

THE
POWER
OF THE
VOICE

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FOREWORD

It all began one Christmas Eve, in 1978. Back then, I was in my first year of residency. I was a resident in surgery at a general hospital near Paris and, as luck would have it, for my first December 24 night as a surgeon in the hospital. That night, I was on duty in the emergency room. No time for a Christmas truce! Indeed, due to the usual high number of accidents on Christmas Eve, it was one of the busiest shifts of the year. It didn't help that back then, wearing a seat belt wasn't yet compulsory. Around 6 a.m., a 23-year-old female was admitted in the emergency room and directly transferred to the intensive care unit. She had multiple contusions and respiratory distress. Her abdomen was supple, there was no internal bleeding, but both jaw and larynx appeared to be fractured, as confirmed later by X-ray. She was barely conscious. Of course, restoring her breathing capacity was a priority, but I found myself unexpectedly just as concerned about ensuring the young woman didn't lose her ability to speak!

Now here we are:

Her blood oxygen level was sinking fast. To restore it to normal levels, we needed to urgently transfer her to the operating room to intubate her. In the operating room on the first floor, the surgical lights were already on. The young woman's blood oxygen levels were down to 87%. The fractures of the larynx and the mandible ruled out intubation. Our only option was a tracheotomy: a lifesaving incision under the Adam's apple. The chief operating room nurse assisting me told me what I already knew: "Mr. Abitbol, we have to perform a tracheotomy urgently, I'll help you and we can't wait for your colleagues." The anesthetist backed her on this. We got started. But they did not know that I had never done a tracheotomy! To be on the safe side, I asked them to beep the chief resident: He was busy operating on a fractured femur. I then called the assistant resident: He was operating on a ruptured spleen. In despair, I asked that the associate

professor of ENT be advised: He was also operating. I knew how to perform this life-saving procedure, which I was taught in Paris on the sixth floor of the medical school in Rue des Saint-Pères on cadavers and practised on cadavers at the morgue at the medical institute near the Quai de la Rapée located along the River Seine embankment. So, this was my first “live” tracheotomy. By now my patient was close to heart failure. I had to take action. Minutes later, having donned scrubs and surgical gloves, I was disinfecting the surgical field. I palpated the neck, searching for the thyroid cartilage, and two fingers higher, I felt the cricothyroid membrane and the cricoid, the ring of cartilage that surrounds the trachea. I pressed down on the membrane with my index and, holding my breath, made an incision just above it, at the tip of my index finger. All was well, the trachea was now open, and I could intubate. Moments later, the associate professor joined me and together we completed the intervention, applying ourselves to rebuilding the jaw and the larynx. My initial concern hadn’t abated and I shared it with the professor. “Do you think this young woman will be able to speak again?” “For sure, no reason why not,” he answers. I then asked him which department might best help me perfect my technique and master the tracheotomy. “Why young man, the ENT department of course!” And that is how I discovered my vocation, on a Christmas Eve shift in 1978. I decided then and there to devote myself to the science and art of the voice and ear.

After the operation, I sought out the woman’s fiancé to reassure him and discover how the accident came about. Heading for home after Christmas Eve celebrations with the family, he lost control of his Peugeot 204 on an icy patch of road and slammed straight into a tree at 60 mph. I saw the couple again three months later. The young woman had recovered her voice, and a beautiful one at that.

After 18 months of general surgery internship in Amiens, I decided to become an ENT specialist. At the end of 1978, I joined the staff of the Hôpital Foch, in Paris. I’m lucky: Laser technology had just made its appearance, and Foch was the first hospital in Europe to adopt this revolutionary invention. Gaining hands-on

experience as a young surgeon, the laser accompanied my every step, allowing me to discover both the world of microsurgery and the world of laryngology, a specialty dealing with science and emotion: the voice.

