking and willing"?

How does it work? If something has "no physical or material reality", how does it generate any signal to send? And even if a sensible answer can be given to that question (although I bet a billion dollars that it can't!), then where does your [immortal] 'soul' store its "knowledge base" to have anything to communicate to the rest of you? I mean: sure the Central Processing Units (CPUs) and storage capabilities of modern computers are becoming amazingly compact, but something "having no physical or material reality"? As a certain grandchild used to say: "**Gimme a break!**"

Dear: I trust you see various mistakes (misunderstandings and misidentifications) on which the silly idea of [immortal] souls is based. One mistake was the model of how we get our ideas and how we think. Certainly it's correct that each of us has abilities (to varying degrees) of "**thinking and willing... determining... behavior**", but only relatively recently have scientists begun to decipher how the organ known as the 'brain' functions, creating what's usually called a [living] 'mind'. Primitive people thought (and still think!) that there was a "ghost in the machine" (as someone else described it), i.e., that an [immortal] soul, "**having no physical or material reality**" was inside a person's head, somehow conveying information to the person's mind. That "scientific model" (stretching the concept of "scientific model", because it was based on zero data and contained zero predictive ability – at least, predictions that could be tested by other than dead people!) is now scientifically dead.

Consider what others have said about such silliness.

There is no science of the soul, for since psychology (the "science of the soul") began to acquire knowledge in the only way which leads to agreed and verifiable results – by direct observation of realities or by strictly logical inferences from observed realities – it has abandoned the idea of a soul. It [psychology] is now the knowledge of mental acts or states or behavior. [Joseph McCabe, 1929]

Descartes... suggested that the mind is “spiritual” and the body, material – and that God had decreed neither should be influenced by the other – that they were separate entities. In this he lacked the knowledge given us later by psychologists, who have shown that mind is merely the function of the brain and that the brain is a material substance. One might as well argue that digestion is a separate reality, when the fact is that physiology... shows that digestion is merely the stomach in action, a purely materialistic, physical function. To hold that this non-material substance (as Descartes described the brain) comes from God... is to utter the sheerest fancy of formless words. There must first be evidence that the brain is not a material thing. [E. Haldeman-Julius, 1930]

So, *Soul One* [i.e., “immortal soul”, as opposed to *Soul Two*, i.e., ‘essence’ or similar] refers to a particular theory of life. It’s the theory that there is something non-material about life, some non-physical *vital principle*. It’s the theory according to which a body has to be animated by some *anima*, vitalized by a *vital force*, energized by some *mysterious energy*, spiritualized by some *mysterious spirit*, made conscious by some mysterious thing or substance called *consciousness*. You’ll notice that all those definitions... are circular and non-productive. It’s no accident. Julian Huxley once satirically likened *vitalism* to the theory that a railway engine works by “force-locomotif”. I don’t always agree with Julian Huxley, but here he hit the nail beautifully. In the sense of *Soul One*, science has either killed the soul or is in the process of doing so. [Richard Dawkins, 1999]

Yet, as far as I know, much work still needs to be done to understand how we think. Maybe one or more brilliant grandchildren will contribute to such developments. If so, then you might want to start by getting your Ph.D. in Artificial Intelligence (AI), e.g., as a specialization in Electrical Engineering and/or Computer Science, with substantial studies of logic, psychiatry, and physiology – because already much is known. For example, Dear, as you probably know, already robots can be made that are much better watch-dogs than your dog Sirius – and much better chess-players than I am!

Although I’ve never worked in AI, I can imagine that it’s “relatively easy” (probably because I’ve never worked in the field!) to construct a robot that can process information and react “appropriately” to signals from five sensors (that simulate seeing, hearing, smelling, tasting, and touching). I assume that the fundamentals would involve five “parallel processors”, one for each of the five “senses”. Thereby, I can imagine a robot dog that, upon seeing, hearing, or smelling an intruder, would go into the bedroom and gently awaken its “master” – or fire off a laser in the direction of the intruder!

I can similarly imagine how a computer can be programmed to “assess” potential consequences of each of an opponent’s moves on a chess board, then to “decide” on an appropriate response, and even “learn” how its opponent plays, by “evaluating” which of many possibilities its opponent chooses. I can imagine, also, how to make (at least in principle!) a robot that could seek a trio of survival goals: of itself, its “family”, and a set of “values”. Granted that the “program” would need to be astoundingly complicated, but a robot with five senses could be programmed (at least in principle!) to use its sensors and suitable operations to protect itself and whoever is programmed to be its “family” (e.g., its “master” sleeping comfortably in her bed). And already this robot would be programmed with a very “robust” set of “values”, based on the survival of it and its family!

But then, Dear, if you would like to try to understand how the human brain functions, how would you program a robot to “think”, by itself (independently from its programming): “I’m alive! I exist!”?

As far as I know (and again, I admit to knowing little about this field of science), the “machine language” used in our brains isn’t yet known. Currently, the “machine language” of most (if not all) digital computers is binary numbers (one or zero; ‘on’ vs. ‘off’; ‘existence’ vs. ‘nonexistence’). With this language (as you probably know), it’s relatively easy to write binary equivalent of decimal numbers. Thus, with decimal 0 = 0 binary, decimal 1 = 1 binary, decimal 2 = 10 binary, decimal 3 = 11 (i.e., 1 two and 1 one), 4 = 100, (i.e., one four and no twos or zeros), 5 = 101, 6 = 110, 7 = 111, 8 = 1000, 9 = 1001, 10 = 1010, etc., it’s then relatively easy to write the 26 letters of our alphabet in binary form. But is this fundamental binary number system (“on” vs. “off”, “existence” vs. “nonexistence”) the “machine language” of our brains?

Of course I don’t know the answer to that question, but I bet that it’s “No!” To me, a hint that the “machine language” isn’t binary is available from the absolutely astounding “language” used by our DNA molecules. Let me put it this way: if I gave you four molecules, say *G*, *C*, *A*, and *T* (a *G-CA-T!*),<sup>2</sup>

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<sup>2</sup> Just to refresh your memory, Dear, DNA is the usual abbreviation for deoxyribonucleic acid. This double-helix molecule contains the information in each gene by varying the order and number of the four “nucleotide building blocks” (*G*, *C*, *A*, and *T*) along its “backbone”, where these molecules are *G* = guanine, *C* = cytosine, *A* = adenine, and *T* = thymine (where I’ve used italics to differentiate these molecules from atoms identified with the same letters and where I’ve used the hyphens in G-CA-T to indicate how these molecules pair).

told you that you could pack them in any way in three dimensions, then could you figure out a way to use them to convey information about the color of your eyes, hair, and skin, that you're to have two feet instead of four, that you have the tendency to be skeptical, and so on?! So now, if I gave you a little electrical power and  $10^{12}$  (or so) nerve cells connected like wires to make a brain (enough "wire" to extend in a line for roughly a million miles!), then would you be able to invent a "machine language", a code, so that this "G-CA-T's nest of wires would be able to think for itself, e.g., that it exists!?

And of course I don't know the answer to that question, either, but I wouldn't be surprised if the "machine language" of our brains is amazingly advanced: as far above the DNA code as our 4-letter DNA code is above the 2-letter binary code of modern computers. And I'm not suggesting just an 8- (or higher number-) letter code: I wouldn't be surprised if the "machine language" of our minds are different networks (or patterns) of three-dimensional electrical circuits, some of which have been "programmed" by evolution and others that we learn by experience.

Animals can apparently establish similar circuits: a particular sound with associated odors and possibly a visual image apparently starts a particular electrical current in my German shepherd's (Heidi's) brain, leading her to bark "Intruder alert!" I assume that her DNA has already defined for her the "idea" that: "If electrical currents ever start flowing in this particular region of my brain, then my survival is threatened; so, start barking."

Similarly with humans – but more so. Thus, Dear, I expect that the first time you saw, smelled, touched, and tasted what you heard someone describe as "pizza", a particular electrical current started flowing in your brain, stimulated by the five sets of electronic signals that propagated in waves from your five "sensors" (for hearing, seeing, smelling, touching, tasting) into your brain. Then, the next time you experienced pizza, the same (or very similar) signals from you sensors stimulated the same (or very similar) electrical currents in your brain – with slight differences, e.g., if the pizza's topping was different. Somehow or other, once a sufficiently stimulating electrical current (or "circuit" or "pattern") is established, it can be recalled, and apparently, it's stimulated more easily, the more times it's stimulated. Thereby, apparently, the "information" (about the electrical pattern) can be recalled; apparently, it's "filed", creating memories and habits.

Thus, because you ate the pizza (rather than, for example, try to wear it – although stories could be told about that!), you apparently stored information about this pizza along with the set of all other circuits or patterns or “ideas” that dealt with food. Then, the next time your mother asked what you wanted for dinner, you stimulated all the circuits corresponding to “food”, recalled the sights, smells, and tastes of them all, and then rather than blurting out “Intruder alert!”, you yelled “**Pizza!**”

My point: I wouldn’t be surprised if the “machine language” of at least part of one’s brain consists of “established electrical connections” or “circuits” or “networks” or “patterns” (or “pictures”!), some of which are intuitive or instinctive (i.e., established by evolution) and others, created by one’s experiences. Amazingly, we learn how to stimulate these patterns (these “pictures”) using only sounds: “**How about ‘pizza’ for dinner?**” As we grow older, we learn how to stimulate such patterns using only a group of otherwise ridiculous looking letters, e.g., P I Z Z A – although notice that the Ancient Egyptians and Mayans used pictures (hieroglyphics), as the Japanese and Chinese still do. And if you had a computer that used a huge number of such patterns or pictures as its machine language (rather than 1 and 0 and rather than four letters, G, A, C, and T), can you imagine the staggering possibilities available?! Can you imagine...?!!

But, Dear, of course all of the above was just “idle speculations”. If you want to know how the human brain “works”, you’ll need to figure it out for yourself!<sup>3</sup> All that I’m quite sure of is that, some how or other, our amazing maze of nerve cells in our brains has become conscious of itself! And of course it’s this “consciousness”, this “awareness of itself”, that separates the intelligence of humans from that of robots – and as far as I know, from essentially all other animals. Further, from the little I know about psychiatry, children don’t normally develop their “separate consciousness” (separating themselves normally from especially their mothers) until they’re in their teens. And I’m sorry to say that some people seem never to become aware of their separate consciousness.

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<sup>3</sup> To start, Dear, you might want to read the 1994 book by Francis Crick (the Nobel-prize winning co-discover of the structure of DNA) entitled *The Astonishing Hypothesis*, in which he writes: “**You, your joys and your sorrow, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules. As Lewis Carroll’s Alice might have phrased it: ‘You’re nothing but a pack of neurons’.**”

But that sadness aside, the question remains: How could you program a robot to achieve awareness? And whereas (as far as I know) nobody else has answered that question, then maybe I should give you my answer. It's trivially easy to do! A person wouldn't need to program and connect thousands of parallel processors, with a million miles of wiring, and wouldn't need to invent a new machine language based on pictures. All a person need to do (with a little help from a second person) is just make a few brilliant grandchildren – and then challenge them to figure out how to do it!

