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GODLY CHILD-REARING: PART 2

In November 2010 I wrote an article entitled "Godly Child-Rearing". Since then I have come to understand certain things that I was not aware of two years ago. And so I now feel the need to address some additional material pertaining to child-rearing that I believe is extremely relevant. This material covers areas that were not addressed in the previous article.

This material has to do with **the development of the human brain**. I was doing some in-depth research for an article on the subject of "pain" when I came across this information. While this information does relate to understanding the processes by which we experience pain, I was struck by the profound implications this information has for the subject of child-rearing. And so I have decided to divide the material I was gathering into two distinct articles: one article that deals with the staggering potential of the human brain and the implications this has for godly child-rearing, and another article that deals with the human brain with a focus on the subject "WHY God created pain".

This present article deals with the application of this information to child-rearing. Let's start by considering the human brain.

THE HUMAN BRAIN

While scientists are basically agreed on the components of the brain and how the different areas of the brain are made up, there is considerable discrepancy between different people regarding the number of nerve cells that are found in the brain, with some authors claiming far higher numbers than other authors. There are also major discrepancies for the number of synaptic connections within the brain, with some authors likewise claiming far higher numbers than other authors.

For us these differences are of no significance, since references to such figures here in our context are **only for comparative purposes**, and not for scientific purposes. We'll go with the most commonly accepted figures, while acknowledging that other scientists may perhaps claim different total numbers of cells and cell connections for the human brain.

So let's consider the most commonly accepted available information.

In the **adult** human brain there are about **100 billion** nerve cells called "**neurons**", plus another at least 100+ billion "glial cells". Neurons have the ability to process and to transmit information to other cells. Glial cells, from the Greek word "glia" meaning "glue", provide support and protection for the neurons both in the brain itself and also for neurons in all other parts of the nervous system throughout the body, i.e. in the peripheral nervous system. Recent research indicates that they may even be capable of passing on information in certain cases. At any rate, glial cells are support cells, whereas neurons are what we think of as brain cells. In our discussion here we do not need to consider the role of the glial cells.

In isolation by themselves the neurons are pretty useless. The only way that neurons have any value is if they are in some way able to connect to other neurons. They must have such connections in order to communicate with other cells. The more active connections that a neuron has to other neurons around it,

the more valuable that neuron becomes. As a hypothetical illustration, a brain in which every neuron is connected to two thousand other neurons is far more valuable than a brain in which every neuron is only connected to one thousand other neurons.

The brain with the greater number of connections for every one of its neurons is the brain with the greater overall potential. The greater number of connections makes it possible to infuse a far greater potential into the brain.

The connections between neurons in the brain are called "**synapses**". This is an anglicized version of the made-up Greek word "synaptein", consisting of "sun" (or "syn") meaning "together" and "haptein" meaning "to clasp". Thus a synapse is a way of neurons clasping together. A more appropriate way to say this is that "a synapse is a link that allows a neuron to pass a chemical message to another cell in the body, be that other cell another neuron or some other type of cell".

In the adult brain each of those 100 billion neurons has on average **about 1000 synaptic connections** with other brain neurons. Thus in the adult brain there are typically about **100 trillion** connections with other brain cells. Those connections empower the brain to function and to perform all of its tasks. The more synaptic connections there are in the brain, the greater the potential for the brain to perform tasks and to store information. When some of these connections are for any reason destroyed, then this "usually" results in a loss of some or other ability for the brain. (I say "usually" because under certain conditions the brain has the capability to perform the tasks previously performed by the destroyed cells in another part of the brain. This is called neuroplasticity. More on this later.)

[COMMENT: There are also some very large types of neurons in the brain. One type is called Betz cells and another type is called Purkinje cells, both of which have far more synapses than the other types of neurons. It is because of these very large types of neurons that some reference works say that neurons have anywhere from 1,000 to 10,000 synapses each. But these very large neurons need not concern us in our discussion.]

Before proceeding I should mention that **some authors claim vastly different numbers** of cells and of synapses. For example Dr. Richard Restak, a neuropsychiatrist, has written about 20 different books about the brain in addition to lecturing extensively about neurology. In his 1984 book entitled "THE BRAIN" he stated:

"each of the at least **ten billion** neurons in the human brain may have over **a thousand synapses**".

27 years later, in a series of 12 lectures which Dr. Restak recorded in 2011 for "The Great Courses" entitled "Optimizing Brain Fitness" he has changed those numbers to the following values:

"The brain encompasses **100 billion neurons** with each neuron connected to perhaps **10,000 others** for a total of 1 million billion connections." (i.e. 1000 trillion)

So Dr. Restak's total number of neurons increased by a factor of 10, and his total number of synapses increased by a factor of 100, reflecting a better understanding of the brain than a quarter of a century earlier.

In those same 2011 lectures he presented certain figures which are at least debatable. Thus he claims that synaptic connections form in the womb at a rate of "a million per second", a figure that is likely to be correct. But the embryonic brain only starts to be formed in the third week of actual pregnancy (i.e. the fifth week when the count is started at the last menstrual cycle). Thus the brain has only 35 weeks in the womb before birth. Now 35 weeks of "a million new synapses per second" amounts to just over 21 trillion synapses at birth. But in the very next sentence in his lecture Dr. Restak then claims that at birth the

baby already has "50 trillion synapses", well more than double the "a million per second" rate he stated earlier.

Dr. Restak continues to claim that "**in the first month of life**" that number of synapses increases from 50 trillion to 1000 trillion, thus at a rate of **over 360 million per second** for a whole 30 days. That's over a third of a billion of synapses **per second**!

Dr. Restak is a highly qualified doctor, but he isn't necessarily a mathematician. I have not found any other authors who claim the same rapid development during a baby's first month of life. And I don't believe that Dr. Restak's figures here are correct.

Other authors on this subject whose writings I have seen say that the child's synaptic connections develop during the child's **first 3 years of life**. That translates into a rate of around **10 million new synapses per second**, for the entire first three years, i.e. Dr. Restak's one month at 360 million per second is replaced by 36 months at 10 million per second. This is likely to be the more correct figure.

At any rate, I have presented to above statements from Dr. Restak purely to show that **there are different opinions** amongst the experts. For our purposes in this article these differences are of minor significance, since I will only use these figures for comparative purposes, and concerning processes for which all the experts are in agreement.

So here is a very simplified approach to understanding the basic functioning of these brain cells. Most neurons have three parts: 1) a cell body, 2) a system for receiving inputs to the cell, 3) a system for sending outputs to other cells. The usual terms for these three parts are:

1) On one side of the neuron is the system for receiving input information. Those input devices are named "**dendrites**", from the Greek word "dendron" meaning "a tree". Think of dendrites as **antennas** for the cell which can pick up information that has been broadcast from somewhere else. Dendrites look like the branches of a tree; they are covered by hundreds and even thousands of synapses. The input the dendrites receive is then forwarded to the cell body.

2) The cell body is called "**soma**", which is the Greek word for "body". The content of the soma is enclosed by a covering called the neuronal membrane. The soma contains the nucleus of the cell. The input received by the synapses on the dendrites is forwarded to the soma. So a single nerve cell can receive simultaneous input from hundreds and even thousands of other cells. The cell then forms **a composite picture of all the information received**, by combining the input it has received via this multitude of synapses from all the other cells. When this combined input information reaches a certain critical level, called "action potential" or "a nerve impulse", then the cell body forwards an instruction to the third part of the cell, located on the side opposite to the dendrites.

3) On the opposite side to the dendrites is a long fiber called the "**axon**", and also called "a nerve fiber". This word axon comes from the Greek word for "axis" and also for "axle". The axon is the cell's output device. Axons may be as short as $4/1000^{th}$ of an inch, or they may be as long as six feet (i.e. running from the brain down to the foot). Axons convey electric signals to the dendrites of other cells.

[COMMENT: There is a group of neurons, called "amacrine cells", that do not have axons. In those cells the dendrites have the ability to function like axons, i.e. those dendrites can both receive and send messages. Those cells also need not concern us.]

The synapses consist of presynaptic terminals on an axon of one cell being in very close proximity to the postsynaptic terminals on the dendrites of other cells. Think of synapses as "junctions" between different cells. It is at these synaptic junctions that one of three things

happens to the nerve cells: at the synapses the neurons are either EXCITED (i.e. the input is made stronger), or they are INHIBITED (i.e. the input is made weaker), or they are MODULATED (i.e. the input is changed into various neurotransmitters).

Thus an input signal arrives at the presynaptic terminal, and before that signal is passed on to the next neuron it is either made stronger or weaker, or it is modulated into various neurotransmitters to influence the activities of other neurons in the brain. The point is that **the synapses are one of the main keys to the brain's power and efficiency**. The more synapses there are, the greater the brain's potential to accomplish things, because with more synapses there are more "highways" for the brain to transmit instructions and information to other areas of the brain and other areas of the whole body.

[**COMMENT:** As an aside, it was always taught that when brain cells (i.e. neurons) die, then they cannot be replaced. About 15 years ago, in May 1998, the journal "Nature Medicine" published an article entitled "Closer to Neurogenesis in Adult Humans" by Gerd Kempermann and Fred H. Gage of the Salk Institute for Biological Studies, in which these authors quoted from a study by another research team (i.e. Gould and colleagues) which demonstrated that new nerve cells can indeed be generated in the brains of adult monkeys, though on a relatively small scale.

The article went on to show that it has since then been confirmed by a number of other researchers that this is also a process that takes place in human brains, that within certain parameters **there can be a certain amount of generation of new brain cells within the adult human brain**. And this process of new neurons being generated continues into old age, virtually up to the time of death. The point is that when brain cells are destroyed, in some cases there can be a certain amount of regeneration of brain cells, if the conditions are right (providing an alternative to the functions of the destroyed cells sometimes being taken over by cells in other areas of the brain).

Those "right conditions" that open the possibility of regeneration of some destroyed neurons include, amongst others, at least four things: physical exercise, a calorie restricted diet for elderly people, use of the spice turmeric for its main ingredient curcumin, and consumption of the omega-3 fat DHA.

A major aspect of the "right conditions" is also a concerted effort to force the brain to do those activities that were impaired when certain groups of neurons died; e.g. someone who has had a stroke **actively and persistently trying to use the limbs** that were affected by the stroke to perform all their previous activities.

This information is not really essential to our discussion here. I mention it only as an interest factor, and also to forestall any objections from readers who might be aware of this research and who feel that I should have taken this relatively new understanding into account.]

So to summarize all this technical information:

In the brain of the typical adult there are about 100 billion neurons which are connected to one another by about 100 trillion synapses, at approximately 1000 synapses for every neuron. This is all on a microscopic scale. The typical neuron in the brain has a diameter of about one one-thousandth of a millimeter, with about 1000 connections to other neurons. Brain tissue the size of a match-head contains about a billion synaptic connections. These things all exist on an incredibly small scale.

THE BRAIN OF A SMALL CHILD

Now let's consider the brain of a small child.

Babies are born with a more or less full complement of very close to 100 billion neurons, basically the

same number they will have in adulthood. However, at birth in the baby's brain only a relatively small number of those neurons are actually connected to other neurons in the brain by way of synapses. The "one million synapses per second" would give a baby around 21 trillion synapses at birth, while Dr. Restak asserted a figure of 50 trillion synapses at birth. Either way this is a relatively small number compared to the 100 trillion synapses in adulthood.

The baby's brain that weighs about 400 grams (about 14 ounces) at birth grows to about 1000 grams (about 35 ounces) by age one year. Large areas of the brain continue to develop and grow **after we are born**; that's how God designed it.

Now keep in mind that neurons are of very limited value unless they are connected to other neurons. So a relatively limited number of synaptic connections in a fetal brain severely restricts the ability of the fetal brain to process any information. Contrary to certain popularized notions, a baby in the womb is not really capable of recording anything in long-term memory.

The fetus simply does not yet have either the required synaptic connections between the neurons in the brain or the development of major brain areas, to be capable of processing and storing any information it may be exposed to. The synaptic connections required for storing memories have not yet been formed and major brain areas have not yet fully developed. We cannot really teach a baby in the womb anything or expect any person to have memories from the period of time spent in the womb.

I mention this because, while some people may have some memories from around age two years, some psychoanalysts will claim that "pre-verbal infants will have stored memories, and that people can store memories from their first year of life. During the first year of life the long-term memory centers in the brain have not yet achieved full development, and for most people that condition would also include the greater part of the second year of life.

Now it is the synaptic connections that impart value to neurons. And the process of establishing such synaptic connections really takes off **after the baby has drawn its first breath**. That's the way God made it!

And so by age three years the child's brain will have formed around **1000 trillion** synapses, at a rate of close to **one trillion new synapses per day for those three years**. The three year old child in effect has **10000 synapses for every neuron**! That is ten times as many synapses as exist in the typical adult brain. (Dr. Restak's claim would require 36 trillion new synapses every day for one month.)

