



# CHAPTER ONE

## *MUSIC* *&* *THE BRAIN*



**MUSIC  
&  
THE BRAIN**

***“This is my father's world  
And to my listening ears  
All nature sings, and round me rings  
The music of the spheres”***

***(Maltbie Davenport Babcock, 1901)***



Arise carefree before dawn and witness the Great Artist's genius as; *"all nature sings, and round me rings; the music of the spheres"*. Inhale the freshness of each morning while feasting hungry eyes on the Father's world; resembling a painting rich in colors, sounds, and textures offered as his gift to all creation; a one of a kind unique masterpiece that's filled with reflections fair in color and pure in form. Soak in the beauty of the dew kissed leaves and blades of grass that serve as a feast for the eyes decked out in various hues of color with some even appearing to be dipped in rich icy liquid greenness.

But alas, in contrast to the description presented above, can the serenity of this place turn into a mysterious, noisy adventure? Is it possible the anticipation for a peaceful sojourn into nature can take on a new complexion causing the human mind to wonder if the expected outcome could be only an empty desire? Certainly, on this ambrosial morning, anticipating the woods to be a place of solace, soon turns into a natural melodic symphony of sounds worthy to be heard; a calming poultice yet energetic nourishment for the brain. Without fanfare, quietly hidden among the canopy of leaves in the trees overhead, as if on cue, a thousand birds began to twitter and sing heralding the beginning of a new day. Although the vast cacophony of sounds appears to be emerging from hundreds of various sources, methinks it is a gift from the Master that is divine and immortal; notes the mind interprets as glorious and ethereal.

Thus, dear reader, how is it possible to have such an awakening by simply going for a walk in the woods? Can a mere human even recount the emotions of such a journey, that for all intense purposes, should be interpreted by the ear as nothing but chaos and noise? The following words written by Henry David Thoreau on September 28, 1852 seem to supply a perfect description of what creation experiences when listening to the magnificent score of nature written by the Master: "Ah, if I could put into words that music which I hear; that music which can bring tears to the eyes of marble statues! ---to which the muscles of men are obedient!"

Even though Thoreau's words are beautiful, indeed, they only serve as a temptation to explore deeply why the mind of man gathers the array of sounds that should be heard as discordant and translates them into a breath- taking musical composition; thus, the motivation for delving further into the most complicated organ of the body.... the brain and its relationship to music.

#### MUSIC AND SONG BIRDS



***This is my father's world  
The birds their carols raise  
The morning light, the lily white  
Declare their maker's praise***

However, before moving forward, it is important to determine if, other than humans, there is another creature that uses music as a form of communication. A clue to the answer for this question can be seen immediately at the top of the page on both sides of the title. Yes, birds are the only other species that use song as a method of transmitting messages to one another.

Although the terms “song” and “call” are used interchangeably when referring to our feathered friends, a yearly planner offered by “Birds and Blooms” clearly pointed out the enormous difference. Calls are inborn and are produced instinctively. They are the exclusive sounds used by a given species, whereas, songs, on the other hand, are musical phrases delivered by song-birds to vocalize messages to one another. Surprisingly, these musical phrases even can take on a regional dialect by birds, just like human beings that reside in a variety of locations throughout the world. The male birds, known for singing, mimic their own dads, or pick up the proper phrasing from nearby songsters. Even more astonishing, however, is the fact that scientists believe birds learn to sing as chicks still in the egg.

Additionally, it is important to note male birds use their ability to sing most often during their breeding seasons; as a method of attracting a mate, as well as a warning when defending their territory or for the purpose of alerting the female partner. Then, as the bird ages, the song from within becomes even more refined, rich and beautiful. (Rephrased from “Birds & Blooms” 2011 daily planner, written by John Neville, Salt Spring Island, British Columbia)

While investigating the birds and the songs they sing to communicate, the writer recalls reading about an incident that occurred at a concert being held in Washington D.C. that turned out to be a show stopper. During one rendition, when a flutist was playing a solo part, a shockingly wonderful event occurred that interrupted the performance. Ladies and gentleman, the attention of a lone mocking bird sitting in a nearby tree became centered on the flutist’s notes that floated in the air all around.

