# The Tomatis Method For Singers and Musicians

*An Excerpt from "About the Tomatis Method", 1987*

by Paul Madaule

*About The Tomatis Method*
Edited by Timothy M. Gilmour, Ph.D., Paul Madaule, L.Ps., Billie Thompson, Ph.D.
In collaboration with Tim Wilson
May 1998
Second Edition


Anyone familiar with the Tomatis Method knows it is scarcely stretching a poetic point to say it is the heart that hears. Or love that listens. The prenatal bond with the mother, the reaching out through language into relation ship with the world, the desire to connect, this is all the province of listening in the expanded sense Tomatis has given it.

Closest to Tomatis' heart through the nearly 40 years of his research has been the application of his insights to the making of music. The Method, in fact, originated in the treatment of singers. As an ear nose and throat specialist,, Dr. Tomatis has personally treated the world's greatest virtuosos, Maria Callas among them. His most recent, and one of his most substantial, books is titled L'Oreille at La Voix (The Ear and the Voice).

Unique among Tomatis' discoveries is, firstly, the notion that there is empirically such thing as a "musical ear," one which has a quite specific ascending curve of response. It is the ear of the diva, or the monk - providing that they are singing properly. It is the same ear required for mastery of any instrument.

Only slightly less remarkable is Tomatis' description of the ear's involvement with the body. Because of its connections with the vital pneumogastric (vagus) nerve, the ear has a part in nearly everything we feel - from a tickle in the throat or "butterflies" in the stomach, to heartbeats and breathing.

Practically, the Tomatis method places great emphasis on specific "listening postures" both for receiving and for making sound. It offers an effective way to produce better tone.

In this paper, originally presented in 1976 to the South African Association of Music Teachers, Paul Madaule elaborates on Tomatis' assertion that "it is the ear which sings." He amplifies and gives a theoretical basis to some features of the Method described earlier in the "Overview" section of the anthology. The paper has been translated from the original French.

## The Tomatis Method For Singers and Musicians

Dr. Alfred A. Tomatis' research shows the essential part the human ear plays in the control of phonation, in body image awareness, and in motor control. In the course of his work, Dr. Tomatis investigated the influence of certain auditory modifications on the vocal qualities of singers and on the instrumental performances of musicians.

The virtuoso, the perfect master of his voice or musical instrument, knows how to control with maximum precision all the parameters of the musical piece he is rendering. Against this background, Dr. Tomatis showed that improvement of the auditory skills of a performer, specifi cally of his self-monitoring through listening, allows him to acquire a greater mastery of his voice or instrument. thus the Tomatis method, applied to singers and musicians, increases listening ability and leads to an improvement in performing potential.

By knowing how the human ear functions as a control instrument of the sound flow, by being aware of weak nesses which most often impede this function, and by using the techniques developed by Tomatis, it is possible to restore to the ear its essential effectiveness.

### *THE MUSICAL EAR*

This kind of mastery is due to what Tomatis has described as "the musical ear." A musical ear (Fig. 1) has to be able to attune itself to the entire sound spectrum. It must know how to perceive and analyze every part of the frequency spectrum with maximum speed and precision. The range critical for musicality is in a bandwidth located between 500 Hz 4000 Hz, forming a curve of response for which Tomatis has identified precise characteristics (Tomatis, 1955a, p.24; 1963, p.101).

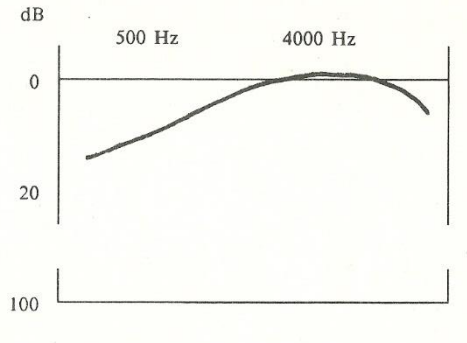


Fig. 1 – The specific threshold curve of the musical ear (from Tomatis, 1963, p.101)

Optimum perception involves:

(1)Hearing within normal range.
(2)Absence of distortion in the response curve.

Optimum analysis of music involves:
(1)An ascending curve up to the frequencies 3000- 4000 Hz with stabilization at this level and a slight drop in the highest frequencies
(2)an open "auditory selectivity," which is the ability to analyze and compare sounds of different frequencies as well as the ability to determine the direction of the variation, that is to say whether one tone is higher or lower than the other (Tomatis, 1954; 1972a, p.123).
(3) A precise auditory spatialization, which is the ability to identify the source of the sound in surrounding space (Tomatis, 1972a, p. 123).