To give this some perspective: starting at birth your baby establishes **around 10 million** new synapses **every second** for the first three years of his life. During the 9 months of gestation the fetal brain grows about **4000 neurons per second**. And during the first three years after birth the brain grows about **10 million synapses per second**. The speed at which all this development takes place is truly mind-boggling.

This rapid brain development gives babies and small children **the potential to learn** many new things every single day! Think about 10 million new brain connections every second! It is this potential for a baby to learn new things that many of the experts frequently ignore.

So **at age three years** a child has about **ten times** as many synapses as the average adult may have. And while some people feel that the adult brain has far more than just 100 trillion synapses, all authorities are agreed that **a three-year-old child has FAR MORE synapses than any adult**! In our context the exact numbers are not as important as is the fact that the three-year-old brain has from at least three times as many synapses as an adult brain to quite possibly ten times as many synapses as the typical adult brain.

Now when you increase the number of synapses in the brain, then the increase in the brain's potential is not just linear. An increase in the number of synapses has a more or less exponential effect in increasing the brain's potential. This means that the three-year-old's brain has a far, far greater potential capacity for learning and for acquiring knowledge and skills than does the adult brain. That's why whenever some new technology is introduced, it is the kids that pick it up almost effortlessly, while we adults struggle to assimilate the skills to correctly use one more new gadget ... **their brains are** simply **superior** in dealing with new information when compared to the typical adult brain.

Can you contemplate the phenomenal, mind-boggling power which an adult brain with 1000 trillion synapses could have, when you compare that to our brains actually having only around 10% of that number of synapses (or maybe even 20% or perhaps even 30%)? **At age three years a child has an absolutely staggering potential!**

Very young children have a phenomenal capacity for learning because they have an absolutely staggering number of connections within their brains. Little children learn new information very easily, very much quicker than you and I are capable of learning that new information. And the reason for their phenomenal learning abilities resides in the far greater number of synapses in their brains.

But then something happens before those children enter their teenage years.

At around age 11 or 12 years **the brain begins to prune back** most of the unused synaptic connections. So from age 12 onwards a person will lose from 80% to 90% of potential connections within the brain, without any significant loss of brain cells! By early adulthood very few brain cells have died, but many of the pathways in the brain that have not been used by the child will begin to disappear, starting around age 12 years. And all neurologists are agreed that this pruning back takes place.

[COMMENT: Of the 100 billion neurons in the brain approximately 20 to 30 billion are identified as "neocortical neurons" (i.e. the outer six layers of the cerebral hemispheres), and these neurons are involved in "higher functions" of the brain, like spatial reasoning, conscious thought, language, etc. It is now known that throughout life we all have an average loss of about one neocortical neuron per second or around 30 million per year. Thus by age 70 years we have typically lost close to 2 billion neocortical neurons, or approaching 10% of the total approx. 20 to 30 billion we had in early childhood. This accounts for the typical reduction in learning abilities that we experience specially after age 50 years or 60 years, in addition to a lower number of synaptic connections. I mention this point only to make clear that there is in fact some small loss of brain cells throughout adult life.]

I don't expect that you've ever thought of the teenage years as the period when **the brain loses the overwhelming part of its potential**, so that at the end of the teenage years 80% and more of the synapses in the brain have disappeared. Might this totally unperceived process have something to do with "the troublesome teenage years"? I don't know.

And if brain connections have not been used during those first 12 years, then **the majority of them are likely to be lost for ever**! The old runners' saying "what you don't use you lose" is not only true for fitness and muscle tone; it is equally true for the brain capacity of a very young child. The only way to minimize the loss of synapses in the brain after age 12 years is for that child to regularly use as many of those 1000 trillion synapses as possible **before** age 12 years.

In plain language: the children who are highly stimulated and challenged, both intellectually and also physically, in the first ten years of their lives are likely to retain a higher number of synapses in their brains for the rest of their lives, than their counterparts who are physically and intellectually less challenged in the years leading up to age 10-12 years. The loss of potential mental and physical capacities and capabilities is **the price for laziness in youth**.

As parents we need to grasp that the majority of synaptic connections that are lost after age 12 years can NEVER be regained. Yes, after age 12 years we can still learn a vast amount of knowledge and skills, but such learning will have to be accomplished to a large degree without the benefit of a truckload of synaptic "highways" that were lost because they were never used during those first 12 years of life. On the other hand, the retention of a greater number of synapses throughout life is the reward for effort put forth in early life.

As an aside: the top scientists in neurology are almost all evolutionists, who believe that this magnificent organ (i.e. the brain) somehow "evolved". And so such people need to always find some kind of evolutionary justifications for everything that happens. Thus such authorities will tell you that this pruning back of synaptic connections during the teenage years is actually a good thing, somehow making the brain more efficient, by getting rid of connections that are not utilized. But that is a lot of baloney!

The pruning back of synaptic connections is not a good thing! And those same scientists will then encourage you to engage in certain brain exercises to promote the growth of new synaptic connections, in effect trying to reestablish some of those pruned back synaptic connections. The truth is, as I have already said, that this pruning back process is really a God-instituted penalty for brain laziness in youth! Don't buy the evolutionist's line of reasoning. See also my short article entitled "The Real Author of 'Use It Or Lose It'".

Anyway, SOME of those lost synaptic connections can later still be restored if we put forth the effort to restore them. Neuroscience now recognizes that the human brain is plastic (I don't mean the stuff plastic bags are made of; I mean the ability to change, that the brain changes in response to experiences), and that in certain circumstances it has the ability to grow new neurons and to establish new synaptic connections. But such growth and development in response to methodically devised brain activities will not restore the full synaptic network that existed at age three years. Some connections will remain permanently lost.

The key truly lies in Proverbs 22:6, that we train up a child in the way he should go, **while the child is still young**.

CONSIDER THE POTENTIAL

When we grasp that a four-year-old child has far more highly developed pathways in his brain than a 30-year old scientist or scholar, who himself may have perhaps 10% to 20% more synapses than the average adult, because he has made a concerted effort to develop his mind, then it should make clear why young children have the capacity, **given the right kind of mental stimulation**, to easily learn several different languages simultaneously, as well as mathematics and all of the sciences at a high level, as well as physical skills like tennis and golf and playing musical instruments, etc. This is why someone like Wolfgang Amadeus Mozart could already **at age five years** compose pieces of piano music, which he played on the piano to his father who then wrote them down in musical notation.

As an interesting example, you might consider two people who learned English as a second language while they were in the 10-14 year age bracket. Both come from the same language background; i.e. both are Dutch or German or Portuguese or Chinese or French or Greek or Italian, etc. (This could apply to a family who immigrated to the Unites States or to Canada when their two children were 14 years and 9 years old?) One person learned to speak English within an English-speaking culture at age 10 years or even sightly earlier, while the other person learned to speak English in that same English-speaking culture at age 14 years or even slightly later. Even though their initial exposure to the English language is separated by an age difference of no more than 4 or 5 years, yet these two people are on different

sides of the 11-12 year divide, the age at which the brain starts to prune back unused synaptic links.

While there certainly are exceptions to this, in most cases the 10-year old will still learn to speak English without the accent that is associated with people from his linguistic background, while the 14-year old will very likely retain a slight but distinctive accent. The explanation for this phenomenon is that the 14-year old has already lost trillions of synapses that had existed in his brain prior to age 12 years. **The ability to vocalize certain specific sounds** that are unique to certain languages is achieved by utilizing many of the synapses that are likely to be pruned away after age 12 years if they are never used. That is why most people who learn a second language in their teenage years or later will always retain a certain accent, even when their comprehension of that second language is flawless.

For example, Dr. Patricia Kuhl of the University of Washington in Seattle has demonstrated that **exposure to language alters the brain**. Human infants are capable of hearing any sound distinction in all of the thousands of languages and dialects that are spoken anywhere on Earth, but after a certain period a young child who hears only the sounds from one particular language will lose the capacity to actually hear numerous sounds inherent in various other languages, when unused synapses are pruned away. **Something is lost with this pruning process**.

SATAN CONTROLS OUR EDUCATIONAL SYSTEMS

In our educational systems we grossly underestimate the academic capacities of very young children. Yet neuroscience proves that a four or five year old's brain has a vastly superior capacity to absorb learning, when compared to the brain of that five year old's 35-year old teacher. We are here talking about capacity or potential, not about actual abilities, which are cumulative over a person's whole life.

Almost universally **our educational systems squelch the mental development** of all children, first by almost totally wasting the first few years up to age 6 or 7 years, and then by severely restricting the academic development prior to age 12 years to doling out **pitifully small rations** of academic learning. At that point (i.e. around age 12 years) the potential for mental development starts to shrink as unused synapses begin to disappear, albeit at a slower speed from the speed with which they were established before age 3 years. And what is then lost will most likely be lost permanently, even though the child has not yet lost any significant number of brain cells.

Our educational systems are **Satan's way of seeking to severely restrict the human potential**. We need to recognize that God did not create our brains so that we would end up using no more than 5% to 10% of the potential God provided in the first three years of our lives. What we look upon as "normal" or as "average", as far as intellectual development is concerned, is based on all our experiences being restricted to a world that is under Satan's complete control.

Satan has filled this world with **a spirit of hostility towards real intellectual and physical development**. Small children in our western cultures commonly have a spirit of wanting to get out of school and out of learning and homework exercises, and out of doing physically demanding activities. That is a part of what Ephesians 2:2 tells us. And **many people** in the Church as well as in the world **are very critical of higher learning**, as if ignorance was somehow something noble and honorable. That is very unfortunate because it is really Satan who is critical of true higher learning, and of human beings achieving their true intellectual and physical potential. It is God who wants all of us to develop our minds to their maximum potential; **God does not approve of "lazy brains"!**

In our society many parents will **send out their very little children** to nursery schools and to babysitters so that the mother can go out and earn some more money, not realizing that her baby's brain is

forming **almost a trillion new synapses every day**, and the staggering learning potential for the child that is wasted when the young child is handed over to "daycare" all day long, instead of the mother actively and methodically using all of the baby's waking moments to expose the child to **mentally challenging and stimulating situations**, as well as exposure to carefully designed activities that very methodically encourage the development of **a vast range of motor skills**.

Yes, most of society around us wastes the precious first few years of a child's life, filling the child's mind with stupid fairy tales about giants and dwarfs and princesses and animals that talk and other imaginary creatures, etc. An exception to this wasteful approach is the educational program developed by Glenn Doman. He developed a program of providing a vast amount of structured stimulation to small children, starting at birth, teaching young children to read, to do maths, to learn foreign languages, etc.

You can find information both for and against Glenn Doman on the internet, if you are so inclined. While some of his claims may be somewhat exaggerated, I do know from personal experience, as well as personally knowing people in South Africa who have used his programs for brain-damaged children, that his teaching methods do produce some powerfully positive results.

Not surprisingly the professional organizations that deal with early child development have found fault with his methods, and they do their utmost to discourage people from applying Doman's methods. **There is a genuine hostility towards any system that promotes very young children achieving their true potential.** The main criticisms of professional organizations for Doman's program don't focus on exposing why Doman's teaching methods are supposedly bad; no, instead they focus their criticism on these three points:

1) Doman supposedly gives parents a false hope for improvements for their brain-damaged children. They claim it is cruel for Doman to give parents such supposedly false hopes.

2) Doman's system supposedly makes parents feel guilty.

3) Parents waste a lot of money on Doman's program, which may cause financial problems for the other children in the family.

But these critics never actually make any effort to disprove **the effectiveness** of Doman's teaching methods! In the view of such critics it is obviously perfectly acceptable if those same parents (or their medical aids) spend thousands of dollars a year using THEIR psychological and psychiatric and physio-therapy and medical services for these same children; but spending that same money on Doman's approach is unacceptable to them. They clearly have a vested interest in criticizing money spent on Doman's program.

I disagree with their other two points of criticism as well, but you can make up your own mind, if you are interested in looking into the available information. I don't mean this article to be some kind of commercial for the Doman programs.

The bottom line is this: By today's understanding, that a child between the ages of three and 12 years has far, far more synaptic connections in his brain when compared to the average adult, the majority of which synapses will be lost unless they are actively utilized very early in life, it is imperative that parents expose their young children to as many mentally and physically stimulating situations as possible, in a non-threatening, relaxed atmosphere that does not demand specific achievements at specific times. Rather, there should be an atmosphere in which all these mentally and physically stimulating situations are introduced as play. It was Doman who 50 years ago alerted pediatricians and therapists to the need that intervention programs for brain-damaged children need to be initiated as early as possible, starting at birth, something with

which these disciplines themselves are today in full agreement. (And those same programs will achieve even greater results in healthy children.)

One false premise of Doman's approach is that he approached this subject from an evolutionary perspective, looking at the supposed evolutionary development of the brains of various animals and then coming to man's brain. So he reached the conclusion of teaching children as much as possible as early as possible from a wrong premise. However, fifty years ago when Doman started his programs nobody knew that compared to an adult, a three year old child has up to ten times as many synapses in his brain, AND that 90% of those synapses will begin to disappear starting around age 12 years. So the reason for doing as much as possible as early as possible has nothing to do with any supposed "evolutionary development", and it has everything to do with making use of those 1000 trillion synaptic connections before the majority of them begin to disappear.

