

Sing High, Sing Low

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Introduction:

The impetus to write this paper occurred a few years ago during a lecture given at Chicago's Newberry Library on the operas of George Frederick Handel. The speaker discussed the role of the castrati in the Italian operatic style Handel introduced in London during the decades between 1720 and 1740. As an aside, the speaker mentioned that there was speculation that castrati may have enjoyed an increased life-expectancy. Always on the lookout for subjects highlighting the interface between medicine and music, his casual comment sparked my interest. Here was a topic for further investigation that I had never considered. I must confess that the mention of an opera by Handel, brought to my mind the somewhat incongruous specter of a warrior girded in armor chest plates striding onto the stage, sword held on high, confronting his adversaries with a melismatic fuselage of fiery sixteenth notes sounding a stratospheric two octaves above their expected pitch.

The phenomenon of the castrati enters the history of Western music in the latter half of the 16th century, becoming a dominant factor in Italian music through most of the 17th and 18th centuries, and then gradually fading during the 19th century. To understand who the castrati were and to locate their place in Western culture we should explore the anthropology of

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human castration and when it was first employed in the service of vocal art. This will include a look at the attitude of the Church toward the castrati as well as their contribution to the history of opera. We will seek to understand the conditions that persuaded parents to submit their children to these procedures and the sociology of the castrati as a profession. Then there are those subjects germane to the field of medicine – how and by whom were these operations performed and what were the biologic and psychologic consequences? What was the nature of their vocal art and what made their singing so appealing to the audiences of their day?

In 1977, Meyer M. Melicow, the Given Professor of Urothology at Columbian-Presbyterian Medical Center in New York could write that castration was one of the most common operations performed in the United States.² At that time the operation was performed for prostate cancer and had entered 20th century practice of medicine as the result of the Nobel Prize winning discovery by the University of Chicago urologist Charles Brenton Higgins, who discovered that the growth of prostate cancer was dependent on the stimulation of testosterone and that a significant remission could be induced by orchiectomy or removal of the testes. Writing on the history of castration, Dr. Melicow noted that through the ages the operation had been performed to retain supremacy of male elders, as revenge against enemies on the battlefield, on slaves serving as eunuchs in harems or seraglios, as punishment for rape, seduction and adultery, as part of self-inflicted religious

² Meyer M. Melicow, *Castration Down the Ages*, New York State Journal of Medicine, 77, 804-806, April 1977.

rites, and to preserve a boy's treble voice into adulthood.³ Ancient as well is the history of castration in the domestication of animals serving to produce capons, geldings and oxen and taming our favorite pets.

History does not record when it was first recognized that the treble voice of a boy could be preserved and cultivated for singing by prepubescent castration. Vocally-gifted eunuchs were present in the early dynasties of the Imperial Chinese court and gelded choristers appeared in the Byzantine Empire as early as 400 AD. Mention of their highly sophisticated style of singing disappears after the sacking of Constantinople in 1204 during the 4th Crusade.

“The Sacred” (Church History)

To account for the appearance of castrati in Italy during second half of the 16th century, certain points must be mentioned. From its inception, women were not allowed to sing in the church, sanctioned by St. Paul's injunction in his letter to the Corinthians (I Corinthians 14:34): “let your women keep silence in the churches for it is not permitted for them to speak...” During the middle ages, sacred music was dominated by the monody of plainsong (Gregorian chant) that was well suited to the male voice. The growth of polyphony during the 16th century created the need for soprano voices. Soprano parts were taken either by young boys with good voices and musical ability or by male contraltos i.e. falsettists. This solution was less than satisfactory in the case of young boys since their voices lacked the strength

³ Castration has not been limited to men, oophorectomy (removal of the ovaries) has also been successful in the treatment of estrogen dependent breast cancer in women.

and timbre of an adult and the investment in training was lost when their voices “broke” during puberty. There was a tradition of Spanish falsettists, part of the Mozarabic tradition in the Spanish Church. These singers traced their roots to the Byzantine castrati who migrated first to Sicily and hence to Spain when Sicily fell under Argonese hegemony in 1282. The first castrati to appear in the churches of Italy during second half of the 16th century were imported from Spain. Castrati also found their way into Italy from other parts of Europe. Richard Sherr documented the efforts of Guglielmo Gonzaga, the third Duke of Mantua, a musician and composer, to obtain castrati from Northern France during the years of his reign 1555-1587.⁴ Castrati in France occupied high-paying positions at Court and this is surprising in light of the “Gallic horror of the singers [castrati] so evident in the seventeenth and eighteenth centuries.”