But that “cop out” aside, there are some things of which I'm quite confident. For example, I'm confident that the old “scientific” model of how our brains work is dead wrong. There ain't no “ghost in the machine”! Webster's definition of an entity “*which is regarded as being the immortal or spiritual part of the person and, though having no physical or material reality, is credited with the function of thinking and willing, and hence determining all behavior*” is pure bunk, right up there (or better, “down there”) with the silly “science” that claimed the Earth is a flat plate and that some “gaseous vertebrate of astronomical heft [God]” made this universe. It's only ignorance that uses ‘God’ and “[immortal] soul” as synonyms for “I dunno”!

Anyway, let me try to move on, to try to show you why I call the idea of “immortal soul” pure bunk. In this chapter, so far, I've been trying to show you just the definition for [immortal] ‘soul’. I admit that I've been ridiculing the definition – but it seems to deserve it: an “immortal soul”, a “ghost in the machine”, a “nonmaterial substance”, an “unsubstantial substance”, a “nonmaterial material”, is nonsensical nonsense! Now, after showing you the “standard definition” for “immortal soul”, you might expect me to go through details of the “science” behind the “hypothesis” (better, ‘speculation’) of the “existence” of any “immortal soul” and go through any “proofs” of the “existence” of such an “unsubstantial substance” (similar to what I did in the previous two chapters, debunking all ideas of all gods). But as I'll now try to show you, such an endeavor would face severe limitations.

For example, you might expect that, for the rest of this chapter, I would re-use the sections and subsections of two chapters ago, to go through speculations about “immortal souls”. The section titles that I used to evaluate “the god idea” were:

1. *Any hypothesis must succinctly summarize some data*
2. *Any hypothesis should conform to established scientific principles*

3. *Any hypothesis providing no testable predictions should be rejected*
4. *Any hypothesis whose predictions are false must be rejected*
5. *Before any hypothesis is accepted as a “scientific principle”, its predictions must pass so many experimental tests that competent, diligent, persevering people become “sick and tired” of testing it!*

But in the case of the “hypothesis” (better, ‘speculation’) of the existence of “immortal souls”, is it worth going through the above list in detail?

I think not, for the following reasons.

- The idea of the existence of a “nonsubstantial substance” summarizes zero data – save for the claims of some who say that they’ve seen ghosts (or goblins) or that they were abducted by extraterrestrial visitors.
- Insofar as all information-exchange requires material storage devices and senders and then momentum exchange (e.g., via electromagnetic waves), then “for starters”, a “ghost in the machine” violates those scientific principles.
- As far as I know, no testable predictions of the idea of “immortal souls” has ever been proposed – except tests to be performed by dead people!

Thereby, with the idea of “immortal souls” rejected as “mere speculation” via criteria #1 through #3 in the above list (quoted from the earlier chapter), there’s no point in even considering criteria #4 and #5!

But knowing how your old grandfather seems to like dragging out stories, you might now expect me to go through all the “proofs” for the existence of “immortal souls”, criticizing them as I did with similar “proofs” for the existence of various “gods”. Well, Dear, for you I’d be willing to do that. Paraphrasing Eliza’s father (from *My Fair Lady*): “**I’m willing to do it, I’m waiting to do it, I’m wanting to do it!**” But there’s a slight problem: as far as I know, no one has been dumb enough to submit a “proof” for the existence of “immortal souls”! If you find one, please let me know.

Instead of such “proofs”, what are available are some of the most outlandish, “fallacious arguments” that have ever polluted humanity, and for the rest of this chapter, what I want to do is show you some of the many “fallacies in arguments for immortality and immortal souls” – which strangely enough is surprisingly similar to the title for this chapter.

Yet, Dear, I don't plan to show you the fallacies in all arguments that allegedly demonstrate the existence of immortal souls. And the reason is solely that going through them becomes a "real pain" – as I'll show you by going through just some of them!

Let me put it this way: I have low tolerance for stupidity, and some of the "arguments" in support of the concept of immortal souls are so dumb, revealing so much ignorance, that my patience "wears thin". Yet in later chapters (in "the excursions" **Qx** and **Yx**), I'll show you a host of similar fallacies in some of our culture's "holy books" (namely, the Bible, the Quran, and the Book of Mormon), because given your exposure to such books, I think that you really should see some of the huge number of logical errors they contain. But for now, let me show you fallacies in at least some of the arguments for the existence of "[immortal] souls".

If you ever read a book or take a course at university in "Logic" or "Good Reasoning" or "Good Thinking", then besides learning techniques about how to reason without error, almost certainly you'll be exposed to a huge list of well-recognized "logical errors" or "logical fallacies" or "seductions". Systematizing these errors was performed during the Middle Ages in Europe, when Latin was the "learned language", and unfortunately for most modern students, these fallacies are still usually identified in Latin. In the list that follow, I'll provide English translation of the Latin identifications and also, in many cases, I'll add more modern names of the fallacies (putting these modern names in capital letters).

If you want to explore these fallacies by yourself, Dear, then start by typing "logical fallacies" in a good internet search engine. For what follows, I want to show you how some of these fallacies appear in (and undermine) arguments for "immortality", "immortal souls", and in some cases, various "gods" and "holy books". For this demonstration, I've relied on various lists of these fallacies, including those in the book *Good Thinking, An Introduction to Logic* by Gerald Runkle (Holt, Rinehart and Winston, New York, 1978) and the lists at the following web sites:

<http://kspope.com/fallacies/fallacies.php>,  
<http://www.locksley.com/6696/logic.htm>,  
<http://www.infidels.org/news/atheism/logic.html>,  
<http://www.csun.edu/~dgw61315/fallacies.html>, and  
<http://academic.engr.arizona.edu/HWR/seminar/fallacies.html>.

I'll group the fallacies under five headings, listed below. These groupings are my own creation, and I readily admit that the boundaries between them are rather porous and ill defined. Nonetheless, I hope that the groupings will make the task of going through the fallacies not quite so daunting. I'll start with the group:

### *1. Logical Fallacies Derived from Appealing to an Idea's Source*

Dear: Of course it's justifiable in arguments to reference reliable sources, but for contrast, consider the following fallacious examples.

*Argumentum ad antiquitatem* (“argument from antiquity or tradition”); **PAST BELIEF**. An example of this fallacy is: “It's obvious that immortal souls exist. During at least the past 10,000 years, people have believed that they possessed immortal souls.” Such arguments can be demolished with something similar to: “So what? For the same period of time, most people thought that the world was a flat plate!”

*Argumentum ad novitatem* (“argument of the new”); **NEWER IS BETTER**. Such an error, opposite to *argumentum ad antiquitatem*, argues for the “truth” of some idea because it's new. An example might be to argue that, being newer, Christianity is better than Judaism, Islam is better than Christianity, and Mormonism is the best! With similar reasoning, one could argue that scientific humanism is better than all religions. But such reasoning is equally fallacious – I mean, after all, obviously in some cases, **OLDER IS BETTER**; for example, certain old people...☺

*Argumentum ad populum* (“argument from popular opinion”); **APPEAL TO POPULARITY, APPEALING TO THE GALLERY, COMMON BELIEF, THE BAND-WAGON FALLACY**. This is similar to an *argumentum ad antiquitatem*, but bases the argument on the fact that the idea is popular rather than old, e.g., “Obviously we have immortal souls; more than 90% of Americans believe we do.” If Columbus had been similarly swayed by the then-current popular opinion that the Earth was a flat plate, he wouldn't have discovered America. Arguments are similarly unsound if based on claims that they're accepted by numerous people (*argumentum ad numerum*) or by certain people, e.g., those who are rich (*argumentum ad crumenam*), poor (*argumentum ad lazarum*), or have some authority (*argumentum ad verecundiam*).

As an example of the fallacy of *argumentum ad verecundiam* (APPEAL TO AUTHORITY) is the following: “Truth is what the most brilliant people believe. It’s therefore obviously true that we have immortal souls and that God exists, because Plato and Descartes were convinced that people possess immortal souls and Aristotle and Kant were convinced that God exists.” In contrast, it’s my opinion that these examples provide data to support the concept that brilliant people can espouse some astoundingly dumb ideas.

Another example of *argumentum ad verecundiam* (ARGUMENT or APPEAL TO AUTHORITY) is: “You agree that Aristotle and Newton were brilliant, don’t you? Well, Aristotle believed in God, and Newton believed that he possessed an immortal soul. So...” If you care to respond to such an argument, Dear (although never forget: “You don’t have to answer the phone!”), you might mention “Aristotle also advocated slavery, and Newton convinced himself that the passage of time was independent of an observer’s motion. All of which goes to show that...”

And actually, Dear, that sock can also be put on the other foot: just as fallacious as such appeals to authority (to “prove” that God or immortal souls exist) are appeals to authority to “prove” that God or immortal souls don’t exist. For example: “Newton thought that God exists and that time’s flow was independent of the motion of the observer; Einstein didn’t believe in God and demonstrated that observers in relative motion wouldn’t agree on time. We should therefore accept Einstein’s idea that there are no gods.” Fortunately, I know a certain grandchild who would respond to such silliness with “Show me the data!”

Yet, Dear, of course it’s not fallacious to try to bolster an argument by referencing appropriate “authority figures”, e.g., “My grandfather says...” (Sorry Dear: I’m doing my best to keep up my “spirits”!) But, Dear, when you do reference some “authority figure”, make sure that “the authority’s authority” is sound, e.g., based on reliable data. In that regard, perhaps you’d like to consider if you really want to eat cereal “endorsed” by some sports “hero” or wear clothes “endorsed” by some “movie star”. I mean, make sure what “authority” means!

## 2. Logical Fallacies Derived from Appealing to Emotions

There are many types of logical fallacies that appeal to emotion – probably as many as there are types of emotions! Rather than relying on data and on

science, the arguer (e.g., especially clerics and politician) will appeal to emotions associated with security or fear, love or hate, pride or pity, tolerance or bigotry, and so on. I'll list a few that are so familiar that they've been named.

*Argumentum ad baculum* [in Latin, *baculine* is “of a rod, or punishment administered with a rod”]; **APPEAL TO FORCE**. An example of this fallacy is: “If you don't believe that you possess an immortal soul, then you'll burn in hell for eternity.” That's not a sound argument for the existence of “immortal souls”; it's a threat.

*Argumentum ad misericordiam* (“argument to pity”); **APPEAL TO PITY; SPECIAL PLEADING**. An example is: “We must have immortal souls, because if we didn't, then it would mean that death would be the end of us.” Perhaps the best way to respond to such an argument is to try to get the pitiful person to realize 1) that she won't realize her own death (it's impossible to be aware of lack of awareness), 2) that whatever she has managed to contribute to humanity can live on, and 3) that the realization that her existence will soon be terminated should give her enormous incentive to try to enjoy her brief existence, e.g., by helping humanity while she can.

*Argumentum ad hominem* (“argument directed at the man”); **ATTACKING THE PERSON**. An example is: “I believe in immortal souls (or our god, our holy book, or our prophet); those who don't are evil.” Such idiocy (which is rampant) doesn't establish the existence of “immortal souls” (or some God, the “truth” of some “holy book” or the veracity of some “prophet”). It's an attack on people who don't “buy into” some idea – and is usually associated with some threat (*argumentum ad baculum*), such as “kill the infidels”.

Actually, as explained by the unidentified author of the web page at <http://www.infidels.org/news/atheism/logic.html>, there are two major types of *ad hominem* arguments: abusive and circumstantial. The abusive type is obvious; an example was already given. Circumstantial *ad hominem* arguments are also described as **POISONING THE WELL**; an example is: “People who deny the existence of immortal souls do so because they're afraid their souls are headed for hell.”