In June 1980, I visited for the first time The Voice Foundation in New York, where I had a lucky break. I met the master: Doctor Wilbur James Gould and his chief resident Robert Thayer Sataloff, who has since been my best friend for almost 40 years. In the context of the Juilliard School, a performing arts conservatory of international fame and a holy temple of research into the human voice, Gould had hatched the brilliant idea of bringing together physicists, ENT specialists, surgeons, acousticians, and voice performers under one roof for a seven-day conference. He had understood the potential of such a diversity of talents, and by opening up the various disciplines that focused on different aspects of the voice, he succeeded in creating a meeting of minds that transcended them. The lesson I took away from this served me throughout my life and career. Since then, I have never missed the opportunity to attend in June this remarkable brainstorming event at which art and science fuse so seamlessly.

In 1984, I produced *L'Empreinte vocal (The Vocal Imprint)* a 16-mm documentary film lasting 27 minutes. In it, I presented the technology for exploring the larynx and the voice, using voice performers such as the Golden Gate Quartet; Clyde Wright was the tenor or the Gipsy Kings in their early days. I put the film in a red box, intending to show it to Professor Gould.

To be honest, I found this a daunting prospect, but Gould's response was disconcertingly straightforward. Not only did he agree to view my film, but he also suggested that three of his co-chairmen attend the viewing: G. Paul Moore, Friedrich Brodnitz, and Hans von Leden, who were the kings of voice science in the United States, the original roots team of The Voice Foundation. Without further ado, the viewing was set for the following Tuesday, in the auditorium, between 12 and 2 p.m., during the lunch break.

I have to admit the enthusiastic reaction of these distinguished researchers took me by surprise. Gould immediately

invited me to show the documentary in a plenary session, a true consecration of my work, more precious to me than any prize could be. *The Vocal Imprint* was subsequently voted best documentary at the international festival of medical films in Paris in 1985. The prize was awarded by then Minister of Health, Georgina Dufoix, and was shown in more than 17 countries. It is still available at the Voice Foundation.

I started out my medical career as a surgeon, then practiced as an otolaryngologist specializing in head and neck surgery while gaining experience in phoniatics, the medical specialty dealing with voice problems. My exposure to the Voice Foundation was without a doubt the trigger that set me on the path to becoming the specialist I am today as not only an ENT but, as we say in France, a phoniatician since 1990. My predilection for a multidisciplinary approach was born there, and it made me realize that the doctor dealing with voice has to be a fan of voice professionals, because voice surgery deals first and foremost with emotions.

As I navigated the worlds of science, medicine, and vocal emotion, my path was studded with scientific adventures, singular meetings, and remarkable stories. Initially, I set out to understand the origins of the human voice. That gave rise to my first book, *The Odyssey of the Voice* (Plural Publishing, 2006; translated from *L'Odysée de la Voix*, second Edition Flammarion, «Champs Sciences», 2013).

In it, I invite the reader on a wonderful journey getting to know the evolution of our planet and of our DNA with the Foxp2 gene of the voice, the origins of the voice in *Homo sapiens* and the differences between man and other primates that have enabled humans to speak. But the same passion I nursed for the human voice led me to want to get to the bottom of another question that was haunting me: How does the voice hold so much sway? How come the voice has such a power? Is it the power of the voice that gives the power to our leaders?

INTRODUCTION

Our Voice Empowers Us!

Man possesses a rare treasure: the human voice. It connects all human beings on Planet Earth. It underpins our past, as it wills our future. We're all children of the human voice. Throughout the centuries, it has ensured the survival of our species, fascinating scientists, philosophers, intellectuals, and artists.

The voice isn't just a communication tool; it also allows us to be creative, and it shapes our thoughts and gives expression to our emotions. From the dawn of history to the modern day, the voice has always captivated the minds of men.

Our voice can make our fortune or spell disaster for us. The result of an alchemy of mind and body, it is an instrument for persuasion, seduction, and charm, and it reflects our personality and our true self. In *The Sacred Night*, Tahar Ben Jelloun writes, "You can't lie to a blind person; you can spin a yarn, but the blind will lend more credence to your voice than to the words spoken."