So much for the Glenn Doman programs. Now let's get back to our subject and let's try to understand what God has done.

WHEN GOD CREATED ADAM AND EVE

When God created Adam and Eve, God in good faith bestowed an incredible potential upon those two human beings. God wanted them to actually become like God! God wanted to create sons and daughters for the Family of God. That is why God created human beings "in His image", to look like God in general features. And we human beings are also created "in the LIKENESS of God".

Being created in the likeness of God refers to being created conceptually like God, with the same mental capacities as God, with the ability to use our minds the same way that God uses His mind.

God had first created the angels. And God had given the angels the potential to have brilliant minds. **Angels have extremely powerful minds**. The angels that rebelled with Satan perverted their own minds in the process of rebelling against God, and so those angels who became demons have corrupted their minds. When God tells us in Ezekiel 28:17 that Satan "corrupted his wisdom", the Hebrew words mean that Satan perverted and destroyed his own wisdom. Satan didn't use his mind the right way, and therefore God took away Satan's wisdom, and in plain language Satan is today "a STUPID demon". He has no wisdom to speak of, none at all. Put another way, Satan's act of rebellion caused Satan's IQ to plummet to the spiritual moron level! His prior wisdom has been taken from him. Satan ruling over his demons today is somewhat like a mentally backward Idi Amin ruling over the Ugandan Army by sheer force and brutality.

For both angels and human beings IQ is something that can be taken away by God. And that is precisely what God did with Satan and the demons. They have lost a great deal of the intelligence they used to have, though they may not even perceive that loss of intelligence.

Coming to mankind:

God created Adam and Eve with the potential to never have to die. And even after they sinned God gave them an enormously long lifespan by our standards ... they lived for almost 1000 years. We should learn something from this.

I believe that God originally gave mankind the same brilliant minds God had given to the angels. In other words, where where every additional zero represents a tenfold increase of the previous amount.

What this tells us is that the human brain has an almost infinite potential!

We need to understand that Adam did not sin because he was intellectually inferior to Satan. In actual fact Adam's intellectual abilities were on a par with the intellectual abilities of the righteous angels, and therefore **Adam was in fact intellectually SUPERIOR TO SATAN**, because at that point Satan had already lost his wisdom.

This also illustrates another point, and that is this: when other people tempt us to do something that is wrong and we succumb to that temptation, almost invariably that temptation will have come from people whose intellectual abilities are less than our own abilities. That is how Satan almost always works, by getting those who have less intellectual potential to coerce those who have the greater potential to succumb to sin. And that was also the case when Satan himself tempted Adam and Eve ... both of them had an intellect that was at that point in time superior to Satan's intellect.

Anyway, when God originally gave human beings brains with 100 billion neurons, then God also gave them (on average) 10000 synapses per neuron, for a total of 1000 trillion synapses in their brains! And **they retained those 1000 trillion synapses throughout their lives**. If they had been of a willing mind, they could have communicated with God on a very high level, on the same level that God communicates with the angels. Their minds would have been able to grasp any of the detailed intricacies of God's plans for the future that God might have been willing to share with those who unconditionally submitted their minds to God.

I believe that as adults Cain and Abel also had around 1000 trillion synaptic connections in their brains, up to ten times as many as we have today. I suspect that under the pre-flood system God gave all people the opportunity to be highly intelligent **if they chose to use their minds wisely**.

That takes us down to the time of the flood. In this regard now look at Genesis 6:5.

And GOD saw that the wickedness of man *was* great in the earth, and *that* **every imagination of the thoughts of his heart** *was* only evil continually. (Genesis 6:5)

God here tells us that the greatest problem with mankind was **the way human beings used their minds**. Elsewhere I have already explained that after the flood God set in motion a new plan for mankind. One aspect of that new plan involved methodically reducing man's maximum age from just under 1000 years to just under 125 years, with most people not living past 90 years.

I believe that **after the flood God also reduced man's mental potential**, by initiating the cutting back of synaptic connections after the age of 12 years. Whether God reduced the number of synapses from around 1000 trillion to around 100 trillion in one step or over several steps is not significant in our context. In Genesis 6:5 God had identified that human beings used their powerful brains only for evil "continually". That succinct statement of the real problem implies to me that God was also going to deal with that problem in some way. God was going to do something to curtail the impact man's evil way of using his mind would have on this earth in general.

Where Noah lived to be 950 years, today we have a small number of people who reach 10% of Noah's age (my own Mother has just started her 95th year). But while some people today live longer than 10% of Noah's age, the vast majority of people today don't reach even 10% of Noah's age, something that is also true for the vast majority of all people who have lived during the past 3,000 years.

Likewise, where people before the flood very likely had brains with 1000 trillion synapses, most people today have only around 10% of that number. And those who are encouraged to actively develop their brains especially during the first ten years of their lives may perhaps end up having 10% or even 20%

more synapses than the average person?

It seems pretty clear to me that God has set some upper ceiling for this present age which started after the flood. While parents can assist their children in retaining a greater number of synapses after age 12 years, by the way they motivate and challenge their children to utilize as many synaptic connections in their brains as possible before age 12 years, there is no way that anyone in this age would be able to in adulthood have 1000 trillion synapses in his brain. Very likely there is an unidentified maximum that God has imposed for this present age, even taking neuroplasticity's ability to generate some new neurons and new synapses into account. And God has left behind the vast network of synaptic connections at age three years as a witness for the intellectual potential that God initially bestowed on mankind.

So to be clear:

When I say that parents need to stimulate their children both physically and mentally to use as many synaptic connections in their brains as possible before age 12 years, I do NOT mean to imply that this would cause those children to retain all 1000 trillion synapses, any more than I would suggest that following a nutritionally perfect diet could lead to people living for 900 years. Eating a nutritionally perfect diet is likely to promote longevity by extending a person's life by perhaps 10 or 20 or even 30 years, but certainly not by 900 years! Likewise, actively seeking to use as many brain pathways as possible during a child's early life is likely to help the child retain 10% or even 20% more synapses in his brain than other adults, but most certainly not all 1000 trillion synapses! That possibility God has "taken off the table" for this present age!

I would speculate that a person's IQ has some relationship to the number of active synapses in the person's brain. The more synapses the brain has been able to retain into adulthood, or to develop as a result of neuroplasticity, the greater that adult brain's IQ potential is likely to be.

Anyway:

The fact that a 3-year old child has 1000 trillion synapses in his brain tells me that **God originally INTENDED for all human beings to have that number of synapses for their entire lives**! I believe that God created Adam and Eve as adults with 1000 trillion synapses in their brains, with no decrease in the number of these connections throughout their lives of 900+ years. And when sons and daughters were born to them, then (I suspect) those people after age 3 years likewise retained a full complement of 1000 trillion brain connections throughout their lives.

God originally endowed mankind with, seen from our present perspective, a phenomenal potential for this present physical life. Had man remained submissive to God, I believe that this brain potential would not have decreased very easily. God had in good faith given man enormous mental capacities, even as God in good faith gave man every other blessing. Even the most intelligent people on earth today are vastly inferior to the intellectual capacity which God originally gave to Adam.

In the years leading up to the flood God saw how man actually used this enormous mental capacity, that "every imagination of the thoughts of his heart was only evil continually" (Genesis 6:5). This recognition grieved God "at His heart" (Genesis 6:6). So after the flood God ushered in a new plan for dealing with mankind. In the new plan God determined to drastically shorten man's lifespan. And I suspect that with the plan after the flood God also determined to decrease man's intellectual potential, **unless a person actually made an effort to develop his mind** and his potential at an early age, in which case that person might perhaps retain 20 trillion or 30 trillion or even 50 trillion more synapses than other adults? So after the flood God in effect said:

"Okay, I will still give you the opportunity to have 1000 trillion synapses in your brain during your early

childhood, the time when "every imagination of the thoughts of your heart" is not yet rigidly fixed. But after that early childhood period you will then only retain those pathways into adulthood that you yourself actually make an effort to utilize during your formative years. And those pathways that you never utilize I will begin to prune away, to the point where you will end up with only about 10% of what I had originally wanted you to have, that is unless you yourself early in your life actually use your mind in the ways I intended for human beings to use their minds. In that case you may end up retaining a slightly larger number of synapses than other people who do not put forth the same efforts."

When God told Solomon "I have given you a wise and an understanding heart" (1 Kings 3:12), I suspect that God intervened in such a way that Solomon's brain retained a greater number of synapses throughout at least the first part of Solomon's adult life than any other individual since the flood would have had. PERHAPS God even allowed Solomon to retain the full complement of 1000 trillion synapses that had been the norm before the flood?

Anyway, Solomon's greater number of synapses ensured that "there would be none before Solomon nor after him" (1 Kings 3:12, second part paraphrased) with the same intellectual potential. Solomon in a sense was God's experiment in seeing whether a vastly higher intellectual potential (under the new system since the flood) **for someone who started out with an excellent attitude** would work in favor of God's intentions for human beings. So God deliberately allowed Solomon's brain to retain a large number of synapses in excess of the maximum limit that God had imposed for all other human beings after the flood. As it turned out, this excessively high intellectual potential given to Solomon did not work out well. Like Satan had done earlier, so Solomon also perverted his great intellectual capacity by compromising with idolatry in his later life.

I don't think there is any chance whatsoever that even the best teaching methods employed by wise parents today will be able to remotely approach the retention of the number of synaptic connections in the brains of their children, that God by direct intervention allowed Solomon's brain to retain.

Consider the parallel:

After the flood God methodically decreased man's lifespan in stages, starting with just under 1000 years to then just under 500 years to then just under 250 years to then just under 125 years. Did God perhaps also decrease man's mental potential in stages, or did God do it in one step? And even as the originally long human lifespan did not work in favor of God's intentions for mankind, so likewise man's original enormous intellectual potential did not work in favor of God's intentions for mankind. So God **curtailed both longevity and mental potential** in the plan that went into effect after the flood.

This is obviously pure speculation on my part. But "just under 125 trillion synapses" is where we are today for the typical adult.

The facts which are not speculation are: at about age 3 years a child has around 1000 trillion synaptic connections in his brain. When that child reaches adulthood he typically will only have about 100 trillion synapses left in his brain; the other 900 trillion will have been pruned away because they were never utilized. So the average adult has about 10% of the number of brain synapses he had at age 3 years.

WHAT THIS MEANS FOR PARENTS

Parents need to understand that Satan is indeed "the prince of the power of the air" (Ephesians 2:2), and his goal is to stifle the human potential wherever he possibly can. As "the god of this age" (2 Corinthians 4:4) Satan controls the educational systems in all countries around the world. So Satan has seen to it

that the early years in a child's life are wasted. Once schooling starts Satan has seen to it that brain development is held back as much as possible by severely limiting the academic curriculum for children to **an intellectual diet of crumbs and scraps**!

The teaching made available in schools for children between the ages of 6 years and 12 years is utterly pathetic! And the sad thing is that we are blissfully unaware of the true state of affairs. We actually think that we are doing well when we just manage to get our kids to learn to read and to write.

We don't grasp the potential that is being wasted during those first 12 years or so.

When you think about it, this is one more way that evolution is disproved! The whole theory of evolution is based on progressing from the simple to the more complex. So evolution would require the brain to have started out with a smaller number of synaptic connections in it, and then gradually progressed to a larger and larger number of synapses. God's creation, on the other hand, starts out with the more complex circumstances and then sins result in those complex circumstances being curtailed time and again. That was the case with the typical human lifespan being curtailed because of sins. And that is also the case with the number of synapses in the brain being reduced from 1000 trillion to only 100 trillion. This is the diametric opposite of evolution.

Anyway, earlier I mentioned the example of learning a second language. Now for the brain to retain the ability to make certain sounds that are unique to one specific language, or group of languages, that does not necessarily require the child to start speaking all of those languages.

The auditory nerves are stimulated by every sound they hear. There is enormous benefit to exposing little children to regularly hearing a number of different languages being spoken and sung. It could be taped conversations or readings in half a dozen different languages. For example, Spanish language tapes would expose the 2-year old to the rolling "rrr" sound of Spanish, German language tapes would expose that child to the guttural "ch" sound of German, French language tapes would expose the child to the distinctive nasal sounds of the French language, Chinese and Japanese tapes would expose the child to the distinctive sounds of the Chinese and Japanese languages, etc.

In addition, tapes of bird calls and other animal sounds (never so loud as to be scary for the child) would expose the child's brain to those distinctive sounds. Also, frequent exposure to hearing well-played piano music would train the very young child's auditory nerves to hear "perfect pitch" (i.e. absolute pitch), something that no amount of musical training can bestow upon adults, because the synapses required for this ability disappear before adulthood. The possibilities for teaching the auditory nerves of small children are almost endless.

One additional plug I'd like to make at this stage is this: it would be extremely beneficial for a child from birth to age 3 years especially, and certainly also beyond age 3 years, to have a regular exposure to yodeling music, songs sung in Bavarian or Austrian or Swiss dialects of German. Yodeling requires some very difficult vocal abilities, something that is almost impossible to learn in adulthood if there was no exposure to yodeling during early childhood.

