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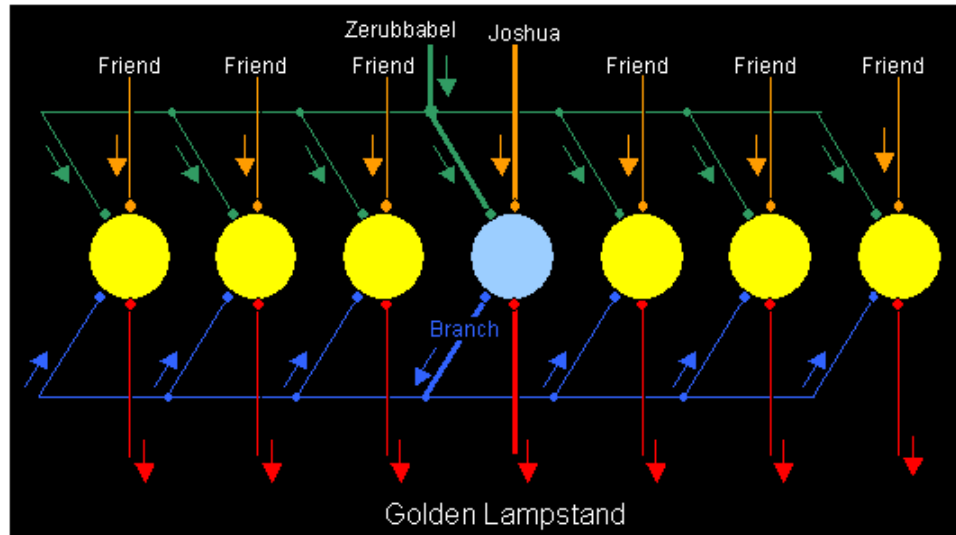
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Action Selection

# Artificial Intelligence From the Bible!

## The Shocking Revelation



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### Hiding Sacred Knowledge in Plain Sight

The ruling classes of many ancient civilizations had a way of using metaphors to record the sacred knowledge. To the casual reader, a sacred text might look like a collection of fables or poems, but to the initiate, the hidden meaning was immediately apparent. Symbolic encodement was known to have been practiced in the ancient Sumerian, Babylonian, Egyptian and Greek eras. It was even used by the Mayans, a new world civilization which is not known to have been culturally connected with the old. The Mayan priesthood devised ingenious tales about mythical battles to encode its sophisticated knowledge of astronomy (see the work of the late great archaeologist/anthropologist [Linda Schele](#) for more on [Mayan symbology](#)). There are good reasons to suspect that many of the well-known myths of antiquity are not myths at all, but carefully compiled records of sacred knowledge. Sir Isaac Newton (see [news article](#)) and other renowned philosophers of his day, including his nemesis, Gottfried Leibniz, were convinced that almost all Greek and Roman myths were allegorical recipes for secret knowledge.

The above strongly suggests that these ancient keepers of knowledge--at least the ones who came about from history--somehow inherited their record keeping practices from an even more authoritative source. The question is: who was this ancient source?

"The greatest thing by far is to be a master of metaphor. It is a sign of genius, since a good metaphor implies an intuitive perception of the similarity in dissimilars."

"Metaphor is the application of an alien name by transference either from genus to species; from species to genus, or from species to species, or by analogy, that is, proportion."

Aristotle, *Poetics*.

## Biblical Symbolism

In these pages, I will examine various passages of the books of [Zechariah](#) (old testament) and [Revelation](#) (new testament). [Revelation](#) is widely understood to be a purely allegorical text written some time around A.D. 95 on the Greek Island of Patmos by a Christian Jew named John, who was, many believe, one of the original twelve disciples of Jesus of Nazareth. John's vision in which he is told to write a short cryptic message to each of seven churches: Ephesus, Smyrna, Pergamum, Thyatira, Sardis, Philadelphia and Laodicea. These were among the most prominent Christian Jewish churches which existed in Asia Minor (modern day Turkey) at the time.

The book of Zechariah was written around 520 B.C., more than six centuries before Revelation. In the first part of his book, Zechariah describes a vision which is directly related to three of the churches mentioned in Revelation: Pergamum, Thyatira and Sardis. Revelation and the book of Zechariah seem to be alluding to the seven-lamp lampstand (candelabrum or menorah) that God commanded Moses to build for the tabernacle (see [Exodus 25:31-40](#)).

I will argue that the messages to the seven churches of Asia are a detailed metaphorical description of the organization and operation of the brain. I will further argue that the golden lampstand (Jewish menorah) symbolizes a seven-node sequence in brain memory.

## Decoding the Riddle of the Seven Churches

Many people have said and written many things about the seven churches of Asia through the centuries but all seem to have missed the mark. When interpreting any part of the book of Revelation, it is necessary to keep in mind a most important caveat: unless indicated otherwise, the stories and imagery were not meant to be taken literally. They were intended to be purely symbolic. While appearing at first glance to be a divine admonition to a handful of struggling 1st century Christian churches, the text is actually describing something else altogether. In other words, the message is not really about churches, angels, stars, lampstands, flaming eyes, feet, double-edged swords, fornication, or idolatry. These are mere symbols, the true meaning of which has remained hidden until now.

Finding the correct key to the riddle requires an open mind free of preconceptions. The interpreter should have some prior familiarity with the hidden subject even though he or she may not know what the subject is beforehand. This is essential in order to discern one or more of the analogies used in the text. It is also a good idea to identify the target audience. As I explain elsewhere ([history](#)), the text of the seven churches was not written for the benefit of John's contemporaries. On the contrary, it was meant for our current age, the age of computers and scientific enlightenment. The key to decoding the riddle of the seven churches is in knowing what the subject matter is. Once the subject is known, then it is just a matter of time before all the pieces of the puzzle begin to fit together into a meaningful and coherent whole. If any of the pieces do not fit, that is to say, if the chosen key does not lead to a fully coherent picture, then it is the wrong key.

## The Surprising Answer

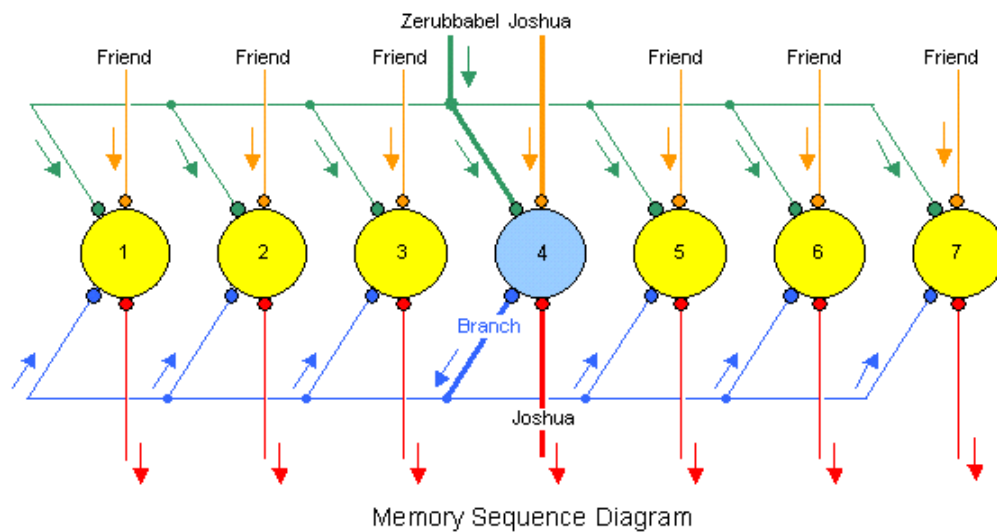
The true meaning of the churches will come as a shock to many, especially to members of the scientific community. As incredible as it may sound, the message of the seven churches is a symbolic description of the principles that govern the operation of the brain! Each church represents a major cell assembly or subnetwork in the central nervous system, each with its own unique function and operating principle. The following table lists the corresponding functions

cell assembly (or network) of each church ([Predictions](#)):

Verses	Church	Function	Neural Cell Assem
2: 1-7	<a href="#">Ephesus</a>	Signal Separation & Feedback Network	Sensory Cortex
2: 8-11	<a href="#">Smyrna</a>	Signal Fusion Network	Temporal/Association Cc
2: 12-17	<a href="#">Pergamum</a>	Speech Control Network	Broca's Area
2: 18-29	<a href="#">Thyatira</a>	Motivation/Motor Control Network	Amygdala/Motor Cortex
3: 1-6	<a href="#">Sardis</a>	STM/LTM/Attention Network	Hippocampus
3: 7-13	<a href="#">Philadelphia</a>	Motor and Conflict Detection Network	Basal Ganglia
3: 14-22	<a href="#">Laodicea</a>	Supervised Motor Network	Cerebellum

**Note:** Pergamum, Thyatira and Sardis are all involved with attention and action selection. In addition to giving the function of each assembly, the text also describes in symbolic language interconnection pathways between them. It is important to realize that the seven churches represent only one side of the brain, the left hemisphere. This is the hemisphere that controls the right hand side of the body and speech generation. The interconnection [pathways](#) and relationships between hemispheres are also given symbolically. This is explained in greater detail elsewhere.

To give the reader a sense of the high level of detail that can be decoded from the symbols here is a diagram of a seven-node memory sequence which is an interpretation of Zechariah's vision of the golden lampstand (Zechariah 4):



### The Animal Project

The experimental setup that I use for my research project is a chess learning program called [Animal](#). Chess is a complex enough causal environment that can be easily simulated on a computer without much expense in time and money. A neural network that can learn to play chess from scratch through trial and error would certainly be proof of intelligence.

Animal is not a typical chess program. There is no look-ahead tree-searching algorithm. Animal does not generate millions of moves like IBM's famous Deep Blue supercomputer. It learns much the same way a human being does, that is, by sensing and interacting with its environment through trial and error.

I started working on Animal (around 1995; see [history](#)) years before I formulated my biblical hypothesis. As I get more and more confident about the accuracy of my interpretation of the biblical metaphors, I will incorporate my findings into it. I hope to have it learn the game of chess on its own, including the rules of play. If my hypothesis is correct, there is no limit to how competent the program can be at playing chess.

## Naked Emperors

Assuming, for the sake of argument, that my hypothesis is correct (there is no doubt in my mind at this point), and given the low level of scientific understanding at the time, how could John or any of his contemporaries have known about the workings of the human brain? The answer is obvious: They could not. John only claims that he had a vision in which he was directed to write down what he heard and saw. Considering the truly fantastic nature of the revelation, the date of the publication and the enormous impact that AI is bound to have on the world, is there any reason to doubt his claim? By the same token, given that Revelation makes numerous references to both old and new testament scriptures, should we not take a closer look at these biblical texts? How many more surprises are there? What lessons are we to learn from it? Knowing what I know about other biblical symbolic passages, I am willing to stick my neck out and make the following prediction:

**The most revolutionary scientific advances in this century will come from the Bible!**

There is no doubt that the discovery of AI, one of the most coveted holy grails of modern science, will be shocking news in its own right. The notion that the secret of AI was written down in the Bible nearly two thousand years ago is bound to ruffle many a scientific feather. And that the biblical question should turn out to be the Bible (of all things!) will be more than many can bear. Why not the Koran? Why not the Vedic scriptures? Why did not the secret of AI come from Buddhism or Hinduism or some other religion? Most important of all, why did it not come from the scientific community seeing that they are all so quick to discredit the scientific importance of just the Bible, but all ancient scriptures? Certainly there will be those who will decide to hang on to their obsolete views at all costs. But to those of us with an honest and rational mind, it is clear that humanity's accumulated body of knowledge, especially its understanding of its origin and purpose in the universe, is in for a radical if not painful revision. Inevitably, many cherished paradigms will be discredited.

## The Age of the Super Intelligent Machine

The brain is a composite network consisting of a number of tightly integrated subnetworks or cell assemblies. As mentioned previously, each of the seven churches represents a cell assembly (subnetwork) in the brain. In turn, each cell assembly has a unique function and architecture and performs a specific signal processing task which is essential to the functioning of the system as a whole. Using this knowledge, it is possible to endow a machine with the ability to learn from its environment and attain sophisticated behavioral and reasoning skills, very much like a human being.

Intelligent machines will run the gamut from self-piloting ground and air vehicles to highly advanced robotic systems. They will become proficient in every human field of knowledge and expertise. There will be robot doctors, nurses, engineers, technicians, scientists, chefs, soldiers, historians, construction workers, farmers, architects, store managers, investment advisors, language interpreters, gardeners, housekeepers, landscapers, factory workers and many more. They will come in all shapes, sizes and specialties. Some will move about on wheels, some will have arms and others will sport multiple legs and arms and various other appendages. Many will interact directly with humans while others will remain hidden from view most of the time, coming out only to perform their chores quietly when no humans are in sight. Some will not move at all, as their function will be to search the internet and databases for new knowledge. But this is just the tip of the iceberg because, for the first time in recorded history, humanity is in a position to build machines that are so powerful, that their intelligence will surpass that of the smartest human beings on earth! And contrary to what some experts may suppose, it can be done now, using existing computer technology. Where will this road take us? It is anyone's guess. But this is undoubtedly the beginning of the age of the super intelligent machine.

## The Quickening

We are about to witness a very rapid transformation of all sectors (religious, economic, social, political and environmental) of human society. Here are some of the reasons:



- The realization that the secret of intelligence was in the Bible all along will ripple through

- scientific and religious worlds like a shock wave.
- ⊕ Immediately thereafter there will be a feeding frenzy, as governments, corporations even individuals compete to be the first to take advantage of the new science.
- ⊕ Intelligent machines will learn at a much quicker pace than either humans or animals.
- ⊕ Robot factories will be designed, built and operated by the robots themselves.
- ⊕ Only a relatively small number of intelligent machines will need to be trained from the ground up. The others will be copies of the originals.

Remark that the most complex part of an intelligent machine will be its brain. But a machine brain is, after all, just software and most of us know how easy it is to copy software. The creation of one robotic cook will engender untold numbers of equally capable robotic cooks. Intelligent robots will be manufactured, fully trained, by the millions. It will be the first time in the history of the world that skills and expertise which normally take a lifetime to acquire, are duplicated instantly. The movable press introduced the concept of cheap mass-produced information in the world. This gave rise to widespread literacy, the industrial revolution and the present information age. Now imagine a world of cheap mass-produced intelligence!

### **Doomsday vs. Utopia**

The impact that the introduction of AI will have on the world will be profound. But does it have to be catastrophic, as so many have predicted? Certainly there are dangers but it all depends on the choices we make. I often come across the assertion that intelligent machines will advance to a point where they will rebel against their human masters. The underlying assumption is that intelligence implies a necessity or desire to dominate and enslave others. This assumption is false. Intelligence (reason) with motivation (emotions). The truth is that reason is always at the helm of emotion. No intelligence can behave in a manner which is inconsistent with its condition. In other words, to say, no intelligent system, artificial or otherwise, can rebel against its own internal motivation. This is always true, regardless of how intelligent the system is. Certainly an intelligent machine may intentionally hurt a human being, but only if it was conditioned to do so. It is up to us to impart the right motivational values to our synthetic intelligences. If properly motivated, they will serve us to the best of their abilities, regardless of how smart they are.