A third type of *ad hominem* argument, the *tu quoque* (“you too”) fallacy (TWO WRONGS MAKE A RIGHT) can be illustrated with: “Your idea of ‘immortal souls’ doesn’t make sense”, and then the second speaker responds: “Well, your idea that people don’t have immortal souls makes even less sense.”

Another type of fallacy derived from appealing to emotions, a fallacy that’s used to hook the unsuspecting in Evangelical (“feel good”) Christianity and Mormonism, is the FALLIOUS PROOF BY PLEASURE principle, which is illustrated with the following quote from Friedrich Nietzsche’s [pronounced “Neecha’s”] book *All Too Human*:

An agreeable opinion is accepted as true: this is the proof by pleasure (or, as the church says, the proof by strength), which all religions are so proud of, whereas they ought to be ashamed. If the belief did not make us happy, it would not be believed: how little must it then be worth!

Think about it, Dear: would you really accept only those ideas that give you pleasure and reject all those that give you pain? Perhaps it would be pleasurable to live forever in paradise; people who “think” so adopt the idea. On the other hand, obviously it wouldn’t be pleasurable if one’s consciousness ends with one’s death; therefore, many people reject that idea. It would be pleasurable to think that all children are happy; so, do such people assume it’s true? And it’s painful to think that many children are miserable; so, do such people assume it’s false? And yet, that’s the “proof by pleasure” principle. In contrast, as Carrie P. Snow said: “Science is the refusal to believe on the basis of hope.”

### 3. Logical Fallacies within an Argument’s Construction

Dear: I expect that you’ll find this group less interesting and maybe more difficult, but I hope you’ll not ignore them, because they’re important, starting with:

**AFFIRMATION OF THE CONSEQUENT.** In symbolic form, this fallacy is: “A implies B; B is true (affirming the consequent); therefore, A is true.” An example is the following (taken from one of the referenced web pages, but as I showed you in the previous chapter, it was used by Pope John Paul in his “proof” of God’s existence): “If the universe was created by God, then it would display order rather than chaos. The universe does display order; therefore, God created it.” But the illogic of the argument aside (viz.,

\* Go to other chapters via

affirmation of only the consequent), its silliness can perhaps be best revealed if you realize that, if God created the universe, then She would have put dispensers of free strawberry milkshakes on every street corner!

**DENIAL OF THE ANTECEDENT.** This is the converse of the previous fallacy (affirmation of the consequent); it's of the form: "If A then B; not B; therefore not A." I can easily give you example by continuing with the previous one: whereas free strawberry milkshakes aren't available at every street corner (denial of the antecedent); therefore, obviously God didn't create the universe.

**CONVERTING A CONDITIONAL.** This fallacy is similar to "affirmation of the consequent", but stated as a conditional. In symbolic form it's: "If A, then B; B; therefore, A." For example: "If a person 'knows', then he or she will believe; I believe; therefore, I know... [that God exists, that people have immortal souls, that invisible flying elephants are pink, whatever!]."

*Argumentum ad logicam* (argument to logic); the FALLACY FALLACY. If you argue that the conclusion of an argument is wrong because it's based on fallacious reasoning, Dear, then it's you who could be wrong – because it's possible to reach a correct conclusion from a faulty argument! For example, someone could argue: "After you die, God judges your immortal soul, and if you didn't treat people well, He will judge you harshly; so, obviously we should be nice to other people." Most people probably would agree with that conclusion – but I'll bet that you can identify at least one person who considers the logic faulty.

**IRRELEVANT CONCLUSION** (*ignoratio elenchi*). An example is: "Given that religious people are much better behaved than atheists, it's therefore clear that God exists and that people have immortal souls." Even if the premiss of that argument were true (and data reveal that it's not), it's irrelevant to the conclusion that gods and immortal souls exist.

*Non causa pro causa* ("not the cause of that"); **IDENTIFYING A NON-CAUSE AS A CAUSE; QUESTIONABLE CAUSE.** An argument of the form "A implies B; A is true [or false]; therefore, B is true [or false]" may look okay, but can be fallacious if the assumption "A implies B" is wrong. An example is: "I know I have an immortal soul, because when I think about living for eternity in heaven, I feel much better." Although there's

little doubt that such claims are made honestly, there's also little doubt that it can be pleasant to daydream.

*Cum hoc ergo propter hoc* (“with this, therefore because of this”). This is a special case of identifying a non-cause as a cause (*non causa pro causa*); in an earlier chapter, I cautioned against this fallacy by quoting the Stanford professor's slogan: “Correlation doesn't mean causation!” If you find, for example, that the proportion of believers vs. unbelievers in U.S. prisons is higher than in the general population of the U.S. (as it is), or that the proportion of criminals is higher in the generally-more-believing U.S. than in European countries (as it is), then you can conclude... that you'll have a lot of work to do, to try to understand the cause(s)!

*Post hoc ergo propter hoc* (“after this; therefore because of this”). This is another case of identifying a non-cause as a cause (*non causa pro causa*) and similar to *cum hoc ergo propter hoc*, except that the claim is a causal link in time, whereas all that's known is that one event occurred before another. An example is: “I know I have an immortal soul, because once I started to believe that I had one, my fortunes began to turn for the better.” Maybe the best response to such an argument is the comedian Bill Cosby's “Riiiiiiight.”<sup>4</sup>

*Ad hoc* (“after the fact”). Actually, the *ad hoc* fallacy is not an argument, but an explanation made to look like an argument, using an “after the fact” statement. For example, “All intelligent people believe that they have immortal souls; to do otherwise would be dumb.” Such a communication only reveals the person's definition of “intelligent people” – and if you don't mind a little *ad hoc* addition of my own, it demonstrates that the person has adopted a mighty dumb definition!

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<sup>4</sup> Would that all my grandchildren would learn to say “Riiiiiiight” as well as Bill Cosby. “God exists,” says someone. “Riiiiiiight”, responds my first grandchild, adding “would you mind showing me the data?” “Jesus is the son of God,” says someone else. “Riiiiiiight”, responds another grandchild, adding “I guess I missed seeing the data on which your statement depends.” “Gabriel conveyed Allah's message to Muhammad,” adds someone else. “Riiiiiiight”, responds another grandchild, adding “are you quite sure that Muhammad wasn't just tuned into MTV?” “The golden plates were given to Joseph Smith by the angel Moroni,” adds still another someone. “Riiiiiiight”, responds still another grandchild, adding “are you sure that the ‘i’ should be included in that angel's name?” All invisible flying elephants are pink,” adds still another schemer. “Riiiiiiight”, responds my youngest grandchild, “save for the invisible polka-dot elephant that's just about to dump a load on your head!”

Another example, one that really gets me angry, is the first President Bush’s statement [paraphrased from memory]: “No, I don’t think atheists should be considered as patriots; America is ‘one nation under God’.” An unperturbed listener could point out to him his *ad hoc* error, but my response would be: “Blow out your ear, you pea-brained, mealy-mouthed, arrogant little twit.” That is, Dear, *ad hominem* remarks can be used to vent steam – to avoid slugging someone!<sup>5</sup>

Finally in this group of fallacies dealing with the construction of an argument (skipping “illicit process”, “fallacy of the undistributed middle”, and other rather “esoteric” examples), there’s a set of fallacies that can be identified with the term **AMBIGUITY**. Among the “fallacies of ambiguity” are those commonly identified as *ACCENTUS*, *AMPHIBOLY*, *COMPOSITION*, *DIVISION*, *EQUIVOCATION*, and *REIFICATION* (or *HYPOSTATIZATION*), each of which I’ll now illustrate.

**ACCENTUS**. This ambiguity arises from emphasis (accent) placed on a spoken word or phrase but commonly not shown in writing – but I’ll accent the words here by using capital letters. Consider: 1) **I KNOW that I have an immortal soul** [Does the speaker “know” what ‘knowledge’ means?], 2) **I know that I have an IMMORTAL soul** [Really? What data supports the contention that anything is ‘immortal’?], 3) **I know that I have an immortal SOUL**. [Does the speaker mean that he has an ‘essence’ that can continue?].

**AMPHIBOLY** [From the Greek word *ballein* meaning “to throw” (as in ball!) with the Greek prefix *amphi* meaning **1.** on both sides or on both ends **2.** around or about **3.** of both kinds – as in ‘amphitheater’ and ‘amphibian’ (where *bios* is the Greek word for life, as in ‘biology’)]; so, ‘amphiboly’ means “throwing (meaning) around”]. The ambiguity of amphiboly arises from faulty sentence structure (faulty “syntax”). An example that I rather like is the one given in one of the referenced web pages, which I’ll modify to: “**Belief in immortal souls fills a much-needed void.**”

**COMPOSITION**. The fallacy of composition is to argue that some “whole” has the same property as its parts. Although examples such as the following are given in the referenced web pages, “The bicycle is made entirely of low

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<sup>5</sup> And yes, Dear, “I know, I know...” but realize that, like everyone else, I’m of (at least) “two minds”. My right brain “pictures” the satisfaction of my solemnly spitting on the man’s grave, while my left brain reminds me that “the best revenge is to live well” – but my left brain mentions, also, that sometimes what’s best for Body is to vent my emotions!

mass components, and is therefore very lightweight”, the fallacy of composition can also be used to confound religious people, e.g., with “**Being omnipotent, God rules everything; everything includes evil; therefore, God rules evil.**”

**DIVISION.** This fallacy is the opposite of the fallacy of composition; using the fallacy of division the arguer claims that all parts have the same property as their “whole”, e.g., “**God is everything; obviously I’m a part of everything; therefore, I’m God.**”

**EQUIVOCATION.** This is another form of semantic ambiguity, but this time caused by a shift in the meaning of a word or phrase, e.g., “**God is love; obviously love exists; therefore God exists.**” As I tried to show you in Chapter **Ib2** (dealing with basic ideas of logic), the fallacy in this argument is to shift the meaning of the word ‘is’ from the ‘is’ of attribution (or predication) in “God is love” to the ‘is’ of existence in “God exists”. A similar fallacy is behind “**A person’s essence is his soul; people exist; therefore, people obviously have immortal souls.**” In this case, the shift is from the meaning of ‘soul’ from “SOUL TWO” (meaning ‘essence’ or similar) to “SOUL ONE” (meaning “immortal soul”).

**REIFICATION / HYPOSTATIZATION.** ‘Reify’ is from the Latin word *res* meaning ‘thing’ (used in the word ‘real’), in turn from the Indo-European base word *rei* meaning “property or thing”; the reification fallacy is to argue that an abstract concept is a concrete thing. Similarly for ‘hypostatization’: with *hypo* the Greek word meaning ‘under’ (as in hypodermic needle, which goes under the *dermis*, i.e., the skin) and *statice* from the Greek word *statikos* meaning “causing to stand”, then again, the meaning of this fallacy is to assume that something concrete exists “under” an idea, “causing it to stand”. As I’ll show you in a later chapter, Plato was notorious for this fallacy (his “Theory of Forms”). Similarly, all proponents of all ideas of gods and immortal souls assume that something real exists, causing their ideas “to stand” – without providing any data to support their ideas.