Then suddenly, as if right on cue, the mocking bird began singing its heart out, filling the air with notes that identically mimicked the rich sound coming from the flute. Thus, the wise conductor immediately stopped the orchestra and allowed the attendees to listen to the sounds of nature at its finest. What a beautiful gift from the great Creator!

Consequently, after realizing all this fascinating information regarding birds and music existed, it seemed only natural to include them in this collection. Therefore, please note the beautiful photographs of birds that appear at the beginning of each chapter as a way of celebrating our wonderful Creator.

### THE INCREDIBLE BRAIN



First, it is important to point out that the human brain is not only the most complex organ of the body, but the speed at which research is developing regarding it is almost dizzying, making the writer realize it is necessary to leave this area in the hands of the experts. However, as a way of launching the study on the elderly and music engagement, it was important to set the foundation with at least a bit of background about this amazing organ.

Many years ago, when the writer was a teacher, as a way of gaining information that would enable her to better help her students learn, she read a book titled “The Brain Book” written by Peter Russell. One thing that immediately stood out was the importance of exposing the children to a variety of subjects and experiences from conception forward. In order to make his point, Russell reported a story about a

mother- to- be that sang in a Bach choir throughout her pregnancy. Even after giving up her time with the group following her daughter's birth, she still found that when Bach music was playing on the radio, her new born child would become so engrossed listening to it that she would pass over everything else...even food.

In addition to this fascinating story, as a first grade teacher, the writer recalls a student named Michael that was one of the largest, most active individuals in her class that pointed out the mystery of the brain at a very personal level. Having carefully prepared the class to attend the "Cleveland Nutcracker Ballet" she was startled after the performance to see a local newspaper reporter interviewing Michael regarding his feelings concerning the event. Surprisingly, this six year old student proceeded to identify his favorite movements of the music using descriptive words only someone proficient in the field would have known. Later, when conversing with the parents about the puzzling incident, it was discovered they had piped classical music on the intercom into his room as he was preparing to sleep from infancy forward. This rough tough child absolutely adored classical music because of being introduced to it at an early age.

### FAST TRACK BRAIN RESEARCH

Hence, when you focus on the rapidity at which brain research is unfolding, an example that shows how quickly the advances are occurring would be to take a look at the brain's cells called neurons. In 1979 when "The Brain Book" was copyrighted, it was reported that ten billion neurons were found in the brain. Whereas, today in a book by researcher Daniel J Levitin called "The Brain On Music", the number of neurons reported to be in the brain are one hundred billion. Levitin also indicates the manner in which the neurons are connected to each other make the number of different thought or brain states each of us can have to be over 32,768 possibilities. Additionally, researchers have noted that extra neurons are present at birth that naturally lessen over time. Fascinating!

In order to simplify our understanding of how the brain works, Levitin used a wonderful example that should offer clarity for nonresearchers like myself. He defined the brain as follows:

*Brain—like the computer's hardware (an organ of the body that is a collection of cells and water, chemicals and blood vessels, that reside in the skull)*

*Mind---like the computer's software that runs on the hardware. (a collection of our thoughts, hopes, desires, memories, beliefs, and experiences that define who we are as an individual)*

*\*\*\*\*\* Levitin believes the brain and mind are two parts of the same thing.*

*Levitin also wrote in his book, "The Brain On Music" that a neurosurgeon once told Daniel Dennett (a prominent and persuasive spokesperson for functionalism) that he had operated on hundreds of people and seen hundreds of live, thinking brains, but he had never seen a THOUGHT." Mysterious, isn't it?*





## MUSIC AND THE BRAIN



The definition of music differs depending on the source. The scientific definition of music is as follows:

***Full Definition of music. 1a: the science or art of ordering tones or sounds in succession, in combination, and in temporal relationships to produce a composition having unity and continuity: 1b: vocal, instrumental, or mechanical sounds having rhythm, melody, or harmony. (Webster Dictionary)***

Let us now turn the scientific definition of music into a thing of beauty by adding emotions from the hearts of mankind by redefining it.