There is reference to the presence of castrati in the Sistine Choir during the years 1565 – 1598 but the first castrato officially named in the Sistine Chapel choir was Giacomo Vásquez, admitted on May 27, 1588.⁵ In 1589 the Papal Bull, *Cum pro nostro pastorali munere*, of Pope Sixtus V organized the Cappella Giulia of St. Peter’s Basilica in Rome. Conducted by Palestrina, it was to include among its twenty voices, “four soprano eunuchs, if skilled ones can be found.”⁶ The established falsettists, equivalent to modern

⁴ Richard Sherr, *Guglielmo Gonzaga and the Castrati*, *Renaissance Quarterly*, 33 (1), Spring 1980, pp. 33-56.

⁵ *Cappella dei Cantori Pontifici* was the official designation of the Sistine Chapel Choir. The original papal *schola cantorum* (school of singers) dated from the 4th century, while the Sistine Chapel derived its name from Pope Sixtus IV (reigned from 1471-1484), who had the chapel built.

⁶ Anthony Milner, *The Sacred Capons*, *Musical Times*, 114:250-252, 1973 (an excellent reference on Castrati and the Church)

countertenors, were less than pleased but the new voices rapidly found favor and papal sanction. Pope Clement VIII (reigned 1592 - 1605) opined: “the creation of castrati for church choirs was to be held *ad honorem Dei* [to the honor of God].” The castrati outshone the reedier and thinner timbre of the falsettists and also the comparatively transient beauty of the boy choristers. Part of the policy of Pope Clement VIII was to free the Papacy from Spanish influence as he soon dismissed the Spanish *falsetitas* (the Spanish term) from the Sistine choir. The first homegrown Italian castrato joined the Sistine Chapel choir in 1599 and by 1640 it could be said that castrati were members of all the chief choirs in Italy.

The Church was deeply conflicted in its position on castrati. The admission of castrati to the Sistine Chapel as part of the priesthood had been forbidden by the First Ecumenical Council of Nicea in 325 A.D. Castration was against Canon Law that stated: “amputation of any part of the human body is never lawful except when the whole body cannot be saved from destruction in any other way.” Yet mutilation in the form of amputation including castration as punishment was sanctioned by secular rulers throughout Europe as well as in the Papal States.

Theologians addressed the issue of the castrati throughout the 17th and 18th centuries and the leading voices starting with the German, Paul Laymann (1574 -1635) condemned the practice. A contrary opinion was held by some. The Sicilian Jesuit Thomas Tamburini (1591-1675) affirmed: “...it is lawful, provided that there is no mortal danger to life, and that it is not done without

the boy's consent..." He reasoned that "they served the common good by singing the divine praises more sweetly in churches..." Rober Sayer (Sayus in Latin), an English Benedictine moralist of the late 16th century who spent his last years in Venice, reasoned that the voice was a faculty more precious than virility as it distinguished man from animals and justified doing without impiety what was necessary to suppress virility to enhance the voice. The new sopranos were considered necessary in the praise of God.

During the 18th century anyone who performed castration or was associated with the practice was excommunicated by the Church. Clement XIV (1769 – 1775) forbade castration and in an effort to suppress the passion for the castrato voice, allowed women to sing in both the churches and the theaters of the Papal States. Castrati continued to sing in the Sistine Chapel throughout the 19th century. The official posed photograph of the Sistine Chapel choir taken on March 4, 1898 in celebration of the 30th anniversary of the coronation of Pope Leo XII shows them in their clerical finery and includes seven members who were castrati. A rivalry between a castrato, Domenico Mustafa, who was the director of soloists and Maestro Lorenzo Perosi who was the director of the choir came to an end during an audience during an audience with Pope Leo XII on February 3, 1902, when Perosi acting out of strong moral conviction, convinced the 92-year old pontiff for the first time in three centuries to ban the use of castrati in church music. The December 28, 1902 issue of the Rome newspaper *La Tribuna* reported; "A decision *ex audentia sanctissima* taken three months earlier and kept secret

