REHARSHAL OF TYHE WAYS OF AUDITORY SYSTEM.

The evolution of the connections of music with mind: mind was first able to understand sounds, before the Broca area of language was activated, when hominids communicated each other by means of gestures and sounds.

Man acquired the word when a mutation of the gene fozp2 occurred with modification of the anatomy of mouth and larinx ; of course music accompanied by words, with their emotional component, will find the way to mind better than guttural sounds …

Music will restore the correct orientation of molecules that transmit the musical message and the repetition of the musical imputs will provoke also a long-term memory with a multisensorial, relational and cognitive involvement

We know for several years, now, the pathways of sensations inside the brain since their entrance into the encephalon up to the prefrontal cortex of the brain , passing by

the nuclei of the base of the brain for their elaboration and transformation in perceptions.

We know a “where” way and a “what” way that pass by the parahippocampal and perirhinal areas , rispectively, before arriving at the prefrontal cortex.

Sounds are evoked by air vibrations in the space which have an audible effect.
Sounds enter the brain through the ears with the air vibrations.
Vibrations , according to their frequence (hertz ),their sequence and rhythm,
give different types of excitation to the vibratile cilia of the ciliated cells of the organ of Corti.

However our ear recognizes sounds having multiple rumble strips.
Vibrations provoke movements of the timpanic membrane which are then transmitted and amplified by the chaine of the auditory ossicles : malleus, incus and stapes.

The stapes, through the oval window, conveys the vibrations to the fluid of the inner ear which moves the basal membrane and the cilia of the ciliated cells of different regions of the membrane.( about 16.000)

Different cilia vibrate under different types of waves of the fluid.

Ciliated cells , by means of the spiral ganglion of the coclea and the acustic nerve give specific pieces of information to the brain that codifies them according to their origin .

Codification causes the transformation of vibrations in electric impulses that set off to the auditory area throughout the sound ways They first pass through the coclear nucleus where

 various types of neurons, by means of different post-stimulus times ( P.S.T.) give different results .

The descending way leads information to the peripheral system and back to the ciliated cells of the coclea. There are also several parallel ways in the two emispheresAnd ways connecting the two emispheres throughout the corpus callosum

But it is not so simple : by means of bidirectional connections the brain is able To select

 ( among the other sounds and voices of the environment) that voice that he wants to listen to or to appreciate.

As regards the understanding of the music , like for the words,the broca area ( word articulation) and the Wernike area ( semantics ) ( in the are connected by means of the arcuated fasciculus that has beenWell demonstrated by the combination of functional Magnetic resonance and tractography

The understanding and comprehension of music Involves various regions and stages in both the auditory Areas and the whole brain, Including feedback and feedforward systems and connection with memories and experiences,

F*requence and time* correspond to melody and rhythm

As there is not a special cortical area or nucleus For the memory on whole

because memory is brought to mind by the parahippocampal which collect it from the myriads of mnemonic scraps stored in neurons of different areas of the cortex and nuclei :

the visual, auditory, sensory, motor, language, olfactory sentimental areas and so on, also for the musical memory a specific cortical area does not exist.

A melody, a song, a march, a fanfare may be evoked by a chord or even by a single note that stimulate the brain to recall all the passages of that melody stored in the most remote corners of thousand of neurons bringing them back to the mind throughout the temporal medial lobe.

In music we distinguish the **syntax** ( the structure of the piece )and the **semantics** ( the meaning of the piece). Syntax and semantics use brain areas common with those of the language. Sounds and music passing through the amigdala acquire peculiar emotional colors that give more or less pleasure to the listeners

I believe that in autistic and comatous patients the musical sounds , after their entrance into the brain, try to find the preferential way they follone in the brain before trauma and coma or those ways that they should follow if the brain were not Isolated from the world as it is in the autistic patients.

*And so it must be* if it is true, like it is, that comatous patients under the effect of musical pieces they knew and likedbefore coma, slowly emerge from the comatous condition and recover the communication, the presence and the attention they had lost.

The notes passively arrived in the auditory area **Push**  to make teir way inside the brain

And to find the before used pathways