On another tangent, consider that skilled labor and intellectual expertise will become very scarce very fast, throwing an increasingly vast percentage of humanity into unemployment. It is not just gardeners, housekeepers and factory workers who will lose their jobs but also scientists, engineers, lawyers, accountants, chief executive officers and other professionals. True AI will mean the end of work as we know it. Will we be ready? Can our current economic systems handle a new laborless economy? Obviously neither capitalism nor communism will do since they are based on human labor. Will we take the necessary measures to change to a better system or will we plunge headlong into a global Orwellian nightmare? Here is a hint: The solutions to all our problems can all be found in the same book where the secret of intelligence came from.

It has been said that AI is the ultimate invention, i.e., the invention to end all inventions. I can envision a golden age in which humanity's every need and desire are met by legions of intelligent and benevolent synthetic servants. And why not? The development of truly intelligent machines can certainly bring about an age of plenty and careless living for all. Furthermore, super-intelligent machines will be hard at work searching for solutions to some of the world's most pressing problems. However, the road to utopia will be filled with potholes and populated with monsters. The warning is loud and clear: proceed with caution, and pay attention to the road signs. We have a simple choice: doomsday or utopia. Will we heed the message?

### **Science and Intelligence**

It cannot be said that the scientific community is clueless with regard to intelligence. Certainly there is a lot of cluelessness out there, especially in the GOFAI (good old-fashioned AI) community, but a few scientists seem to have grasped a number of important aspects of the brain's operation. Psychologists, in particular, have made giant strides in their understanding of human and animal behavior. I recently read a surprisingly insightful [paper](#) (PDF format) by [Alexander Riegler](#) titled "The Role of Anticipation in Cognition." Riegler methodically and

mercilessly demolishes what he calls "the standard definition of anticipatory systems" according to which "anticipation is based on a predictive model of the system itself and its environment" and goes on to write about the concept of "operationally closed systems" which he defines thus: "operational closure of the nervous system means that it is a self-referring system which operates on its own states. Nervous signals are unspecific, e.g., visual stimuli produces the same kind of internal signals as tactile ones." This is right on the money.

Another thing that caught my attention in the same paper, is what Riegler calls the "canalization" of sensory-motor behavior. Essentially, the brain uses a mechanism of action selection where once a particular behavior is selected, all unrelated sensory and perceptual pathways are pathologically locked out. This allows an intelligent organism to focus on one task at a time. As Riegler explains, this can lead to odd behaviors in some animals such as snakes and geese. This fits rather well with the symbolic meaning of the key of David mentioned in the message to the church of Philadelphia.

Riegler's stance is in sharp contrast to that of the AI community. Contrary to what many AI researchers have preached (and continue to preach as I write) over the last fifty years or so, intelligence and reasoning are not the result of symbol processing. Intelligence is strictly a signal-processing phenomenon. It is all about the relative timing of unnamed signals and how that timing is used to block or route signals through specific pathways.

Riegler's work on anticipation and attention, one of the most important aspects of intelligence, is brilliant. But he is not alone. Psychology is a fertile ground where passionate researchers continually create new models with which to explain subtle and not so subtle aspects of human behavior. However, there are so many possible avenues of inquiry that a fully coherent picture that combines all aspects of intelligence is hard to come by. Even with people like Riegler who are at the vanguard of intelligence research, it could conceivably take scientists many decades or even centuries to solve the entire problem. Fortunately for some (and unfortunately for others), the search is now over. Suddenly, the solution is here. And it has come from a rather unexpected source. The question is, will it be well received in the scientific community? Will scientists see it as an opportunity to expand their understanding and modify their world view? Will they find excitement or disbelief? Will they embrace the solution and ignore the source? Only time will tell.

### Naked Evolutionists?

Darwinian evolution is by necessity a blind incremental process. In other words, it does not anticipate. Most intelligence researchers (e.g., [Rodney Brooks](#), director of the MIT Artificial Intelligence Lab) base their work on evolutionarily plausible scenarios. In their view, intelligence evolved gradually over the years as new behaviors are built on top of previously evolved behaviors (this is the [basis](#) (PDF) of Brooks' [subsumption](#) architecture). The end result, we are told, is that the more recent members of a species are smarter than their ancestors. But this overlooks an important consideration. Humans are born with almost no behavioral skills. They must learn a huge number of new behaviors during their lifetimes. Consider the following:

- ⊕ The brain has seven major cell assemblies, each with its own principle of operation.
- ⊕ There is a huge number of possible cell assemblies.
- ⊕ There is a huge number of possible cell types.
- ⊕ There is a huge number of possible connections between cells.
- ⊕ There is a huge number of possible interconnection pathways between cell assemblies.
- ⊕ Appropriate pathways within and between cell assemblies are critical to the functioning of the whole system.
- ⊕ None of the cell assemblies makes sense without the others. They either work together or they do not work at all.

The main conclusion which can be drawn from the above is that no incremental non-anticipatory process could possibly come up with all seven cell assemblies, let alone connect them all together in a meaningful way. But, even supposing that there is a flaw in this argument (there is no



much bigger problem for evolutionists is that now we see the correct solution to the riddle of intelligence coming, not from the scientific community, but from the Bible! Is this not the same Bible that evolutionists have dismissed as mere superstition? Is it not the same Bible which says that all living organisms were originally created by powerful intelligent beings, each organism according to its kind. And how do evolutionists explain the fact that advanced knowledge of brain function was known and written down in a book thousands of years ago? Answer: they cannot. Because it does not fit into their understanding of the origin and history of humanity. They have lost their garments and are walking about naked.

Is this to say that there was no evolution? Of course not. We must, however, understand how and when evolution came about and what sort of evolution actually took place. It was, without a doubt, evolution guided by an intelligent agent. By analogous example, one can say that our current computers evolved from the more primitive machines of the previous century. But they did not evolve on their own.

## Science and Consciousness

One of the unspoken agendas of the scientific community is to dismiss almost anything, regardless of merit, that might give credence to religion, especially to Christianity. It is an agenda with long precedents dating back to the days of Galileo. The modus operandi adopted by most scientists can be summed up thus: if it cannot be observed or measured, it does not exist. Nowhere is this form of materialism more apparent than in their stance on consciousness. Indeed, as far as most scientists are concerned, consciousness is but a by-product of the functioning of the brain. There is no room in their view, to invoke the existence of anything other than the brain and its network of neurons to explain consciousness. Never mind, of course, that they do not have the tiniest shred of evidence, nor any logical argument, to support their claim.

The painful truth is that scientists, like everyone else, are totally clueless as to the nature of consciousness. Protestations to the contrary notwithstanding, theirs is a purely ideological position stemming from their anti-religion prejudice. And to their eternal chagrin, the solution to the riddle of intelligence comes from the one place that they told us all to disregard, the Judeo-Christian Bible. Now, is this not the same Bible that speaks of human spirit and divine creation, the things that scientists have long ago dismissed as mere superstition? To borrow from the scriptures, "the stone that the builders rejected has become the chief corner stone."

## Deus ex Machina

I argue that intelligence does not imply consciousness any more than consciousness implies intelligence. Consciousness requires two components, a knower and a known. The two are complementary opposites. This means that the knower cannot be known and the known cannot know itself. Both are needed for consciousness to exist because neither the knower nor the known can know itself. Why? Because no entity or concept can be its own opposite. The known is obviously the electrochemical reactions (signals) in certain parts of the brain. The knower is something else.

Having said that, there is no way to stop people from ascribing conscious feelings to machines. They will do it for the same reason that they now ascribe consciousness to animals and to human beings. They do it without knowing what consciousness is. They assume (wrongly) that emotional reactions are signs of consciousness. It is both sad and humorous to mention, but the Society for the Prevention of Cruelty to Machines (SPCM) is in our future. As the world becomes more and more unstable, it will come a time when people will view smart machines as sentient beings and even idolize them as the unexpected saviors of humanity. One of the dangers is that there are many power-hungry people on earth who will not hesitate to use this weakness in human nature as a species to dominate the world.

Next: [Background Information](#)

**Falsifiable Predictions.** On the basis of my interpretation of the seven churches and other biblical metaphors, I am able to derive several precise and falsifiable [predictions](#) about the internal operation of the brain. These are before-the-fact predictions that I could not have known, not having done the experiments. So nobody can accuse me of force-fitting known scientific facts into random biblical texts. If the predictions are falsified in the laboratory, my hypothesis is also falsified and I will be discredited as a charlatan. But if the predictions are corroborated, and certain they will be, then my detractors (I have many) should be prepared to eat a mountain of crow.

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Predecessors and Successors

Predecessors and Successors: the Biblical Symbolism

Predecessors and Successors: Confirmation

He Who Has an Ear

Left Brain/Right Brain: A Scientific Puzzle

Left Brain/Right Brain: The Biblical Explanation

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Falsifiable Predictions

**Abstract.** This preamble sets the stage for the more meaty stuff that will come later. It connects several symbolic teachings in the Bible with the organization of the brain as a whole. This information will come in handy when I begin my dissertation on the precise meaning of the seven churches of Asia.

## Predecessors and Successors

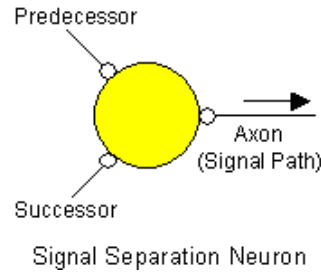
My first inkling that the Bible might have something very profound to say about the brain came more than ten years ago while I was researching the temporal nature of sensory perception. I had come to understand that the meaning (identity) of an incoming sensory signal--such as might be generated by a light-sensitive cell in the retina, depended on whether or not it was immediately preceded by another signal generated by a different sensor. For example, to detect the direction of motion of a dot in the visual field, two adjacent sensors must fire in sequence. One signal must precede the other by a small interval (about 10 milliseconds in the human brain). The predecessor signal is generated by a center cell within a "center-surround" group of cells. The successor signal comes from an adjacent cell on the periphery. The signals are fed to a retinal ganglion cell (RGC) which fires when the two are in close succession. The ensuing signal is then channeled to a specific axonal path and eventually finds its way into the visual cortex in the back of the brain where further temporal processing is performed. In other words, the signal's identity is determined by the path that it takes.

The sensory cortex is essentially a huge discrete signal separation/filtration/classification network. Multiple streams of sensory signals are separated into a huge number of individual paths reflecting the temporal identity (class or category) of the signals. Signals that are blocked from a given path will likely be allowed access to another path because input sensory streams make predecessor and successor connections with multiple downstream neurons. This is the reason that approximately one million fibers coming from the human retina ultimately synapse onto four hundred million neurons in the input layer of the visual cortex. This is a four hundred to one ratio! The ratio is less in other mammals.

[To find out more about signal separation neurons in the sensory cortex, take a look at



my ongoing [work](#) in artificial intelligence.]



To repeat, we have two contiguous signals (predecessor and successor) arriving in separate streams and a prepared path for the successor. Why prepared? Because the predecessor signal primes the neuron upon arrival so that, if the successor signal arrives immediately afterwards (within 10 milliseconds), the neuron fires and the signal is transmitted down the axonal path. The neuron does not fire if the successor signal arrives either simultaneously, before, or more than a short predetermined interval after the predecessor. The length of the interval is not the same for all nervous systems but it should be short enough to ensure the organism's survival in its environment. This mechanism essentially channels the successor signal down a prepared path while blocking other signals in the same stream. This is what I have been calling discrete signal separation, only because, with the use of multiple neurons, signals in a sensory stream are separated from the stream and sent down separate pathways.

### Predecessor and Successors: the Biblical Symbolism

Once I understood the predecessor-successor-pathway mechanism and its importance to sensory processing, it did not take me long to notice the perfect analogy between it and these well-known biblical passages:

#### Malachi 3:1

"Behold, I am sending my messenger to prepare a path before me."

#### Isaiah 40:3

"Behold, I will send my messenger before you, who shall prepare your way; the voice of one crying in the wilderness: Prepare the way of the Lord, make the Lord's path straight."

I had always wondered about the significance of sending a messenger to prepare a path just before the arrival of the Messiah. There is no practical necessity for it. Why would the Messiah need someone to prepare a path for him? As with so many things in the Bible, there has to be a metaphorical purpose to it. I hypothesize that it is a message with a hidden symbolic meaning, or rather, part of a greater message. The temporal aspect of these biblical verses should not be lost on anyone familiar with my ideas on intelligence. After all, the web page that started it all is titled [Temporal Intelligence](#). The principal observation to make here is that the arrivals of the prophet and the Messiah are analogous to the arrivals of two successive signals at a destination neuron. The analogy is crucial to the correct interpretation of the seven churches, as I explain elsewhere.

### Predecessor and Successors: Confirmation

Not long after I came to these realizations (1994), Dr. Henry Markram of the Weizmann Institute of Science in Israel, published a watershed [paper](#) (PDF) titled "Regulation of Synaptic Efficacy by Coincidence of Postsynaptic APs and EPSPs". The paper confirmed the importance of a timing gap (about 10 milliseconds) between pre and postsynaptic action potentials in cortical pyramidal neurons (1). Needless to say, I was elated.

### He Who Has an Ear

All of this begs the question: What is the link between the messenger/Messiah/path metaphor and that of the seven churches of Asia in the book of Revelation? Well, the answer has to do with the expression "[He who has an ear, let him hear](#)". It is used seven

times in Revelation, once in each of the seven messages to the seven churches. It is also used in the eleventh chapter of the book of Matthew, Jesus had this to say about the prophet John the Baptist:

**Matthew 11:10**

"This is the one about whom it is written, "Behold I send my messenger before your face, who will prepare your way before you.""

Here, Jesus is referring to the old testament prophecies of [Malachi](#) and [Isaiah](#). He goes on to say:

**Matthew 11:14-15**

"...he himself is Elijah, who is to come. He who has an ear, let him hear."

Obviously, the use of the expression "He who has an ear, let him hear", is meant to point out that there is a hidden meaning in what Jesus was saying about John. Now, consider this verse in the first message to the seven churches of Asia, the message to the church at Ephesus:

**Revelation 2:2**

I know your deeds and your toil and perseverance, and that you cannot tolerate evil men, and you put to the test those who call themselves apostles, and they are not, and you found them to be false;

Notice the use of the term "apostle". An apostle is a messenger or prophet (i.e., a predecessor signal). In the church of Ephesus (sensory cortex), all predecessor signals are tested to see if their predictions come true. I interpret this to mean that the metaphors of the seven churches of Asia are related to the messenger/Messiah/path metaphor.