Do I think it is important that all children should learn to yodel? No, of course not. But the point is that **repeated exposure** to highly skilled yodeling stimulates the auditory nerves of a very young child to such a degree that synaptic pathways are established and retained. And this stimulation of the auditory nerves will establish the brain potential for that child throughout the rest of his life being able to produce a variety of vocal sounds that most other people are simply not capable of producing with their voices.

For that matter, American yodeling from Wisconsin or Minnesota is not the same as the Alpine yodeling of Europe. American yodeling (the yodeling cowboys of the 1930's and 1940's ... did you know that even

a young John Wayne tried his hand at playing a yodeling cowboy?) is a mere shadow of the vocal abilities and vast vocal range inherent in Alpine yodeling. The mere exposure to that type of singing during the first three years of life will positively affect the developing auditory nerves of the young child.

The point is: when a very young brain HEARS certain sounds, that hearing develops specific pathways in the brain which make it possible for the brain to later reproduce those sounds. This is independent of knowing what those sounds are supposed to mean. So even if the child never learns to speak German and Spanish and French and Chinese (or to yodel), the early exposure to the distinctive sounds in those languages has equipped the brain to later correctly distinguish those sounds, and to be capable of reproducing those specific sounds, should the child ever be taught those languages. And it has also equipped the child's brain to retain some of the synapses that might otherwise have been lost.

Do you follow?

There are very slight nuances in the way most vowels are pronounced when you go from one language to another. When we learn that language at a later age those nuances often escape us. Thus, for example, I pronounce the vowel sounds in German differently from the way I pronounce those same vowel sounds in English, and I do that intuitively and mostly unconsciously. Now the untrained ear will in most cases not even perceive the minute distinction between how these vowels are pronounced in these two languages respectively.

So here is the point:

When we are in early childhood exposed to those different vowel sounds (same applies to consonants) native to different languages, and the earlier the better, then our brains figure out intuitively how to reproduce those same sounds, even if it takes some coaxing at first. Nobody has to tell a small child how to move the tongue in the mouth in order to say a specific word. No, constant exposure to hearing that specific word spoken is sufficient to help the brain of a very young child to figure out how to reproduce that identical sound. It is extremely important that babies and young children hear a great deal of clear speaking, and preferably in several different languages.

Recent brain research has revealed a very interesting point about learning a second language.

Neurologists have learned that language development has a critical period, which starts at birth and ends somewhere between ages 8 and 12 years. Additional languages learned after this critical period are processed in a different area of the auditory cortex of the brain as is the person's first language. So if your native language is English, then your English language abilities are processed in one particular part of your auditory cortex. Then in high school you learn Spanish or French or German. Those second language abilities are then not processed in the same area of your auditory cortex that processes the English language; no, that second language is processed in a different area of your auditory cortex. Your brain in effect sets up a second library of sounds for that new language. So your brain will then have two distinct and separate libraries of sounds: one for English language sounds, and another for the sounds of your second language.

But if a small child is raised from infancy with exposure to two or three or five different languages simultaneously, then all those languages are processed together in the same area of the auditory cortex of that child's brain. This is a vastly more efficient way for the brain to process a plurality of languages. All of these different language sounds learned in early childhood will become much more intuitive to that child as he grows up.

That is why leading neuroplasticians (neurologists that specialize in understanding the brain's neuroplasticity) like Michael Merzenich strongly advocate the things I have already stated, that it is highly

desirable to expose very young children to as many different language sounds as possible, so that these children can then develop a single large cortical library of sounds in their brains. This will enable them later in life to have a much easier time learning a new language.

Thus if that child's brain with ten times as many synaptic connections as the typical adult brain is exposed to a vast range of unique sounds from a whole range of different languages, then the brain will store all of those sounds together in one location of the cortex; and the brain will then also figure out on its own how to reproduce that vast range of unique sounds. Such exposure will fine-tune the child's brain to actually hear clear distinctions between how the "a" and "ee" and "i" (or "ei") and "o" and "u" and "ow" and "au" and "ou" are pronounced in different languages, minute distinctions that will escape many adults who try to learn another language once they are adults.

Even in the Old Testament we have an example that illustrates this point. When Jephthah was a judge the Ephraimites were upset with Jephthah and fought against him. The Ephraimites were defeated and fled for their lives. Now even back then there were certain distinctions in the accents with which different people spoke. It was well-known that Ephraimites could not pronounce certain sounds. So when the fleeing Ephraimites pretended to be non-Ephraimites, Jephthah's men said: "okay, say the word **shibboleth**" (meaning "an ear of grain"), which Ephraimites always pronounced as **sibboleth**.

The point is that the Ephraimites couldn't say "shibboleth" to save their lives ... and so 42,000 Ephraimites were killed at the crossings of the Jordan River (see Judges 12:5-6). What this illustrates is that Ephraimites were never exposed to the pronunciation "shibboleth" during their childhood years, and so in adulthood their brains had lost the synaptic connections that would have enabled them to pronounce the word "shibboleth" correctly (i.e. judged by pronunciation standards accepted amongst the other tribes of Israel).

To get back to our discussion, if the ability to make the sounds unique to the Spanish language, for example, is acquired in early childhood, then the ability to speak Spanish can be acquired later, and the pronunciation will then be compatible with the pronunciation heard in early childhood.

Now please don't misunderstand.

My point is not to try to convince you that it is important to learn to speak many languages. It is simply that the ability to learn to speak another language like a native speaker, without any foreign accent, is something that can be immediately discerned. Have a native speaker teach a six-year old child another language, and that child will learn the language with the same pronunciation and inflection as the native speaker. But have that same native speaker teach that language to a 15-year old child, and in most cases that 15-year old will retain a noticeable accent in the second language. **Something has changed for the brain** between the age of 6 and the age of 15. And learning a foreign language very readily exposes this distinction.

So I have presented the matter of learning a foreign language simply as an illustration, one that can be objectively observed, of the fact that the brain of a 15-year old no longer has the same potential that the same youngster had at age 6 years. The 15-year old can learn to use and to understand the foreign language just as thoroughly as the 6-year old. The accent which the 15-year old may retain does not in any way reflect on his grasp of the foreign language, or on his ability to express himself just as clearly and grammatically correctly as the native speaker. The accent does not affect his comprehension of the language; its effect is restricted to the way he articulates his words in that second language.

Now when it comes to learning mathematics or physics or chemistry or playing a musical instrument or learning a coordination skill like hitting, throwing or kicking a ball, then there is no "accent" attached to the skill learned at a later age. Therefore with this type of learning it is much more difficult to discern any

theoretical limitations for the person who learned these things later in life when compared to someone else who started to learn these same things before the age of 12 years. And this is not to imply that things learned later in life are somehow not as good as when those things are learned early in life.

Besides the example of a noticeable accent retained by people who learn another language in their teenage years or later, there is **one other example** that also illustrates the retention of specific synapses by people who are exposed to certain information early in life. And that example involves how we perceive numbers and how our brains process information about numbers.

It is well-known that very many people are pretty hopeless when it comes to working with numbers (no offense meant if that happens to include you). If you take away their electronic calculators they have difficulties with even the simplest additions and subtractions. This is a consequence of the large number of synapses which their brains have lost. It is now known that when very young children, before the age of two years, are repeatedly exposed to numbers in certain ways (i.e. initially large dark dots rather than numeric figures), then their brains develop the ability to process numeric information in much more powerful ways than other people will ever be capable of doing. Do you know how this happens?

The key here is that children must be exposed to such "**games with numbers**" during the time when their brains are still adding ten million new synapses every second. Apparently exposing the child's brain to the concept of dealing with numeric values and establishing relationships between such numeric values (i.e. almost instantly recognizing what the total sum for an addition or subtraction or multiplication must be) actually shapes and influences how those ten million new synapses which are formed every second are used **to meet the need confronting the child's brain** at that very moment.

To state this in plain and obviously over-simplified terms:

The very young child's brain says: "I need to figure out what is going on with these numbers that are presented to me. Therefore the additional synaptic connections I need right now to deal with this information must be formed right now." (In the two seconds it takes to type the words "right now" another 20 million new synapses have been established.)

So let me state a speculation:

During the child's first two to three years of life the child's brain develops synaptic connections at a phenomenal rate of slightly less than one trillion new synapses every day. That process goes on 24/7 for those three years. However, I strongly suspect that **IF THE CHILD'S BRAIN IS CONFRONTED WITH CHALLENGING SITUATIONS DURING THIS TIME, THEN THE BRAIN RESPONDS BY GIVING PRIORITY TO THE ESTABLISHMENT OF SPECIFIC SYNAPSES THAT ARE INTENDED TO DEAL WITH AND TO RESOLVE THOSE CHALLENGING SITUATIONS!**

I obviously cannot prove this. But I believe that this unique way of processing numeric information can only be established on two conditions:

1) This must happen before the process of adding new synapses in the brain comes to an end. That is typically around age three years.

2) This exposure to numbers must also occur BEFORE the child is exposed to our way of processing numeric information. **Our way of processing numeric information** is to teach a child that "two plus two is four", showing the child four objects in the process. This involves reasoning. The child has to reason out that the two fingers on each hand that we are holding up to his face have a relationship that amounts to "four". Now once the child has been exposed to this "two plus two is four" reasoning process, then that process will dominate in the child's mind, and the child's potential intuitive way of dealing with number

relationships will have been lost. Now this line of numeric reasoning (that two fingers plus two fingers are equal to four fingers) can be understood by the brain starting around age two years.

So in order to meet both of these conditions, the child must really be exposed to numbers before age two years. Before that age the brain uses its own system to figure out relationships between numbers, much like the brain at that age will figure out totally on its own how to reproduce the language sounds it is hearing. The child's brain figures these things out intuitively.

And even as we don't have to tell the small child how to hold the tongue in the mouth in order to pronounce certain words, so also do we not have to tell the child HOW TO REACH THE CONCLUSION that "two plus two is four". If we did try to tell the small child how to hold the tongue in the mouth in order to correctly pronounce a certain word, we would only confuse the child. Likewise, our way of showing the child **how** "two plus two is four" only confuses the child's intuitive way of establishing the relationship between "two plus two", to the point where the intuitive way will be abandoned in favor of the way we have shown to the child.

So this unique way of performing arithmetic calculations can in most cases only be acquired before age two years.

After age three years a person can certainly still develop the ability to process numeric information powerfully and effectively, but NOT by the method the brain would have used had the brain been challenged to process numeric information before age two years. Developing the brain's capacity for working with numbers after age two years restricts the brain to a less efficient system for doing so.

Recognizing that there is only a very small window in very early childhood during which a person is able to acquire a specific mental skill, i.e. a phenomenal way of apparently visually grasping numeric relationships, which skill people at an older age are no longer capable of acquiring, **must have a logical explanation**. Yes, certainly, people at an older age can learn to grasp the same numeric relationships between numbers, but their brains will come to the same conclusions about those relationships by A DIFFERENT AND LESS EFFICIENT WAY, when compared to the way someone who was exposed to such numeric information during especially the first two years of life comes to those conclusions.

During those first two years of life, while the brain is still adding phenomenal numbers of synapses every single second, dealing efficiently with specific demands on the brain is given priority in synaptic development.

Put another way, God has given parents a huge responsibility for how the brains of their children will develop. **It lies within the power of the parents** to direct the development of synaptic connections within the brains of their children by the physical and mental stimuli the parents choose to expose their children to.

Yes, the children's brains will develop vast networks of synapses with or without very deliberate input from the parents. But parents who carefully plan all the mental and physical stimulations to which they will expose their children (e.g. hearing foreign languages spoken and sung, playing yodeling music, musical instruments being played, skills of coordination being practiced, exposure to reading and to mathematics and to physics and chemistry and biology and geography and history, exposure to smells of various herbs and spices and other fragrances, exposure to water and to swimming, etc.) actually exert a measure of control over that process of synaptic development. God basically says to the parent: IF you take responsibility for your child's mental and physical development, THEN I will let you exercise some measure of control over just how all those synapses are established.

Satan does not want parents to grasp the staggeringly powerful influence they can have on how the

brains of their children will develop. So Satan pressures parents to give their children to daycare and to babysitters and to boring schools, at least throughout their pre-teen years.

One other very powerful weapon Satan uses to stifle the brain potential of children is tied up in the word "play".

SATAN INVITES CHILDREN TO PLAY WITH HIM

Do you really know what are the main purposes of playing? WHY does Satan want children to play? Have you bought Satan's deception that "playing develops the child's mind" (i.e. Satan's forms of playing)? Do you really understand the facts about playing?

Here are the REAL main purposes for most (though certainly not all!) of the typical forms of playing:

1) Playing means that **we don't have to give account** for any of our actions. It is, after all, only "play". So what if a playing child damages some of his toys? Children certainly don't have to give an account for how they have spent their "play time".