#### **4. Fallacies in the Way an Argument is Presented**

**BIAS / SLANTING / INNUENDO / GUILT (OR INNOCENCE) BY ASSOCIATION.** Such fallacies commonly occur within the body of an argument by the use of emotive words or phrases. For example: “**Have you ever noticed how close in pronunciation are the names ‘Luther’ & ‘Lucifer’**”

and ‘Mormon’ & ‘Moron’?” In this book, I have been (and will continue to be) guilty of many of these fallacies, using emotive words and phrases, e.g., “If you want to see a *stupid* idea, then...”, “The *crazy* clerics say...” Sorry about that, Dear, but as I’ve written before, I have a low tolerance for stupidity masquerading as intelligence. Besides, if grandchildren aren’t better than their grandparents, then what was the point of it all?!

**CIRCULAR ARGUMENT** (*circulus in demonstrando*); **CIRCULAR REASONING** (*circulus in probando*); **BEGGING THE QUESTION** (*petitio principii*). There are subtle differences among these fallacies, but I doubt if it’s worth describing them. Generally these fallacies are of the form 1) A is true, because A is true, 2) A is true, because B is true, and B is true because A is true, etc. In one form or another, the fallacy occurs when the truth of an assertion is assumed to prove that the assertion is true. Usually this fallacy isn’t so blatant as, “I know that the Bible [or Quran or Book of Mormon or...] is true, because it says so in the Bible [or Quran or Book of Mormon or...]” Yet, in more complicated examples (e.g., “I know that it’s true that I have an immortal soul and will be resurrected after I die; it says so in our sacred literature; our sacred literature contains the word of God and therefore contains nothing but the truth; God does not lie; therefore, I know that I have an immortal soul”), if some of the intervening nonsense is deleted, then the fallacy appears as A is true because A is true.

**LOADED QUESTION; FALLACY OF INTERROGATION; FALLACY OF PRESUPPOSITION; COMPLEX QUESTION; MANY QUESTIONS** (*plurium interrogationum*). These are other forms of the circular reasoning fallacy, but expressed as a question in which an unproved assertion is used as a (usually unstated) premiss. Lawyers make notorious use of this fallacy; the classic example is: “Have you stopped beating your wife yet?” But many examples are readily available from religion (and politics): “If God didn’t make the universe, then who did?”, “Why is it that bad things always happen in our country whenever the Supreme Court rules against God?”, “If you don’t have an immortal soul, then how will God judge you after you die?” Probably the best way to respond to such questions (especially if they start with some involved preamble that introduce some questionable premisses) is to say: “Check your premisses.”

Otherwise, a good technique is to respond by asking another question in which you demand data: “What data support your idea that the universe was made by someone? Maybe it made itself. Maybe it always existed.”

“When you say ‘bad things happen’, do you mean the frequency of tornados? Can you show me some data?” “Have you thought about the possibility that if God doesn’t exist, then the idea of immortal souls is silly?”

**THE EITHER/OR FALLACY; THE BLACK-AND-WHITE FALLACY; FALSE DILEMMA; FALSE DICHOTOMY; BIFURCATION; TRIFURCATION...** It’s common that only two options are offered in this type of fallacy (therefore the word “bifurcation”), but the same type of fallacy occurs if ever an arguer offers fewer options than are appropriate (therefore the “trifurcation...”). An example of just two options is: “**Either God made the universe or he didn’t; if he didn’t then some other being did; but I call the being who made the universe ‘God’.**” Another is: “**Either you believe that you have an immortal soul or you don’t.**” Maybe the best response to such nonsense is to ask: “**What about the possibilities that the word ‘God’ and the word ‘immortal’ have no meaning?**”

**REPETITIVE ARGUMENT** (*Argumentum ad nauseam*). These are repetitive argument, to the point of making one sick! Which makes me ask, Dear: how can you stand going to church so frequently, listening to the same old balderdash, time and time again? Talk about *ad nauseam*! Repeating something doesn’t make it “truer”! As Dan Barker wrote:<sup>6</sup>

Scientists do not join hands every Sunday, singing, “Yes, gravity is real! I will have faith! I will be strong! I believe in my heart that what goes up, up, up must come down, down, down. Amen!” If they did, we would think they were pretty insecure about it.

## 5. *Some Basic Fallacies of Entire Arguments*

There are a similarly large number of fallacies in this category, only some of which I’ll illustrate, starting with:

**FALSE ANALOGY.** You really should stay alert for false analogies, Dear, because people use analogies so frequently – and analogies can easily mislead. An example of a false analogy is the quotation at the start of this chapter from the Mormon website: “**From an earthly perspective death looks like an end. But it is really a beginning, just as birth is.**”

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<sup>6</sup> Dan Barker was a Christian preacher for 19 years and then abandoned Christianity. His 1992 book is entitled *Losing Faith in Faith: From Preacher to Atheist*.

In essence, the analogy is: “Like birth, death is a beginning.” Hello?! That’s like drawing an analogy between black and white! And though some people may reply “Well, black and white are both colors”, they’re not: white light contains all colors; black is the absence of light. A more meaningful analogy than “Like birth, death is a beginning” would be: “Birth is like a ray of white light, containing all colors; death is black, the absence of color.”

**EXTENDED ANALOGY.** In the case of extended analogies, the inappropriateness of an analogy usually doesn’t become apparent until it’s extended beyond its ability to convey a useful “picture”. An example can be shown by extending the following false analogy, which is frequently used by religious people:

The universe is like a giant clock with an absolutely incredible number of interacting springs and wheels, pushing and shoving, spinning and whirling, and time just ticking by. And of course, behind it all is not only a watchmaker but also someone who keeps track of it all and keeps it all going. That someone is God.

Perhaps the best way to respond to such an analogy is for you, also, to commit the “extended analogy fallacy”, by extending the analogy even further (a method promoted by the philosopher David Hume) until its originator seeks to withdraw it. For example, you might extend the false analogy of “God, the great watch-maker” in a manner similar to:

Well, what I find truly amazing is how God managed to assemble all the pieces together so well, with each piece crafted so perfectly. He must have a fabulous workshop somewhere, with incredible tools and machines. Wouldn’t it be neat if someday we could travel to that workshop to see his tools and machines? And beyond that, wouldn’t it be neat to see the raw material that he used, not only to build the clock but also to build his machines and tools? And beyond that...

If you continue with such an approach, Dear, the person who proposed the analogy will probably complain: “You’re carrying the analogy too far!”

**ANECDOTAL EVIDENCE.** I know that you’re well familiar with this type of fallacy, Dear, but let me suggest that the problem with so much reliance on anecdotal evidence is faulty wiring in the human brain! When you construct your robot that can think for itself, Dear, maybe you can improve on the circuitry!

I assume that there was an evolutionary advantage in remembering “the good times” and “the successes” and forgetting about “the bad times” and “the failures”, but it’s also clear that we should guard against the resulting fallacy of anecdotal evidence, e.g.,

I know that there is a God and that he watches over my immortal soul, because I remember being in a terrible storm and praying that I wouldn’t be hit by lightning; God heard my prayer and protected me.

As you unfortunately know, the Mormon Church promotes reporting such “anecdotal evidence” by encouraging members to give their “testimonies” – probably relying on the generally accepted idea that, if a substantial quantity of consistent anecdotal evidence is assembled, then the “truth” will be “revealed”. But even if 10 million Mormons provide their mistaken “testimonies” that God’s presence has been “revealed” to them, the sum is still faulty evidence: 10 million zeros is still zero!

**SWEEPING GENERALIZATION (*dicto simpliciter*; “spoken simply”); FALLACY OF ACCIDENT.** This fallacy occurs when a general rule is applied inappropriately. For example, a defense lawyer might say: “If you add up ten zeros, you get zero; similarly, if you add up all the evidence against my client, you also get zero.” Although ten (or ten million) zeros do sum to zero, the sweeping generalization is made that each piece of evidence amounts to nothing. Similar is the argument: “There’s no doubt that the essence of a person, a person’s soul, continues past the person’s death; think of all the many people whose accomplishments continue long after they’re dead; therefore, there’s no doubt that a person’s soul is immortal.”

There’s also no doubt that the sweeping generalization fallacy can be combined with other fallacies, such as equivocation (switching the meaning of words, in this case from “Soul Two” to “Soul One”). Religious people commonly get themselves in binds by committing the sweeping generalization fallacy of taking “absolute moral codes” from their “holy books” and then trying to apply such “general principles” to specific situations, e.g., “The Bible commands ‘Thou shalt not kill’; therefore, I must conscientiously object and refuse to participate in any war.” Thereby, however – at least in the U.S. – the “believer” *via dicto simpliciter* does manage to get other people to risk their lives protecting him.

**HASTY GENERALIZATION** (*secundum quid*); **CONVERSE ACCIDENT**. Opposite to the sweeping generalization fallacy (the converse of fallacy of accident) is the hasty generalization: rather than go from a general rule to a specific case inappropriately, the arguer inappropriately goes from a specific case to a general rule, commonly relying on anecdotal evidence. Hasty generalizations are the bane of statisticians, who continually worry about potential biases in their sampling. An example is: “Every educated, intelligent person I’ve ever met, every book that I’ve ever read, supports the idea that God exists and that we have immortal souls; therefore...” What the arguer neglects to mention is that she always lived in “tight” Mormon communities and that, consistent with the Church’s edicts, she restricted her reading to “faith-building literature”.

**THE NATURAL LAW FALLACY; APPEAL TO NATURE; THE NATURALISTIC FALLACY**. Such fallacies are commonly made not by religious people but by “humanists” or “naturalists”. The fallacy is to assume that, if some thing or process is natural, then it’s “good”, e.g., “Milk is good for you! What could be more natural than milk?!” I can almost hear a certain grandchild respond: “Yah, well, this natural milk is sour.” Granted that most people consider many natural processes to be “good” (e.g., sunshine, rain, growth of trees), but the source of the fallacy is to forget (or not realize) that ideas about “good” vs. “bad” (and all shades in between – topics in “morality” that I’ll get to later, in **M**) are opinions we humans form in the pursuit of our goals. Thus, I consider tornados to be “bad” not because they aren’t natural but because I want to live (which, admittedly, also seems to be quite “natural”). On the other hand, those (mentally ill) people who want to die (which is also quite “natural” – unless one admits that such people are “supernatural”!) might argue that tornados are “good” – although apparently many such people prefer to tie man-made explosives around their waists to blow themselves up, rather than wait for a tornado to whisk them off to their man-made heaven.

**INCONSISTENCY**. One memorable example of this type of fallacy was mentioned in an earlier **I**-chapter: Martin Luther using logic to demonstrate that logic shouldn’t be used! Another example is: “I’m a scientist who believes that God exists and that I have an immortal soul.” Fortunately, less than 10% of the members of the U.S. National Academy of Sciences would now make such a statement – thereby demonstrating that ~10% of the members of the Academy don’t have a clue about how to apply the scientific method to policy – and therefore, should be kicked out of the Academy!