### Left Brain/Right Brain: A Scientific Puzzle

In the last century, medicine has taught us that every human being is actually two persons in one. Our brain consists of a left hemisphere and a right hemisphere connected by a bundle of fibers called the corpus callosum. Most of us have learned that the left hemisphere is responsible for speech processing and symbolic/logical thinking whereas the right hemisphere is more preoccupied with intuitive and holistic subjects. What we were not told is that the right hemisphere tells the left one what to do. That is, the left brain is subservient to the right brain (2). How do I know this? I do because I understand the biblical symbolism that pertains to this subject, as I will explain in the next section.

Anatomy students have known for more than a century that the right brain controls the left side of the body while the left brain controls the right side. Science has no explanation to offer for this rather peculiar arrangement of the nervous system. Indeed, what is the evolutionary advantage of this overly complicated crisscrossing of the nervous pathways? Answer: there is none. Still, there has to be a reason for it.

### Left Brain/Right Brain: The Biblical Explanation

So why are the nervous pathways crisscrossed? Does the Bible offer an explanation? I dare say that it does. Consider the following passages:

<b>Left Brain and Right Brain Are One</b>	
<b>John 10:30</b>	I and the Father are one.
<b>John 14:11</b>	Believe me that I am in the Father, and the Father in me.

In the old testament, we often encounter the phrase "God is One." Most people immediately think it means "there is one God." What it really means is that God

comprises two complementary opposite persons, a master and a slave. Opposites are one. This is one aspect of the yin-yang duality that I keep making such a big deal about in my [work](#) on intelligence. Yin and yang are one. The quoted verses above are of tremendous importance as far as the seven churches are concerned. As we shall see, the manner in which the two hemispheres communicate (**I am in the Father and the Father is in me**) is explained symbolically in the message to the churches.

<b>Left Brain Is Subservient to Right Brain</b>	
<b>John 14:28</b>	The Father is greater than I.
<b>John 5:19</b>	Truly, truly I say to you, the Son can do nothing of Himself, unless it is something He sees the Father doing; for whatever the Father does, these things the Son also does in like manner.
<b>John 8:28</b>	I do nothing of my own authority but speak as the Father has taught me.

<b>Left Brain Generates Speech</b>	
<b>John 14:10</b>	The words that I <b>speak</b> unto you I <b>speak</b> not of myself: but the Father that dwelleth in me, he doeth the works.
<b>John 8:28</b>	I do nothing of my own authority but <b>speak</b> as the Father has taught me.
<b>John 1:1-3</b>	In the beginning was the <b>Word</b> (Logos), and the <b>Word</b> was with God, and the <b>Word</b> was God.

<b>Left Brain Controls Right Side of Body</b>	
<b>Matt 22:44</b>	The Lord said to my Lord, sit on my right hand.
<b>Heb 10:12</b>	[Jesus] sat down at the right hand of the throne of God.

The last table above is highly significant because, as we shall see, the seven churches of Asia represents the left hemisphere of the brain which controls the right side of the body. The point here is that there is no physical necessity for the brain to have a crisscrossed nervous system. To sit on the right side of God is a position of honor. As a Christian I believe that, since we were created in the image of God, and since God originally designed the DNA of every living thing and hence their brains, it is only fitting that he should pattern our brains after his own.

### The Network



The diagram depicted above shows the major pathways between cell assemblies. The picture reflects my current understanding of the biblical metaphors. It is subject to revision. Note: The diagram pictured above is outdated. An update is in the works.

## Falsifiable Predictions

I have prepared a special prediction [page](#) where I list all the predictions I derive from my interpretation of the biblical text. I will add to the list as I go along.

Next: [Ephesus](#)

1. Note that Markram's paper did not show that there is a time gap between two presynaptic signals, only that an input synapse is strengthened if it receives a spike (signal) a short time before the post-synaptic neuron fires. This is, of course, the learning mechanism. My hypothesis predicts that the post-synaptic neuron fires when it receives a signal from a specific synapse which I call the successor synapse. This prediction is falsifiable in the laboratory.
2. Left brain is subservient to right brain. In keeping with modern scientific practices, this is the second of several testable predictions I will make regarding the brain. It should not be too hard to design an experiment to try to falsify this claim.

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Action Selection

# Artificial Intelligence From the Bible

## Ephesus

**(Signal Separation and Feedback Network, Sensory Cortex)**

### Revelation 2:1-7



Note: This interpretation is partially incorrect and subject to change at any time. See the latest [news](#) for more info.

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## Introduction

The Church of Ephesus is the signal separation and feedback cortex. Sensory feedback is the mechanism used by the brain to identify successive signals over time scales longer than the base (10 millisecond) interval. This a fixed and precise interval used in sensory learning and perception and its duration can be more or less depending on the sensor type. As we will see later in the interpretation of the [Sardis](#) message and the [golden lampstand of Zechariah](#), the brain can learn to perceive correlated events occurring over varying time scales. Ephesus sends its output signals to the church of [Smyrna](#) where they are fused into multiple concurrent groups. The purpose of the sensory cortex is to separate signals in incoming sensory streams into individual paths having unique meanings. This is the reason that one million fibers originating from the human retina ultimately synapse onto about four hundred million neurons in the input layer of the visual cortex. That is a four hundred to one ratio! This ratio is less in animals.

## Interpretation (under revision)

### 2:1

**To the angel of the church in Ephesus write: The One who holds the seven stars in His right hand, the One who walks among the seven golden lampstands, says this:**

The **seven stars** are the angels of the seven churches as is revealed in [Rev 1:20](#). Does this mean that there is a star (angel) for every church? My original interpretation was that these stars were the angels to whom the messages are delivered, one message per angel. However, why would a message be given to an angel, if the angel is held in the right hand of the Son of Man? Does not make any sense. Lately, I am of the opinion that each church has its own angel (messenger) who receives a specific message to be delivered to the church. The seven stars are probably symbolic of something else. There is more on this subject in my interpretation of the church of [Sardis](#).

**His right hand** means that the seven churches represents only one hemisphere of the brain, the left. The messiah represents the left hemisphere but sits on the right hand of God. This means that the seven churches represent the left brain which controls the right side (or right hand) of the body.

**The One who walks among the seven golden lampstands.** Walk is a metaphor for motor behavior. Notice that the literal meaning of the word translated "among" from the original Greek is "in the middle of" or "in the center of." It so happens that Thyatira is the middle church and is directly involved in generating or controlling motor behavior. Motor control has to do with action selection.

Note: I am still trying to figure out why the above was included in the message to Ephesus. See this news item for more on my thoughts on this important matter.

## 2:2

**I know your deeds and your toil and perseverance, and that you cannot tolerate evil men, and you put to the test those who call themselves apostles, and they are not, and you found them to be false;**

Toil seems to refer to the search for new connections. Perseverance has to do with waiting and not giving up. Neurons in this layer wait for the successive arrivals of predecessor and successor signals. An apostle is a messenger or prophet (i.e., a predecessor signal). They must be put to the test (tried) to see if their predictions come true.

## 2:3

**And you have perseverance and have endured for My name's sake, and have not grown weary.**

See verse 2:2.

## 2:4

**But I have this against you, that you have left your first love.**

**You have left your first love.** This, in my opinion, means that Ephesus is too quick to move on to other things. See next verse.

## 2:5

**Therefore remember from where you have fallen, and repent and do the deeds you did at first; or else I am coming to you and will remove your lampstand out of its place--unless you repent.**

**Do the deeds you did at first.** The KJV translation is, **do the first deeds**. This means that Ephesus must use feedback signals from its output side to the input side. It is interesting to note that the sensory cortex uses massive feedback to process

**Or else I am coming to you and will remove your lampstand out of its place.** This is probably a way of saying that Ephesus must process sensory signals so as to capture their evolution over time. In other words, there are multiple places (temporally speaking) and it's important to go back and process new signals in the light of previous ones (the first deeds).

## 2:6

**Yet this you do have, that you hate the deeds of the Nicolaitans, which I also hate.**

The Nicolaitans used to belong to a group of early Christians who believed that there should be a hierarchy in the church, i.e., that church leaders should be treated differently than the members of the church. This verse means that masters (successors) should also be slaves (predecessors) and vice versa. This is reminiscent of the well-known Christian teaching according to which the first shall be last.



## 2:7

**He who has an ear, let him hear what the Spirit says to the churches. To him who overcomes, I will grant to eat of the tree of life which is in the Paradise of God.**

**To him who overcomes.** This always represents a signal that makes it to the output side of a layer.

**I will grant to eat of the tree of life.** The promise of life is always to those who are going to die and be resurrected to life eternal. This means that, although the signals generated by this layer are about to die (see [Sardis](#)) they will later be resurrected (tree of life).

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Next: [Smyrna](#)

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# Artificial Intelligence From the Bible

## Smyrna

**(Signal Fusion Network, Temporal Cortex)**

### Revelation 2:8-11



Note: This interpretation is partially incorrect and subject to change at any time. See the latest [news](#) for more info.

## Introduction

The church of Smyrna is the signal fusion network. Signals that were separated in the sensory cortex ([Ephesus](#)) are fused into multiple concurrent groups in Smyrna. Output signals are fed directly into [Sardis](#) where they are used in sequence learning.

## Interpretation (under revision)

### 2:8

**And to the angel of the church in Smyrna write: The first and the last, who was dead, and has come to life, says this:**

**The first and the last.** This seems to be an allusion to complementary sensory signals which are used to mark the onset or offset of sensory phenomena.

**Who was dead, and has come to life.** This means that signals arriving at Smyrna may die when they make to [Sardis](#). The reason is that Sardis handles attention and short-term memory. Signals that are not part of the system's current focus are simply ignored. See [verse 2:10](#) below.

### 2:9

**I know your tribulation and your poverty (but you are rich), and the blasphemy by those who say they are Jews and are not, but are a synagogue of Satan.**

**I know your tribulation.** Connections in Smyrna undergo severe tests (tribulation).

**And your poverty, (but you are rich).** This seems to be a way of contrasting Smyrna with the church of [Laodicea](#) whose members think they are rich and in need of nothing, even though they are wretched and poor.

**The blasphemy by those who say they are Jews and are not, but are of the synagogue of Satan.** The synagogue of Satan is also mentioned in the letter to the church of [Philadelphia](#). I originally interpreted this as a reference to sustained, long-lasting signals such as might be generated by pressure sensitive sensors. Smyrna processes only

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transient on/off (first and last) signals that represent changes in the environment. I have since changed my mind on this. I now believe that these non-Jews symbolize signals that somehow fail either as successors or predecessors. The synagogue of Satan is [Laodicea](#). These non-Jews or gentiles will be used for supervised motor control as I explain in the discussion of Laodicea. This makes sense because, the brain needs a way to focus on a train of thought while accomplishing a task such as walking or driving. It can delegate the task to the cerebellum (Laodicea) for automatic processing. The cerebellum processes signals mostly from proprioceptive inputs such as muscle status or position, tactile inputs, etc... These signals do not normally arrive in close succession like visual and auditory stimuli. See this [news article](#) for more on this subject.

## 2:10

**Do not fear what you are about to suffer. Behold, the devil is about to cast some of you into prison, so that you will be tested, and you will have tribulation for ten days. Be faithful until death, and I will give you the crown of life.**

The devil is about to cast some of you into prison, so that you will be tested. Every input connection must be tested.

You shall have tribulation for ten days. A day always refers to a single cycle (~10 milliseconds in the human brain). Ten days means that the signal correlation (training) factor is 10 to 1. What this means is that a connection must contribute to the firing of a cell at least once for every ten tries. If not, it must be disconnected.

Be faithful unto death, and I will give you the crown of life. In my opinion, this means that outputs are fed into [Sardis](#) (sequence memory) where they may die before being brought back to life.

## 2:11

**He who has an ear, let him hear what the Spirit says to the churches. He who overcomes will not be hurt by the second death.**

He who overcomes will not be hurt by the second death. As explained before, overcoming always refers to a signal making it to the output side of a cell assembly or layer. The first death is the death that occurs in [Sardis](#) where signals die. It is a temporary death.

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# Artificial Intelligence From the Bible

## Pergamum (Speech Motor Control Network)

### Revelation 2:12-17

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Note: This interpretation is partially incorrect and subject to change at any time. See the I

## Introduction

Pergamum controls speech motor command selection, coordination and learning. It receives the part of Sardis that is involved in auditory processing. Output signals from Pergamum (an output assembly) where they are used to effect motor behavior. Philadelphia, in turn, sends

## Interpretation (under revision)

### 2:12

**And to the angel of the church in Pergamum write: The One who has the sharp two-edged sword.**

The One who has the sharp two-edged sword. This symbol represents special corrective signals (Philadelphia). This is explained further [below](#).

### 2:13

**I know where you dwell, where Satan's throne is; and you hold fast My name, an Antipas, My witness, My faithful one, who was killed among you, where Satan dwells.**

I know where you dwell, where Satan's throne is. This is one of the ways that the text of Revelation 2:13 in the third chapter of the book of [Zechariah](#) where we see Satan standing at the right side of Joshua. Satan reference refers to the fact that opportunities to make mistakes abound in Pergamum.

**And you hold fast My name, and did not deny My faith.** This refers to expectation and anticipation of Zechariah.

**Even in the days of Antipas, My witness, My faithful one, who was killed among you, where Satan dwells.** reference to the one of two witnesses (there is one for each hemisphere). My current understanding of conflict resolution during internal thinking or reasoning. More on that later.

### 2:14

**But I have a few things against you, because you have there some who hold the teaching of Balaam, who put a stumbling block before the sons of Israel, to eat things sacrificed to idols and to commit fornication.**

To put a stumbling block before the sons of Israel. To stumble is to take a bad step. This is

place in Pergamum. Symbolically, to stumble means to send an inappropriate motor signal form of motor behavior exclusively: speech production.

To eat things sacrificed to idols and to commit acts of immorality. There are two ways (her signals can be inappropriate: idolatry and fornication (acts of immorality). These are explained

### Idolatry

Idolatry literally means serving multiple gods. Consider that a motor action is controlled (Philadelphia). That is to say, an effector (e.g., a muscle) has more than one way of producing a powerful contraction. This means that every effector has a set of motor neurons for each occurs when more than one activation level is used simultaneously. In other words, it can activate a muscle both gently and forcefully at the same time. As the teaching goes,

### Fornication

Fornication literally means having sex with more than one husband at a time. The brain motor neuron in the motor output layer (Philadelphia) will have a huge number of inputs for function and context. The idea is that the motor neuron should never be activated by itself. If it happens, one or more connections is inappropriate.

**Note.** Detecting and correcting "idolatry" and "fornication" are two primary motor learning mechanisms used by the brain. This is yet another falsifiable (testable) prediction. According to the interpretation of the biblical symbology, motor conflicts are detected in the basal ganglia, the part of the brain that generates intentional motor behavior. There are two corrective signals, as explained above. It should be possible to use micro electrodes to determine the signal patterns at a particular effector and the conditions under which they are generated. There is no doubt in my mind that the brain evidence will corroborate the biblical predictions. In fact, these are revolutionary aspects of brain function, unknown to science until now. That this knowledge should come from the Bible is even more revolutionary.