until now, has just been transformed into a decree that will come into operation at once: as a result those singers who, let us say are ‘imperfect’ on a physical plane although ... complete as singers are totally excluded from the Sistine Chapel.” This meant that “the famous inscription which could be read a century earlier outside a barber’s shop in the Bianchi Vecchi [of Rome], ‘Boys castrated here for the Papal Chapel’, became an archeological memory”⁷

“The Profane” (Opera)

Not only did the year 1600 mark the appearance of castrati in the Sistine Chapel, it also coincides with the advent of a new art form, that of opera. Performed that year in Florence, Jacopo Peri’s setting to music of the pastoral-mythological verse play *Euridice*, by Ottavio Rinuccini, became the first surviving opera.⁸ Opera evolved from an aesthetic philosophy of the Florentine Camerata whose members included Vincenzo Galilei, father of the astronomer Galileo. The Camerata sought to recreate a vision of ancient Greek dramaturgy that stressed the singing of a single melody by a soloist capable of moving the listener through the natural expressiveness of the voice. The first performance of *Euridice*, written to celebrate the marriage in Florence of King Henri IV of France and Maria dei Medici, included three castrati, two of whom sang female roles. Casting castrati in female roles would continue in the early operas of the 17th century as exemplified by the three great operas of

⁷ Patrick Barbier, *The World of the Castrati*, tr Margaret Crosland, Souvenir Press, London 1996, p.239.

⁸ An earlier opera, *Daphne* of 1597, by Peri and Rinuccini has not survived, but is often credited as the first opera.

Monteverdi.⁹ Centered in the theaters of Venice, opera became a growth industry in Italy that spread throughout Europe. It was the development of *Opera seria* that propelled the castrati on a course that would give them a ‘rock-star’ status that allowed them to command unheard of fees and to be sought after in the major capitals of Europe, Russia and England. *Opera seria*, set to Italian libretti, most notably those of Apostolo Zeno and Pietro Metastasio, featured situations and characters drawn from ancient mythology and classical history. The gods and heroes in these works appealed to aristocratic audiences who valued their lofty diction and elevated sentiments and who found the otherworldly (heavenly) timbre of the castrato voice ideally suited to this genre.

Sources often state that during the 18th century as many as 4000 boys a year were castrated in Italy to preserve their treble voices into adulthood. Readers of Voltaire may recall the Old Woman’s Tale in *Candide* where we read: “I was born in Naples he told me, where they caponize two or three thousand children every year; some die of it, others acquire a voice more beautiful than any woman’s, still others go on to become governors of kingdoms.”¹⁰

This estimate may have been an exaggeration. In an article, *The Castrati as a Professional Group and Social Phenomenon, 1550-1850*, the English historian and musicologist John Rosselli surveys existing church records

⁹ *Orfeo* produced in Mantua in 1607 and his subsequent operas, *Il ritorno d’Ulisse in patria* and *L’incoronazione di Poppea*, performed in Venetian theaters in the 1640’s.

¹⁰ Voltaire is referring to the castrato Farinelli (1705-82) who came to exercise considerable influence over the Kings of Spain, Philip V and Ferdinand VI

throughout Italy in an effort to clarify these numbers. While admitting that a precise calculation is not possible, he notes: “at any time between about 1630 and 1750 there must have been living several hundred castrati, nearly all Italians.... In Naples, Rome, Bologna, and Venice... and in some smaller towns (Padua, Assisi, Loreto), there were groups of castrati large and stable enough to be a feature of every day life.”