(4)A right-sided auditory dominance. Since the time of Broca (1888) and his successors, in particular Penfield (1959), works published on neurology, neuro-surgery and neuro-physiology have demonstrated the functional differentiation of the cerebral hemispheres for language. Tomatis suggests that the right ear controls and analyzes sounds; that is why the right ear has to be the leading or dominant ear with singers and musicians (Tomatis, 1953b; 1963, p.8; 1963, p.130; 1974a, p.71). Other researchers have shown the predominance of the right ear in musicians who followed a long and intensified course of musical training (T.G. Bever and R.J. Chiarello, 1974, p.537).

These narrowly overlapping and complementary functions of the ear constitute the listening act. The failure of one or several of these parameters provokes a disharmony which translates into impaired listening and consequently into deficient musicality.

According to Tomatis, a listening problem which is not the result of organic lesion generally has a psychological origin. Here is his hypothesis. At a very early stage of one's life, there may be a refusal or reluctance to accept certain stimuli from the environment, specifically those of spoken language. One way to reject such information is to close , or "lock" the ear. Such shutting out is actually possible. It manifests itself at the physiological level by a relaxation of the muscles of the middle ear. this state of flaccidity, akin to a "blinking" of the ear, considerably impedes the passage of sound. Unfortunately, it is not so easy for the ear as it is for the eye to open again. If the muscles of the middle ear are inactive for too long, they lose their tonicity. Sounds are imprecisely perceived, and as a result incorrectly analyzed. In other words, listening is impeded. (Tomatis, 1963, p.69; 1963, p.437; 1970, p.9; 1972a, p.54; 1972b; 1974a, p.41.)

***THE ELECTRONIC EAR***

In order to assist the human ear to establish or reestablish its full potential, Tomatis developed an apparatus called the Electronic Ear.

The Electronic Ear sets in motion three mechanisms:

(1) The Filters. these can be regulated so that the information is altered or modified inside the and-width of the musical ear in order to suppress distortion.
(2) The Electronic Gate. To enable the ear to attune itself automatically and spontaneously for listening, stimulation of the middle ear is effected by the alternating passage of sound from one channel which tenses or focuses the muscles. The alternation from one channel to another is automatically regulated by an electronic gate which opens and closes itself according to the varying signal. Repetition of the action over time will maintain the ear's ability to perceive and analyze sound properly (Tomatis, 1953c, p.335; 1960, p.197; 1963, p.106; 1972a, p.141; Van Jaarsveld, 1973, p.248).

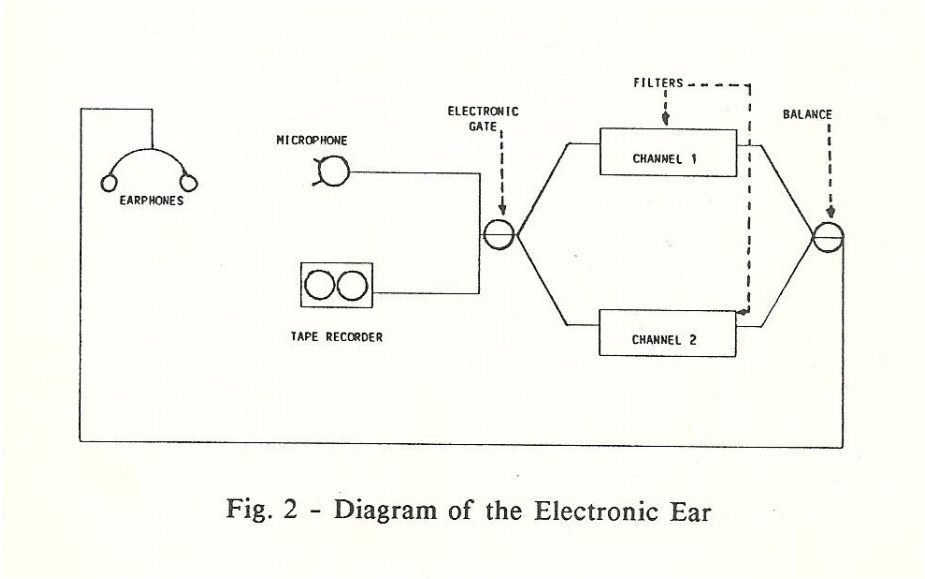


Fig. 2 - Diagram of the Electronic Ear

### *THE SESSIONS*

Each session with the Electronic Ear takes about 30 minutes. The number and the scheduling of these sessions are set out following the initial assessment which included tests of listening, lateral dominance, figure drawings, and a clinical interview.