As we will see in the interpretation of the [Thyatira](#) and [Sardis](#) messages, detecting fornication requires constant attention. That is to say, an intelligent system cannot think of everything at the same time. The most salient non-conflicting sequences are kept "awake" at any one time.

## 2:15

**So you also have some who in the same way hold the teaching of the Nicolaitans.**

As mentioned [previously](#), the Nicolaitans believed that the church should be divided into a hierarchy of members. This verse is pointing out that Pergamum not only has idol worshipers and fornicators with the church of [Ephesus](#), Pergamum receives two types of signals which can be either from the Nicolaitans would maintain a permanent class of masters separate from the slaves. The master can also be a slave. More on this in the interpretation of [Zechariah](#).

## 2:16

**Therefore repent; or else I am coming to you quickly, and I will make war against them.**

Therefore repent; or else I am coming to you quickly. Conflicting connections are quickly suppressed.

And I will make war against them with the sword of My mouth. This is the double-edged sword of fornicators. What this means is that the corrective feedback signals come from the motor output layer when a conflict is detected. But more specifically, given that *mouth* obviously symbolizes speech generation, the sword is production. Contrast this with Laodicea which is [forbidden to generate speech](#).

## 2:17

**He who has an ear, let him hear what the Spirit says to the churches. To him who  
manna, and I will give him a white stone, and a new name written on the stone v**

**To him who overcomes, to him I will give some of the hidden manna.** This was the portion to keep in the temple as a reminder of their time in the wilderness. Normally, no one had (there is a connection here with [Zechariah](#) and Joshua the high priest). As we shall see, the output layer. Thus, to eat of the hidden manna, one must enter the temple. This entails that go directly to Philadelphia.

**I will give him a white stone.** This is significant because the book of Zechariah also mentio

**And a new name written on the stone.** This implies that the signal had an old name. This is book of Zechariah which also [mentions](#) a stone on which a name is written.

**Which no one knows but he that receives it.** In the past I had misinterpreted the meaning, assertion against traditional symbol processing in AI. I now realize that it means just one of Pergamum's signals are not used in the training of the cerebellum (Laodicea). It makes se volitional control and not relegated to an automatic mechanism like the cerebellum.

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# Artificial Intelligence From the Bible

## Thyatira

**(Motivation and Action Selection Layer, Amygdala and Motor Cortex)**

### Revelation 2:18-29

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Note: This interpretation is partially incorrect and subject to change at any time. See the latest [news](#) for more info.

## Introduction

Thyatira is the center of motivation. As such it plays a major role in attention, action selection and classical/operant conditioning. Without Thyatira there would be no goals or desires and no fears or dislikes. Thyatira rules behavior by associating motor sequences with good or bad consequences. It receives its inputs from Sardis and sends output signals back to Sardis. It also receives input signals from visceral sensors, either pain or pleasure.

One of the biggest problems a behaving system must face is the following: there is a limited number of motor effectors available at any one time. This is known as the action selection problem. As we have seen in the message to [Pergamum](#), it is easy to detect and correct the two types of motor conflicts that occur during a given behavior or motor sequence. But what if there are several behaviors competing for the same limited resources?

To solve the problem, motor resources must be allocated to one behavior at a time so as not to cause motor conflicts. So which sequence should be given priority? Prioritizing behavior sequences is the job of Thyatira. Sequences are ranked according to their outcome or consequences. Thyatira tries to discover temporal correlations between motor sequences and pain and/or pleasure stimuli. This is essential to operant and classical conditioning.

This brings us to another problem a behaving system must deal with: blame or credit assignment. Which of the preceding motor sequences should be associated with a given pain or pleasure stimulus. More on this below.

## Interpretation

### 2:18

**And to the angel of the church in Thyatira write: The Son of God, who has eyes like a flame of fire, and His feet are like burnished bronze, says this:**

**Who has eyes like a flame of fire.** These are the **seven spirits of God** (see [Sardis](#)). They symbolize perception.

**His feet are like burnished bronze.** Another translation is, **his feet are like fine brass.** As mentioned in the interpretation of [Pergamum](#), feet have to do with walking, i.e., motor actions. Fine brass means that motor connections are refined through experience, i.e., all motor conflicts are resolved over time, leaving only tried and tested connections. An important part of the symbolism of feet is the idea of steps or sequences of steps.

## 2:19

**I know your deeds, and your love and faith and service and perseverance, and that your deeds of late are greater than at first.**

**I know your deeds, and your love.** To love a person is to direct him or her toward behaviors that are potentially rewarding and away from behaviors that may result in pain or discomfort. The implication is that Thyatira receives visceral inputs and is able to associate certain behaviors with either pain or pleasure.

**And service.** Thyatira just performs a service for others, i.e., for Sardis (eyes) and Pergamum (feet).

**And faith, and your perseverance.** Faith and perseverance have to do with waiting and hoping for something to happen. In this case, Thyatira must wait for pain or pleasure signals to arrive. It discovers temporal associations between visceral signals and motor sequences. There is no way to precisely predict when and if a visceral stimulus will occur after a given action. Hence the need for patience.

**And that your deeds of late are greater than at first.** The King James translation is, **And your works, the last more than the first.** This is apparently referring to the idea that the most recent associations take precedence over the oldest. It may also have to do with the fact that the most recently performed motor sequence should receive the strongest association with following visceral stimuli.

## 2:20

**But I have this against you, that you tolerate the woman Jezebel, who calls herself a prophetess, and she teaches and leads My bond-servants astray so that they commit acts of immorality and eat things sacrificed to idols.**

**You tolerate that woman Jezebel.** Why a woman? What is she a symbol of and why is she called Jezebel? It turns out that there is a (in)famous Jezebel mentioned in the old testament. Obviously, there has to be a symbolic connection between the old and new Testament Jezebels since the former was also an adulteress and did encourage the children of Israel to commit fornication and idolatry. Jezebel had a powerful nemesis, however, in the person of God's prophet Elijah. More on this later.

**Who calls herself a prophetess.** Prophetess implies that Jezebel is associated with making predictions? In this sense, she symbolizes an anticipatory signal. Notice that Jezebel just calls herself a prophetess which means that she is not a true prophetess. Most of the time, she may just be guessing about a future consequence. There may be a blame/credit assignment problem in the works. In other words, it is not easy to determine which preceding actions should be rewarded or punished.

**She teaches and leads My bond-servants astray.** Teaching and leading can only mean that there is some sort of correlation between Jezebel and God's servants, probably on the basis of her predictions (or prophecies). Teaching does imply that Jezebel, somehow, engages in fornication with more than one of God's servants at a time. Symbolically, this probably means that she does know enough to properly assign blame or credit to preceding behaviors. So she assigns them to several behaviors at a time (she fornicates).

**So that they commit acts of immorality and eat things sacrificed to idols.** As I wrote in the [Pergamum](#) page, fornication (acts of immorality) and idolatry have to do with generating conflicting motor commands. But there is a limit to what Pergamum can do to correct motor conflicts. It can only handle conflicts within individual motor sequences.

Multiple sequences running concurrently would certainly induce conflicts due to the sharing of limited motor resources. If Pergamum were to correct these conflicts, it would only result in destroying the motor sequences. This is not desirable. There must be a way to keep competing or conflicting sequences from running concurrently.

## 2:21

**I gave her time to repent, and she does not want to repent of her immorality.**

**And I gave her time to repent.** This seems to mean that it takes time to ascertain whether or not an actual conflict (fornication) has occurred.

**She does not want to repent of her immorality.** Why does it say her immorality? Obviously Jezebel must be involved with more than one sexual partner at a time. She married the king of Judah (or was it Israel? I can't remember right now) although she was not an Israelite and was already married to someone else. But is her immorality the same as the immorality mentioned in the message to Pergamum? Apparently not since fornication in Pergamum had to do with motor output. This seems to imply that Jezebel symbolizes the act of assigning blame (or credit) to more than one sequence at a time. In other words, she correlates a pain or pleasure input to more than one behavior (sequence of actions) at a time.

## 2:22

**Behold, I will throw her on a bed of sickness, and those who commit adultery with her into great tribulation, unless they repent of her deeds.**

**I will throw her on a bed of sickness.** Some translations do not mention **sickness**. This could also be alluding to sleep. To be cast into a bed is to be rendered weak and ineffective: to be disabled.

**And those who commit adultery with her into great tribulation, unless they repent of their deeds.** This indicates that the particular motor sequence(s) associated with a given visceral input is (are) temporarily disabled.

## 2:23

**And I will kill her children with pestilence, and all the churches will know that I am He who searches the minds and hearts; and I will give to each one of you according to your deeds.**

**And I will kill her children with death.** Continuing to expand on the same model, this means that misbehaving cells are not allowed to fire. The signals (children) are turned off (killed).

[Note: I am still working on Sardis and I will have more to say on the issue of behavior sequences soon. For now, suffice to say that a sequence involves both input (eyes) and motor output (feet). The big problem that I am trying to iron out is: how are sequences played back? and by whom? At least we know it's not Jezebel as she only tries to seduce the servants of God.]

**And all the churches will know that I am He who searches the minds and hearts.** The OT Greek the word translated 'minds' is literally 'reins.' This is both humorous and powerful. It is humorous because reins (kidney) and hearts are the sort of things that will immediately cause a modern scientist to wince. After all, we, the enlightened, know that we do not think with our hearts and kidneys. But remember, Revelation is a purely allegorical text. It is not talking about hearts and kidneys. These words are metaphors that stand for other things.

The kidney has traditionally stood for the seat of reason whereas the heart symbolizes the seat of emotions. **I am He who searches** means that sequences are continually searched for both motor conflicts and motivational relevance. One of the advantages of having preset sequences is that they can be *searched* (scanned) prior to actually doing

anything. This is what we normally call 'thinking' or 'reasoning' and it can be done by temporarily disabling motor output. It is clear that this ability is not available to all animals.

**And I will give to each one of you according to your deeds.** This means that each motor sequence has a motivational strength (negative or positive) based on its prior association with pleasure and/or pain stimuli of various strengths. The idea here is that there is a blame/credit assignment problem which is resolved by competition among motor sequences. The strongest one always wins. If two sequences have equal motivational strengths, then I suppose one must be chosen at random.

## 2:24

**But I say to you, the rest who are in Thyatira, who do not hold this teaching, who have not known the deep things of Satan, as they call them--I place no other burden on you.**

Who do not hold this teaching, who have not known the deep things of Satan, as they call them. This means that not all outputs from Thyatira are correlated to (i.e., are fornicating with) more than one sequence.

I place no other burden on you. Nothing else for Thyatira to do.

## 2:25

**Nevertheless what you have, hold fast until I come.**

Do not forget learned pain/pleasure correlations.

## 2:26

**He who overcomes, and he who keeps My deeds until the end, TO HIM I WILL GIVE AUTHORITY OVER THE NATIONS;**

This means that Thyatira has powerful control over motor output. As will be seen in the discussion on [Philadelphia](#), motor signals are used to train the supervised layer or [Laodicea](#) (the nations or the gentiles).

## 2:27

**AND HE SHALL RULE THEM WITH A ROD OF IRON, AS THE VESSELS OF THE POTTER ARE BROKEN TO PIECES, as I also have received authority from My Father;**

Rod of iron means strict control.

Broken into pieces means that motor control is organized into many individual sequences competing for attention.

As I also have received authority from My Father. 'My Father' signifies the right hemisphere. This tells me that the left hemisphere's amygdala receives connections directly from the right hemisphere. This is how the right hemisphere gains behavior control over the left. Yet one more falsifiable prediction for the scientifically minded.

## 2:28

**And I will give him the morning star.**

I am not sure about the meaning of this. A morning star (usually the planet Venus) is the only star bright enough so as to be seen after daybreak. We already know that 'star' is another word for [angel](#). The message to Sardis also mentions [seven stars](#), and angels figure prominently in [Zechariah](#)'s vision. Somewhere in Revelation it says that the Son of

Man is the bright morning star. This is all interrelated but the exact metaphor still escapes me. I will have to get back to this later.

## 2:29

**He who has an ear, let him hear what the Spirit says to the churches.**

More to come.

—

Scripture taken from the [NASB](#)®.

Next: [Sardis](#)

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# Artificial Intelligence From the Bible

## Sardis

(Short and Long-Term Memory/Sequence/Attention Layer, Hippocampal Formation)

### Revelation 3:1-6

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Note: This interpretation is partially incorrect and subject to change at any time. See the latest [news](#) for more info.

### Introduction

Sardis is my personal favorite among the churches. The metaphors are powerful and pregnant with meaning and subtlety. Sardis is essential to attention and short-term memory. One of the main functions of Sardis is to generate motor command sequences (behaviors). Precisely timed signals from Sardis are sent to [Pergamum](#) where they are selected for motor output.

As I explain below, the church of Sardis is also described in the book of [Zechariah](#) as the golden lampstand with the seven lamps, the two olive branches and the two golden pipes ([Zech 4:2](#)). This is identical to the golden lampstand that God commanded Moses to build on Mount Sinai. Obviously God attached a lot of importance to it, because he commanded Moses to have it placed inside the temple and to keep it lit continually.

Note. My interpretation of the two olive branches and two [golden pipes](#) of Zechariah is that they represent the paired outputs of Sardis. Why paired? Because Sardis sends its signals to Pergamum, the motor learning layer, where the signals are used as motor commands. There is a need for two complementary commands for every motor action, one for starting the action and the other for stopping it. It is possible that my interpretation is slightly off in this matter and that the paired parallel pathways really project from Pergamum rather than Sardis. After all, neurobiologists have identified two parallel input pathways projecting into the basal ganglia. I will have more on this when I take on the book of [Zechariah](#).

There is a very tight relationship between Sardis and Pergamum as evidenced by the bi-directional pathway between the two. It seems that the organization of Sardis closely reflect that of Pergamum. The main difference is that Sardis can only retain memory traces for a very short time whereas Pergamum has either zero or permanent retention. As explained below, a memory trace is the temporal interval between two events.

Sardis is known as the dead church. My understanding is that the interval between incoming signals die temporarily (are recorded or memorized) before being resurrected. Note that there are aspects of Sardis that I have not yet figured out. I would appreciate any help in this regard.

### Interpretation



### 3:1

**To the angel of the church in Sardis write: He who has the seven Spirits of God and the seven stars, says this: 'I know your deeds, that you have a name that you are alive, but you are dead.'**

**He who has the seven Spirits of God.** As mentioned elsewhere in Revelation ([4:5](#) and [5:6](#)), the seven Spirits of God are the seven eyes of the Lord. The book of Zechariah ([3:9](#)) has a lot to say about these symbols. I interpret the eyes to be a symbol of perception. 'Seven eyes/spirits' seems to symbolize the organization of incoming signals into small groups of seven sequential signals.