Roselli goes on to ask:

... what led ordinary people and adults in authority to condone such a drastic step? Europe during the early 17th century was in a period of severe economic crisis. For Italy the years around 1620 marked a severe depression followed by war and plague. Landholding was the main source of income and the upper classes sought to safeguard the line of descent. During this period there was a dramatic increase in the numbers of monks and nuns.¹¹

Getting a child into the clergy became a source of security for middling and poor people and Roselli observes: “celibacy was on the increase in the period 1600-1750 through the workings of economic hardship and the efforts of families to safeguard property...” Quoting Joseph Jérôme LaLande’s *Voyage en Italie* (1766), the practice of castration “attracts no notice in a country where the population is huge in relation to the amount of work available” and concludes: “To become a castrato – still more, to make your son become one – need not in

¹¹ John Roselli, *The Castrati as a Professional Group and as a Social Phenomenon, 1550-1850*, *Acta Musicologica*, 60, 143-179, 1988.

these conditions seem a total misfortune.” Richard Somerset-Ward in *Angels & Monsters: Male and Female Sopranos in the Story of Opera, 1600-1900* observes:

“The province of Apulia is on the Adriatic side of Italy, in the southeast corner. In the seventeenth and eighteenth centuries it accounted for a large part of the kingdom of Naples and it faithfully reflected the economic and social conditions of the time – widespread poverty, dominance of the Church, and an economy in which owning land was the only real source of security. These were also the conditions that gave rise to the phenomenon of the castrati, and it is not surprising that Apulia was one of the place from which many of them came including, Farinelli from Andria and Caffarelli from Bitonto.”

Castrati could become fabulously rich, perhaps one out of a hundred, but those who did not, would be able to support themselves through employment in the Church and in either case send money home to their families. Somerset-Ward speculates that only 10 or 15 percent were able to do this, “but in largely impoverished communities those were attractive odds nonetheless.”

In explaining the vocal art of the castrati, two factors need to be considered. The anatomical changes resulting from the operation are widely recognized and will be discussed shortly, but also the intensive training that promising young singers received, though less well recognized, played an important part in their success. Boys who were castrated before the onset of puberty did not experience a break in their voice and therefore from a very young

age were able to receive intensive and uninterrupted music training. This advantage gave them a head start over intact male and female singers of their day. In Naples, the center of musical training for eunuchs during this era, there were four conservatories devoted to training of intact singers and castrati. These institutions often entered into written contracts with the parents of these boys, stipulating that in return for the payment of the surgery, room, board, and musical training, all income from their singing for extended periods of time would revert back to the school. Alternate agreements were made between the parents and music teachers or noble patrons who paid for the operation and training. Requests for castration were required of boys eight to ten years of age indicating their willingness to accept the operation and devote their lives to the Church. In 1687, one Silvestro Prittoni petitioned the Duke of Modena:

Silvestro Prittoni, servant of Your Serene Highness, finds himself in the state of rejoicing in a voice sufficiently good to practice music and wishing to retain it, begs Your Serene Highness on his goodness to make it such that he is without those instruments, which would allow the change in voice to take place with advancing years; that he might receive all this as charity, it being the case that he cannot find the means of being able to do this because of his poverty.

The petition was granted, May 11, 1687 and the Duke authorized the payment of four duple to Silvestro “for the aforementioned purpose” with the precaution that

the treasurer was to state it was issued “for reasons known to us.” Contracts also assigned penalties to the parents, if the boys attempted to run away.

The training of young castrati was intensive and thorough. Not only did they receive extensive training in the art of singing, but instrumental training including keyboard instruments, theory and composition. They also were educated in literature and drama. A famous castrato Geatano Majorano Caffarelli (1710 – 1783), gives us this account of the daily routine in the conservatory:

Morning, 1 hr. of singing passages of difficult execution; 1 hr. of letters (values of words etc.); and 1 hr. of singing passages in front of a mirror, to practice deportment, gesture and guard against ugly grimaces while singing; afternoon ½ hr. theoretical work; ½ hr. of counterpoint on a *canto fermo* (practice in improvisation); 1 hr. studying counterpoint with the *cartella* (a board on which musical notes were written); and 1 hr. studying letters. The rest of the day spent in exercise at the harpsichord and the composition of motets and psalms.