Usually it is better to begin with an accelerated training. An intensive program consists of four to six session a day over three weeks. After this intensive period, one may continue at a rate of twelve sessions per week for several months, or stop after six weeks and start an intensive training again.

### *THE PROGRAM*

Each listening program for singers and musicians has two phases: auditory (i.e., receptive) training and audio-vocal (i.e., expressive) training.

### *THE AUDITORY TRAINING*

This consists of listening through the Electronic Ear to the sounds of music and voice which have been electronically treated or "trimmed" by attenuating significantly the low frequencies. This "filtered music," which is then modified by the Electronic Ear, has as its first effect the opening of the auditory diaphragm. This increases the selective power of the ear, which is to say, the person is given the ability to perceive sound with less distortion and to analyze it more precisely over the whole of its frequency range: from the fundamental frequencies to the highest harmonics. For a non-trained ear, the fundamental frequency of a sound too often masks its harmonic spectrum. Under such conditions, the singer has difficulty in controlling the timbre of his voice ( the mix of higher harmonics). Consequently it stays flat, with no modulation. It is the same for the musician who, even if he has an out standing technique, is unable to adjust his listening to the harmonics of the sounds emitted by his instrument and as a result cannot regulate the musicality of the melody.

Listening to filtered music through the Electronic Ear trains the muscles of the middle ear to accommodate or at tune to the higher harmonics of any sound source. it helps the singer to gradually control the timbre of his voice better and the musician to control and remedy the color of the sounds produced by his instrument.

### *The Listening Posture*

Not only the ear, but the whole body listens, and good listeners must become aware of their posture. The acquisition of correct listening posture is a major part of the auditory training phase of the program. In general, this means an erect spine but not stiffly so, a slight tilting forward of the head with eyes closed, a relaxed neck and jaw, and open chest to allow ample breathing. This can be obtained by sitting on a high stool or standing with the small of the back against a wall.

The high sounds of the filtered music presented during this part of the program are a considerable help in maintaining this erect posture and more ample breathing (Tomatis, 1974a, p.92). The reasons for this will become apparent with a better understanding of the effect of sound on the nervous system.

### *Filtered Music and the Concept of Cortical Charge*

Tomatis emphasizes that the actual functions of the human ear exceed those traditionally assigned to it. It is neither an "instrument" solely for hearing and listening, nor merely an organ for the maintenance of equilibrium and verticality. For Tomatis, the ear is primarily an apparatus intended to effect a cortical charge, i.e. to increase the electrical potential of the brain. In fact, sound is transformed into nervous influx by the cilifom cells of the inner ear. The electrical energy obtained from the influx of nervous impulses reaches the cortex, which then distributes it throughout the body. This tones up the whole system and imparts greater dynamism (Tomatis, 1972c; 1972d; 1974a, p.124; 1974b, p.74; Van Jaarsveld, 1974, p.158).

But not all sounds effect this process of charging. Tomatis points out that on the basilar membrane the cells of Corti are much more densely packed in the area responsive to high frequencies than in that responsive to low frequencies. Thus the number of impulses transmitted to the cortex is greater, more concentrated, in the case of lower ones.

This is the reason who Tomatis calls the sounds rich in high harmonics the "charged" or "charging" sounds. It is why opera singers, for example, who produce these sounds for themselves, are renowned for their vitality and dynamism. In contrast, lower-frequency sounds not only supply insufficient energy to the cortex, but many even tire the person by producing motor responses which absorb more energy than the ear can provide. People who tend to be tired or depressed often have dull, toneless voices with very little high-frequency content. The effects of the increased cortical charge which is given by listening to filtered sounds can be experienced as follows:

- greater motivation in everyday activity - greater ease and competence in working
- a lower susceptibility to fatigue
- an awareness of dynamism together with an impression of vitality

- better attention and concentration
- better memory less time required for sleep

All of these factors, but particularly the increased abilities of concentration and memory, can help the person considerably in the acquisition in musical expertise. Following a series of

filtered music sessions, the singer or the instrumentalist realizes that the whole integration of a piece of music becomes faster and easier. He also experiences greater interest in studying music, and feels new reserves of energy.