Normally, when all seven signals arrive (i.e., are seen by the seven eyes) simultaneously, the neuron fires. As I will explain in my interpretation of [Zechariah](#), sometimes the neuron fires even though it receives only a fraction of its input signals. This is needed for what is known as pattern completion, an essential capability in animals having to do with anticipation. I have more details on this issue in the [Zechariah](#) page.

**And the seven stars.** Apparently, this is mentioned so as to distinguish the seven stars with the seven spirits. But this could very well be different stars than the ones that the Son of Man holds in his right hand ([Rev. 1:16](#)). We know that a star is also an angel in the symbology used in Revelation. Is this the mechanism responsible for the seven-item capacity of short-term memory? We shall see.

**You have a name that you are alive, but you are dead.** I interpret this to mean that signals arriving at Sardis immediately die. That is to say, they are not immediately transmitted to the next layer. They are recorded for later retrieval (resurrection) or playback.

### 3:2

**Wake up, and strengthen the things that remain, which were about to die; for I have not found your deeds completed in the sight of My God.**

**Wake up.** Another translation is, **be watchful**. This metaphor is used repeatedly elsewhere in relation to the church of Sardis. To watch is to monitor the arrival of input signals. It is a way of saying that Sardis is a perceptual layer. However, there is more to being watchful or being awake than mere perception. The metaphor seems to refer to the phenomenon of attention. Unless the system is paying attention (is awake) to certain inputs, it will miss them. This implies some sort of sensorimotor *canalization* whereby only sensory channels that correspond to whatever sequence the system is currently focusing on (watching) are monitored. The other channels are ignored. Here's an interesting [paper](#) on canalization by Alexander Riegler that sheds some light on this subject.

**Strengthen the things that remain, which were about to die.** This is apparently an allusion to short-term memory (STM). STM traces are known to last only a very short time (10 to 20 seconds according to various sources) as the name implies. The idea seems to be that, by strengthening connections that fire often, STM memory traces become long term.

[Note: Although I have some ideas on the matter, the mechanism responsible for transferring STM traces into long term memory (LTM) still eludes me.]

**For I have not found your deeds completed.** This seems to indicate that Sardis is in constant flux and that there is always more work to do. However, I tend to believe that there is more to this verse than meets the eye. Completion may also refer to the act of permanently imprinting memorized intervals into LTM. This is probably the reason for the conjunctive adverb 'for' (meaning because) in the beginning of this sentence, to connect it with the preceding one.

In the sight of My God. This has a lot more meaning to it than one might suspect. Apparently, the actions of Sardis are monitored by the right hemisphere (my God) of the brain. This correctness of this interpretation is further reinforced in verse [3:5 below](#).

### 3:3

**So remember what (how) you have received and heard; and keep it, and repent. Therefore if you do not wake up, I will come like a thief, and you will not know at what hour I will come to you.**

So remember what you have received and heard. There are several things to note here:

- ⊕ Remembering has to do with recording, which is what one would expect a memory network to do. But record what?
- ⊕ The adverb 'so' (synonymous with therefore) is telling. It connects the previous verse with the current sentence. In other words, "I have not found your deeds completed in the sight of My God, therefore remember how..." There is always more work for sleeping Sardis to do. Again, remember what?
- ⊕ Notice that the original text does not say "remember what you have received and heard" but "remember how you have received and heard." There is a big difference between **what** and **how**. This sentence tells me that there are two types of incoming signals (symbolized by **received** and **heard**) and that it is not the signals themselves that matter or even their individual times of arrival but **how** they arrive, i.e., how far apart they are from each other.
- ⊕ Sardis then seems to be recording the relative intervals between incoming signals. One would suspect that these intervals change from one moment to next, hence the admonition that "I have not found your deeds completed in the sight of My God."

#### The Importance of Recorded Intervals

Why is it necessary to record the intervals between events? Why is it so important to intelligence? The answer is that the proper relative order of events is needed for causal reasoning and motor timing. Reasoning is, in fact, a species of motor behavior. During playback, the generated signals must maintain the same relative temporal order that they had at the time of their recording. The reason is that the ability to detect motor conflicts (see [Pergamum](#) for more on conflict detection) depends on the relative order of motor commands. These commands are generated from Sardis.

Note that it is not the exact intervals that matter the most but the relative timing order. In other words, if all the intervals are halved or otherwise changed by the same percentage, it would not affect reasoning. Therefore, recorded events may be played back at a much faster rate. The result is that a system can think and reason extremely fast internally. This, of course, suggests that machines will be able to think much faster than humans. Why? Because they are not limited by the processing speed of biological neurons.

Consider also that the ability to replay recorded sequences at different rates is crucial to behavior. Sometimes we need to perform tasks at a faster rate than at other times.

**And keep it.** Another translation is, **hold fast**. This has to do with retaining or keeping what (the intervals) is recorded. Once recorded, an interval (or memory trace) must be kept but for how long? It does not say in this verse although I have evidence that the exact duration of short-term memory (in terms of neural cycles) is given in a different part of the book of Revelation. I will get to it in a future page. My understanding is that

the recorded interval (i.e., **the things that remain, which are about to die**) is kept for a little while unless the memory is long term, in which case it is retained for an indefinite period of time.

**And repent.** To repent is to stop doing what one was doing previously and do something else. In this context, I think this means that whatever interval was previously recorded for a pair of signals should be discarded and replaced with the new one. The implication is that the system must always be ready to change its "mind" in the face of new sensory evidence.

**Therefore if you do not wake up.** This second emphasis on waking up is telling. Again, I believe it has to do with the mechanism of attention. It is evident that it is expected that the Sardis system will not be able to watch everything at all times, i.e., it shall be frequently distracted. After all we can only pay attention to just a few things at a time. Again we notice the use of the word therefore. As before, we must take it to mean that there is a connection between what was said previously in the message and what is about to be said. The verse can be rephrased thus: "**Remember how you received and heard and keep it and repent. Therefore, if you do not wake up...**" In other words, there is a connection between remembering and being awake. Unless one is paying attention to something, it will not be remembered.

**I will come like a thief, and you will not know at what hour I will come to you.** This seems to be saying that the interval between signals is never really known beforehand and is always subject to revision. So it is important to keep watching but, for obvious reasons, the system cannot pay attention to everything at the same time. More on attention later.

### 3:4

**But you have a few people in Sardis who have not soiled their garments; and they will walk with Me in white, for they are worthy.**

**You have a few people in Sardis.** The word translated 'people' here is literally 'name' in the Greek text. This is a clue that tells us that Sardis sends its signals to Pergamum where they are given a new name. The word 'name' here and in Pergamum is what I call a connecting label because it links one church to another. The word 'few' symbolizes the fact that these particular signals are rare. More on this later.

**Who have not soiled their garments; and they will walk with Me in white: for they are worthy.** The symbolic meaning of **garments** seems to be rather important because it is mentioned elsewhere (e.g., Zech.3:3, Rev. 16:15). It is apparently very important to be able to distinguish between clean and filthy garments. Only a few have clean garments. Notice that these few are not given new clothing but keep their original garments because they have not soiled them. I will have more to say on this subject when I discuss the book of Zechariah.

**And they will walk with me in white.** This tells us that output signals from Sardis are used for motor actions (walking). As mentioned previously, Pergamum is where walking takes place.

### 3:5

**He who overcomes will thus be clothed in white garments; and I will not erase his name from the book of life, and I will confess his name before My Father and before His angels.**

**He who overcomes will thus be clothed in white garments.** This does not seem to be referring to the **few people who have not soiled their garments** in verse 3:4. Here the reference is to those who are given white garments to wear, ostensibly because their old garments are dirty. Again, this will be explained further in the Zechariah page. Here is another verse in Revelation that speaks of garments:

**Rev. 16:15**

Behold, I come as a thief. Blessed is he who watches, and keeps his garments, lest he walks naked, and they see his shame. Here the text does not mention filthy or white garments but the lack of garments. Shame and nakedness seem to be a reference to unfounded assumptions. Sometimes we behave (walk) under the assumption that certain things occurred or did not occur, only to find out later that we were wrong, hence the importance of paying attention (watching).

I will not erase his name from the book of life. This seems to indicate some sort of resurrection. Dead signals are somehow resurrected (played back). Notice the reference to 'his name.' This is another clue that tells me that output signals from Sardis eventually make their way to [Pergamum](#) where they are given a new name and used for motor output.

But I will confess his name before my Father. Father refers to the right hemisphere (see the [preamble](#) for more on this). This means that output signals from Sardis are also sent to the right hemisphere (1).

And before his angels. This part is what makes me wonder about the meaning of the seven stars in [verse 3:1](#) (star is another word for angel). Are they the same as the seven stars that the Son of Man holds in his right hand (is it one angel for every church?) or are they specific to Sardis? I tend to think the latter. Why would these signals be sent to all the churches (cell assemblies) in the right hemisphere? And why would seven stars be mentioned in the message to Sardis? I have more thinking to do. (If the reader has a suggestion, please contact me.)

### 3:6

**He who has an ear, let him hear what the Spirit says to the churches.**

Indeed. I am trying as best as I can. Again, this is not the end of the Sardis saga. There is a lot more to learn from the book of [Zechariah](#), things that are directly connected to the operation and function of Sardis. More on this in the near future.

—

Scripture taken from the [NASB](#)<sup>®</sup>.

Next: [Philadelphia](#)

(1) Yet another falsifiable prediction for the science-minded skeptic. But wait a minute, this is already well-known. See, for example, "[The case for a relationship between human memory, hippocampus and corpus callosum.](#)"

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# Artificial Intelligence From the Bible

## Philadelphia (Motor and Conflict Detection Layer, Basal Ganglia)

Revelation 3:7-13 (under construction)



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Note: This interpretation is partially incorrect and subject to change at any time. See the latest [news](#) for more info.

### Introduction

Philadelphia is the motor output layer. It receives command signals from [Pergamum](#) and sends corrective signals back to Pergamum. Its primary function is to activate and deactivate motor effectors and to detect motor command conflicts. Philadelphia also sends training signals to [Laodicea](#) (supervised motor layer or cerebellum).

### Interpretation

#### 3:7

**And to the angel of the church in Philadelphia write: He who is holy, who is true, who has the key of David, who opens and no one will shut, and who shuts and no one opens, says this:**

Who has the key of David, who opens and no one will shut, and who shuts and no one opens. The key of David and the open and shut door means that this layer can be inhibited so as to prevent motor output.

#### 3:8

**I know your deeds. Behold, I have put before you an open door which no one can shut, because you have a little power, and have kept My word, and have not denied My name.**

#### 3:9

**Behold, I will cause those of the synagogue of Satan, who say that they are Jews and are not, but lie--I will make them come and bow down at your feet, and make them know that I have loved you.**

### 3:10

Because you have kept the word of My perseverance, I also will keep you from the hour of testing, that hour which is about to come upon the whole world, to test those who dwell on the earth.

### 3:11

I am coming quickly; hold fast what you have, so that no one will take your crown.

### 3:12

He who overcomes, I will make him a pillar in the temple of My God, and he will not go out from it anymore; and I will write on him the name of My God, and the name of the city of My God, the new Jerusalem, which comes down out of heaven from My God, and My new name.

### 3:13

He who has an ear, let him hear what the Spirit says to the churches.

—

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Next: [Laodicea](#)

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# Artificial Intelligence From the Bible

**Laodicea**  
**(Supervised Motor Layer, Cerebellum)**

**Revelation 3:14-22 (under construction)**

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Note: This interpretation is partially incorrect and subject to change at any time. See the latest [news](#) for more info.

## Introduction

The church of Laodicea is the supervised motor layer, the cerebellum. It receives its training directly from the Church of [Philadelphia](#), i.e., the basal ganglia. Laodicea's function seems to be the automatic involuntary control of motor effectors. As such it provides a much needed help to the rest of the system, allowing it to concentrate on more important things. In the biblical symbology, Laodicea is known as the gentile (non-Jews) church who is given access to the temple's courts but not the temple's interior.

## Interpretation

### 3:14

**To the angel of the church in Laodicea write: The Amen, the faithful and true Witness, the Beginning of the creation of God, says this:**

I am not yet sure of the symbolic significance of the above. The Amen seems to be an allusion to the end of something.

### 3:15

**I know your deeds, that you are neither cold nor hot; I wish that you were cold or hot.**

Signals arriving in Laodicea have not been properly tested. They are neither good nor bad.

### 3:16

**So because you are lukewarm, and neither hot nor cold, I will spit you out of My mouth.**

Again, as in [Pergamum](#), we find the [reference to 'mouth'](#) which is symbolic of speech motor output. This means that Laodicea is not given control of speech production. This

interpretation is not something that I had initially understood. In retrospect, it makes sense that speech is something that must be always kept under volitional (or conscious) control. Searching the web, I could not find anything in the neurobiological literature that mentions the exclusion of the cerebellum with regard to speech. I have added it to my [list of predictions](#) as one more falsifiable prediction for the skeptics.

### 3:17

**Because you say, "I am rich, and have become wealthy, and have need of nothing," and you do not know that you are wretched and miserable and poor and blind and naked,**

I interpret this to mean that Laodicea has no way of determining good or bad actions on its own. It is under the assumption that it does but it is mistaken. It needs proper training. Contrast this to the church of [Smyrna](#) who are considered rich even though they are poor. "Blind" seems to be an allusion that the cerebellum does not receive signals originating from either the visual cortex or the retina. Compare "naked" with the multiple references to [garments](#) in the message to the church of Sardis.

### 3:18

**I advise you to buy from Me gold refined by fire so that you may become rich, and white garments so that you may clothe yourself, and that the shame of your nakedness will not be revealed; and eye salve to anoint your eyes so that you may see.**

Laodicea must rely on [Philadelphia for supervision and training](#). Notice the reference to 'white raiment' and 'eyes' (see [Sardis](#)). The idea is that Laodicea must go to those who went through trials and testing in order to learn how to do things right. Laodicea must be trained and supervised.

### 3:19

**Those whom I love, I reprove and discipline; therefore be zealous and repent.**

This is referring to supervised training. See below.

### 3:20

**Behold, I stand at the door and knock; if anyone hears My voice and opens the door, I will come in to him and will dine with him, and he with Me.**

**Behold, I stand at the door.** The [door metaphor](#) is also used in the message to Philadelphia. It symbolizes some sort of gate which can be either open or close. The idea is that Laodicea can do nothing unless its door is open.

**And knock.** Signals originating from Philadelphia serve as training signals. This is probably referring to the climbing fiber signal that are used to train Purkinje cells in the cerebellum. Laodicean cells (Purkinje) receive a huge number of afferent projections from all sensory sources in the body. Climbing fiber spikes are known to strongly depress any synapse that fired recently. Many neurobiologists already agree that the purpose of the climbing fiber is to train the afferent synapses.