Within the conservatories, the castrati dressed in separate and finer uniforms than those of their intact contemporaries and received preferential treatment in their accommodations and diet. At Sant’Onofrio, one of the four conservatories in Naples, we read these pithy observations: “the refectory was in common; but, especially in the winter, they took care to guard the little nightingales-in-training from the rigors and changes in temperature, and so they were fed in their own rooms; moreover the food prepared for them differed from

the food for the other boys. Eggs, broth, boiled chicken, a generous wine habitually filled these delicate stomachs: even the clothes these preferred boys wore were such to protect them much better from the seasons' inclemencies."

By the age of 16, Castrati were often ready to make their operatic debut and frequently assumed female roles playing their parts with great success. The memoirs of Giacomo Casanova are replete with libidinous anecdotes about castrati that also speak to this point:

In the middle of the confusion, I saw a priest with a very attractive countenance come in. The size of his hips made me take him for a woman dressed in men's clothes, and I said so to Gama, who told me that he was the celebrated castrato, Beppino della mamana. The abbe called him to us, and told him with a laugh that I had taken him for a girl. The impudent fellow looked me in the face, and said that, if I liked, he would shew me whether I had been right or wrong.

Honoré De Balzac in his novella, *Sarrasine*, of 1830 capitalizes on this sexual ambiguity in a gothic tale depicting a corrupt European culture during this era.

Medical Aspects:

We turn to the medical aspects of our subject and the question of by whom and how these operations were performed? One often reads that they were done by "barber surgeons", but in fact these procedures were performed by surgeons favored by the aristocracy who represented the highest echelons of the medical profession. Evidence for this and the toleration afforded the practice by

officialdom can be found in an article by Ralph R Landes, “Tommaso Alghisi: Florentine Lithotomist (1669-1713).¹² The paper lists the surgeons at the Ospedale Sant’ Maria Nuova in the year 1700. Included along with their yearly stipend we read; “Antonio Santarelli, Master *dei Castrati*, 14 scudi and Girolamo Coramboni, Second Master *dei Castrati*, 18 scudi. A commentary on the history of the hospital written in 1853 notes: “Eight beds were earmarked [at the Maria Nuova Hospital] to receive the unhappy children, who through the most inhuman barbarity of their own parents were for the filthy love of money condemned to emasculation.”

Charles Burney, English musician, composer, music historian and author of, *The present State of Music in France and Italy, or the Journal of a Tour through these Countries undertaken to Collect Material for a General History of Music, 1771 and 1772*, has much to say on the subject of castrati. He records his efforts to learn where the operation was performed:

I inquired throughout Italy at what place boys qualified for singing by castration, but could get no certain intelligence. I was told at Milan that it was Venice; at Venice, that it was at Bologna; but at Bologna the fact was denied and I was sent to Naples. The operation most certainly is against the law in all these places, as well as against nature; and all the Italians are so much ashamed of it, that in every province they transfer it to some other.

¹² Ralph R. Landes, Tommaso Alghisi: Florentine Lithotomist (1669-1713), *Journal of the history of Medicine and Allied Sciences*, 325-349, 1952

Although the procedure was done clandestinely, Bologna, Lecce and Norcia became centers for the operation which was performed by surgeons whose skills were called to capitals throughout Europe. At the time of Dr. Burney's travels in Italy, the practice of castration was illegal and also punishable by excommunication. Parents, probably out of shame, sought to conceal the reasons for the operation by medicalizing its necessity with fabrications that included injury such as a fall from a horse, disease (tuberculosis or hernia) or attacks by animals, favorites were swans or wild pigs.

We know little about the operation itself though it may have been relatively mild and safe. The testicles may have been removed or caused to wither through pressure, maceration or the cutting of the spermatic cords. The single and most often quoted description of the surgery comes from a work published first in French in 1707 and translated into English in 1717 under the pseudonym of Charles d'Ancillon titled, *Eunuchism Displayed*, by the author who describes himself as a man of character.