***"Where words leave off, music begins."***

***— Heinrich Heine***



***"Where words fail, music speaks."***

***— Hans Christian Andersen***



***"Music is the universal language of mankind."***

***— Henry Wadsworth Longfellow***



***"Music acts like a magic key, to which the most tightly closed heart opens."***

***— Maria Augusta von Trapp***



***"Music... will help dissolve your perplexities and purify your character and sensibilities, and in time of care and sorrow, will keep a fountain of joy alive in you."***

***— Dietrich Bonhoeffer***



***"When I hear music, I fear no danger. I am invulnerable. I see no foe. I am related to the earliest times, and to the latest."***

***— Henry David Thoreau***



***"My heart, which is so full to overflowing, has often been solaced and refreshed by music when sick and weary."***

***— Martin Luther***



***"Music is an agreeable harmony for the honor of God and the permissible delights of the soul."***

***— Johann Sebastian Bach***

In an article called "How Music Affects the Brain" writer Jacob Berkowitz stated that neuroscientist, Robert Zatorre, pointed to Dr. Wilder Penfield (Montreal Neurological Institute and Hospital) the institutes founder, who, over the course of hundreds of brain surgeries to relieve patients' debilitating seizures from 1934 to 1961 learned that his patients clearly had music hard-wired into their brains, with even the correct rhythm and timing. In Dr. Penfield's post-surgery notes, the title of the song each patient had heard during surgery was recorded. Also, Lola Cuddy, a music psychology pioneer stated

that Dr. Penfield's probing discoveries indicated that **"MUSIC IS REPRESENTED ALL THROUGH THE BRAIN, THERE'S NO MUSIC CENTRE"**.

Furthermore, in March 2013, McGill psychologist and leading mind-and-music researcher Daniel Levitin summarized the findings of more than 400 scientific studies and noted there's clinical evidence that playing and listening to music can boost our immune systems and reduce stress—in fact, listening to music was found to be more effective than prescription drugs in reducing a patient's pre-surgery anxiety.

Additionally, in the article written by Jacob Berkowitz, an example of high-profile congresswoman Gabrielle Giffords (shot in 2011) was sighted as being helped with music therapy. After awakening from a coma unable to speak, it was discovered she could still sing. Therefore, music therapists used a technique called melodic intonation therapy (often used with stroke survivors) to rewire Ms. Giffords' language skills, using melody to shift her brain's language centre from the left hemisphere to the right one.

Also, Peter Russell stated in The Brain Book that "while in the womb, a child learns the sound of his mother's heartbeat and after birth the sound of a human heart will have a very soothing effect on the baby. It has been suggested that this also accounts for the universal appeal of rhythmic music to adults."

Researcher Levitin continued by stating, according to longtime researcher, Francis Crick that when we love a piece of music, it reminds us of other music we have heard and activates memory traces of emotional times in our lives. Your brain on music is all about connections.

Oliver Sacks, author of the book, "Musicophilia", shows how important it is to include music in programs with the goal of adding focus or depth to a presentation because of the impact it has upon the brain. He stated, "Music can pierce the heart directly; it needs no mediation. *Music, uniquely among the arts, is both completely abstract and profoundly emotional. It has no power to represent anything particular or external, but it has as unique power to express inner states.*"

### MOTIVATION FOR ENGAGING THE ELDERLY MORE DEEPLY IN MUSIC

Ladies and gentlemen, after observing the residents' reactions to various musical programs at the nursing home, it soon became obvious that music brought out an array of emotions on a very personal level for each one. Although it was impossible to determine the source that caused tears, joy, shouting, laughter, or dancing feet, there was no doubt regarding the unique power it represented.