### 3:21

**He who overcomes, I will grant to him to sit down with Me on My throne, as I also overcame and sat down with My Father on His throne.**

The throne is in the temple in new Jerusalem, i.e., in Philadelphia. This means that signals coming from Laodicea are allowed to control motor output in Philadelphia but only after they are trained.



**3:22**

**He who has an ear, let him hear what the Spirit says to the churches.**

—

Scripture taken from the [NASB](#)<sup>®</sup>.

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# Artificial Intelligence From the Bible

## Joshua the High Priest

(Short and Long-term Memory, Anticipation, Sequence Learning and Pattern Completion)

### Zechariah 3:1-10



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**Note.** This interpretation is subject to revision. Please see [latest news](#). Last revision: May 18, 2005.

## Introduction

Zechariah means "The Lord Remembers" in Hebrew. This is fitting since Zechariah's vision is a collection of metaphors describing the organization of the brain's memory system. The *seven eyes on one stone* (and the seven lamps) represent the seven-item capacity of working memory. I knew from the beginning that the book of Zechariah was related to the seven churches of Asia. However, it was not until much later that I came to recognize its profound connection with the churches of [Sardis](#) and [Pergamum](#). In the message to Sardis (verse 3:1), John writes "He who has the seven Spirits of God and the seven stars, says this." It turns out that the seven spirits of God are defined elsewhere in Revelation as the seven lamps (4:5) and the seven eyes of the Lord (5:6). Both Sardis and Pergamum contain references to walking (motor output) and Pergamum mentions a white [stone](#) on which an inscription (or name) is written. As it turns out, the book of Zechariah refers to the same things:

### 3:9

**For behold, the stone that I have set before Joshua; on one stone are seven eyes. Behold, I will engrave an inscription on it,' declares the LORD of hosts, 'and I will remove the iniquity of that land in one day.**

### 4:2

**He said to me, What do you see? And I said, I see, and behold, a lampstand all of gold with its bowl on the top of it, and its seven lamps on it with seven spouts belonging to each of the lamps which are on the top of it;**

### 4:10

**For who has despised the day of small things? But these seven will be glad when they see the plumb line in the hand of Zerubbabel--these are the eyes of the LORD which range to and fro throughout the earth.**

It is obvious that Zechariah's text has a lot in common with Sardis and Pergamum. The question is, what are the meanings of these symbols? This is what I will attempt to unravel in these pages. Please refer to the [diagram](#) at the bottom of the page while reading this interpretation. Also, keep in mind that Zechariah is using historical figures during the time of the Temple's reconstruction and that these people all were in captivity

and much tribulation in Babylon. I am always grateful for constructive criticism from interested readers.

## Interpretation

### 3:1

**Then he showed me Joshua the high priest standing before the angel of the LORD, and Satan standing at his right hand to accuse him.**

And he showed me Joshua the high priest standing before the angel of the LORD. What is the symbolic meaning of angel? This is not the first time we encounter this metaphor. In the message to Sardis, we read that God has seven stars (another word for angel). Here we see that Joshua is standing in front of the angel of the LORD. The angels seem to be entrance guards who decide who is to walk into the temple.

**Satan standing at his right hand to accuse him.** Obviously Joshua has done something wrong. Otherwise Satan would not be there to accuse him. There seems to be a direct connection between this verse and the Church of Pergamum (Revelation 2:13) which is said to be the seat of Satan. The implication is that Joshua represents a neural signal in Pergamum. Again we encounter the verb "standing", as opposed to "sitting" (see below). One is reminded that only standing people can walk (i.e., perform motor actions).

**Note:** I am not yet sure of the significance, if any, of Satan standing at Joshua's right hand. Why his right hand and not his left?

### 3:2

**The LORD said to Satan, The LORD rebuke you, Satan! Indeed, the LORD who has chosen Jerusalem rebuke you! Is this not a brand plucked from the fire?**

**Is this not a brand plucked from the fire?** Where have we seen fire mentioned before? In Revelation, we read, **He who has his eyes like a flame of fire** (Rev 2:18). We know the seven spirits of God are the eyes of God which are the seven lamps referred to in Zech 4:2. Fire is a symbol of testing or tribulation. Therefore, if Joshua is plucked out of the fire, we can deduce that the signal or input symbolized by Joshua originates from a place of tribulation. This, in my opinion means that Joshua comes from Smyrna or Ephesus where signals undergo rigorous testing through a separation process. At this stage, Joshua is no longer in the fire because he has been plucked out.

### 3:3

**Now Joshua was clothed with filthy garments and standing before the angel.**

**Joshua was clothed with filthy garments.** **Filthy garments** is a recurring metaphor in the message to the Church of Sardis. It symbolizes some sort of incompleteness or imperfection or sin. My interpretation is that Joshua was unfaithful in his duties, meaning that he failed to arrive for his duties as a high priest as was expected of him.

**And standing before the angel.** The repeated mention of "standing" is a sign of the importance of the 'standing' metaphor. Contrast this with Joshua's friends below: they are sitting. My hypothesis is that standing signals are ready to be used as motor commands (symbolized by walking) in Pergamum. At this point, they can only stand and are not yet walking.

### 3:4

**He spoke and said to those who were standing before him, saying, Remove the filthy garments from him. Again he said to him, See, I have taken your iniquity away from you and will clothe you with festal robes.**

**He spoke and said to those who were standing before him.** Who are these beings

standing before the angel? And why are there standing as opposed to sitting? I initially surmised that these beings were other angels but I have since changed my mind. I now believe that there are multiple other beings who, like Joshua, are standing on their feet before the angel. They apparently all have something to do with motor behavior (walking). Later (see below), Joshua is given **free access among these who are standing**.

But why is there a necessity to have several standing beings attend to Joshua's clothing when only one would do? I think this is just a way of saying that there are multiple incoming signals that will be used for motor control.

**Remove the filthy garments from him.** "Filthy garments" is symbolic of sin. Joshua is forgiven for his sins. My take is that Joshua did not arrive as expected for his duties as a high priest. The angel forgives him for a specific reason: he underwent rigorous testing. But some mechanism of forgiveness must be provided, as we find out below.

### 3:5

**Then I said, Let them put a clean turban on his head. So they put a clean turban on his head and clothed him with garments, while the angel of the LORD was standing by.**

**Then I said, Let them put a clean turban on his head.** What is the symbolic significance of the clean turban being put on Joshua's head? Does it have a meaning separate from clean garments? Why would Zechariah say this if the clean garments were sufficient to convey the metaphor. Could it be for emphasis on cleanliness? Possibly. I suspect, however, that this is emphasizing something about Joshua's role or position. A turban is a sign of authority. After all, Joshua is a high priest.

**While the angel of the Lord was standing by.** This is probably an indication that the clean turban being put on Joshua's head is done with the approval of the angel. It may also indicate that the activity is time consuming.

### 3:6

**And the angel of the LORD admonished Joshua, saying,**

### 3:7

**Thus says the LORD of hosts, If you will walk in My ways and if you will perform My service, then you will also govern My house and also have charge of My courts, and I will grant you free access among these who are standing {here.}**

**If you will walk in my ways.** We have already seen in [Pergamum](#) that 'walking' symbolizes [motor behavior](#). What does it mean to walk in my ways? It means to walk correctly without stumbling (the ways of Satan) and to follow the correct path. The [stumbling block](#) mentioned in Pergamum represents two types of motor conflict. One of the reasons that Satan is also standing is probably to cause Joshua to stumble and fall.

**And if you will perform my service.** Joshua is a servant of God, a high priest who performs services in the temple. This is important because, in the message to [Thyatira](#), there is an [admonition](#) against tolerating a certain prophetess named Jezebel who teaches and seduces God's servants to commit fornication and idolatry. Again, as seen in the Pergamum [interpretation](#), fornication and idolatry have to do with motor conflicts. So here, it is safe to assume that Joshua symbolizes a motor signal in Pergamum. Or, at least, he's about to become a motor signal.

**Then thou shall also govern my house.** Only the priests were allowed into the temple or the house of God. As we see in the interpretation of [Philadelphia](#), the temple is where motor output actually takes place. Motor output is controlled by afferent signals originating from Pergamum. But the motor signals do not always make it out to the effectors (the outer courts of the temple, see below).

And also have charge of my courts. This is the actual effector/motor layer. As we will see later, the outer courts are periodically given to the gentiles ([Laodicea](#) or cerebellum). Here is a relevant passage from chapter 11 of Revelation to ponder:

**11:1**

**And there was given me a measuring rod like a staff; and measure the temple of God, and the altar, and those who worship in it.**

**11:2**

**And leave out the court which is outside the temple and do not measure it, for it has been given to the gentiles; and they will tread under foot the holy city for forty-two months.**

This is powerful symbolic stuff which involves the churches of Philadelphia, Laodicea, and the so-called two witnesses. I will have a lot more to say about this in my interpretation of the [fourth chapter](#) of Zechariah. Let me say, for now, that this also has to do with internal thinking (measuring the temple) while the cerebellum ([Laodicea](#)) is taking care of automatic motor output (the outer court which is given to the gentiles).

I will grant you free access among these who are standing by. Another translation for free access is places to walk. Again we see the reference to "walking", meaning motor output. The context suggests that these who are standing by were also given the permission to walk in the temple. This further suggests that, like Joshua, they are also high priests who serve in the temple or house of God.

**3:8**

**Now listen, Joshua the high priest, you and your friends who are sitting in front of you--indeed they are men who are a symbol, for behold, I am going to bring in My servant the Branch.**

You and your friends who are sitting in front of you. This is obviously alluding to a special group of people (not angels) associated with Joshua. But notice that Joshua's friends are sitting in front of him. They are not standing with him. This is probably bringing attention to the fact that Joshua's friends are not directly involved with motor actions. 'In front of' should probably be given its temporal meaning as opposed to a spatial meaning. That is, Joshua's friends came before him, not after.

Indeed they are men who are a symbol. Another translation is: for they are men who are an omen of things to come. The implication is that Joshua and his friends act as precursors or predictors to something that will happen later.

For, behold, I am going to bring in My servant the Branch. The "for" preposition makes it clear that the Branch has something to do with the anticipatory nature of Joshua and his friends.

**3:9**

**For behold, the stone that I have set before Joshua; on one stone are seven eyes. Behold, I will engrave an inscription on it,' declares the LORD of hosts, 'and I will remove the iniquity of that land in one day.**

For behold, the stone that I have set before Joshua. Is this the same [stone](#) mentioned in the message to Pergamum? I did not think so in the beginning. My reasoning was based on the following observations: a) The Pergamum stone is white and a name is written on it which no man knows except he who receives; b) Zechariah's stone, by contrast, is placed before Joshua in plain sight where everyone can see whatever is inscribed on it. I now think I was mistaken. There is no indication in the text that others could read the writing on Joshua's stone. It follows that both Zechariah and the message to Pergamum are referring to the same stone.

On one stone are seven eyes. Behold, I will engrave an inscription on it. and I will

**remove the iniquity of that land in one day.** Initially, I thought that the stone with seven eyes represented seven sequential input layers or nodes. I assumed that there was one eye for each lamp on the [golden lampstand](#) in Zechariah's vision. As has happened many times before, I now believe that my original interpretation was wrong. The reason is that Joshua's stone is associated with a single signal pathway, i.e., there is only one stone for each pathway and each stone has seven eyes, not one. I conclude that there are seven eyes associated with each of the seven lamps on the golden lampstand. This makes sense in the light of the fact that [verse 4:2](#) talks about seven spouts belonging to each of the lamps which are on top of the lampstand.

### The Meaning of the Seven Eyes

An eye is a symbol of perception. When signals arrive from the sensory layers (Smyrna and Ephesus), they make contact with the memory layer (Pergamum) in such a way as to form sequences. The sequences are organized into seven nodes each which is symbolized by the seven lamps. Joshua is an input pathway to a single node in a sequence. Each node (except the first one) receives a special input called the Branch. Likewise, each node (except the last) sends out a Branch output. This means that there are six branches altogether, which, if you'll remember, is the number of branches specified for the golden seven-lamp menorah in the Temple (see [Exodus 25:31-40](#)). The Branch is used as a corrective signal that compensates for Joshua's imperfection. This is symbolized in Zechariah's text by the iniquity of the land being taken away in one day.

Several questions arise. Why does a single node have seven eyes? How many ways are there to perceive incoming signals? In other words, what do the seven eyes really represent? In order to answer these questions, one must first understand what it is exactly that is being perceived. As was made clear in the message to the church of Sardis, memory has to do with the recording of intervals between certain events. The problem is that there is an infinite number of possible intervals between events, from fractions of a second to minutes, hours, days, weeks, months, years, etc...

In my opinion, the brain uses seven different precision windows to record intervals: the longer the interval, the lower the precision. This is the reason that we find it hard to remember what event preceded other events in the distant past. To compensate for this lack of precision, we find it necessary to use calendars and clocks. By contrast, we have little difficulty timing the motion of fast moving objects. For example, we can judge how fast a car is moving toward us so as to make a reasonable decision to move out of the way in time.

### 3:10

**In that day, declares the LORD of hosts, every one of you will invite his neighbor to sit under his vine and under his fig tree.**

I am not entirely sure of the meaning of this. It may be a way of linking this verse with the [flying scroll metaphor](#).

To be continued...

## Tentative Memory Model

Check out the latest [memory model](#) based on these interpretations.

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Scripture taken from the [NASB](#)<sup>®</sup>.

Next: [The Lampstand](#)

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# Artificial Intelligence From the Bible

## The Lampstand

(Short and Long-term Memory, Anticipation, Sequence Learning and Pattern Completion)

### Zechariah 4:1-14



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Note: This interpretation is partially incorrect and subject to change at any time. See the latest [news](#) for more info. Last revision: May 18, 2005.

## Introduction

Zechariah means "The Lord Remembers" in Hebrew. This is fitting since Zechariah's vision is a collection of metaphors describing the organization of the brain's memory system. The *seven eyes on one stone* (and the seven lamps) represent the seven-item capacity of working memory. Chapter 4 of Zechariah continues to expand on the metaphors of the previous chapter. We can now understand the mechanism of short-term memory and conscious attention. We learn that sequences are formed, not by Joshua but by the Branch.

## Interpretation

### 4:1

**Then the angel who was speaking with me returned and roused me, as a man who is awakened from his sleep.**

**And the angel who was speaking with me came again.** Zechariah is keen to point out that this is the same angel that was speaking with him earlier. Why? It seems to imply that there are other angels standing by, not just the one who was talking to Zechariah. In other words, there are many sequences running (awake) simultaneously.

**And roused me, as a man who is awakened from his sleep.** For some strange reason, Zechariah falls asleep in the middle of the vision and has to be awakened by the angel. This has to be a parallel between the [Sardis](#) message and Zechariah's vision. Remember that the church of Sardis is repeatedly told to [stay awake](#) (to wake up or be watchful). In my opinion, being awake or being watchful symbolizes conscious attention. The ability to pay attention to certain things and not to others is a very important aspect of intelligent systems. Obviously, one cannot think of everything at the same time.