*Non sequitur* (“not in sequence”; “it does not follow”). In a way, the phrase *non sequitur* summarizes all logical fallacies. Thus, Dear, if your immediate reaction to some argument is that it contains some fallacy, then you can usually get away with saying: “That argument is *non sequitur!*” [viz., it doesn’t follow]. But to be more precise, the *non sequitur* fallacy occurs when the conclusion has no logical connection with the premiss, for example: “**Have you ever noticed that the word GOD is DOG spelled backwards? It means that, in reality, God is a dog – and backwards to boot!**”

**RED HERRING; SMOKE SCREEN.** As you probably know, Dear, “a red herring... one dried, smoked, and salted” [although I know that you’re more familiar with “red salmon”] was “drawn across a fox’s path... to destroy the scent and set the dogs at fault.”<sup>7</sup> Similarly, the red herring fallacy is to inject irrelevant ideas into an argument, to divert attention from the issue under discussion. An example is: “**Certainly the issues of the existence of God and the existence of immortal souls are fundamental ontological problems. But in trying to solve these problems, we must constantly bear in mind the fundamental issue that people should believe in God and their immortal souls. Otherwise, they’ll behave badly.**” Opponents might respond to such a red herring with: “**Hey – relative to the ontological problem of God, the issue of morality is a smoke screen!**”

**SUPPRESSED EVIDENCE; EVADING THE FACTS; FALLACY OF PRESUMPTION, *Audiat et altera pars*** (“let us hear the other side”). This is a common error, but I didn’t see this error identified in the lists of logical fallacies that I referenced earlier. Instead, while I was wandering around the internet looking for something else, I bumped into the following (in a “discussion bulletin board”) that names and describes this fallacy.<sup>8</sup> The only information given about the author is his or her “ID” (24924).

Date: 9/5/2003 3:43:00 PM From Authorid: 24924

Do you know what the fallacy of SUPPRESSED EVIDENCE is? When true and relevant information is left out for any reason, the fallacy called Suppressed Evidence is committed. Because of the absence of important facts, this fallacy is sometimes called “Evading the Facts.”

<sup>7</sup> From Brewer’s [1817] *Dictionary of Phrase and Fable*, revised by Ivor H. Evans (Cassell and Co., New York, 1970).

<sup>8</sup> At <http://www.unsignedmysteries.com/usm354497.html>.

The fallacy of Suppressed Evidence is categorized as a Fallacy of Presumption because it creates the presumption that the true premisses are COMPLETE. It is also sometimes called Unstated Premises or referred to by the Latin phrase *Audiat et altera pars*, which means “let us hear the other side.”

Perhaps the most common use of the fallacy of Suppressed Evidence is in advertising. Most marketing campaigns will present really great information about a product, but will also ignore problematic or bad information. They will ONLY show you THEIR side; THEIR data and only what they WANT you to see.

We sometimes see this fallacy committed in scientific research whenever someone focuses on evidence which supports THEIR hypothesis but ignores data which WOULD tend to disconfirm it. This is why it is important that all experiments can be replicated by others and that the information about how the experiments were conducted be released. Other researchers might catch the data which was originally ignored.

Creationism is a good place to find fallacies of Suppressed Evidence. There are quite a few cases where creationist arguments simply ignore evidence relevant to their claims, but which would cause them problems. For example, when explaining how a “Great Flood” would explain the fossil record...: “As the water level began to rise, the more advanced creatures would move to higher ground for safety, but more primitive creatures would not do so. This is why you find less complex creatures further down in the fossil record, and human fossils near the top.” All sorts of important things are ignored here, for example the fact that marine life would have benefited from such a flood and the would not be found layered in such a way for those reasons. Creationists leave out all sorts of EVIDENCE because they KNOW that the believers will not seek out REAL scientists works and writings; or track down the source of an alleged quote, or check the credibility of an author...

As this author relates and as I mentioned in an earlier chapter, this error is made even by scientists (usually not deliberately) when trying to see evidence for their pet theory in some new data set. And of course the fallacy of suppressed evidence is rampant in essential all organized religions: witness the Catholic’s list of prohibited books, and the instructions to you to read only “faith-building literature”.

**SLIPPERY SLOPE.** Also be careful of this type of fallacy, Dear – cause it’s a slippery slope! The fallacy is to postulate a series of consequences without adequately demonstrating the causal relationships; i.e., it’s stringing together a series of *non sequitur* (“it does not follow”) fallacies.

For example:

If you convince people that God is a figment of primitive imaginations, if you convince people that the idea of immortal souls is silly, then they'll be unconcerned about God's judgment of their behavior. If people don't care about God's judgment, then they'll do as they please. Thereby, you'll set loose hedonism: drinking, gambling, arguing, fighting, debauchery of every imaginable sort. Morality will collapse; civilizations will collapse; we'll have Hell on Earth.

To stop sliding down a slippery slope, Dear, dig in your heels! Demand some data – or offer some data that contradicts the claims, e.g.,

It's silly, it's preposterous, it's insulting to claim that humanists are immoral. Do you consider yourself more moral than David Hume or Albert Einstein? And what about the vast majority of Chinese people? They consider your ideas of God and immortal souls to be ludicrous. Does it appear to you that their civilizations are collapsing?

And if you'd like to throw a red herring into the argument, Dear, then add: “Or is it that you clerics are worried that, once people realize you've been running a con game, you'll lose all your influence, power, and money?”

**STRAW MAN.** Dear, it's a fallacy (or at least it isn't fair!) to concoct your opponent's argument – and then just criticize your concoction! And I probably don't need to further illustrate the straw-man fallacy – cause I've been doing it throughout this chapter! Yet, to defend myself, let me add: a more accurate description of the straw-man fallacy is if your concoction *misrepresents* your opponent's position, to make it more vulnerable to criticism – and I don't think I did that... very much... ☺

**SHIFTING THE BURDEN OF PROOF / APPEAL TO IGNORANCE / *Argumentum ad ignorantiam*** (“argument from ignorance”). There are two types of this fallacy: 1) That some statement is true, because it hasn't been shown to be false, and 2) That some statement is false, because it hasn't been shown to be true. An example of the first type is “Immortal souls (or gods or ghosts or goblins) exist; no one ever proved that they don't.” For either type, Dear, whereas I know you wouldn't “buy into” an “argument from ignorance” in your day-to-day life, then don't buy into such silliness for the existence of an “afterlife” or gods or similar. For example, if I claimed that nobody ever demonstrated that there isn't water available in a hundred-mile stretch across the desert, I trust that you wouldn't then set out on a hike across that desert without a personal water supply.

Nobody in his or her “right mind” makes decisions arguing from ignorance – only religious people! (And yes, Dear, I agree that that’s an *argumentum ad hominem* – but I reserve the right to try to have a little fun while trekking across this desert!)

Actually, Dear, when examples of *argumentum ad ignorantiam* arise, you should consider two questions: Who has the burden of proof? and Who has the burden of the consequences? In our legal system, for example, the burden of proof rests with the prosecution and the burden of the consequences rests with the accused: it’s assumed that a person is innocent and therefore won’t be punished until evidence convinces a judge or jury otherwise.

As I’ll show you in later chapters, in an amazing miscarriage of what the rest of us consider to be “justice”, a basic tenet of Christianity is that all people are guilty (of Adam’s original sin of eating the apple, even though we weren’t there!) and that we continue to be “guilty”, until we demonstrate otherwise (*via* sundry rigmarole, including being “baptized”). The clerics argue that “unbelievers”, those who don’t buy into their argument from ignorance (i.e., their con game!), are headed for hell.

In the case of heading out on a desert trek without water (now we’re talking about a real hell!), then I’m sure you wouldn’t rely on an *argumentum ad ignorantiam* (that nobody “proved” that water wasn’t there), because it would be totally clear to you who should have the burden of proof (i.e., the idiot who was arguing from ignorance) and who would have the burden of the consequences (i.e., you). Similarly, whereas it’s you who’s expected to bear the burden of the consequences of the proposed existence of “immortal souls”, gods, ghosts, and various other goblins (i.e., you’re to bear the burden of paying the clerics for running their con game), then most people’s sense of justice (to be covered in the “J-chapters”) demands that the burden of proof rests with the con artists who make such claims – and their arguing from ignorance demonstrates only their ignorance! (Maybe I forgot to mention that *ad hominem* arguments can be fun!)

Now, Dear, there’s much more about logical fallacies that I want you to consider, but in view of the length to which this chapter has grown, I think I’d better temporarily “give up the ghost” (planning on resurrecting it in later chapters).

\* Go to other chapters *via*

Yet, before I “call it quits”, I want to direct your attention to some examples of how demands for evidence and logic have decimated the idea of “immortal souls”. My first example is the following long quotation from Joseph McCabe’s book entitled *The Story of Religious Controversy*.<sup>9</sup>

### THE LAW OF DEATH

IN Chapter II, “The Origin of Religion”, I [McCabe] defined religion as the belief in and worship of gods. If there is any error in that definition, it is that it ignores the belief in immortality. That man’s mind survives the body is, in fact... the oldest of all religious beliefs, the germ of all religious thought. Gods were but the princes of the spirit-world. God is its monarch. [But] What if the spirit-world became, like the human world of which it is a fantastic imitation, a republic without aristocracy or princes? Could we have religion without God?

One would expect men to cling more desperately to the belief in immortality than to the belief in God, yet in that universal decay of religion, which I have described, there is as much indifference to the disappearance of the one as of the other dogma. Did men ever profoundly believe in their immortality?

The logic of theology is nowhere more inexorable than in this section. If we are to live three score years and ten on earth, and an eternity in some other sphere, it matters vitally how we prepare for that larger life. And the majority of men have always behaved as if they did not entirely believe the story. The flesh, and its impulses and pleasures they knew, but that dim far-away crown...

Yet at a time when even the dimmest vision of the crown seems to fade, when the rumor spreads that heaven is an illusion, one would think that the most earnest efforts would be made to save the hope. No! Few but professional theologians concern themselves with it. Hardly one in ten of our more learned men now believes in personal immortality, and the news passes from ear to ear. And not a tear falls: not the thinnest shade clouds the unconquerable gaiety of modern life. The angelic harp is the butt of our comedians. Hell is the text of humorous stories.

And the official reply to all this is remarkably feeble. Every man who believes in God has one or another reason for doing so always present in his mind. God must have made the world, or at least the order and beauty of the world, or must have laid down the moral law. But ask your religious neighbor why he believes that he is immortal. The answer will be a series of gasping exclamations: “Why-er, surely-er.” And so on. I venture to say that not one believer in a thousand has in his mind one single definite reason for thinking that he is immortal.

Most people will candidly reply that they believe because the Bible says so or the Church says so. Since the Church can say so only on the authority of the Bible, we

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<sup>9</sup> Available at <http://www.holysmoke.org/an/tan07.htm>.

are reduced to that. And to accept such authority with any confidence in the truth of your belief, you must first be quite convinced, by solid proof, that there is a God to make the promise, and that He actually did inspire the Bible. In the next chapter, “The Futility of Belief in God”, I show how frail is the belief in the very existence of God, and another chapter shows that the claim of revelation in the Bible (whether there is a God or not) is far frailer.

It is strange how people forget that religion is a series of statements of fact, and the boldest and most tremendous statements imaginable. Perhaps the reader will be surprised to know that it is profoundly difficult – many thinkers say impossible – to prove the existence of the material world; of your body and the house you live in. Religion makes the far more formidable statement that there is a Power beyond and greater than the world. But in claiming that man is immortal it makes an even more astounding statement, and one for which we require very clear and cogent proofs.

*Death is the law of the universe.*

The law of the universe is, death. The day dies, as I write this, and will never return. Spiritualist prattle about the immortal souls of cows and cats is too frivolous to be considered here. The law is death.<sup>10</sup>

You say that you are an exception to this universal law. Your body will dissolve into its elements, but you claim to be immortal. Your “soul”, you say, is not compacted of different elements, and will not be dissolved into elements.