2) In playing **we don't have to exercise any restraints**. So children can be totally unrestrained and destructive in their actions, without incurring any kind of censure. Children can shout and scream as much as they want to shout and scream. Such playing is mostly viewed as benign and quite harmless. In playing, children are not required to obey anyone.

3) In playing it is perfectly acceptable to **"play break" God's laws with impunity**, because we are only pretending to kill (playing war games) and to rob (playing pirates), etc. We can use all kinds of "toy weapons" to fight for the sake of fighting. That's supposed to be "fun".

4) In play there is **no pressure to achieve anything productive**. It is all supposedly a meaningless and aimless activity whose sole purpose is to amuse the children and to pass the time.

5) Playing **encourages children to learn to pretend** that something is real, which is excellent groundwork towards become highly proficient in **hypocrisy**, since hypocrisy is just another word for "acting" and for "playing a part". But we should not encourage our children to practice hypocrisy.

6) Many forms of playing **very actively encourage selfishness**, excellent practice for instilling **covetousness** in young minds. In playing, the focus very often is on putting self first, to get the most for self, even if it means depriving other children of the things that we want to have for ourselves.

7) And most importantly, most forms of playing **waste precious time** for guiding and directing **the rapidly developing brain** of the very young child. During an hour's play of running wild and without restraints the little two-year-old child has developed about 36 billion additional new synapses in his brain, but he has not had any incentive of any kind to engage in any kind of constructive activity.

These are the things that are primarily promoted by the typical forms of playing. But are these things really what we want to achieve with our children? I don't think so. Let's understand that all seven of the above points have Satan's unqualified endorsement! They are all goals that the "god of this age" (2 Corinthians 4:4) actively promotes via the spirit that he broadcasts to this age of mankind (Ephesians 2:2).

Let's understand something very basic.

1) There is **never**, never a time when a child should be permitted to be **unrestrained**! The same applies to us adults: there is never a time, not even a split-second, when it is right for us to relinquish all restraint. Whenever any person, child or adult, lets go of restraint, AT THAT VERY MOMENT Satan takes charge of that person's mind! That is what is meant by Satan being "the god of this age", that Satan sways EVERY MIND THAT IS UNRESTRAINED. The condition of a lack of restraint identifies Satan!

Here is a simple "harmless" example that is fairly commonly seen:

You take a two-year-old to a playground where there are a few other children of similar ages, and you tell the child: "go and play". What happens all too often in the child's mind? The first thing is that there is no guidance and no instruction and no compunction to do anything in particular. The child has no plan of any kind in his own mind as to what he actually wants to do.

So the child quickly looks around the playground and then runs to the swings. He swings once or twice and then jumps off and runs to another apparatus in the playground. Then he catches sight of another little boy at the slide, and he runs over to the slide, and slides down once or maybe twice. But the slide doesn't hold his attention for long, and his eyes dart around for something else to do. So he runs over to the sandbox but doesn't actually want to build anything in the sand. Then he sees a small stick and picks it up and starts to hit a tree or a tin or some playground item. He then sees another little boy with a toy car on the other side of the playground and so he walks over there, taking his stick along. The other boy shows no interest in playing with him, and so he then runs back to the slide or the swing. And on and on and on it goes.

It's all pretty harmless, right? After all, the little boy is just letting off some steam, burning up some energy. And yes, none of the activities are a problem; they are all perfectly acceptable actions.

But here is the point:

That type of conduct shows that the child is not really in control of his own mind. The child is doing nothing more than **responding to one impulse after another**. And those impulses did not originate in the child's mind; those impulses came from outside and were then imposed on the child's mind. There is no plan or purpose to any of those actions. No, those actions are a manifestation of **a spirit of confusion**.

The clue that this is indeed the case is seen in **the impulsive switching** from one of these activities to another. As another impulse is put into the child's mind, so the child responds by unpredictably terminating the current activity and switching to something else. The clue is how **suddenly** and **without premeditation** the child responds to such unseen impulses. In this situation the child's mind is fully receptive to all the unseen and unheard impulses sent to his mind by "the prince of the power of the air".

You need to understand something very clearly:

Whenever you see a small child suddenly and clearly without premeditation switch from one activity, which the child normally enjoys doing, to a completely different activity, then you are watching that small child respond to an unseen impulse that was sent to the child's brain from some source outside of the child's own mind, and to which impulse the child's mind is extremely receptive.

So to make this clear:

It is not any of the activities themselves that are problematic. It is fine to play on a swing, and it is fine to play on a slide, and it is fine to play in the sandbox, etc. The activities are not the problem. The problem

is that **the child is not really in control of his own mind**! That is a huge problem! While playing on a swing is not a problem, it is a problem when Satan is the one who tells the child: NOW go and play on the swing, and when Satan then tells the child: NOW stop that play and go to the sandbox to play there, etc.

We need to understand that **Satan uses "play time" to gain control over children and to then consolidate that control**!

Play time is ideal for Satan's purposes. There is virtually no restraint on the children, they are free to act out acts representing transgressions of the laws of God, they don't have to give account for how they spend the time. They are in fact encouraged to pretend any number of things, and they can freely act totally selfishly in their play with scarcely a look from some adult in the background. It is a standing joke that children will frequently "get into mischief" while playing, precisely because of all of these factors.

Now certainly, I do not mean to imply that the above description fits all children and all play situations. Not at all. But surely we can all recognize that, seen on a nation-wide scale, the above descriptions are all too commonly applicable. And because these situations are so common in children's play, there is the pressure on us to accept that same type of conduct from our children.

Now consider this:

When a baby is born, the baby has no idea what play is supposed to be like! He doesn't know what play is, or that children are supposedly expected "to play". The baby has no idea that play means: an opportunity to goof off, to be silly, to pretend, to be free of all constraints, to express selfishness, to express destructiveness (e.g. gleefully smashing sand castles, etc.), to be free of any accountability, etc. The baby doesn't know any of this. The baby doesn't know what is expected from him when he plays.

PLAY SHOULD BE ENJOYABLE AND SOMETHING THE CHILD LIKES TO DO!

But that doesn't mean that play has to incorporate all the things society around us defines as "play", and that we have to let society dictate to us what is expected when our children play. Society is controlled by the god of this age, and that means that **all forms of playing in this world are in some way or other influenced by Satan**. And Satan gets to little children very quickly, to influence them to think of play in the terms I have described above.

I cannot over-emphasize how powerfully Satan utilizes what we call "children playing" for Satan to work "in the children of disobedience". **The attitudes small children develop in their playing activities will have profound effects on how their minds will develop.** And Satan knows that very well. So Satan wants to convince you to let down your guard when your children are doing nothing more than "playing".

So here is what parents ought to do.

TEACHING CHILDREN THE CONCEPT OF PLAYING

Children need to learn to play the right way; playing the right way is not something that children will intuitively do correctly. For children to learn to play the right way is something they need to be taught. It is something that Satan will seek to oppose by peer pressure and any other means at his disposal.

From very early on children need to be taught that the word "**play**" means: **doing something that is**

very enjoyable and pleasant and desirable. Playtime is something the children should look forward to with eager anticipation. In the child's mind the expression "let's play" should really mean "let's learn something new".

To develop a correct concept of "play" in the minds of their children, parents need to do two things:

1) They need to work at establishing an excitement and an eagerness for activities that are aimed at developing both the mind and the body of their child. All these learning opportunities must be presented in a way where the child's mind equates all these activities with "playing" and with having fun. All these activities need to appear not as mandatory but as privileges and as rewards for good behavior. Think of the example of Tom Sawyer getting all the other kids to pay him for the privilege of painting the fence that he was supposed to paint ... it's a matter of perspective.

2) Secondly, parents need to see to it that NONE of the negative aspects enumerated at the start of this section are ever associated with "playing" in the mind of their child. Thus:

The parents need to make sure that their child never associates the word "play" with an opportunity to be unrestrained and impulsive and an opportunity to pretend to be someone else. The child needs to understand that **God never wants us to pretend to be someone else**, or to pretend that we are some or other little friendly animal. **All pretending comes from Satan**, who really is "the great pretender", the one who invented pretending. Our children are never to live in a "pretending" world! And our children must be accountable for how they use their minds, something that should be especially taught when a child has a tantrum, which is a euphemistic way of saying that the child is implicitly following the impulses Satan has sent to his mind.

During those first three years the parents have the opportunity to instill in their children a grasp of what is wrong with the ways that most children in this world play. The parents can help their children **build restraints** against all of those wrong aspects of playing listed earlier.

To be unrestrained is not really "fun"; it is a very well disguised temptation! **It is just as totally undesirable** (to put it mildly!) **for a child** to run to one piece of playground equipment, play for 10 seconds and then suddenly and impulsively run to another item of playground equipment to play another 10 seconds before without any kind of warning running off to some other equipment to play there for a few seconds, etc. ... **as it would be for an adult** to do the exact same things in the exact same manner. If that kind of behavior is odd for an adult, then it is equally odd for a child to behave that way. It is odd because it shows that the individual engaging in such behavior is being controlled and manipulated by an outside force.

Impulsive behavior is always wrong, by adults and by children, because by definition "impulsive behavior" is an unpremeditated response to an outside stimulus, the purpose of which is to manipulate the individual who is willing to behave impulsively.

Make no mistake: Satan gets to influence our children by having their friends act impulsively and rebelliously and without any restraint. For example, when one child is permitted to yell out in anger and in frustration, then our children are being pressured to do the same thing. And pretty soon everybody is doing it.

Look at **the bad examples** in international tennis matches. Back in the 1970's first one player and then two and then others started to yell at match referees. And they were not censured for that type of despicable behavior. In fact those players actually took pride in their unrestrained outbursts! So pretty soon it became common place for players to argue with the linesmen and with the referees. And today little kids throw temper tantrums when a call goes against them. Restraint is not something most children

are taught these days. But little children need to learn that a lack of self-restraint has no place in any form of playing. And neither is there any place for selfishness in the right kind of playing.

BIBLICAL REFERENCES TO CHILDREN PLAYING

There are two references in the Old Testament that speak about children "playing" in the millennium. Let's take a look at them.

And **the sucking child shall play on the hole of the asp**, and the weaned child shall put his hand on the cockatrice' den. (Isaiah 11:8)

This verse tells us that during the millennium when all animals will be tame and harmless, little children will crawl around and "play" without fear of snakes or any other animals. The Hebrew verb here translated as "**play**" is "sha'a" which refers to "**taking delight in something**". So what are the little children in Isaiah 11:8 doing? Are they running wild, screaming, hitting the snakes with sticks to see what will happen, etc.?

No, that's not what is happening in Isaiah 11:8. What is happening is that these little children are learning about the environment by exploring. But there is no hint that these children are uncontrolled or erratic or competitive or unresponsive to parental instructions. They are taking delight in learning about various animals at a very young age; this is speaking about infants. This is not a reference to what most people today would think of as "children playing". These children are learning. As the next verse says:

They shall not hurt nor destroy in all my holy mountain: for the earth shall be full of the knowledge of the LORD, as the waters cover the sea. (Isaiah 11:9)

First of all nothing will be hurtful or destructive. And the context is one of learning, of gaining knowledge about God and God's creation. Notice also another significant point.

This verse is not speaking about a small child "playing" with other small children. There is nothing here about two or more children "playing together". Isaiah 11:8 is speaking about one child interacting with his environment! It is a one-on-one interaction between the child and the environment, not between one child and another child. Can you see that? It is not talking about a small child getting into mischief and then having to be rescued by a parent. That's not the situation at all.

This verse is telling us that the very young child is taking delight in its environment, learning about all the animals (verses 6-9) that the child will encounter. And yes, this type of situation will be looked upon as "play" during the millennium. But there is **nothing** in this verse about a child somehow playing **with other children**.

The only way that small children should play together is if there is some activity which is being supervised and controlled by a responsible adult, and where the activity has a very specific purpose. If two little children are left on their own to play together, that is tantamount to an open invitation to Satan to guide and to direct the activities of these two unsupervised small children. And Satan will never overlook such an opportunity! The idea of leaving small children together to entertain themselves for a period of time is wrong, because Satan will be the one who will direct that entertainment.

That brings us to a very prevalent attitude in our time. And that is this: far too often the instruction to small children to "go and play with the other little children here" is nothing more than an excuse to get the children off our hands for a while, to free us from the burden of constantly having to supervise their

activities. So often it is because WE want some freedom that we tell our little children to "go and play", in which case we usually don’t care what they will do, obviously within certain parameters.

But the purpose of playing is NOT to give the parents some freedom. The purpose of playing should always be to work towards some or other goal, be that learning new information or be that developing and refining some or other skill. And children should be brought up to look upon such opportunities as enjoyable and exciting, i.e. as play.

Let’s look at the second Scripture.