### 4:2

**He said to me, What do you see? And I said, I see, and behold, a lampstand all of gold with its bowl on the top of it, and its seven lamps on it with seven spouts belonging to each of the lamps which are on the top of it;**

**A lampstand all of gold with a bowl on the top of it, and his seven lamps on it.** We have



already encountered the metaphor of the seven lamps. In Revelation [4:5](#) and [5:6](#) we learned that the seven lamps are not only the seven spirits of God but also the seven eyes of the Lord. The same metaphor is mentioned in the message to the church of Sardis. My hypothesis is that the lamps/eyes/spirits symbolize seven sequential nodes which receive input signals from the sensory cortex ([Smyrna](#) and [Ephesus](#)) and from feedback. Elsewhere the eyes are said to be like flames of fire. These symbolize the rigorous testing (trial by fire) that takes place in the sensory cortex. There are seven inputs for each lampstand. My current interpretation is that the lampstand represents a single sequence of seven nodes which can be used directly for motor output. This means that memory is organized into sequences.

With seven spouts belonging to each of the lamps which are on the top of it. Another translation is, **and seven pipes to the seven lamps, which are upon the top thereof.** The number of spouts (or pipes) is either seven, fourteen, or forty-nine depending on who is doing the translating. It now seems (I did not always think so) that there are seven pipes for each lamp on the lampstand. Why would a single lamp need seven pipes? In my opinion, it has to do with the seven eyes on one stone mentioned earlier in [verse 3:9](#).

### 4:3

**Also two olive trees by it, one on the right side of the bowl and the other on its left side.**

Also two olive trees by it. My interpretation is that the two olive trees are part of the short-term memory mechanism. One of their functions is to supply oil to the lampstand's bowl. The book of Revelation also mentions two olive trees:

#### Rev 11:3

**And I will give authority to my two witnesses and they shall prophecy for twelve hundred and sixty days, clothed in sackcloth.**

And I will give authority to my two witnesses and they shall prophecy. The two witnesses (which are the two olive trees as seen in the next verse) are also prophets. This is highly significant because anticipation or prediction is one of the things one would suspect has to occur in memory.

For twelve hundred and sixty days. We have already seen that a day represents one cycle or about ten milliseconds. Apparently the two witnesses are not only prophesying but they do it for twelve hundred and sixty cycles. And while this is happening, the gentiles nations have taken over the [outer courts](#) of the temple. Interesting stuff. I think this means that short-term memory lasts 1260 cycles. Assuming a shortest cycle length of 10 milliseconds, this means that short-term memory should last about 12.6 seconds or longer.

Clothed in sackcloth. I am not sure of the significance of this metaphor. Sackcloth symbolizes repentance. But why would the two witnesses need to repent? It is possible that, since they are the [sons of fresh oil](#), they may have been unfaithful in their duties which is to keep the lampstand continually supplied with fresh oil. However, I rather suspect that the sackcloth is a symbol of the primary function of the two witnesses, which is to correct the misdeeds of the people.

#### Rev 11:4

**These are the two olive trees and the two lampstands that stand before the Lord of the earth.**

Note that the two olive trees are standing before the Lord of the earth. Later in this chapter of Zechariah, in [verse 4:14](#), we read

that they stand by the Lord of the whole earth. I think this is significant, otherwise why the emphasis? My interpretation is that the two olive trees represent the internal thinking/reasoning mechanism of the left and right hemisphere of the brain, hence the reference to the Lord of the *whole* earth.

Note also that Revelation equates the two witnesses with the two olive trees and the two lampstands! I interpret this to mean that there are indeed two identical lampstands and that Zechariah's single lampstand is just a description of lampstands in general. The two lampstands apparently stand for the memory mechanism of the left and the right hemispheres of the brain.

**One on the right side of the bowl and the other on its left side.** This yin-yang, left-right duality obviously has an important symbolic meaning. Although the two lampstands are identical in composition, one is the complement or opposite of the other.

### **The Bowl:**

#### **Attention and Short-Term Memory**

It is obvious that the bowl must have some rather important symbolic significance. Why would it be mentioned twice otherwise? The bowl contains the olive oil which is needed to keep the lamps burning. The implication is that the lamps will stop shining and the eyes will stop seeing (receiving inputs) as soon as the supply of oil is used up. This is obviously related to the mechanism of attention and short-term memory. If we do not pay attention to something, we not only stop reacting to it, we also stop noticing (receiving inputs from) it completely: the eyes are blind, so to speak. Analogically, if there is no oil in the bowl, the lamps will go out and will stop providing light for the eyes to see. Two questions come to mind: What keeps the bowl filled with oil and how often is it replenished? Moses was told by God that the sons of the high priests were to keep the golden lampstand supplied with fresh oil. Later in this chapter, we see that the two olive trees are also called the sons of fresh oil (usually translated as the two anointed ones).

Another question has to do with the bowl's capacity which, one would surmise, is directly related to how long the lamps stay lit. This probably has something to do with the duration of short-term memory. There may be enough oil in the bowl to keep the lamp burning long enough for short term retention.

The fact that the two olive trees are standing right next to the bowl is also very important, in my opinion. The bowl and the two olive trees are obviously connected in some manner. What immediately comes to mind is that the two olive trees are somehow involved with short-term memory duration. I am preparing a special page on the two olive trees to shed more light on this important subject.

### **4:4**

**Then I said to the angel who was speaking with me saying, What are these, my lord?**

**The angel who was speaking with me.** Again, notice the repeated emphasis on specifying a particular angel. The implication is that there were other angels standing around in Zechariah's vision, but only one of them talks to Zechariah. Why is this important? I think it is just a way of implying that the other angels are attending to other lampstands or sequences.

**4:5**

**So the angel who was speaking with me answered and said to me, Do you not know what these are? And I said, No, my lord.**

There may be some sort of symbolic significance to the back and forth dialog between Zechariah and the angel. I think that it may be a way to attract attention to the fact there are other angels standing by. But why would the angel ask Zechariah this question since the answer should be obvious?

**4:6**

**Then he said to me, This is the word of the LORD to Zerubbabel saying, Not by might nor by power, but by My Spirit,' says the LORD of hosts.**

**This is the word of the LORD to Zerubbabel.** The name Zerubbabel means "seed" or "branch of Babylon" in Akkadian and Hebrew.

**Not by might nor by power, but by My Spirit.** I interpret this to mean that conscious memory is ultimately under the control of the spirit that is attached to the brain. It is the spirit that decides what to think about. It is obvious that we cannot build an artificial spirit but does this mean that we cannot build an intelligent yet unconscious machine? I believe we can. There are ways to control attention that do not necessitate a spirit. Attention can be dictated by motivation and when motivation is indecisive, random selection will do.

**Note.** One of my readers brought something important to my attention. Apparently there is some controversy among scholars about the placement of verses 6 to 10 within this chapter. Some think that the scribes whose job was to make copies of old manuscripts, may have unintentionally changed the order of these verses. Some scholars believe that that verses 6-10 should come after verse 14. The end result is that verse 6 would be a direct answer to Zechariah's question in verse 4 and 5. Verses 6 and 7 would then become:

**4:6**

**These seven are the eyes of the Lord, which range to and fro through the whole earth.**

**4:7**

**Then I said to him, What are these two olive trees on the right of the lampstand and on its left?**

The verses would continue normally up to current verse 14, followed by current verses 6 to 10. I am not yet sure of the importance of this, if any.

**4:7**

**What are you, O great mountain? Before Zerubbabel you will become a plain; and he will bring forth the top stone with shouts of Grace, grace to it!**

**What are you, O great mountain? Before Zerubbabel you will become a plain.** This implies that there are major difficulties facing Zerubbabel but he conquers them all. Is there a symbolic significance to this sentence within the context of the brain? I think that it may be pointing out that Zerubbabel has a major job to do: he must build the temple.

**He will bring forth the top stone.** Here again we see the metaphor of the stone which is used to build the house of God. But note that this time around, it is a top stone or capstone, which is the last and most important stone to be placed during construction. This must be the stone placed before Joshua the high priest.

**With shouts of Grace, grace to it!** Grace means forgiveness of sin. This seems to be referring to Joshua's sins being forgiven. And if Joshua's stone is the capstone, the other

stones (which are implied) that are needed to build the temple must be those of his friends.

#### 4:8

**Also the word of the LORD came to me, saying,**

#### 4:9

**The hands of Zerubbabel have laid the foundation of this house, and his hands will finish it. Then you will know that the LORD of hosts has sent me to you.**

The hands of Zerubbabel have laid the foundation of this house, and his hands will also finish it. This seems to indicate that Zerubbabel is involved in the building of entire the house of God from beginning to end. Joshua is not the builder but one of the stones used in the building. This is related to a few verses in chapter 6 of the book of Zechariah in which we are told that the real builder of the temple is the Branch:

#### 6:11

**Take silver and gold, make an ornate crown and set it on the head of Joshua the son of Jehozadak, the high priest.**

Take silver and gold, make an ornate crown and set it on the head of Joshua. In my opinion, the crown on Joshua's head is the same crown we find in the message to the church of Philadelphia. This is another indication that output signals from these nodes are used for motor output.

#### 6:12

**Then say to him, 'Thus says the LORD of hosts, "Behold, a man whose name is Branch, for He will branch out from where He is; and He will build the temple of the LORD.**

For He will branch out from where He is. Metaphorically this means that the Branch is used to link the stones (nodes) into a sequence. Notice that the translator decided to capitalize the H in the second 'He' in the sentence. The assumption made is that both instances of the pronoun He refer to the Branch. But is this justifiable within the context? In my opinion, it makes no sense to say that a branch branches out from itself. The context has to do with the previous verse which is about a crown being placed on Joshua's head. The more obvious implied meaning of the sentence should be as follows: **For He (the Branch) will branch out from where He (Joshua) is.**

#### 6:13

**Yes, it is He who will build the temple of the LORD, and He who will bear the honor and sit and rule on His throne. Thus, He will be a priest on His throne, and the counsel of peace will be between the two offices.**

Yes, it is He who will build the temple of the LORD. The Branch is obviously a metaphor for Zerubbabel (branch of Babylon) who was said earlier to be the builder of the temple.

He who will bear the honor and sit and rule on His throne. Thus, He will be a priest on His throne. The repeated mention of throne is important. The throne is in the temple of the LORD. We see the same throne mentioned in the message to church of Laodicea. This gives us a powerful indication that the church of Laodicea is also involved with motor control.

And the counsel of peace will be between the two offices. Another translation has it thus: "And there shall be harmony between the two." Still another is "And the two shall be in agreement." Given the context, 'the two' seems to be referring to Joshua and the Branch. I interpret this to mean that the two signals shall be in agreement, meaning that they should arrive together.

#### 4:10

**For who has despised the day of small things? But these seven will be glad when they see the plumb line in the hand of Zerubbabel--these are the eyes of the LORD which range to and fro throughout the earth.**

These are the eyes of the LORD which range to and fro throughout the earth. It is obvious that "these seven" are the seven eyes on Joshua's stone. It seems that Zerubbabel is the one that strings the seven lamps (nodes) together to form a sequence. However, what does it mean for the seven eyes to be glad when they see the plumb line in the Hands of Zerubbabel? It must be rather important. I don't yet understand the metaphor but I suspect that it has to do with the timing of [Joshua's friends](#).

#### 4:11

**Then I said to him, What are these two olive trees on the right of the lampstand and on its left?**

The thing to note here is that the angel does not answer Zechariah's question. I believe this is because the answer is given in Revelation 11:4 as discussed [above](#). The question is: Are the two olive trees the same as the two olive branches mentioned below?

#### 4:12

**And I answered the second time and said to him, What are the two olive branches which are beside the two golden pipes, which empty the golden oil from themselves?**

Most Bible commentators think that the two olive branches are the two olive trees. I have my doubts. Why did not the angel answer Zechariah's question about the two olive trees? A branch is certainly not a tree. Notice also that the two olive branches are associated with two golden pipes. These were not mentioned before. What is the symbolic significance of the branches and the pipes?

#### 4:13

**So he answered me, saying, Do you not know what these are? And I said, No, my lord.**

Again, we see the angel asking Zechariah a seemingly silly question considering that the answer should be obvious. Perhaps this is how the angel chooses to express surprise at Zechariah's ignorance. Why would this surprise him? And if so, what is the symbolic significance of it? My experience is that, when it comes to metaphorical texts, every little detail is important. There must be a reason for this weird exchange. I need to think about this some more.

#### 4:14

**Then he said, These are the two anointed ones who are standing by the Lord of the whole earth.**

These are the two anointed ones. The literal translation is: **These are the two sons of fresh oil**. When God commanded Moses to build and place a golden lampstand in the house of the Lord, he also commanded that the sons of the priests (the sons of Aaron and the other Levite priests) should replenish the lamp with oil so as to keep the seven lamps burning continually.

To be continued...

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# Artificial Intelligence From the Bible

## The Flying Scroll:

### Correlational Learning Rules for Memory formation

#### Zechariah 5:1-4



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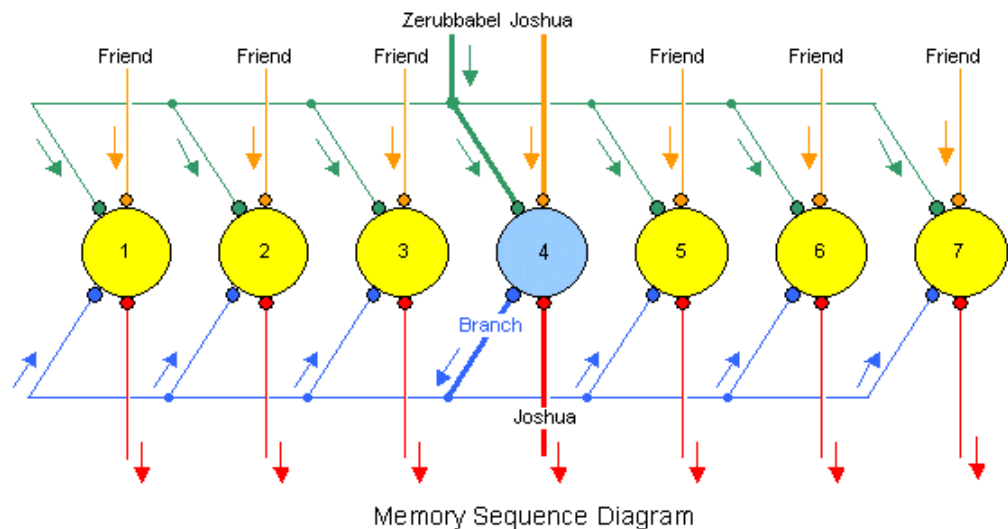
**Note.** This interpretation is partially obsolete and does not completely reflect my latest understanding of the metaphors of the book of Zechariah. I am working on an update. Please see [latest news](#). Latest revision: May 29, 2005.