***Filtered Music, Body Image and Motor Functions***

Tomatis has importantly demonstrated that the vestibular (balancing) and cochlear (decoding of sound) functions of the ear are joined in a single system. anatomically, the vestibular nerve presents itself at every level of the medulla, and is thereby directly connected with all the muscles of the body. Filtered music received by the ear can thus have an effect on body image. This has vital implications for musicians. For string players, pianists, and percussionists, for example, greater awareness of body image translates into more control of arms, wrists, hands and fingers.

It is well known that the vestibular system has a monitoring action on equilibrium. Better vestibular control improves the temporal-spatial awareness required for rhythmic sense (Tomatis 1963, p.179; 1972a, p.90; 1972b, p.70; 1974b, p.139).

***Filtered Music and Relaxation***

Tomatis gives an important role to the sensory auricular branch of the pneumogastric nerve, also called the vagus. Through its numerous branches, the vagus regulates the larynx, the pharynx, and viscera i.e. lungs, heart, stomach, liver, kidney and intestine. The auricular branch actually presents itself on the outer surface of the eardrum, thus forming a link between our inner, neuro- vegetative life, and the outside world.

There is an intimate relationship between what strikes the eardrum and such emotional states as stage-fright or “butterflies” in the stomach, being “choked up” before singing, and somatizations such as angina pectora, gastric and intestinal troubles, overeating, anorexia, and so on (Tomatis, 1972a, p.76; 1972b, p.149; 1974b, p.60, 68; Van Dyk, 1973, p.21; Madaule, 1973; Van Jaarsveld, 1974, p.163).

Listening to filtered music through the Electronic Ear enhances the tension of the tempanic membrane. Tomatis points out that this membrane, when tensed, attenuates the amplitude of the vibration of the sensory auricular branch, and in turn regulates the vagus nerve.

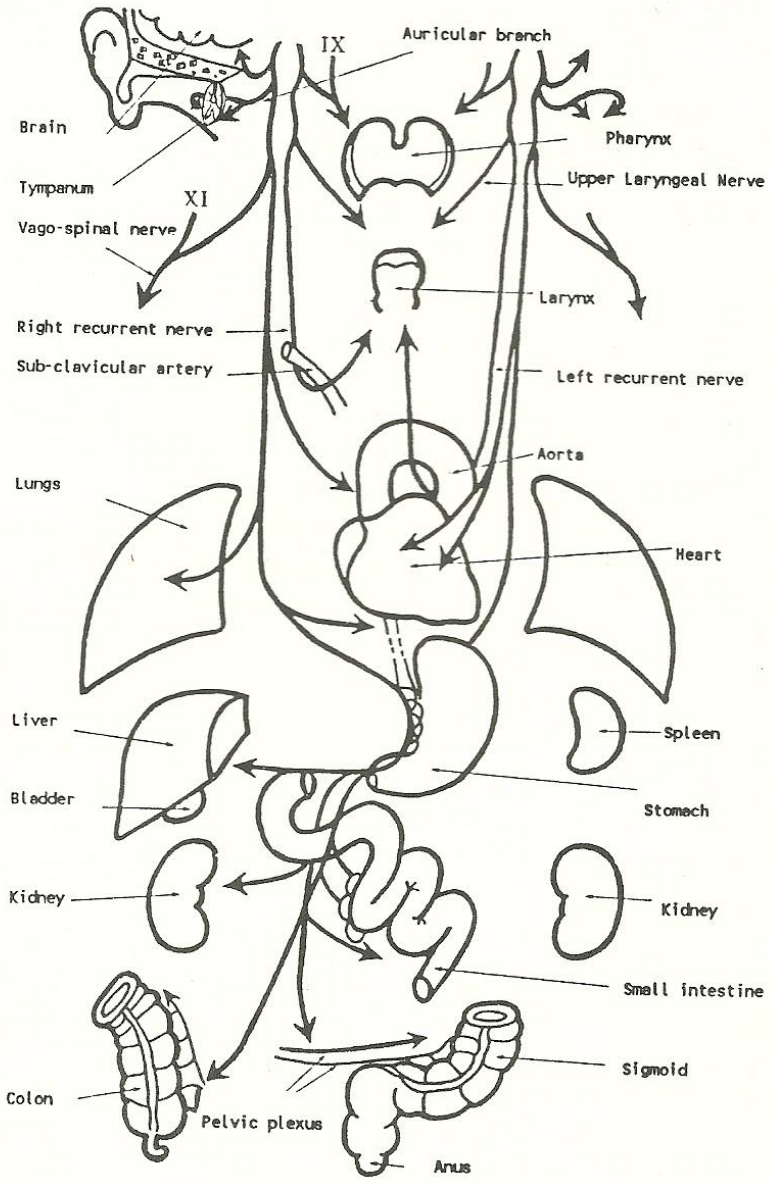


Fig. 3 - Pathway of the Pneumogastric Nerve
(from Tomatis, 1974b, p.68)