The boy was placed in a warm bath to make him more tractable. Some small time after they pressed the Jugular Veins which made the Party so stupid and insensible that he fell into a kind of Apoplexy and then the action was performed with scarce any Pain at all to the patient. Sometimes they used to give a certain quantity of opium to persons designed for Castration whom they cut while they were in their dead Sleep and took from them those Parts which Nature took so great a

care to form; but it was observed that most who had been cut after this manner died by this Narcotick.¹³

The use of opium and bilateral jugular compression would no doubt have been hazardous. A BBC documentary on the Castrati produced by Nicholas Clapton illustrates one method of castration employing a cuplike tongs that were heated to incandescence to achieve cauterization and thereby remove the entire scrotum.¹⁴ Such a procedure would surely have incurred both morbidity and mortality.

Both Franz Joseph Haydn and Gioachino Rossini were talented singers as children and have left us first hand recollections of their narrow escape from being made castrati.

From Haydn recalling events in the 1740s:

At the time many castrati were employed at the Court and the Viennese churches, and the director of the choir School no doubt considered that he was about to make young Haydn's fortune when he brought forth a plan to make him a permanent soprano, and actually asked his father for permission. The father totally disapproved of this proposal, set forth at once for Vienna and thinking that the operation might have already been performed entered the room where his son was and asked, 'Sepperl, does anything hurt you? Can you still walk?'

Delighted to find his son unharmed, he protested against any

¹³ John S. Jenkins, The voice of the Castrato, Lancet, 351, 1877-80, 1998.

¹⁴ BBC Documentary, Castrato, (59 minutes):
<http://video.google.com/videoplay?docid=7126893963606622368>

further proposals of this kind, and a castrato who happened to be there even strengthened him in his resolve.¹⁵

Rossini recalling similar events writes:

I came within a hair's breath of belonging to that famous corporation – or rather let us say de-corporation. As a child, I had a lovely voice and my parents used it to have me earn a few paoli by singing in churches. One uncle of mine, a barber by trade, had convinced my father of the opportunity that he had seen, the breaking of my voice should not be allowed to compromise an organ which – poor as we were, and as I had shown some predisposition towards music – could have become an assured future source of income for us all. Most of the castrati in fact, and in particular those dedicated to a theatrical career, lived in opulence.¹⁶

The Physiological Consequences of Castration:

Germane to our subject is an understanding of the history of the human voice. The ancients recognized the trachea and larynx as the source of voice production and Aristotle is credited with the first mention of the larynx. It would be left to the great anatomists, Leonardo Da Vinci in 1519, Vesalius in 1555, and Giovanni Morgagni in 1719 to describe in detail the anatomy of the organ and

¹⁵ H.C. Robbins Landon, Haydn: A Documentary Study, Rizzoli, New York, 1981, p. 36.

¹⁶ Gaia Sevadio, Rossini, Carroll & Graf publishers, New York, 2003, p.15.

recognize its relationship to speech. The term, *vocal cordes* (vocal cords), was coined by Antonin Ferrin, a French anatomist, who in 1741 described them as comparable to the strings of a violin and activated by a stream of air. While the term ‘vocal cords’ persists in common parlance, these structures are in reality vocal folds. It was not until 1854 that Manuel Garcia, a Spanish-born voice teacher first visualized these vibrating structures in a living human being.¹⁷ Garcia had been preoccupied with the possibility of observing the movements of the vocal cords when he suddenly noticed while walking on a street in Paris the flashing of the sun on the window panes of a house and hit upon the idea of one mirror reflecting on another. He purchased a small dental mirror for six francs and with this mirror placed in his throat, using reflected sunlight and a hand held mirror, he was able for the first time to see his larynx and vocal folds. Thus the clinical art of indirect laryngoscopy was born aided by the fact that Garcia himself seems to have had little or no gag reflex.

At birth the vocal folds consist of two parts, a firm cartilaginous portion and a thin pliable membranous portion crucial in speaking and singing. The pitch of the voice is determined by the frequency of vibration of the vocal folds and inversely related to their length. From birth until the onset of puberty the male and female vocal folds remain at the same size. With the onset of puberty boys experience a progressive decrease in the fundamental pitch of the voice that is accompanied by a progressive increase in the length of the vocal folds. Under the influence of testosterone, the male vocal folds grow from a mean total length of

¹⁷ Manuel Garcia, Observations on the Human Voice, Proceedings of the Royal Society of London, Volume 7, 399-410, 1854-1855.