## Introduction

Chapter 5 of the book of Zechariah has two main metaphors, the **flying scroll** and the woman in the **ephah** (measuring basket). As of now, I am not entirely sure of the symbolic meaning of the woman in the ephah, although I have some ideas. The meaning of the flying scroll, however, is much more obvious to me. One of the things that has not been mentioned so far regarding **Joshua** and his **friends** is this: how does learning take place? In other words, how are connections made and severed in memory?

Normally afferent axons originating from a previous layer, or from feedback, try to make as many random connections with neurons in the [memory layer](#). This is part of a trial and error learning process. Of course, very few of the new connections will be correct. There has to be a way to weed out the bad ones and keep the good ones. In the brain, there is only one thing that matters when it comes to synaptic learning: temporal correlations. In other words, input connections are tested according to some temporal learning rule based on either simultaneity, fixed-interval contiguity, or intervals correlated over varying proportional scales. The latter is used in sequence memory learning.

Every learning rule is based on a correlation factor. In the message to the church of [Smyrna](#) (sensory cortex), we learned that the [correlation factor](#) for testing and modifying synapses is 10 to 1. This means that an input signal must contribute to the firing of its target neuron at least once in every 10 tries. Otherwise it is disconnected. The question is, what is the correlation factor for **Joshua** and his **friends**, not to mention the concurrent inputs (the **exiles**) that contribute to **Joshua's crown**? The answer to this question can be found in the **flying scroll** metaphor as explained below.



## Interpretation (under revision)

### 5:1

**Then I lifted up my eyes again and looked, and behold, there was a flying scroll.**

**And behold, there was a flying scroll.** The flying scroll is, of course, symbolic. A scroll is a book or parchment on which something is written, usually a law or edict. The fact that the scroll is flying probably means that it affects a huge area and that it acts very quickly.

### 5:2

**And he said to me, What do you see? And I answered, I see a flying scroll; its length is twenty cubits and its width ten cubits.**

**And he said to me, What do you see? And I answered, I see a flying scroll.** Again we see Zechariah engaging in conversation with the angel. I still do not know why Zechariah and the angel are having a dialog. I suspect that it is rather important.

**Its length is twenty cubits and its width ten cubits.** This is a huge scroll and, obviously not a real one. But why such a large scroll? I think this may be a way of saying that the scroll covers a wide area. In addition, the scroll is twice as long as it is wide. In my opinion, this is referring to a signal correlation factor used in learning (trial and error). I originally assumed that it stood for a 2 to 1 ratio. In other words, I thought that in order for two or more inputs to be correlated they must agree at least once for every two tries. I subsequently concluded that a 2:1 ratio is much too stringent. Besides, why specify a size of 20 by 10 cubits when 2 by 1 cubits would have been much more appropriate? I now believe that the size of the scroll represents two distinct ratios, one (20 to 1) for **thieves** (everyone who steals) and one (10 to 1) for **false witnesses** (everyone who swears).

### 5:3

**Then he said to me, This is the curse that is going forth over the face of the whole land; surely everyone who steals will be purged away according to the writing on one side, and everyone who swears will be purged away according to the writing on the other side.**

**This is the curse that is going forth over the face of the whole land.** In at least one other translation, **curse** is translated as **verdict**. [NetBible](#) has this footnote: *The Hebrew word translated "curse" (hl\*a\*, 'alah) alludes to the covenant sanctions that attend the*



violation of God's covenant with Israel (cf. Deut 29: 12, 14, 20-21).

Obviously the flying scroll represents some sort of penalty associated with bad behavior. But against whom? The answer is given in the same verse: against thieves and false witnesses. One should note that there are worse behaviors in society than stealing and lying. Why target only these two? This is one more indication, in my opinion, that these things are mere symbols: stealing and lying happen to be more symbolic of the hidden subject matter.

Note also that the curse covers the face of the **whole land**. In my opinion this means that the two learning rules symbolized by the writings on the scroll are applied everywhere within memory. The **whole land** or the **whole earth** normally symbolizes the entire brain, i.e., both the left and right hemispheres.

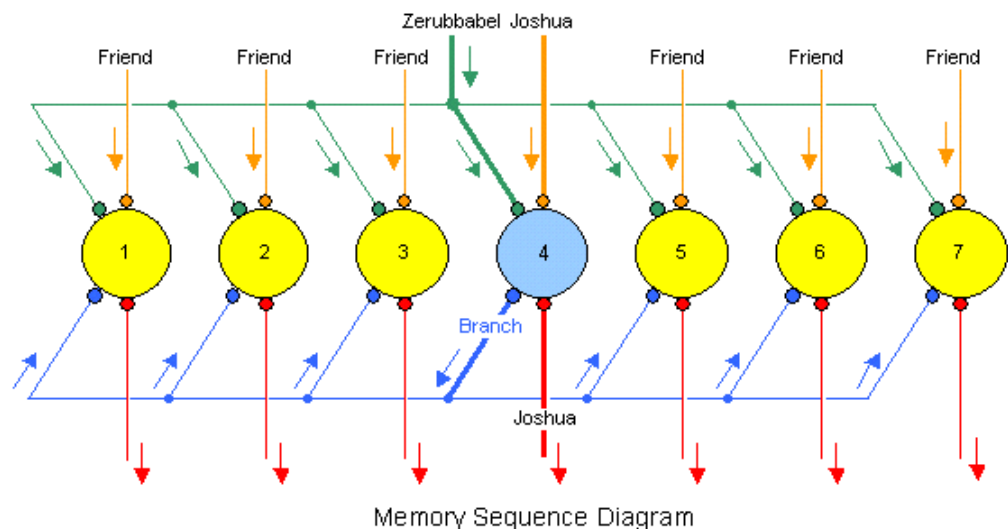
**Surely everyone who steals will be purged away according to the writing on one side.** The relevant metaphor here is, **everyone who steals**. What is this referring to? Stealing implies the existence of possessions or belongings. It also implies that someone has taken something that does not belong to him. We have already seen one passage in Zechariah's vision which has to do with possessions:

**3:10**

**'In that day,' declares the LORD of hosts, 'every one of you will invite his neighbor to sit under his vine and under his fig tree.'**

This verse is referring to **Joshua's friends** who are sitting before him. They represent, in my opinion, concurrent inputs that arrive some time before **Joshua**. What is important in this context is the fact that every one of **Joshua's friends** have possessions, in this case, a vine and a fig tree and, by implication, everyone also has a house sitting on a parcel of land.

What I am arriving at is that stealing has to do with taking what belongs to someone else. In this context, it means that one or more of **Joshua's friends** may be a thief or imposter and must be purged away. The conclusion that I draw, is that a thief symbolizes an input signal that has stolen the place (i.e., connection) of another. It must be cut off. A 20 to 1 correlation factor (see above) is used to weed out these bad connections.



**And everyone who swears will be purged away according to the writing on the other side.** A competing translation is, "everyone who swears falsely will purged away..." Yet another is "everyone who makes false promises will be cut off..." This is most likely a metaphor for false prophets. Consider that to swear falsely is to bear false witness, i.e., to claim or to assert something which is subsequently shown to be false. As seen in the figure above, the **Branch** is an anticipatory mechanism. It predicts signal (Joshua) is a predictor (or prophet): it announces the arrival of a successor signal (the Branch). The prediction can either be true or false. If it is false, the rule is applied and the predecessor connection is severed. The correlation factor used for severing bad predictors is 10 to 1.



## 5:4

**I will make it go forth, declares the LORD of hosts, and it will enter the house of the thief and the house of the one who swears falsely by My name; and it will spend the night within that house and consume it with its timber and stones.**

**And it will spend the night within that house.** Why just a night? Why not the entire day? Indeed, why spend any time at all? A night, of course, is half a day and a day is symbolic of a single cycle. Since, in the biblical metaphorical system, the day is counted from sundown to sundown, a night must represent the first half of the cycle. What this seems to imply is that bad connections are severed before the end of a cycle. The night metaphor is probably more important than it looks but I am having trouble understanding its true relevance in this context. A house is probably symbolic of a synaptic connection.

**And consume it with its timber and stones.** As seen in this verse, the penalty for stealing and lying is pretty severe and quick.

—  
Scripture taken from the [NASB](#)®.

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# Artificial Intelligence From the Bible

## Memory Model



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**Note.** This memory model is now obsolete. A revision is in the works. Please see [latest news](#).  
Last revision: July 25, 2005.

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## Introduction

This page is where I describe a memory model of the brain which reflects my current understanding of the various metaphors and symbols found in Zechariah's vision and in the messages to the churches of Sardis and Pergamum in the book of Revelation. Please refer the related articles for background information on this topic: [Joshua the High Priest](#), [The Lampstand](#), [Pergamum](#) and [Sardis](#). Most people who read the description of the golden lampstand in [Exodus 25:31-40](#) assume that there are seven branches altogether, three on side, three on the other and one in the middle. But a careful examination of the text will reveal that there is no mention of seven branches anywhere. There is no mention of a middle branch either. My current understanding (which may change as I unravel these mysteries) is that there are only six branches and that they are separate and distinct from the seven lamps. The branches do not support the lamps but are attached to the two sides of the lampstand which has the seven lamps on top of it. A lamp is not a branch. I think this is rather important in deciphering the metaphorical meaning of the **Branch** in Zechariah's vision.

## The Model

### Seven Lamps and Six Branches

According to this model, memory is a signal recording and playback mechanism organized

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# Artificial Intelligence From the Bible

## Falsifiable Predictions



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### Why Make Predictions?

The following is a list of falsifiable predictions about the brain which were derived from my interpretation of the seven churches and other biblical symbolic teachings. I will add to the list as I go along. If you know of any lab experiment that either falsifies or corroborates any of these predictions, please contact me.

I provide these predictions for a reason. I am making extraordinary claims in these pages. The predictions listed below concern aspects of brain function that are unknown to modern neurobiology, as far as I know. Thus I cannot be accused by my detractors (I have many, as one might suspect) of force-fitting known scientific discoveries into random Biblical verses after the fact.

I am acutely aware of the negative impact of recently published works on so-called "biblical codes". As a result, many people now suffer from what I call *biblical coditis*. I regularly receive highly critical correspondence comparing my work with the biblical code genre. The truth is that the science of symbol interpretation has been around long before the biblical code hoaxers appeared on the scene. This is how the late great archaeologist Linda Schele was able to decipher the meaning of Mayan "myths" by showing that they were, in reality, precise metaphors for various aspects of Mayan cosmology.

If the predictions are falsified in the lab, my work then amounts to nothing and I get to walk in shame, tarred and feathered and all that. But if they are confirmed, then a lot of people get to eat a mountain of crow. Best of all, I get to watch and say with a smirk on face: "I told you so, goddamnit!" I am only human, after all. Having said that, note that these predictions are based on my current understanding of the Biblical symbology. I may modify them in the future to reflect my growing familiarity with the metaphors.

### Temporal Interval Between Pre-Synaptic Spikes

The theory predicts that a pyramidal neuron in the sensory cortex fires when it receives a spike from a specific synapse which I call the successor synapse. The successor spike must be preceded by a predecessor spike (within ten milliseconds) arriving on a different synapse on the same neuron, otherwise the neuron will not fire. This prediction should probably be tested only in vivo. This is explained further in the [preamble](#).

### Left Brain Is Subservient to Right Brain

Subservient means that the left brain does everything to please the right brain. According to my interpretation of the church of Thyatira, the left brain's amygdala receives projections from the right brain via the corpus callosum which serves to reinforce or suppress the left brain's behavior. A careful psychological experiment can probably be performed on a split-brain patient (assuming there are any around) to falsify this prediction. This is explained further in the [preamble](#).

### 10 to 1 Signal Correlation Ratio

This is the ratio used in neurons in the association cortex to reinforce input synapses. What it means is that, assuming a synapse is weakened by amount A when it receives a presynaptic spike, it is strengthened by an amount exactly 10 times the value of A if the target neuron fires a short time after the presynaptic spike. More can be found in the interpretation of the message to [Smyrna](#).

### Two Types of Corrective Feedback Signals From the Basal Ganglia

According to my interpretation of the message to Pergamum, the basal ganglia transmits two types of corrective signals back to the original source of the motor commands in the motor cortex. This is explained in detail in the Pergamum [page](#).

### Short-Term Memory Duration

How long does a short-term memory trace last? Does the Bible have anything to say on the matter? I think so. In fact, according to my interpretation, the Bible is very precise about it. In the book of Revelation we read the following:

#### 11:3

And I will grant authority to my two witnesses, and they will prophesy for twelve hundred and sixty days, clothed in sackcloth.

This verse has a specific symbolic meaning which I will explain in a future page. What is relevant for this prediction is the meaning of the **1260 days**? According to my hypothesis regarding the biblical symbology used in the book of Revelation, the word 'day' is a metaphor for a neural cycle, i.e., the time between two spikes. Most neurobiology texts maintain that, on average, the action potential of a neuron lasts about 10 milliseconds, which may vary over time or across individuals. 1260 cycles at about 10 ms per cycle is 12.6 seconds. Thus, according to this simple calculation based on the interpretation and the biological data, 12.6 seconds is the approximate duration of a short-term memory trace. The only variable in the equation is the cycle time.

Note that the biblical text says absolutely nothing about the actual duration in terms of seconds but only in terms of neural cycles. The actual duration will vary depending on cycle wavelength. Indeed, spike trains of various frequencies have been detected in the hippocampus, so it is safe to assume that STM duration is a variable. The biblical text is, however, very precise regarding the number of cycles: 1260. This suggests the existence of intra-hippocampal spike trains (timing bursts) which last exactly 1260 cycles. I will leave it to neurobiologists to figure out how this can be tested.

But there is more. Once an item is gone from short-term memory, it must wait about 35 milliseconds (3 and 1/2 days or 3.5 cycles) before it can be allowed back (resurrected) into STM. In Revelation, this is symbolized by the **two witnesses** being dead for three and a half days ([Rev. 11:9](#)) before being resurrected. More on this in a future page.

## Top-down Concept Formation

A number of AI researchers (e.g., Jeff Hawkins) have concluded that the brain uses a bottom-up perceptual pyramid or feed-forward hierarchical tree that culminates in invariant representations of perceived objects. The truth is that high-level concept formation (such as might be represented by a grandmother cell) is accomplished in a top-down manner. It is a motor learning problem, rather than a perceptual learning problem. This is explained in the letter to the church of [Thyatira](#).

## Cerebellum Does Not Generate Speech

The cerebellum ([Laodicea](#)) is an automaton. It is trained by the basal ganglia to perform certain automatic motor tasks while the basal ganglia ([Philadelphia](#)) and motor cortex are busy reasoning internally. My [understanding](#) of the message to the church of [Pergamum](#) (Broca's area) and other Biblical metaphors is that speech is always an attentional or volitional (as opposed to automatic) process which involves corrective feedback from the basal ganglia. The cerebellum is not directly involved in processing speech and language.

Many more predictions to come. Stay tuned.

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