Regulation effected in this way is generally experienced as a sensation of well-being by the person; as a liberation from a heavy load with an ill-defined content. He becomes more self- confident and more aware of his abilities. Breathing expands little by little and muscular contractions disappear. If the dread of appearing in public some times remains, it becomes a positive awareness and it no longer has an inhibiting effect.

### *AUDIO-VOCAL TRAINING*

After a certain number of sessions of fi ltered music which may vary for each person, the person participates in sessions for audio-vocal training.

For singers as well as for musicians, sessions consisting of repetition of words and of texts alternated with sessions of singing and music (fi ltered or non-filtered) are recommended. The words and texts are rich in phonetic con tent and fricative syllables, as well as bring progressively filtered of the low-frequency content. This trains the ear to "listen for" the entire harmonic range of sound information (Tomatis, 1972a, p.151; L. A Tomatis, 1974; Van Jaarsveld, 1974, p.260).

The type of singing chosen for the audio-vocal exercises is Gregorian chant. It is an established fact that the register of the Gregorian chant, like many other sacred chants has very particular characteristics. The fundamental tones are appreciably attenuated compared with the range of harmonics which are very rich. This permits the voice to exploit its possibilities of modulation in order to enrich its musicality. Gregorian chant is to a certain extent a naturally filtered form of music. Furthermore, its rhythm seems to be the translation of the physiological rhythms of the human being. Among other things, these chants can help the subject to control, to pace his respiration better, a particularly important consideration for singers and instrumentalists (Tomatis, 1972c; 1974b, p.139; personal interviews, 1975).

During these exercises a tape containing information interspersed by empty spaces is played to the subject who listens and tries to reproduce as precisely as possible in the empty spaces. His voice, picked up by the microphone, and modified by the Electronic Ear, is instantaneously fed back to him by the earphones. The filters adjust his voice over the whole of the musical spectrum, thus giving high quality control and more efficient analysis of the sound. this process is based on the first law of Tomatis which states that "the larynx emits only those harmonics that the ear hears." The word, the sentence or the musical phrase is thus emitted with greater control (Husson and Moulonguet, 1957; Husson and Grasse, 1957; Tomatis, 1956; 1960, p.197, 200; 1963, p.187; 1972a, p.57).

### *The Audio-Vocal Posture*

The act of vocalizing, of speaking as well as singing, remains one of the highest and most intricate motor activities of the human being. It involve the whole body.

To know how to speak or to sing involves, first of all, knowing how to listen to the vocal flow in order to regulate it better. The singer is the first to hear the sounds that he emits. But controlling these

sounds requires proper listening posture. This is the audio-vocal, or expressive posture. The head has to remain in alignment with the spinal column. in particular, it should not be lifted when producing high notes (Tomatis, 1974a, p. 92; 1974c).

Before making a sound, the subject must inhale deeply. During voice production, the thorax has to remain open in order to give the diaphragm their maximum efficacy.

The lips should be projected forward in order to eliminate tenseness of the corners of the mouth, as tenseness of these muscles inhibits the functioning of the middle ear muscles. This happens through the neural link that exists between the facila nerve at the level of the risorius muscle, which retracts the muscles of the corners of the mouth, and the stirrup muscle which regulates the labyrinth. The Electronic Ear has the effect of gradually making this forward movement automatic.

Articulation involves the anterior part of the tongue, giving the singer the feeling that his voice is being projected forward. Voice control is handled by the right ear. This exercise is facilitated with the Electronic Ear by the progressive diminution of the sound energy on the left.

The repetition of Gregorian chant during audio-vocal training gives predominance to the upper-laryngeal resonators. The voice automatically becomes oriented towards the head. In order to accustom the person to project his voice accurately, he is advised to "hum" the vocal exercises during the first sessions. The singer must have the feeling that the sounds he utters are located toward the back and top of the head; they must vibrate the cranium. Little by little, he will be led to open the mouth in order to form vowels without modifying the quality of the sounds previously uttered with closed lips.