17.3 mm in prepuberty to 28.9 mm in adulthood, an increase of 67%. In contrast, female vocal folds grow from 17.3 to 21.4 mm, an increase of 24%.¹⁸ The castrato's vocal folds would remain at their prepubescent length explaining their ability to sing in a pitch range similar to that of an adult soprano. It has been observed that testosterone produces swelling and vascular congestion of the vocal folds accompanied by the accumulation of collagenous and elastic tissue resulting in a thickening of the folds. The lack of these changes in adult female vocal folds and presumably those of the castrati accounts for the greater flexibility of their voices. This allowed the castrati to execute florid *coloratura*, the elaborate ornamentation and embellishment, for which they were so famous and would also become the hallmark of *bel canto* singing. With the onset of puberty the thyroid cartilage increases to an anteroposterior length that is three times greater in men than in women giving rise to the male "Adam's apple," which was absent in the castrati. Only one post-mortem examination of a castrato has been recorded. It was published in 1909 describing a 28 year-old castrato from Umbria, Italy and documented the small dimensions of the larynx and vocal cords consistent with those of a female high soprano. Because somatic growth was not inhibited by the surgery, as the castrato matured, his voice developed the resonating chambers – sinuses, pharynx, oral cavity and thorax – of an adult. These changes combined with intensive vocal training created a voice of unique timbre.

The biologic and psychologic impact of the operation, as correctly noted by Enid and Richard Peschel, has been underestimated even into the 20th

¹⁸ John S. Jenkins, The Lost Voice: A History of the Castrato, Journal of Pediatric Endocrinology & Metabolism, 13, 1503-1508, 2000.

century.¹⁹ In support of this claim they cite the following passage from Angus Heriot's *The Castrati in Opera* published in 1974: "castration appears, for all its cruelty, to have had surprisingly little effect on the general health and well-being of the subject, any more than on his sexual impulses and intellectual capacities. The hurt was very largely a psychological one in an age when virility was accounted a sovereign virtue."²⁰

Viewed from a 21st century perspective, an endocrinologist recognizes that these men suffered from primary hypogonadism and the physiologic changes that accompany this syndrome. Descriptions of the castrati from the 18th century mention the salient clinical features associated with hypogonadism. Tallness of stature, unusual at the time, and an increase in size of the chest were features frequently mentioned and satirized in drawings.²¹ Both these phenomenon resulted from the delayed closure of the epiphyseal growth centers located at the ends of the long bones of the extremities and ribs. The growth centers are cartilaginous plates that normally ossify as they close resulting in the cessation of growth. Testosterone in tissue surrounding the growth plates is converted by the enzyme aromatase to estrogenic steroids that actually bring about the closure of the epiphyseal plate. In the castrati, the absence of testosterone available for conversion to estrogenic steroids allowed for continued formation of bone at the epiphyseal plate and lengthening of the ribs and the extremities. Normal male secondary sex characteristics failed to appear and there was an absence of hair on

¹⁹ Enid Rhodes Peschel & Richard E. Peschel, Medical Insights into the Castrati, *American Scientist*, 75, 578-583, 1987.

²⁰ Angus Heriot, *The Castrati in Opera*, Da Capo Press, New York, 1974

²¹ Illustrative of this point is a famous engraving by William Hogarth satirizing Handel's opera *Flavio* (1723).

the extremities, a lack of facial hair growth and an absence of a receding hair line and baldness. Their skin was smooth and pale; the pallor might have resulted from a lower hemoglobin level than would have been present in a normal male secondary to decreased levels of testosterone. There was a tendency toward obesity, rounding of the hips and narrowness of the shoulders, curvature of the spine and gynecomastia. The curvature of the spine was indicative of osteoporosis. As a group the castrati, because they were deficient in testosterone, would have been at increased risk for this condition. Gynecomastia or abnormal breast development in a male occurs in the syndrome of hypogonadism as a result of a relative deficiency of androgen secretion and reflex rises in pituitary hormones, lutenizing hormone (LH) and follicle stimulating hormone (FSH). The excess of these pituitary hormones in a castrated male or hypogonadism leads to an excess in estradiol and an alteration of the estradiol/testosterone ratio resulting in gynecomastia. This abnormal breast development and lack of male secondary sex characteristics contributed to instances of sexual ambivalence that was mentioned when young castrati took female roles on the opera stage.