And the streets of the city shall be full of **boys and girls playing in the streets** thereof. (Zechariah 8:5)

The Hebrew verb here translated as "playing" is "sachaq" (or "sahaq"), here used with the piel stem. This Hebrew verb means "to laugh". In fact the Hebrew name "Isaac" is related to this verb. The piel stem is used to express either intensive action or intentional action. The Theological Wordbook of the Old Testament (TWOT) says the following for this verb "sahaq":

"In the Piel **it is used for playing musical instruments or rejoicing**." (TWOT #1905)

The context of Zechariah 8:5 is once again a millennial scene. The picture is one of extremely old men and women living in Jerusalem (verse 4). The scene is thus several centuries into the millennium, time enough for people to have reached such great ages. There is peace and tranquility everywhere, and Jesus Christ will already have been ruling for several centuries.

Now be careful that you don’t interpret the statement "boys and girls playing in the streets" from our present perspective. This is not talking about children playing hide & seek in the streets, or playing some ball game in the streets or skateboarding up and down the streets. These children are not running around, bumping into these very old people who are leaning on their walking sticks.

They are not at all "playing" like children today play "in the streets". This verse is not describing any activity that we in our present world can identify with playing. I grew up in post-World War II Germany in a city that had been devastated by endless bombing raids, and I played in the streets of that city. In fact, I spent a great deal of time playing on those streets. But Zechariah 8:5 is not talking about anything that I can identify with my own experiences of "playing in the streets".

What Zechariah 8:5 is really telling us is that during the millennium **children** (and I would take that to be a reference to basically teenagers) **will entertain the old people by playing music for the old people**. The children will provide good, clean, healthy entertainment for those who are elderly, by making music and singing and dancing, and perhaps some other positive activities as well. That is what this reference to "boys and girls playing in the streets" is talking about.

Again, this verse is not speaking about the children playing some unsupervised activity. On the contrary, their "playing" will be out in the open for one and all to see and to enjoy ("look at how well my great-great-great-grandson can play the trumpet", etc.). And some of the spirit beings from the first resurrection may well on occasion be in the audience when these "boys and girls play in the streets".

So when you hear the word "playing" used in reference to the millennium, please don’t picture what playing means in our age. Nothing in our age, which is ruled by Satan, can compare to what things will be like during the millennium. This also applies to the purposes and motivations for playing.

Now let’s look at something else about the human brain.

VERY EARLY MEMORIES

Occasionally some people will claim to remember specific things from when they were less than two years old. Yes, some people may well remember some things they experienced around age two years, but most of us don't really remember very much from the first two years of our lives, do we? That's the period of time when the brain's synaptic network was still under construction, when connections were still in the process of being formed.

So let's consider those very early memories.

Our early memories may fall into one of two groups: either they are memories which make us feel comfortable or they are unpleasant memories which embarrass us and make us feel uncomfortable. Examples of pleasant memories typically involve having done something pleasant with one or both of our parents. Examples of unpleasant memories may involve being reminded of something foolish or embarrassing that we did at that very early age.

Parents sometimes seem to have the nasty habit of remembering all those occasions from our childhood that embarrass us (the time we pooped in our pants, etc.), which memories parents for some strange reason seem to find very funny. Have you ever noticed that? Don't they understand how uncomfortable it makes us whenever they tell the story of the foolish thing we did as an 18-months-old when we visited uncle Bill on his farm, etc.?

These two categories of memories obviously evoke opposing emotional responses from us. We are happy to remember the one group of events, and we are confident that we remember those things quite clearly and distinctly, and many times that may indeed be the case. The other group of events in most cases we don't really remember from a visual point of view; those events we only know to be true from the countless times we have heard our parents refer to them, usually in embarrassing situations.

We'll come back to these two groups of memories in a moment.

Now our brains are extremely efficient. As I mentioned earlier, a single neuron may receive simultaneous input from a thousand different synapses, and that neuron will combine all those sources of simultaneous input into **one composite picture**, and then pass that composite message (i.e. the action potential) on to other cells in the form of an instruction. This efficient functioning of the brain is also evidenced in another matter.

When the brain receives auditory input that it recognizes, then the brain will frequently provide the visual input that it associates with that auditory input. A simple example of this is: when we hear barking which our brains identify as a dog barking, then our brains will readily provide the image of a dog to go along with the barking we can hear, even though we have not actually seen the dog. Similarly, when our auditory nerves pick up the melodious tunes of a guitar being played somewhere, then our brains readily provide to our minds the picture of a guitar.

In other words, when we hear certain familiar sounds then our brains can readily provide the appropriate visuals to go along with those sounds. Another example of this phenomenon is when we dream. In our dreams we see certain visuals, and typically we also hear some speaking (or we may hear ourselves speaking). The speaking we hear is intelligible though it frequently isn't logical, i.e. we clearly understand what the speech means, though it may not make any sense. The point is this: in dreaming our brains provide auditory input to go along with the visuals the brain is providing.

Now let's get back to early childhood.

Before age two years the synaptic network is still incomplete. And as long as that network is still incomplete it is more difficult to permanently record memories for long-term storage. That's why in adulthood most people remember very little from the first two years of their lives. So how is it that for some people certain events from the first 12 or 18 months of their lives stand out quite clearly in their memories? This is important to understand because it applies to how our children learn things.

I suspect that in most cases such early events which stand out quite prominently in the memories of such people of something they did or experienced at age one year or even age eighteen months, stand out because **their parents frequently referred to those specific events** in the years following their occurrences. Here we are talking about pleasant memories that make people feel good.

I don't mean to imply that some people may not have clear memories of some things they experienced around age two years, though I suspect that people with such early memories are in the minority. But in addition to having real memories of certain events many of us will have additional memories that resulted from verbal input we received at a later time. I know that is true in my circumstances.

We hear a description of what we did or experienced at age one year, or even at age one-and-one-half years. Had our mother not mentioned this event we might never have thought of it again. But because our mother brings up this memory our auditory nerves send this information to the brain. **The brain searches for a visual to go along with that input**, and not finding any visual memory of the incident, the brain then provides the appropriate visual for that specific incident. So we now "see" ourselves at age one doing or experiencing something, not because we had a visual record of that event in our minds, but because our brains provided the necessary visuals based on the auditory input which the brain received when our mother recounts this incident at a family gathering.

From then onwards the visual memory of that event is just as real to us as if we had on our own, without any auditory input from our mother, remembered it. **Auditory input can very readily create visual images in our brains.**

As an example:

When I was not quite one year old my mother was fleeing westwards on the last refugee train from the advancing Russian armies. That refugee train consisted of cattle trucks filled with refugees, and the approximately 300 mile journey took 14 days, mostly doing no more than about 20 miles per day, riding westwards into the western parts of Germany. Every day, like clockwork, a solitary R.A.F. fighter pilot appeared and emptied his machine guns into that refugee train and then left again. (Those were the last two weeks before the end of the war.) And every time he appeared all the refugees scrambled under the train for cover from his bullets. My mother, with me under her arm, did the same thing. And every day my mother also went up to the train's engine to get some boiling water for some baby formula and also to soak some old pieces of dry bread as food for me.

[COMMENT: Regarding the R.A.F. pilot repeatedly attacking the refugee train, I might mention that in a book written by British R.A.F. researcher Andrew Thomas (which book incidently also records by name one particular perspective of the events surrounding the death of my own father on pages 54-55, and the cover of which book actually depicts the very scene of my father's Me 163 Komet rocket fighter plane being shot down while being towed by a Bf 110, something I only learned from the "Luftwaffe and Allied Air Forces Discussion Forum" on the internet) it is mentioned in passing under one photo caption: "Canadian ace, and unit CO, Sqn Ldr Leslie Moore flew it (the plane in the photo) during the early months of 1945 until he was shot down by flak and killed in MV258 **WHILST STRAFING A TRAIN ON 25 MARCH**" (page 46). The book is titled "Griffon Spitfire Aces". I mention this only to illustrate that at the end of WW 2 (March 25 of 1945, five weeks before the official end of the war, was the time when refugees were fleeing in vast numbers in all directions) Spitfire pilots did indeed attack refugee trains.

And the events on the train I was on about two weeks later at just under one year of age were not an isolated occurrence.]

Now I know the incident, and all the other details, so well that **I can picture myself in that cattle truck and under that train with bullets striking the ground around me**, and later eating those water-soaked bread crumbs. I know that incident so well that I could convince myself that I actually "remembered" the whole experience. But that is not correct, and my feelings would be deceiving me. My memory of that experience at almost one year of age is based entirely on auditory input a number of years later; i.e. I can vividly see the whole experience in my mind based on nothing more than what my mother told me about that event. My brain has provided the appropriate visuals to go along with the auditory input I received. But I don't really have a personal memory of those events on that refugee train. And yet I can picture the whole scene very vividly, because of the descriptions my mother has related at various times in the past. And it would not take much for me to convince myself that I actually remembered that train journey.

I suspect that most people who claim to have vivid memories of things they experienced around age one year or even earlier are likewise based on receiving auditory input from their parents at a time when they were considerably older than the one year that applies to those events. We need to recognize that **auditory input is very capable of creating vivid images in our minds**, to the point where sometimes we may no longer discern the difference between what we ourselves remember from an experience on the one hand, and on the other hand what our parents told us about that experience at some later point.

Consider the following things:

People who claim to have **vivid memories** of things that happened to them at age one year or earlier are **VERY SELECTIVE** in the very few things they claim to remember from their own experiences. That is already an indication that at age one year their brains were not yet recording things in long-term memory, otherwise they would have many more specific memories to report from that period of their lives. A few selective memories are very compatible with things that the parents repeated at various times during their childhood, thus creating precise images in the minds of their children, provided those memories are pleasant. If the events repeated in such verbal situations were embarrassing and unpleasant, then **their minds were likely to block any visualization of those events** that they are hearing described by their parents.

In either situation there isn't actually a visual memory of events at age one year until the scene is verbally described by the parents. The brain then visualizes the pleasant situation and refuses to visualize the unpleasant situation.

The brain can readily provide visuals for both auditory sensations (speech and other sounds) and olfactory sensations (sense of smell), as for example the smell of freshly baked bread causing us to picture a loaf of bread. When our brains receive one form of input (i.e. either visual or auditory or olfactory), then the brain will in many cases provide one or both of the other two inputs based on past experiences, even when the other two inputs are not present at that point in time.

Furthermore, when people do recount events from before they turned two years old, they frequently do so from an adult perspective. When they were less than two years old, adults looked huge, as did also all furniture items, as well as the dog, etc. A strictly visual memory of those events would have recorded the size of all items from the two-year-old perspective. But they don't really have a visual memory of the room or the garden or the car, etc., as seen through the eyes of a child less than two years old. No, the memories they describe are typically as seen from the perspective of an adult.

WE NEVER EXPERIENCE THE SAME MEMORY EXACTLY ALIKE

Here is something about our memories that we may not have considered before. Memories are stored in the brain. Short-term memories produce changes in the functions of certain synapses, by strengthening or weakening certain pre-existing conditions. Establishing things in long-term memory requires anatomical changes in the brain. Once a long-term memory has been established, not only have the functions of some synapses been changed, but also new synapses and even new neurons have been established. All our memories are also unavoidably influenced by our emotions.

Now memory is something that cannot possibly be duplicated by a computer for the following reason. A computer can only give back EXACTLY what has been fed into it previously. In recalling stored information a computer cannot possibly modify that stored information in unpredictable ways; it can only give back exactly what was entered into the computer. **BUT THAT IS NOT WHAT HUMAN MEMORY IS LIKE!**

We cannot remember the same experience exactly alike on different occasions! You may have noticed this about other people, that they tell a story slightly differently from the way they told it a year ago. And on many occasions you've experienced examples of husbands and wives correcting one another regarding certain details of some or other story they are recounting.

But surely this doesn't apply to you, does it? I mean, you KNOW that you remember things exactly how they happened, right? Well, yes, actually this does apply to you just as much as it applies to me.

Our brains are constantly changing, based on the things we hear and see and experience, and based on the information we learn and the decisions we make. All these things lead to constant changes taking place in the neuronal networks of our brains. We today do not have the same brains we had last month or last year. In other words, we are different from the persons we were last year. SOME THINGS have changed in our brains over that period of time.

So when we today recall a memory that was stored a year ago or longer, THEN that memory recall is achieved by utilizing DIFFERENT PATHWAYS in our brains from the pathways that were used when that memory was originally recorded in long-term memory. And EVERY TIME we recall that particular memory that recall makes use of SOME different brain pathways than every other time we previously recalled that same memory. And every time we recall something, our emotional state at that very moment has some influence on how we ourselves view that memory.

Recall that earlier we saw that a single neuron may receive **simultaneous input** from a thousand different synapses. And that single neuron will then form **one composite picture** from all those different simultaneous inputs. Some of those one thousand inputs are always likely to be different at different times, and so the output may likewise sometimes differ from the output on previous occasions. We today are recalling all past memories with a slightly different brain than the brain we had when those memories were recorded and later consolidated.

This is not to imply that our memories are not true or that our facts are not correct. I am not questioning that our memories are basically correct. But it is good for us to understand that our memories are **never absolutely identical** to the previous occasions when we recalled those memories. The differences may well be insignificant and inconsequential; I'm not disputing that. We have examples of such inconsequential differences in biblical accounts, where two different accounts describe the same event or occasion. And we rightly just ignore inconsequential differences. And so likewise in our personal lives we should always ignore inconsequential differences in our recall of various memories; they are not worth spending time on.