While the voice is being used smoothly, without any discontinuity, in a vocal flow which modulates itself in intensity (crescendo and diminuendo) and in tonal pitch, the person is asked to place his tongue in such a manner that he would be able to pronounce the phoneme (g) (pronounced as in the word "guitar"). This allows the person to project the voice by pushing the tongue and lip forward and projecting the vowel in the anterior part of the mouth. In order to pinpoint the lingualpalatal fulcrum of the phoneme (g), a diagram is provided (Fig. 4) which indicates the transversal barrier dividing the curve of the tongue in two parts: the anterior, or buccal one, and the posterior, or pharyngeal one.

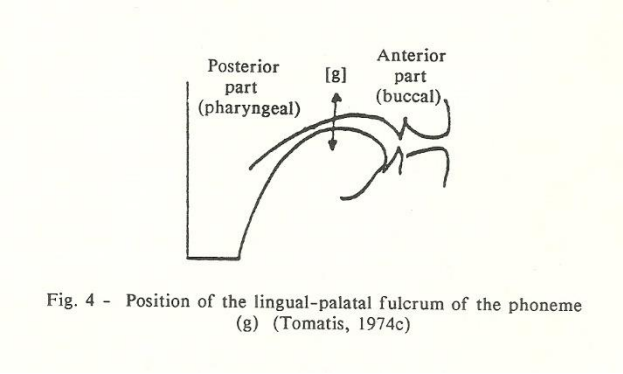


Fig. 4 - Position of the lingual-palatal fulcrum of the phoneme (g) (Tomatis, 1974c)

Essentially this action is aimed at moving this barrier towards the front to bring into play the different resonating cavities which produce the high harmonics and enrich the timbre. A vowel uttered under these conditions gains a brighter color, thus illustrating the opening that Tomatis calls "the phonetic

fan" (Fig. 5). A voice is well "placed" or projected when this fan, the posterior branch of which is at the level of the larynx, sees its anterior branch mobile, assuming its forward position with a view to opening up al the resonating cavities which creates timbre.

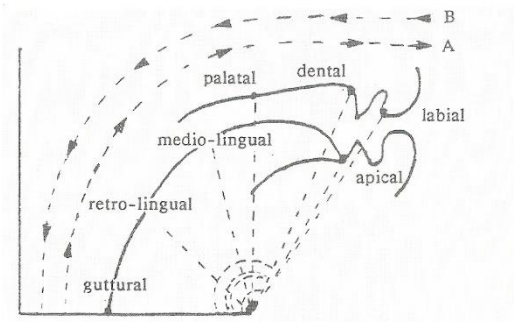


Fig. 5 - The Tomatis phonetic fan (Tomatis, 1974)
Passage A: opening to the front - good position of the voice
Passage B: closing to the back - defective vocal utterance

Daily practice is essential for the integration of these phonatory exercises, destined to improve one's sensory motor control.

***Exercises in Reading Out Loud***

As a follow-up to the audio-vocal program, the person is strongly advised to practice every day for a minimum of half an hour. He or she is given an exercise of reading aloud while maintaining this audio vocal posture. In order to strengthen self-control on the right-hand side, the person will have to take care to place the right hand a few centimeters to the right of the mouth, as if about to read into a microphone. He will rapidly become aware that, in this position, the voice "switches on," or, in other words, it becomes considerably richer in the high harmonics, warmer and more colorful. Likewise, he will realize that the rhythm of the verbal flow is considerably improved. (Tomatis, 1972a, p.152).

The person will also have to persevere in this daily practice so as to overcome the difficulty of the first exercises, during which the reading out loud will seem boring. Often he will not understand what he reads; his hand placed on the right side of the mouth will annoy him and will have a tendency to anchylosis (or stiffness of the joints). Nevertheless, the person who overcomes the initial difficulties which stem from resistance of prior conditioning, will be quickly gratified by an awareness of dynamism and of well-being generated by this exercise. As audio-vocal control improves, the desire to speak and sing will grow.

CONCLUSION

The Tomatis Method not only provides a direct and effective answer to problems experienced by singers and musicians, but it sheds new light on the understanding of the neuro-physio- psychological processes underlying musical expression. It also adds new elements to support the conviction that music is intimately part of our body, mind and spirit.

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