Between chaos and harmony, coalescing the real and the virtual, body and soul, the human voice is singular, yet universal. Like a fingerprint, common to mankind, yet unique to each of us.

An integral part of our life and of our past, the voice is a common marker of our history, an essential link between our emotions, our imagination, and our reason. It allows us to both interact with our environment and to evolve within it.

Though our voice reflects our true self, it is also our secret garden. Indeed, it allows us to build relationships but also animates an internal dialogue that is hermetic to others. In that inner silence, our voice is never quiet; it never forsakes us, constantly prodding us, capable of instilling in us the life force that moves us on, guiding our actions and forging our intuition. *Voice is both immanence and transcendence.*

Today, the voice metamorphoses into writing. We talk to a computer and it transcribes the sounds into written form. The

power of the voice is impressive, its sway far beyond what was thought possible half a century ago. Where there is voice, there is life. Once enunciated, things spring into existence. Our voice is a writing instrument for our thoughts, a virtual hyphen between the conscious and the unconscious mind. Both flagship and pilot boat of our imagination, its power is amazing, leading us at times, much to our surprise, into new territories and in roads of our mind that at the beginning of our talk we did not expect at all.

The voice can be used offensively or defensively. It is a weapon of seduction or of mass destruction. It is the archer, the bow, and the arrow rolled into one. The voice is Satan when the archer is Hitler, Venus when the archer is Cupid.

An intrinsic part of our daily life, it is so omnipresent that we take it for granted and treat it with indifference, until the day it fails us, and then we miss it. It just is! Stress or straining the voice can impair it, as can diseases, and the resulting voice disorders and dysphonia bring in a break with the outside world. When our voice is broken or hoarse, croaky or raspy, injured or faint, it loses all its power, dispossessed of its influence over its owner and over others. When the voice returns after such an eclipse, it brings light back into our life and we cherish it like a human being, like someone we care for, with wonderment and relief, glad that this imposed, wretched silence is over. Indeed, we refer to our voice as if it were another person: "I've lost my voice," "I don't know what's happened to my voice," and "I never thought that my voice can leave me like this."

Since time immemorial, human beings have forged primary emotional ties with each other thanks to the voice. It affects every aspect of our existence. It is a cornerstone of any society, enabling us to network, to connect with the outside world, and to integrate ourselves in it. The voice is a mainstay for man's self, soul, and very existence.

From the ancient agora to the television screen, the voice wields its influence over all human matters, be they of a legal, political, commercial, artistic, or romantic nature.

When we read a book, we're at liberty to stop at any point, to return to an earlier section or to make annotations. The voice

doesn't allow us that freedom. We're swept along by the unfolding narration, by the avalanche of words, by the musicality of the sentence; we're hooked because they soothe us, move us, or stimulate us. Such is the power of the voice, a power that isn't without danger, because a voice can captivate its listeners and transport them into the speaker's affective universe, impeding their capacity to reason and making them susceptible to archaic reflexes that appeal to their reptilian, primitive brain.

The voice, source of our life force and power, can bring for us and in us sunshine, shadows, twilight, or dawn. It regulates the rhythm of our silences. It reflects our state of mind, the scars left by our experiences, our individual space-time continuum. The voice is the past, the present, and the future at the same time.

As a doctor and surgeon with a deep passion for the human voice, let me take you in the ship of the intricacies of the human voice between thunder and calm, not just in its scientific and medical dimensions, but also in its political dimensions, from mentor to tyrant, in its spiritual and artistic dimensions, from preacher to singer, and, in its esthetic dimensions, from sensuality to seduction. I propose to take you on a journey that will reveal to you the alchemy that occurs between our emotions and our reason at the heart of our imperceptible and irrational vibrations. I will take you deep into the kingdom of the voice, of which the larynx is the Holy Grail; and unveiling for you the secret of its power.

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To voice performers

CHAPTER



The Voice as an Instrument

The Voice Under Observation

For over 10,000 years, the voice was considered to be the ether of life by all civilizations, from the Dogon to the Aborigines, from the Egyptians to the Greeks, from the Arab civilization to the Age of Enlightenment. It was only in the 19th century that the voice was revealed as an entity that could be analyzed scientifically.