I am simply presenting an objective observation, one that highly qualified "memory biologists" like Eric Kandel have discussed at length. He is a scientist who has devoted himself to studying how the brain stores our highly varied range of memories.

A PERSONAL EXAMPLE

When I was about six or seven years old I played in a school yard across the street that had a high wall around it. It was higher than my head and I could barely reach the top of that wall to climb over it. I remember the height very vividly because a man instructed his large dog to jump over the wall, and the dog did so. I was very impressed by that dog's ability to jump over such a high wall, and the experience made a vivid impression on me.

Some time after that I then left that town and only returned later at age 18 years. In due course I had occasion to go to that same school yard, and the memory of that dog jumping over that wall came back to me. However, when I then saw that wall, it was an unexpected surprise to see how small that wall actually was. Revisiting the scene over ten years later destroyed the visual image I had carried in my mind all those years. When I now think back to that occasion of the big dog jumping over that wall, I now am no longer able to see the image I had carried in my mind between ages 6 and 18; now I can only see that occasion from my adult perspective.

The same applied to trees I used to climb as a little boy up to age 10 years. When I returned to that town years later as an adult, all my favorite trees weren't nearly as high as I remembered them to be.

The point is this:

My memories were in the perspective in which I had seen things at that young age. And because I then left that area therefore that perspective remained in my memory when I grew up. That perspective reflected an actual visual memory, not a memory that had been adjusted by the brain due to now seeing things as an adult. It was not until I was literally confronted with the same scenes from my childhood that my brain THEN adjusted my visual memories for those events. And so today the memory of those events is no longer based on the visual impressions my brain recorded at that young age; no, today the memory of those events has been modified by later visual input, resulting in an adult perspective of those things that I experienced in my childhood. Today my memory no longer pictures that wall quite as high as it did when I was six years old, and my memory no longer pictures the trees that I climbed as being quite as tall as I perceived them to be up to age 10 years old; today my memory pictures those things as I view them from the perspective of a six foot tall person.

Now the only reason these things stand out in my mind is because I left that environment as a young child, and did not return until I was fully grown up. If I had not left that area, then my perception of all these things would have changed and adapted ever so slowly as I grew bigger; and I would not be aware of the contrast in perspectives for those two ages (i.e. age 6 years and age 18 years).

I suspect that people who claim to visually remember things that happened before they were a year old don't really grasp how their perceptions of the general environment have changed since they were little tots, because those changes have been ever so gradual. Today they picture those things with adult eyes, which is an "adapted memory".

This does not mean that their memories are not vivid. Their memories may in fact be very vivid, and I certainly do not wish to argue with anyone's early memories.

The point I wish to make is this:

It is highly unlikely that any memories from the period in our lives when we were less than two years old, when the synaptic network in our brains was not yet fully formed, will be accurately retained in later life. Yes, some people may well have some memories from when they were around two years old, but most memories from that period before age two years are likely due to the brain's interpretation of non-visual input (i.e. being told about those events or reading about them), where the brain re-creates a visual image that is compatible with the auditory input it has received. That's like me being able to picture myself on that refugee train.

When people say: "when I read that account of what had happened, **THEN IT ALL CAME BACK TO ME**", what they mean is: when they read that account, then THEIR BRAIN INSTANTLY PROVIDED A PICTURE COMPATIBLE WITH THAT STORY". Don't underestimate the power of the brain to instantly create visuals to go along with auditory input the brain is receiving. This happens all the time when we read a novel, where our brains provide the visuals for the text we are reading ... we can "see" the story unfolding before our eyes.

Am I saying that this is always the case? No, certainly not! But is this something that happens easily and readily? Yes, it does! I merely wish to explain things, not argue with your cherished memories. I have no problems with whatever you may remember for your early childhood, however young you may have been.

Now here is how this applies to teaching our children. This is important to grasp.

Parents SHOULD teach their children as much as possible as early as possible, mostly in the context of playing and of having fun. And it is possible for children to learn a great deal before the age of three years. BUT ...

Very little of what the child learns before age three years is likely to stay with the child for the rest of his life UNLESS all the things that have already been learned are continually REINFORCED by repetition for several more years. They need to be reinforced UNTIL the child's long-term memory mechanism has been well established. The things that have been learned can be reinforced either by repetition or by becoming the foundation for more learning. Things that are constantly used (e.g. numbers and the alphabet) become much more firmly fixed in long-term memory than things that are seldom mentioned again (e.g. learning the names and attributes of a multitude of butterflies and other insects, only to then never use that information again).

Everything that a small child is taught must then be periodically repeated **for several more years** to ensure that this learning becomes a part of the child's long-term memory, much like the alphabet and the numbering system are firmly entrenched by constantly applying this knowledge in reading and in calculation activities. Such repetition of everything the child has learned should probably continue for most of the child's first ten years.

Then when the years come for most of the synaptic pathways in the brain to be pruned back (i.e. from about age 12 years onwards), THEN the pathways that have been utilized by the frequent repetition of all the things the child has already learned will be strong enough to survive that period of pruning. Pathways in the brain that have been constantly used to maintain a knowledge of all the child has already learned are like six-lane highways in the brain, compared to something being learned once to then never being used again being like a very small unmarked path through the woods.

And don't assume that things learned before age three years will stay in the child's long-term memory, unless those things are repeatedly reinforced by repetition and by being utilized in other circumstances.

I believe that this is a mistake that parents who have endeavored to teach their little children a vast amount of knowledge have sometimes made, that they neglected the things their children had learned very well at a very young age. We need to recognize that children only develop an efficient functioning of long-term memory around ten years of age. Long-term memory is certainly already established between ages two and ten years, but optimum functioning is only achieved around ten years of age. And until an **efficient** functioning of long-term memory has been firmly established, all the things already learned need to regularly be revisited, to ensure that they are not forgotten.

What this means is that the instruction "train up a child in the way he should go" (Proverbs 22:6) doesn't stop with age two or three years. This instruction applies **especially** to the first ten years of life.

ANOTHER IMPORTANT TEACHING OPPORTUNITY

Many parents introduce their children to various board games. One of the best things parents can do in this regard is to teach their **little children how to play chess**!

Playing chess has very powerful effects on the brain, and on the development of spatial reasoning. The game requires the mind to comprehend that different pieces on the board are governed by different rules (e.g. a castle, a knight and a bishop all move in different patterns, etc.). The game also provides ideal circumstances for thinking ahead and correctly anticipating what will happen IF a certain course of action is chosen. Playing chess has enormous potential for positive brain development in small children.

Now remember Tom Sawyer persuading the other kids to paint the fence for him. Ideally the parents should play chess with one another when their child is 18 months old and two years old and three years old. When the little child sees daddy and mommy playing chess, then this creates the desire in that child to also want to play that game. Playing chess should appear as a special treat for the child.

It is totally immaterial whether one or both parents are "hopeless chess players". The parents do NOT have to be good at playing chess. The only requirement on the parents is that they know all the rules, that a castle can only move vertically and horizontally, that a bishop can only move diagonally, that a queen can make all the moves that a castle or a bishop can make, etc.

The child's mind will very quickly comprehend all the ways in which each piece on the board is allowed to move. The child will also learn fairly quickly to look at least one move ahead, teaching the child cause and effect. And with a bit of practice it is quite possible that the small child will become a better chess player than either parent. One of the reasons for this is that, if the proper incentives are provided, the small child's brain can **visually** anticipate three or even four moves ahead the consequences of making certain moves, where the adults will have to do such thinking ahead on an intellectual level, and somewhat less visually than the small child.

If the game of chess is presented in a context where it is a very desirable activity for the child, it can have a very powerful positive effect on brain development.

ONE MORE POWERFUL TEACHING TOOL

A hundred years ago one of the most efficient means for long distance communications was by morse code. With the advent of a multitude of communications satellites flying through our skies the use of morse code has become almost obsolete. In an age where anybody with a cell phone can instantly talk to anybody else in any other location, why would anybody possibly want to learn morse code?

Here is the point.

In morse code all the letters of the alphabet are represented by a combination of from one to four short or long sounds, with the ten numeric digits all consisting of a combination of 5 short or long sounds. Typically the long sound in morse code is phonetically represented as "da", and the short sound is represented as "dee" inside a letter or as "dit" at the end of a letter. When people learn to hear morse code they do NOT hear it as a burst of short and long impulses. Thus I don't hear the name "Frank" as "**short-short-long-short** + **short-long-short** + **short-long** + **long-short** + **long-short-long**". And no person who can audibly read morse code tries to figure out: was that two short and one long, or was that one short and two long?

To a morse code operator each letter has a very distinct "**sound image**", much like the words of a language. Initially it is helpful for people to make ridiculous rhymes for some of the more complex sounds of certain letters, and the more ridiculous the rhyme, the easier it is to remember. The process of learning to hear and correctly decipher morse code involves getting the brain to identify each of the distinct sound images with the correct letter of the alphabet. For example, the letter "Y" consists of "long - short - long - long", and we were taught to associate that sound with the word 'Yo - ko - ha - ma", mentally pronouncing the syllable "ko" short and the other three syllables long. Ditto for certain other letters.

While the letters may consist of from one to four individual sounds, the average length of a letter is from two to three distinct sounds. In our unit in the Signal Corps we had men who could both send and receive up to 100 letters per minute (I wasn't one of them). This means that they could both send and receive about 250 distinct individual impulses per minute, or about four impulses per second.

What this means is that their brains had been trained to correctly distinguish about four distinct sounds every second, and they were able to do this for several minutes at a time.

What has all this got to do with child-rearing?

The auditory nerves of a small child require exposure to sounds in order to develop properly. I have already mentioned exposure to different languages, music and yodeling. One more tool for developing those auditory nerves is exposure to morse code.

This may need to wait until the child is thoroughly familiar with the alphabet? Most children can be taught to easily recognize every letter physically by about age four years (and many children can learn the whole alphabet at an even earlier age). Once the child is totally confident in recognizing every letter from A to Z, then a new game could be introduced. And that new game would be listening to morse code.

This game need not require the child to send morse code letters, as that process requires a certain dexterity of wrist movements. The game would be restricted to hearing and correctly identifying the various letters.

Small children will quickly learn to identify the sound images, or "sound pictures" for all of the letters ("YO-KO-HA-MA" for Y, etc.). In the same way that a small child's brain figures out how to reproduce the sounds in the words they hear from their parents, so also will the small child's brain figure out all these sound pictures. And as they learn to correctly identify one letter after another, so the speed at which the letters are presented to the child can be gradually increased.

Is it important for children to learn morse code? Of course not! But such exposure to morse code sound pictures will powerfully develop the small child's auditory acuity. The ability to distinguish several distinct sounds per second will quite likely also have a positive effect on the development of the child's musical

abilities. And it certainly helps in developing a very focused attention, always a valuable asset for anyone to possess.

So morse code itself has no particular value in our age. But the brain development that it can achieve in a young child is very considerable.

Now I obviously realize that very few parents are in a position to provide structured tuition in morse code for their children. So I didn't mention this earlier when we talked about exposure to foreign languages. I mention it now simply in passing for those few people who may have the opportunity to find a way for their children to experience hearing morse code at a fairly slow speed initially. Also, discussing the positive effects exposure to hearing morse code can have, may give you some ideas about other things that could have equally beneficial effects on the development of a child's brain.

Now let's consider another very significant fact about the brain that I have already briefly referred to.

THE PLASTICITY OF THE BRAIN

Neurologists now understand that the human brain is highly plastic, meaning that it is constantly changing. While the brain remains plastic well into old age, the degree of plasticity is greatest in the first ten years of life. This also has profound consequences for child-rearing.

I am in somewhat of a dilemma as to whether or not I should bring a particular book to your attention. While the book contains a great deal of excellent information, it also contains two rather bad chapters. On consideration I will tell you about this book and prepare you for the bad chapters.

The book is entitled "THE BRAIN THAT CHANGES ITSELF". The subtitle on the cover is "Stories of Personal Triumph from the Frontiers of Brain Science". The author is Dr. Norman Doidge. I found the book on the internet.

Dr. Doidge has interviewed various people and written up their stories. What all of these stories demonstrate is that the human brain will adapt and change to meet new challenges. For example, if you know anyone who has had a stoke and is now paralyzed on one side of his or her body as a result of the stroke, then you need this book, because it will demonstrate to you that in many cases the stroke victim can in fact regain full use of the paralyzed limbs. If you know someone who suffers real pain from a phantom limb (i.e. they lost an arm or leg but now still feel severe pain in the arm or leg they no longer have, a not uncommon phenomenon), then you also need this book, because it presents a solution for getting rid of pain in a phantom limb. If you want to understand how a woman who was born with only half a brain (i.e. her left brain hemisphere simply never developed) can live and cope with life, then you need to read this book. There are a number of other real life stories in this book.

Dr. Doidge is an evolutionist, and this comes through in various places in the book. However, most of the book is devoted to a reasonably objective description of people dealing with brain problems. And those descriptions are mostly not affected by his evolutionist perspective.