I am quite prepared to consider it; only, reflect, you must now give stronger proofs than were ever required before. “Why”, you may ask, “must I? Why should I give any proofs at all?” There was a brilliant American (ultimately British) novelist, Henry James, who believed in personal immortality, and he one day told the world why he believed: “Because I choose to”, he said. He knew that he could not prove it.

Possibly many people believe because they choose to, and since this book is concerned with supposed proofs of religious statements, let us have a word on this point.

When you say that you believe because you choose to, what do you mean by ‘believe’? The usual meaning is to accept a statement as true. But to accept a statement as true without proof is impossible, unless you take it on the authority of others. All that you can mean is that you will go on repeating the statement because you like to. It may be a pretty statement. It may soothe your mind. You may be indifferent as to whether it is true or not. But it is psychologically impossible for you

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<sup>10</sup> Actually, Dear, if you accept this claim made by McCabe, then perhaps you could “prove” that gods can’t exist. Thus: All things that exist in reality external to people’s minds have finite lifetimes; gods are claimed to be immortal (i.e., have infinite lifetimes); therefore, gods don’t exist external to people’s minds. And thus, as Harlan Ellison said: “When belief in a god dies, the god dies.”

to believe it to be true without proof or authority, and I am not concerned with people who repeat creeds and care not whether their statements be true or false.

So we are concerned here only with the proofs of the statements they make. The law of the entire universe is death, and you state that one single being in it, man, one amongst myriads of living things on a single globe out of myriads of globes, is a grand exception to the law. I ask proof in proportion to the magnitude of the claim.

But, you will say – and this is the nearest approach to an argument that most people could offer – man is so obviously different from everything else in the universe that the claim really has a plausible ground. Man builds cities, writes poems, measures the universe. Does any other creature in the world even remotely approach him in his powers and his nature?

There is certainly one human power which is remarkable and convenient: the power of generalizing. Remember that in reality there is no such thing as ‘man’. There are only men. Now which man do you mean? I presume that you do not build cities, write poems, or measure the universe. A few men do these things. But...

But, you say, there is a perfect gradation of power from me to these intellectual aristocrats of the race. It is only a question of degree. I have the same nature as they.

Yes, quite true, and it cuts both ways. The sodden, stupid brute in the gutter has the same nature as you. The laborer, so low in intelligence that he cannot even understand what other men discover, has the same nature. The native in the forests of the Congo has the same nature. The wild Veddah in the forests of Ceylon has the same nature. Are they so mightily different from the other forms of life?

In fact, not so long ago there were no men who could write poems or measure the universe. Consider the whole race as it was a hundred thousand years ago, and we know it well. Men could not even make homes of the rudest description. They had not begun to scratch the outline of an elephant on a bone or a stone. The utmost that any man could do was to chip a piece of flint a little better than his neighbor.

And this is by no means the lowest level of humanity that is known to us. On the contrary, man was then already some millions of years old. We can trace him to half a million years ago. [Now, multi-million years ago.] There is no savage in the world so low as the entire race then was. Suppose some glimmer of the philosophic spirit had then arisen in the dull brain of one of these early prehistoric humans. Suppose he had announced to his fellows that they were so vastly superior to all the rest of the living world that they must be immortal. I fancy that these squat, hairy, beetle-browed predecessors of ours would have smiled their first smile.

You see the fallacy. A few men can do wonderful things, and we naturally claim the credit for ‘man’ – which includes ourselves. But even we, though most of us are not very obviously spiritual and immortal beings, are certainly evolved from a lower type,

which looked still less spiritual and immortal. From this we go back to a still earlier type of man, so brutal and animal-like that the claim of a spiritual and immortal nature really begins to be grotesque. And, finally, we go back even beyond this type and we see the most primitive semblance of humanity merging into the “lower animal” type from which, you say, we are so glaringly different that you can claim for man the unique privilege of deathlessness.

...in other words, the one reason which most people have in their minds for claiming immortality is quite unsound. The ordinary and unanimous teaching of modern science has, I will not say undermined, but annihilated it.

But that is another story. For the moment our case is complete. Evolution makes the belief in an immortal soul improbable in the last degree. It does not disprove it. We do not attempt to prove negative statements. But, clearly, we now, in face of the general law of death and man’s continuity with the animals, demand very strong and clear proof of the religious claim.

But the religious person must think clearly what he is saying. When does he suppose that God created the immortal mind of man? He might as well put the great event in the Miocene Age, since there is no other time more suitable. Well, we are to see in the next chapter [of McCabe’s book] that there probably is no God to create a soul, but even granting that there is, the whole thing remains a painful mystery. Why create the soul millions of years before it can act? Why go on creating souls – for the only plausible theological theory is that the soul has to be created in each individual human being – during those millions of years of the lowest savagery? Not very plausible, is it?

It has always been an insoluble problem in religious philosophy how a spirit can act on or through matter. I do not want to press this, but the reader who is inclined to think that ‘God’ and ‘soul’ explain things ought to be reminded of it. No thinker who ever lived has given us the least plausible idea how spirit can act on or with matter. It merely introduces new mysteries instead of ‘explaining’ the mystery of thought.

So again, and for the third time, we have a reason for demanding that the proofs of the spirituality of the soul shall be particularly strong. There is a strong presumption against it: (1) because death is the rule of the universe, (2) because man’s mind is certainly evolved from a mind that is not spiritual and immortal, and (3) because it [the idea of ‘immortality’ of the soul] is unintelligible and creates more mysteries than it solves [i.e., it can be (and should be!) eliminated with Ockham’s razor].

By searching on the internet, you can find many more (and more recent) examples of decimating the idea of “immortal souls”. As two examples, I encourage you to peruse the writings of Keith Augustine,<sup>11</sup> particularly his

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<sup>11</sup> Listed at [http://www.infidels.org/library/modern/keith\\_augustine/](http://www.infidels.org/library/modern/keith_augustine/).

1997 essay entitled “The Case Against Immortality”,<sup>12</sup> and the 2007 essay (updated in 2010) by Vexen Crabtree entitled “Souls do not Exist”.<sup>13</sup> In addition, please consider the following quotation,<sup>14</sup> which was posted by “Q” at SciForums.com in a thread entitled “Arguments for the soul’s existence”, which, in turn, “Q” states was originally “a post written by a member long ago; Boris”, and to which I’ve made a few, minor grammatical changes. I think that the post is amazingly informative, especially for someone who knows essentially nothing about how brains work, e.g., me!

### **Argument from interaction**

Clearly, for a soul to have a meaningful connection to the body, it must be capable of interacting with matter. Yet, souls are defined as immaterial and not subject to the laws that govern matter. Hence, the paradox arises: by its definition, a soul must be both capable of interacting with matter, and not capable of interacting with matter. [As far as is known, paradoxes don’t exist.]

To elaborate, matter affects matter through interactions. For example, you can push a desk, or bludgeon a man, or dig a river. It is because matter is so “interactive”, that we can make measurements, conduct experiments, and observe phenomena associated with matter. The soul, on the other hand, is by definition immaterial. Hence, with our scientific instruments we cannot detect it. If we could detect it, we could then determine its properties and structure and we would be able to materially interact with it, which would make the soul material.

But that’s a funny thing, considering that the soul is supposed to interact with the body. After all, we are only aware of our world through our senses; and our conscious decisions directly translate into physical actions – e.g. if I wanted to clap my hands together, I could do it. So it seems that material information must have a way to enter the soul, and material information must have a way of emanating from the soul and traveling to the body.

The latter of these phenomena has a definite effect on the body, and hence must be indirectly detectable. This is because the body is indeed material, and any changes introduced within it are thus immediately detectable with proper instruments. Thus, were the soul to feed information back to the body, scientists ought to be able to find the spot where information from the soul enters the body for the first time. (Of course, despite centuries of searching, no such spot has been found.) But this again contradicts the notion that the soul is not detectable through material means (of course, this contradiction arises out of the already contradictory notion that the soul interacts with the body.)

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<sup>12</sup> Available at [http://www.infidels.org/library/modern/keith\\_augustine/immortality.html](http://www.infidels.org/library/modern/keith_augustine/immortality.html).

<sup>13</sup> Available at <http://www.humantruth.info/souls.html>.

<sup>14</sup> From <http://sciforums.com/showthread.php?t=54764>.

Then there is the question of the very mechanisms through which the exchange between the soul and the body takes place. By definition, a soul is 100% immaterial. On the other hand, the body is 100% material. How do we build a bridge between the two? Does there exist a “something” that is both partly material, and partly immaterial? But anything like that would not make sense, since the idealist concepts of matter vs. essence are incompatible.

Matter is temporary, while the soul is eternal. Matter is corrupt, while the soul is perfect. Matter possesses extension, density, mass, color, temperature, etc. – while the soul has none of those properties. Matter can be subdivided, yet the soul cannot. How can “something” exist that possesses a mix of these contradictory properties? How can something be corrupt and perfect at the same time? How can something be massive and massless, colorful and colorless, extended and shapeless? So it seems there is no reasonable way that the gap between the immaterial and the material can be crossed so as to enable the communication between the soul and the body.

To sum up, two distinct points are raised here: first, the definition of the soul and its relationship with the body are contradictory, and second, there is no satisfactory explanation of how the soul can exchange information with the body.

#### **Argument from neuroscience**

For the purposes of this argument, we must first determine that, of all the body parts, it is the brain that makes us who we are. After all, you can take a normal human, amputate all of her limbs, and she will still be defined as a human being. You can take a human being and cut out his heart, lungs, kidneys, bowels, etc. and he would still be a human being (for as long as surgical machines can do the work of the missing organs.) If you cut off somebody’s head, and somehow manage to keep it alive, then it’s the head we would point toward when we discuss that person; the headless body will no longer be ol’ Joe – since here’s ol’ Joe’s head that speaks in Joe’s voice and thinks and feels like Joe, and possesses all of Joe’s knowledge, etc. So, we can keep imaginatively (and nonchalantly) stripping Joe of body parts until only the brain is left floating in a jar. At this point, we can still safely point to the brain and say that it’s Joe; we can incinerate the other body parts, but as long as the brain is alive, Joe is alive too.

Incidentally, that’s why clinical death is defined as brain death. Any other failed organ can be replaced, at least in principle; however a brain cannot be replaced. Even if Joe clinically died, and you transplanted Brent’s brain into Joe’s skull, all you would have done is transplant Brent’s persona into Joe’s body; Joe would still be dead as a doornail.

Now then, it seems that the brain is the crucial part of us that makes us who we are. Incidentally, the brain also physically controls the body. If you want to bend a finger, a train of signals has to travel from your brain down your spinal cord and through your peripheral nervous system all the way to the muscles of that particular finger, so that they contract or expand so as to bend the finger in the way you wanted. If the

pathway between the brain and any particular part of the body is breached even at one spot, you will lose your control over that part of your body. Hence, the brain is not only the defining part of what it is to be human – it is also the part that actually controls the body! So, if the soul is to interact with the body, it's clear that the soul must interact with the brain.