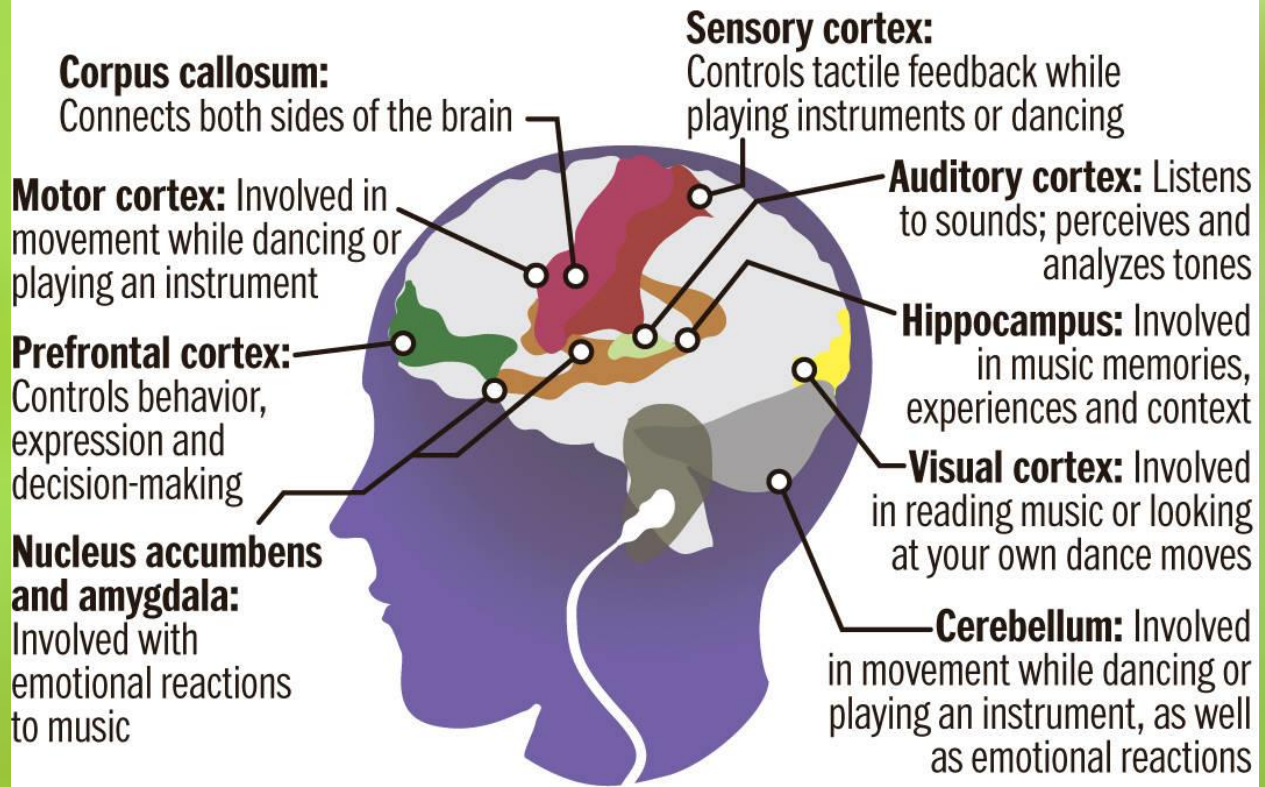
Thus, the writer was motivated to go on a mission of locating ways for the outside community to engage nursing home residents using a variety of techniques. After all, not only would the residents receive greater enjoyment, but those performing, as well.

Certainly, the goal of this collection was not to be a researcher or music therapist, but simply to find ways of touching the lives of sweet old people by encouraging them to sing with joy the songs they so dearly loved when in their youth. As a way of encouraging these techniques to spread worldwide, it was important to leave no stone unturned in the process.

Consequently, in order for you to understand how valuable it is to engage the elderly in music, please feast your eyes on a remarkable photograph that shows how the brain appears on music that will give you the foundation needed to realize why it benefited so immensely the nursing home residents in this collection.

## Music and the brain

*Playing and listening to music works several areas of the brain*



SOURCE: Music for Young Children

DESERET NEWS GRAPHIC

***This is my father's world  
He shines in all that's fair  
In the rustling grass, I hear him pass  
He speaks to me everywhere***