Manuel García's Cane or the Grail of the Voice

On a beautiful autumn day in 1854, Manuel García took a sunlit stroll through the gardens of the Palais-Royal, in Paris. Approaching 50, this dapper man was an eminent professor of singing at the

Royal Academy of Music in London. Engrossed by the glinting reflections of the sun on the silver pommel of his cane, he seemed quite oblivious of the nearby residence of the Duke of Orléans or the crowded cafés patronized by the elite of his day.

Manuel García was no doctor, yet his knowledge of anatomy was impressive. He had on occasion dissected larynxes at a medical school, but the larynx of a dead person doesn't vibrate and it reveals nothing of the workings of the spoken or singing voice. Staring at the reflections on the pommel of his cane, he suddenly had a brainwave: Why not use the reflections of the sun on a mirror to examine a person's throat? Without further ado, he set off for the premises of "*Etablissements Charrière*," makers of surgical instruments near the Saint Germain des Pres and Saint Michel at the Odéon. He purchased a dental mirror costing six francs. Back home, he devised a system for observing the vocal cords and immediately tried it out on himself.

He practiced scales, from the highest to the lowest registers, laughed and coughed, all the while noting the mobility of his vocal cords: They separated when he breathed and came together when he spoke, coughed, or faked crying. This is the mechanism that enables sounds to be produced deep in the throat. As Manuel García observed the voice in action up close, he felt as if he had discovered the Holy Grail of the human voice. A new science and branch of medicine was born: laryngology!

Manuel García died in 1905, aged 101. He left behind a groundbreaking tome: *A Complete Treatise on the Art of Singing*. In this historic book, published in 1847, he laid down the first rules of phonation, thus continuing the García family tradition of outstanding accomplishments in the sphere of the voice.

Manuel Garcia had two sisters: María Malibran, an exceptional opera diva in her day, and Pauline Viardot, an eminent singing teacher.

The laryngeal mirror invented by Manuel García over a century and a half ago remains to this day one of the key tools used by laryngologists. To him we owe being able to observe someone's vocal cords by pressing down on a person's tongue while he or she says "Ahh"

The Cathedral of the Voice

When “observing the voice,” one has the impression of entering a vocal cathedral. The science of phoniatriy experienced its second quantum leap in 1981, first with the advent of the revolutionary videostroboscope. This objective and replicable observation technique analyzes chronologically the kinetic variations of the larynx and thus enabling a precise decryption of vocal pathologies during singing and talking. That same year, I perfected a technique of vocal dynamic exploration that conjugated several aspects of laryngeal observation: pharyngolaryngeal video endoscopy. One could at long last observe the voice speaking and singing. Introduced via the nose, the endoscope reveals the mobility of the vocal tract, without any of the interference that results from introducing an instrument via the mouth coupled with the electrolaryngograph done by Adrian Fourcin. Back then, the frame rate when filming the voice was 25 images per second. In 2000, pharyngolaryngeal video endoscopies achieved a frame rate of 4,000 images per second. The scientific fallout from this has been outstanding. This dynamic exploration of the voice establishes the identity card of the voice: its “voiceprint.”

The tone of a voice, also known as its color, is highly individual and difficult to define. It is one of the principal characteristics of the voiceprint. Likewise in music: The same note played on a violin and on a saxophone will sound quite different, even when played in the same frequency. Indeed, each instrument has its own signature, even within a family of instruments: the acoustics of a Stradivarius, composed of 71 pieces of wood stringently selected for their specificity, will be very different from those of a simple violin for budding musicians, because it is the body of the violin, its resonance chamber, that enhances the radiated tonality. The human voice is subject to the same kind of effect. The timbre that characterizes a person’s voice is shaped by the passage of the voice through the different resonance chambers situated above the vocal cords.

The most impressive feature of this vocal resonance is its harmonic content. Harmonics amplify the voice and embellish