But where in the brain does this interaction with the soul occur? It turns out that there is no possible answer. As you may or may not know, the brain can be crudely subdivided into an old brain and the new brain, the latter composed of the left and right cerebral hemispheres. The old brain consists basically of the brainstem, and in humans is more or less a mere interface between the new brain and the spinal cord, as far as cognitive function is concerned. This is not to say that the old brain is insignificant, since it contains physiologically crucial centers controlling everything from heart beats to breathing to sleep-wake cycles. However, it is the new brain that is responsible for any behavior that we would consider above comatose. The new brain possesses vast tracts processing and combining information from the five senses, it possesses structures that plan, initiate, and control movement, it possesses structures responsible for emotions, it possesses structures involved in memory, attention, spatial navigation, object recognition, production, perception, and comprehension of speech, etc, etc, etc. In fact, brain damage studies show that every last bit of the new brain in adult humans is involved in at least one, and often several, cognitive tasks. So, it would seem that the soul must be in contact with the entire brain if it was to account for all of our human faculties. However, this does not hold when we consider abnormal physiology.

Certain birth defects cause some children to be born with only one cerebral hemisphere; other children lose a hemisphere to surgical intervention very early in life. Despite the fact that for an adult to lose a hemisphere would be absolutely devastating in terms of loss of function and aspects of personality, these children grow up to be nearly normal in all respects. This is just one example where the amazing plasticity of the brain shows itself in full glory. Thing is, the plasticity is lost early in life as the brain becomes increasingly organized, since for a highly structured brain, plastic change would actually mean loss of function rather than gain. Yet, the very fact that people are alive who function normally with only one hemisphere (and a brain that is organized vastly differently!), as opposed to the “normal” people who have two hemispheres and a totally different brain organization – poses difficulties for any proposed mechanism of interaction between the soul and the brain. Already, it would seem that the mechanism is not dependent on the soul, but must adapt to the developing brain on-the-go, so as to connect the soul to the brain correctly, whatever the final architecture of the adult brain may be.

The functional portion of the brain is composed of vast and very complex networks of a total adult average of 10,000,000,000 special cells called neurons (the bodies of these cells contain pigment and are often collectively referred to as “gray matter”). Each neuron sends out slender connections to other neurons, and an average neuron is connected to about 10,000 others (these interconnection fibers are wrapped in other

special cells that form an electrical insulation around these “wires”; as a result, the connections look white to the eye, and en masse are referred to as “white matter”). Of course, there are trillions of other cells in the brain besides neurons, which compose blood vessels, provide insulation and scaffolding for the connections between neurons, nourish neurons and clean up their waste, fight invading pathogens, etc. – but neurons are what actually do all the work of cognition.

Neurons work by sending electrical impulses to other neurons, and accepting similar messages. Without going into too much gory detail, the effect of the messages on any particular neuron is mediated by a slew of factors from the actual chemicals used to pass the message between neurons, to the actual characteristics of the voltage signals that neurons send to each other. But the great and overriding point here is that neurons are literally billions of independent cells, communicating among each other, and every now and then sending impulses through your peripheral nervous system to affect what your body does. It seems that to control the body, the soul would have to connect individually to every last neuron in the brain and control what it does.

But neurons die all the time, and new neurons are born also (although at a much slower rate.) Furthermore, the actual connections between neurons change constantly, and so the role any particular neuron plays in the overall function of the brain varies with time. So, how does the soul know what each neuron’s current function is? Additionally, it seems that scientists can predict neuronal behavior precisely, based purely on the electrochemical impulses it is receiving from other neurons. So, it appears that there is no mysterious soul behind the curtains telling this neuron to fire and that one to hold off once every millisecond; behavior of neurons is determined exactly by the input they receive from other neurons. And some of those other neurons receive a lot of their input from sensory organs, such as the pressure, pain, temperature, etc. (in other words, somatosensory) receptors on your skin and other organs, or from your eyes, ears, nose, or tongue, or from the vestibular apparatus in your inner ear, etc. So, it seems that the brain is a deterministic machine that is driven by inputs from its environment. And all of those receptors and organs have also been studied in detail, and found to be purely biochemical and physically deterministic. There is no place left for the soul to operate!

There is no end to the problems that neuropathology brings for the soul, and I am not going to attempt to list even a small portion of such problems. However, I already mentioned the conundrum posed by neural plasticity. I’ll present just one more “problem”, and then move on to the next argument.

The problem has to do with the split-brain patients. Some people are subject to debilitating seizures, which are uncontrollable through drugs. A seizure is really a runaway chain reaction where a bunch of neurons starts firing chaotically, and the chaos spreads across the cortex, disrupting any cognitive function in its wake. Seizures can sometimes be combated through drugs, which help regulate neuronal activity and stop it from crossing a vital threshold above which it spins out of control. Newer methods include electrodes implanted directly into the particular brain region

where seizures originate, so that an implanted computer can detect an onset of the seizure and apply a mild electric current between electrodes, which in effect “resets” the surrounding neural tissue and stops a seizure in its tracks.

However, a while ago such advanced treatments were not available, and in extremely debilitating cases, the only recourse was surgery. Most often, the small brain region where seizures originate was surgically removed (the mild loss in cognitive function was a small price to pay for the freedom from frequent seizures, and was especially tolerable for children whose brains are still plastic enough to compensate for the injury). However, in a few cases the offending region was crucial to certain treasured faculties, such as for example production or comprehension of speech, or control of posture. In other cases the offending region was just too large. In these cases, the surgeons did the next best thing to excising the part of the brain – they selectively cut some of the connections between this brain part and other parts of the brain, so the seizures would only occur locally and would not spread.

Seizures can occur in relatively localized regions of the cortex, but for some unfortunate people they occur globally, spreading from one hemisphere to the other like wildfire. In these cases, where excision was not an option, surgeons used to sever the huge bundle of fibers (called “corpus callosum”) that connects the right hemisphere with the left. The corpus callosum is the major connection between the hemispheres, and although there are other small communication channels via which certain parts of the two hemispheres exchange information, when the corpus callosum is severed for all practical purposes the hemispheres are cut off from each other. For this reason, the patients that underwent this type of surgery came to be known as split-brain patients. And they permanently exhibit the weirdest behaviors. They really do have two separate, almost independent brains in their skull. Most of the time, the brains coexist peacefully. However, sometimes they don’t agree with each other and the results can range from comic to absurd to horrible.

Because of the way the brain is wired up to the body, each hemisphere controls the opposite half of the body. So, the right hemisphere controls the left arm, leg, etc., while the left hemisphere controls the right half. One patient had a problem with his left hemisphere: apparently, it just couldn’t stand his wife. At the mere sight of his spouse, his right hand would immediately form a fist, his right leg start making valiant attempts to get the body closer to the wife, and his right arm start violently swinging at the wife with a clear intent to do damage. With his left leg he would fight his right leg, and with his left hand try to restrain his right hand, all the while displaying a grimace of rage on the right side of his face while the left side of the face expressed clear alarm and distress.

Another lady had an even more serious problem, with the two halves of her body engaging in a vicious feud. She literally beat herself up, tried to choke herself in her sleep, tore her own hair out, and all of that occurred in the context of the right side of her body doing damage to the left side, and *vice versa*.

Fortunately, such horrible side effects tend to mellow out as time passes, but the patients never return to normal – to the end of their lives, they literally remain split in half. Yet, if a single, indivisible, unified soul was controlling the brain, then surely cutting the link between the hemispheres would not preclude them from functioning in harmony! At the very least, they shouldn't be trying to kill each other! But contrary to all common sense as we used to know it, the two hemispheres literally turn into two distinct personalities. Each of them is capable of independent emotion, independent knowledge, and independent interaction with the world. For example, questions can be asked of the right hemisphere, and it will answer them (though not verbally, because in most people the right hemisphere is incapable of language) – but the left, verbal, hemisphere will never know about either the questions or the answers, and will in fact tell you so when asked.

Even more poignantly, the right hemisphere possesses knowledge that the left hemisphere doesn't, and *vice versa*. Both hemispheres exhibit structured thought and problem solving abilities, independent of each other. Both of them express feelings and emotions, again independently of each other. Each has its own stream of consciousness, again independent of the other hemisphere. So indeed, the two hemispheres are in most respects separate, distinct, independent human beings! Yet, they originally only had one soul. How would the doctrine of souls explain such a phenomenon?

Yet another difficulty lies in the transfer of memory or knowledge between the brain and the soul. For example, you might remember what you did during the last Christmas, and when asked you would tell us a story describing what happened. This process of recalling facts and then verbalizing them involves many crucial faculties that are just about as central to our stream of consciousness as anything – so, presumably at least a large part of the process occurs in the soul and not in the physical brain. However, it is well known that the brain contains certain regions specifically dedicated to memory. When these regions are damaged, the result is amnesia – loss of memory – despite the fact that all other cognitive functions remain intact.

Now, what happens when an amnesic is asked to describe something they knew prior to the brain damage, but of which they now have no recollection? The request gets correctly processed and understood by the subject, as can be verified by questioning him about it. Presumably, such higher understanding resides in the soul, so the soul indeed knows what is being asked. The patient is also perfectly able to verbalize other facts, and to tell stories not connected to the particular lost memory – so, these faculties are preserved as well. Therefore, if the soul still retains the memory whose representation is lost in the physical brain, it should have no problem verbalizing that memory and telling stories about it, and thus in fact amnesia would never even be observed!

Yet, amnesia is real and very predictable based on which regions of the brain are damaged. So, it seems that destroying a part of the physical brain utterly destroys the

memories it used to help encode. This means that the soul does not possess memory; memory is purely a property of the brain. Which means that when the brain dies, all memories die with it. Which means that the entire personality dies with the brain, since memory includes, in addition to explicit facts, everything from learned skills such as language, coordinated movement, or art, to such things as preferences, attitudes, beliefs, etc. Which comes into a huge clash with all the claims of afterlife where the souls are supposed to retain memory of earthly existence and even maintain their pre-death personality.

### **Argument from neuropsychology**

This gets to the reason why we conjecture the existence of the soul in the first place. In the old times, when people knew very little about the nature of life or cognition, it baffled them that certain objects were indeed alive, and other weren't. It baffled people even more why certain living creatures, such as humans, have civilizations, art, language, religion, etc. while other living creatures have none of the above. People also wondered what happened to them when they slept, as they often seemed to depart the regular world for other bizarre realities, inhabit bodies other than their own regular body, fly, and do all sorts of amazing things that other normal things just aren't seen to be doing.

And then, people wondered what it would feel like to die, and what happens to their friends and family once their bodies are destroyed, and they also wondered where their stream of consciousness came from, and how come they can't remember anything prior to their early childhood. Thus came around suggestions that what all life has is something special, some kind of a "living essence" that separates it from non-life. You will find that particular idea in every single culture that ever existed, which goes to show just how natural such a conjecture is, and how easily it arises. It may have been a reasonable suggestion, until relatively recently when science began to unravel the true mechanisms of life and cognition.

Today, we know that the simplest forms of life contain no "living essence" at all – they are merely very complicated chemical structures that are able to obtain energy and material from their environment, and to reproduce themselves. Thus, in one deft blow the pre-existing void between matter and essence is bridged. It stands to reason that, if unicellular life does not possess a soul, the same holds for multi-cellular life – since multi-cellular organisms are nothing more than intricately organized and coordinated colonies of single specialized cells.

But what of the stream of consciousness, the emotions, the awareness, the sensations, the knowledge, the reasoning power that we all possess as humans? How do all of these weird qualities derive from mere cells? Well, the answer has not yet been entirely completed, and I personally hope to play a part in completing it. But the beta version goes something like this.