If you do get this book I would recommend that you **do NOT read chapter 4 and chapter 9**! Each chapter in the book is self-contained and you do not need to read previous chapters in order to understand subsequent chapters. If you DO want to read chapters 4 and 9, I would suggest that you at least skip these two chapters until after you have read all the other chapters, and THEN read them.

Chapter 4 is entitled "ACQUIRING TASTES AND LOVES". This chapter presents about 40 pages of

psychoanalysis of sexual deviations, in the process trying to persuade the reader to show understanding for sexual perversions. The whole chapter deals with nothing but sexual perversions and aberrations. I strongly recommend that you skip chapter 4 altogether.

Chapter 9 is titled "TURNING OUR GHOSTS INTO ANCESTORS". This chapter is about a man who was "haunted by dreams" and then underwent psychoanalysis with Dr. Doidge. The whole chapter is pretty weird, illustrating Satan's influence in people's lives. I don't believe there is any positive information to be gleaned from this chapter. So I would strongly recommend that you also skip this chapter.

The other 9 chapters in the book are very, very informative. The information is very helpful in giving us a far clearer picture about the workings of the human brain, and the phenomenal capacities it has for coping with unexpected challenges. If you read those 9 chapters it will open your mind to the powers God inculcated into the human brain when He created mankind.

As far as child-rearing is concerned.

Everything we do affects our brains. When you are faced with a decision, whatever decision you make will produce a change in your brain. We do something that is wrong before God, and a change takes place in our brains. We do something that is right before God, and likewise a change takes place in our brains. Everything we do has either a positive or a negative effect on our brains.

Think of the $10^{1000000+}$ possible different permutations for the neuronal connections in the human brain (that's the number that is over one-and-one-half miles long at ten zeros per inch!) to realize that there is more than ample opportunity to make provision for every single thought we have and every single thing we do!

Consider this analogy presented in the book I have mentioned:

We are standing on top of a large snow-covered mountain. We have clamped on our skis and we want to ski down the mountain into the valley. Everywhere before us there is pristine snow. So we mentally select a route down the mountain and then ski down. We leave a trail behind us. Then we take the ski-lift up to the top of the mountain in order to ski down again. We now face a choice: do we ski down a new route or do we ski down in the track of our previous descent? If we ski down in the same track that we made previously, then the snow in that track will become more compacted. If we ski down the mountain 20 times and use the same track every time, then the track will become firmly established, and more difficult to erase than if we had only used that track one single time.

This is a parallel to what happens in our brains when we make decisions. The first time we do something, that is like skiing down a hillside of pristine snow. If we do the same thing again, then that "track" in our brains (i.e. the network of neural connections involved in performing that particular action or activity) becomes a little stronger. If we do that same thing more times, then this "track" in our brains becomes established. It becomes our action of choice when faced with that particular circumstance.

This is especially important for when we do something that is wrong. But let's view this in terms of child-rearing.

When a child has disobeyed his parents, then that act of disobedience forms a new track in the child's brain. The child's brain is in fact PHYSICALLY CHANGED by that act of disobedience. After the disobedience the child's brain is no longer the same as it was before that act of disobedience. NOW come the consequences.

IF the child is punished for that act of disobedience in a way where the child perceives the punishment as highly undesirable, THEN a new track is formed in the child's brain. This new track will make the previous track created by the act of disobedience much less attractive, and possibly even unattractive. In other words, the new track formed by the punishment for the disobedience will provide a strong deterrent to any likely repetition of the prior act of disobedience.

We are talking about real physical neuronal connections in the brain. This is what neuroscience has recently discovered, not about punishments for disobedience per se, but for the fact that everything we experience results in new connections being formed in our brains.

Now **IF the child is either NOT punished at all or else is punished in a way that is "no big deal" to the child**, THEN a different new track is formed in the child's brain. This new track will reinforce the track formed by the original act of disobedience. So when the child is then confronted with the same situation, then the track formed by the earlier act of disobedience will exert a strong pull, like a magnet, and there is a high likelihood that the child will again engage in the same act of disobedience.

Now IF the child after the initial disobedience decides to resist engaging in the same disobedience in the future, either because of having been punished or because of being self-motivated to do so, then the first subsequent occasion of resisting is the most difficult one. At that point the only track that exists in the brain is the one formed by the previous disobedience. So deciding to not disobey the parents this time round is like skiing down the mountain creating a totally new track. The next time it will be somewhat easier to resist disobeying in this particular matter, because there is a lightly established track in the brain that offers some support for resisting disobedience.

Instead of merely focusing on how to deal with problems and challenging situations that arise, parents should think of the effect different forms of dealing with such "challenging situations" will have on **the brain development of their children**. Everything the children do produces changes in the neuronal networks in their brains, establishing new pathways like a new ski track in pristine snow. In all the things the children do that are good they need to be encouraged to strengthen those new pathways, so that they become firmly established in their brains. And in all the things the children do that are not good (disobedience, unacceptable conduct, foolishness, etc.) the parents need to respond in ways that will discourage the child from utilizing that particular pathway again, doing their best to erase that pathway from the child's brain.

Godly child-rearing amounts to taking responsibility for developing desirable synaptic connections in the child's brain, and stifling and rooting out undesirable neuronal pathways. Parents have considerable responsibilities for the brain development of their children.

When a child turns out to be very intelligent, then that is not just because of the genetic inheritance he received from his parents. ALL children end up having about 1000 trillion synapses in their brains between ages 3 years and approximately 12 years; this enormous number of synapses is not limited to children of highly intelligent parents.

The greatest service (and responsibility!) that parents can provide for their small children is to provide **AN ENVIRONMENT THAT IS BOTH MENTALLY AND PHYSICALLY STIMULATING**! That is the kind of environment that will encourage the positive utilization of the maximum number of neuronal connections in their children's brains, ensuring the retention of a greater number of synaptic connections into adulthood.

God designed this so that any child anywhere on Earth has the potential to become a highly intelligent adult, provided the parents establish the right kind of environment for their children to develop their minds and their bodies. It is Satan who seeks to sabotage that process, by influencing the parents to

establish an environment that will dull the brains of their children. It is Satan who wants parents to delegate these responsibilities to television and to the schools or the governmental institutions. Satan wants people to believe that "the government knows best what is good for your children", because that is just another way of leaving the total development of children in the hands of Satan, who most certainly is the spirit that works in the vast majority of children (see Ephesians 2:2), something all of us ought to know and understand very well from our own personal experiences (that's Ephesians 2:3).

ONE FINAL CLARIFICATION

Throughout this article I have tried to encourage the idea of teaching young children as much as possible as early as possible, in relaxed stimulating but non-threatening circumstances. Some people may misunderstand the motivation and the purpose underlying this advice. So let me explain.

The idea is not to produce child geniuses!

The idea is not to have children graduate from college at age 14 and then receive their PhD degree at age 17 or 18. And the idea is certainly not to deprive children of a proper childhood, a time when they have no cares and no worries, in the full assurance that their parents will take care of them in every way.

The idea is to utilize in an optimum way the synaptic connections in the brain that exist at age 3 years so that the greatest possible number of those connections will be retained into adulthood. The brains of little children should be stimulated towards this goal, irrespective of whether those children later become carpenters or computer scientists, whether they become engineers or electricians, whether they become farmers or financial stock analysts. The brains of all children should be encouraged to maintain the greatest possible synaptic network into adulthood, irrespective of what professions the children may choose later in life.

One profession isn't really better than another. And there is no reason why a carpenter or a plumber should have an intellect that is inferior to the intellect of an engineer or a scientist.

In our present world **child prodigies** very commonly have rather miserable lives! Frequently they don't seem to have the ability to develop satisfactory relationships with other people. For example, earlier I referred to Mozart composing piano music at age 5 years. But Mozart died at age 35 years after repeated miserable personal relationships with other people. He did not have a happy life. And that has been the case for many child prodigies.

In this regard we might keep in mind that our word "prodigy" comes from the Latin word "**prodigium**" which means: **omen**, **monster**, **unnatural deed**, **to portend**, etc. So our word prodigy doesn't have a happy meaning to start with. And often the negative meaning inherent in the Latin root word has indeed applied to such child prodigies.

So we certainly don't want to raise child prodigies!

So often people who are intellectually far above average (i.e. the geniuses and the wannabe geniuses) live their lives in one narrow sector. All they do is compose their music or play their music or their sport or study their mathematics or their sciences, etc., in the process ignoring the fact that there should be more to life than music or sports or intellectual studies. This is certainly not always the case. But it does unfortunately apply far more often than is desirable.

The only area in which people should strive to be single-minded is in their obedience to God. But for

every other aspect of life people should strive to participate in the rich tapestry of experiences and activities that life has to offer. There should be more to life than playing tennis or golf or making money or endless academic research. There should be variety in experiences and in activities.

Parents should seek to provide a stimulating environment for their children, with activities that promote the retention and development of synaptic connections in the brains of their children. But this should never turn into specializing the brain development of their little children in one specific area at the expense of all other areas of brain development. The goal is not to produce a genius or a child prodigy, but to equip the child with the potential to later in life choose from a large range of vocational opportunities, because using as many synaptic pathways as possible in early childhood had the effect of retaining more of those pathways into adulthood, thereby keeping many more options open. And so there should also be variety in the experiences which parents make available while the children are growing up. Intellectual activities should be balanced with physical activities, with an emphasis on both intellectual abilities and physical skills.

Earlier I mentioned that I personally know a family in South Africa who have diligently applied the Glenn Doman program to teach their children as much as possible as early as possible. They have no connections to the Church of God.

I knew their little girls for about the first seven years of their lives, and I heard again from their father about two years ago. They grew up speaking Greek and English fluently. They are both way ahead of their school mates academically. They excel in playing the violin and they also excel in the sporting activities at their school and in ballet classes. And most of all, they are HAPPY LITTLE GIRLS WITH BUBBLY OUTGOING PERSONALITIES, who will easily approach you and greet you with a big smile. There is nothing unbalanced about those two little girls.

So don’t think of this approach of teaching the children very early somehow producing some highly unbalanced "oddball genius kids"! That’s not what happens when you apply this approach to a vast range of physical and intellectual activities, always stimulating and challenging the rapidly developing minds of young children.

So in conclusion:

As parents we need to understand very clearly that everything our children do results in some changes occurring in their brains. Godly child-rearing has the following goals and responsibilities:

1) Parents need to establish an environment that will positively stimulate the **mental** development of their children, by exposing their children to a whole range of learning opportunities and experiences. We’ve considered a number of examples.

2) Parents also need to establish an environment that will positively stimulate the **physical** development of their children, by in playful circumstances exposing the children to running, kicking balls with both feet, throwing balls with both hands, hitting balls with a bat or a racket with either hand, controlled climbing and brachiating, cycling, swimming, etc.

3) Parents also need to provide an environment that enables the children to develop their **auditory** cortex, by exposing the children to a vast range of sounds, including various languages being spoken, melodious music being played, perhaps playing good quality yodeling singing, and perhaps even exposure to morse code.

4) Whenever their children **do something for the first time**, parents need to understand that these actions have forged **new pathways** in the brains of their children.

If that something was good and positive and desirable, then the parents need to encourage the repetition of that particular action or activity. Repeatedly doing what is right helps to strengthen that new pathway in the brain. And the stronger that new pathway is made, by repetition, the less likely it is that a competing negative action or activity will appeal to their children.

But **if that something was bad** and disobedient and rebellious, then the parents need to realize that how they respond to this action of disobedience or rebellion is of paramount importance for the long-term development of their child's character. Unless the parents provide a response that creates a strong enough deterrent in their child's brain (i.e. an additional new pathway in the brain of their child), the child is highly likely to repeat the undesirable action or conduct. The child will repeat the undesirable conduct because in his brain there is now a pathway, a precedent, for dealing with that type of situation.

5) All children will at times do things that are **foolish** and wrong (Proverbs 22:15). Every time that happens a new pathway in the brain is established. It is "the rod of correction" (same verse) that will help to erase that wrong pathway. The greatest challenge parents face, after seeking to provide mentally and physically stimulating situations for their children's development, is how they deal with foolishness, disobedience and rebellion on the part of their children. Different ways of responding to these types of situations result in different developments in the brains of their children, laying the foundations for the character their children will develop later in life.

6) All the things the children have learned in the first few years of their lives need to be **regularly reviewed** until the long-term memory mechanism has become well-established in the children's brains. Unless the things learned in the first few years of life are constantly repeated, they are likely to be forgotten, undoing the work that went into teaching the children those things in the first place.

7) This last point is also true for teaching the children God's truth and God's way of life. Biblical teachings need to be repeated at various times, without assuming that the children absorbed and retained everything they were taught earlier.

Now we don't really need any big government program like "no child left behind" to ensure that our children will develop intellectually. Rather, what we need is parents consciously and deliberately creating an environment in their homes that will be mentally and physically stimulating for their children's immature but rapidly developing brains. Only when parents provide such positive mental and physical opportunities will we get to the situation where truly no child will be left behind.

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