In what may at first glance appear to be a grotesquely oversimplified analogy, consider modern computers. What you see on your screen is a pretty complex visual

image representing an attempt at a simple, elegant, and easy to comprehend User Interface (UI). Behind that interface lies complex functionality that enables you to create documents, exchange information with other people, play games, create art, listen to music, render computer movies, simulate collisions of galaxies, analyze data, design other computers, and in general do an amazing variety of things. Most of those applications depend on arcane algorithms and complex protocols to work, of which you as a user have no knowledge or comprehension; all you work with is a friendly (or at least not so arcane as the source code) UI, which abstracts you away from all the hair-raising complexity that dwells on your CD-ROMs and inside your particular beige box.

The brain presents a somewhat analogous picture. What we observe is the outside, equipped with a “user interface” consisting of the body. We can interact with the body, we can communicate through it to the brain, and receive replies from the brain through the body. In essence, the body abstracts the brain from us, and as generic “users”, we are not aware of how exactly the brain does what it does – nor do we particularly care, as long as the brain does its job, and does it well.

However, the analogy with computers is not complete, since whereas with computers we at least have engineers and programmers who understand exactly how the computer does the things it does, with the brain, at least at the outset, we possess no such knowledge. Thus, the problem of figuring out how the brain works can be compared to the following hypothetical situation: imagine that the enlightened ancient Greeks happen to chance on a complete modern computer system, loaded with all the software, connected to an uninterruptible power supply that will last for decades, and programmed so that its user interface is in ancient Greek (so they can at least partially decipher what it is that it does).

Now imagine just how hard it would have been for the poor Greeks to figure out how all that graphical splendor and functionality arises from that box cluttered with weird metallic and non-metallic parts. Heck, they’d have to develop the theory of quantum mechanics before they could understand how a single transistor works, and they’d have to develop ultra-powerful microscopes to even find those transistors. They’d have to develop an entire theory of computation before they could understand how the mysterious box is able to exhibit such strangely life-like interactivity. Then, they would have to reverse-engineer all the circuits of the computer, and understand exactly how they interact and tie together into a working system. Then, they’d have to reverse-engineer all the binary machine code on the computer’s hard drive, and determine how it affects the CPU and other components to do the things that they do when various programs are run. Then they’d have to find ways to de-compile the machine code into a human-readable language, so that they may finally understand how the programs are put together, and how they work. Only then will they finally understand that the computer is not a magic or cursed item, that it is not a living organism or a gateway into another dimension, that it is not a God in disguise and not a fundamental key to all creation – but that it is what it is: a machine that processes information according to certain pre-set algorithms.

An equivalent claim is made for the brain: it is a machine that processes information according to certain pre-set algorithms. And we face a horrendous task of reverse-engineering the brain in order to understand it, in a way very similar to the plight of the unfortunate ancient Greeks. Only, the brain is even more daunting than the most complicated computer in existence. It sports an equivalent of 10,000,000,000 processors interconnected in complicated ways, all working simultaneously at 50 Hz in a cacophony of communication. It is fluid, and constantly changes its very structure. It computes not only with electricity, but also in a large way with biochemistry, which makes the behavior of its individual CPUs much more complicated to unravel than the behavior of a typical circuit. It is inexorably tied to the body throughout its development and function, and so to understand the brain we must also understand the workings of the body in all of their intricate detail. The brain is shaped by genetics as well as sensory and chemical input as it develops and matures, so we must understand all of those processes with a high degree of confidence and in great detail over time spans lasting well over a decade from birth to maturity – if we are to understand how the brain acquires its structure and generates its circuits.

And then, once we unravel the story of the hardware, we must understand how it translates into the actual behaviors that we observe – in essence, we then must reverse-engineer the brain's algorithms and put them into plain English before we ever hope to claim that we completely understand how the brain works. The task is clearly not for the weak of heart. In fact, it can be argued that unraveling the human brain is among the few most difficult challenges science has ever faced. And the task will clearly take at least decades, if not centuries, to complete. But we are already making the first brave steps, and so far, we have learned enough to very crudely describe what lies behind our various and wonderful cognitive powers.

In the course of our studies, we have localized regions of the brain, or “nuclei”, that either by themselves or in concert with other nuclei directly correspond to various human faculties. For example, there is a clearly defined subsystem in the brain that is linked to emotion. Lesioning the limbic system will turn a person into an automaton incapable of generating or expressing absolutely any kind of affection for anything. Such patients even talk in rhythmically perfect monotone, like robots from cheap sci-fi flicks.

As another example, the memory subsystem has been located in another brain structure, the hippocampus and the parahippocampal and entorhinal cortex regions. Damage to these areas predictably results in various forms of amnesia, with the exact symptomology dependent upon exactly which parts of the system were damaged, and how extensively.

As another example, take the ability to understand spoken speech. This capacity is at least in part dependent on a part of the cortex called Wernicke's area, damage to which instantly turns the speech a patient hears into meaningless gibberish, and has

the same effect on the speech actually produced by the person (though they are not aware that they make no sense to the others; in fact they are usually quite distressed at the fact that the others are talking gibberish and can't understand what the patient is saying).

Amazingly enough, in a fully organized adult brain there even are regions devoted specifically to reading written text, or specifically to writing text. Damage to these regions results in strange symptomology, such as for example a person being able to read, but no longer able to write, or being able to write, but not being able to read back what they just wrote. Such study of neural pathology has produced an innumerable flood of findings like these, and the deluge has yet to show signs of subsiding.

Additionally, computational modeling and animal research have been providing insights into other crucial powers of cognition. For example, the faculty of vision has been, is, and will be studied with utmost intensity. As examples, we have discovered cells in the brain that respond to lines of various orientations in the visual field, or variously oriented and scaled gratings of alternating light and dark regions; we have found cells in the visual cortex that respond to local motion in a certain direction, or to a contraction or expansion of the local texture (indicating approaching or receding objects); we have found cells higher up in the processing hierarchy that combine those basic features into more complex items, such as corner, or circle, or crosshatch patterns, and we've found cells yet higher up that respond to entire objects only of a certain type, such as faces for example. We've tentatively begun to trace the diverging pathways in the visual processing stream, where one pathway specializes in recognizing objects, while the other pathway specializes in determining the location of objects in space around the observer, or the observer's relative coordinates with respect to objects. We are currently constructing rather successful computational models of how rats tell where they are, based exclusively on the rat neurophysiology and actual electrical recordings from individual cells in rat brains. We have constructed a very successful neuro-computational explanation of how barn owls determine the direction of the sounds they hear.

People are digging in on all levels, from planning, coordination, and initiation of motion, to hearing, somatosensory perception, mastication, memory, emotion, mechanisms of attention, to cognitive and neurobiological development, to language, etc, etc, etc. Slowly but surely, the brain's enigma is giving way and grudgingly surrendering territory. And absolutely at no point anywhere within this extensive and burgeoning research field has any research group ever found even a remotest hint of anything supernatural.

But what we actually do, at this time, know about the link between brain and cognition – is that the various cognitive faculties that in the past could not even be imagined to stem from mere matter, derive from specific regions in the brain, and the relationships between these brain regions and how linked regions combine to create cognition, are very physical and well-defined indeed. Additionally, severe damage to

a brain region (in adults) connected to some cognitive ability completely and permanently destroys that ability; no hint of its past existence can be recovered through the use of other faculties, as should have been the case if the “lost” faculty actually resided in the soul.

### **Argument from evolution**

Well, this one’s short and sweet, and will work against only a narrowed selection of various doctrines. It basically says that, since simple life forms obviously don’t have souls, and we are merely evolved forms of the same thing, then surely we don’t have souls either. At a deeper level, the argument challenges the believer to define at which point living beings acquire souls. Do only humans have souls? But then you have problems with primates, since they are so incredibly similar to us both physically and behaviorally. Do only primates have souls? But then you have a problem with the simians, since monkeys are so similar to apes both physically and behaviorally. Do only primates and simians have souls? But then you have a problem with the prosimians, etc., etc. Eventually, you are forced to retreat to a generalization over all mammals, then over all animals, and finally over all life – at which point you arrive at a stark contradiction with a clearly observable fact – that the lowest forms of life don’t have souls.

### **Argument from development**

This is somewhat similar to the argument from evolution. Here, you are challenged to define just at what point during development a human acquires a soul. It couldn’t be at the point of egg fertilization, since at that time, everything is still purely biochemical and the fertilized embryo has no properties normally associated with a soul. It couldn’t be during early embryonic development, since an early human embryo is anatomically and functionally indistinguishable even from fish embryos. So when is it that a human acquires a soul? The answer to that question is impossible similarly to how it is impossible to define a cutoff across different lifeforms – because just as the spectrum of lifeforms on earth is fairly continuous in terms of their capabilities, form and function, the development of an embryo is similarly continuous. At no point during development does the embryo suddenly make a quantum leap and exhibits some feature it didn’t have a second ago. This continuity makes it impossible to define a cutoff at which the soul definitely must be there. From another (and more mathematical) perspective, since a fertilized egg has no soul, then by induction over this smooth continuum of development we arrive at the conclusion that even a fully developed adult human doesn’t have a soul.

### **Argument from objectivity**

This calls into question the very need to have a concept of souls or afterlife. Neither are objective, in that neither are tangible, measurable, or independent of observer (e.g., neither can be detected by “brainless”, mechanical scientific instruments that don’t have a propensity for misinterpreting things like humans do). Neither can be tested; neither provides any tangible evidence for its existence. In fact, if one starts out with a (still futuristic) complete physical explanation of cognition, then one is not going to be likely to conjecture the existence of souls or afterlife – simply because

there would be no remaining evidence available that would prompt such a conjecture. Hence, objectively, the theories of “vital essence”, or souls, or afterlife are outdated and superceded by modern science. Therefore, as any invalidated theory should, the ideas of soul or afterlife properly belong in the history books, but no longer in the domain of serious discourse.

### **Argument from equivalence**

This is where we assume that the brain has, at some point in the future, been scientifically unraveled to the point that absolutely everything is known, understood, and explained about its form and function. Then, we can imagine that the scientists of the future endeavor to replicate a complete human brain, but not in flesh in blood, but as a program running in some blindingly powerful supercomputer. The brain is simulated down to the last atom, complete with information input from simulated eyes that mimic human eyes, and simulated ears that mimic human ears, and all other sensory modalities equally well implemented, with a simulated body providing feedback to the brain, and a simulated ultra-detailed environment for that body to roam and interact with. Because the simulation replicates the function of a real human brain to the last detail, and it replicates a realistic environment for that simulated brain to mature in, the simulated human will certainly develop its own conscious stream of awareness, learn the details and workings of its environment, exhibit emotions, intelligence, sensations – it will be altogether equivalent in all of its functions to an actual physical human.

But it is painfully obvious that the simulated human does not have a soul, because in reality, he is nothing but a pattern of bits in the memory banks of our supercomputer. Ironically, if we were to simulate not one such human, but an entire tribe living in some virtual jungle, and allow the simulation to progress across many generations, the humans will develop language, culture, and even religion, and likely one of their first metaphysical conjectures will have to do with the fundamental distinction between life and nonlife – the “vital essence”.

In later chapters, I’ll show you more logical fallacies, including some notorious errors committed by some of the most brilliant and most famous people known. For now, “all” that I hope you see is how astoundingly easy it is to make logical errors and, therefore, the paramount importance of application of the scientific method, which starts from reliable data, e.g., the data showing that exercise is good for you!