It may come as a surprise to learn that it was still possible in the 20th century to study the medical consequences of castration. Information comes from studies conducted on a religious sect that practiced castration in Russia, the Skoptzy (Russian for castrated). It was estimated that 1000 to 2000 were present in Soviet Russia in 1930, 500 were living in Moscow, but as a result of severe persecution by 1962, none were thought to be alive. Prior to World War II, three medical studies were published photographing and performing anthropologic

measurements on Skoptzy men many who had been castrated in childhood many years earlier. Similar studies have been performed on eunuchs who were part of the Imperial Court in China's Forbidden City and eunuchs of the Ottoman court. These studies documented increased height, osteoporosis, instances of pituitary enlargement, atrophy of the prostate and gynecomastia; findings noted in the descriptions of the castrati. No mention in these studies is made of laryngeal anatomy or their having a role as singers.²²

The biographies of famous castrati from the "Golden Age" of Opera (1700-1760) include frequent references to their heterosexual exploits. Endocrinologists agree that castration before the onset of puberty would result in permanent sterility and impotence. Urologists also agree on this point as documented in a survey conducted by Meyer M. Melicow.²³ The variable age and uncertain techniques employed at the time of castration would certainly have led to variability in the suppression of their secondary sex characteristics and must be considered in evaluating 18th century accounts of their sexual exploits. Illustrative of this point is an anecdote about Pope Innocent XI (1676-1689). He was one of the least understanding popes and known as Minga, a Milanese dialect word meaning 'no.' Since castrati were not capable of reproduction, the Church would not sanctify their entry into matrimony. A castrato by the name of Cortona petitioned to be allowed to marry since his castration had been badly carried out

²² Jean D. Wilson and Claus Roethrborn, Long-term consequences of Castration in Men: Lessons from the Skoptzy and Eunuchs of the Chinese and Ottoman Courts, *The Journal of Clinical Endocrinology and Metabolism*, 84, 4324-4331, 1999.

²³ Meyer M. Melicow, Castrati Singers and the Lost "Cords", *Bull. N.Y. Acad. Med.* 59(8), Oct. 1983, pp. 744-764.

and he was fit for marriage. Pope Innocent XI read the letter and wrote in the margin, “let him be castrated better.”

Returning to the question that initially had captured my interest in this subject; an increase in the life expectancy of the castrati would be of scientific interest as it relates to the observation that women live longer than men and the hypothesis that testosterone by some mechanism, might contribute to a shorter life span. In 1993, Eberhard and Susan Nieschlag published in the journal *Nature* the results of a survey on the longevity of 50 castrati mentioned in encyclopedias and biographies with birth dates between the year 1581 and 1858.²⁴ Their control group was a series of 200 intact male singers from similar sources born during the same period. The two groups were indistinguishable; the castrati had a lifespan of 65.5 ± 18.8 years and the intact singers 64.3 ± 14.1 years (mean \pm S.D.). It would be of interest to know the life span of the normal male population at that time. Did professional singers as a group enjoy a longer life-expectancy as a sheltered population as noted in accounts describing the cosseted treatment of young castrati in the conservatories of Naples? The previously mentioned studies on the Skoptzy and Oriental eunuchs revealed no increase in longevity. An article published in 1969 on the survival of mentally retarded patients institutionalized in Kansas who were castrated for eugenic purposes, found a slight but not statistically significant increase in the longevity of castrated men when compared

²⁴ Eberhard Nieschlag, Susan Nieschlag, & Herman Behre, Life span and testosterone, *Nature*, 366, 215, 1993

with intact men matched for their date of birth.²⁵ The mean age of castration was twenty and no mention was made if any of these individuals were castrated before puberty.

Psychologic Impact

We have said little of the psychologic impact this operation would have had on young boys in a society that highly prized virility. The 1994 film “Farinelli,” based on the life of the one of the most famous castrati, Carlo Broschi, begins with a scene depicting the suicide of a young castrato at a conservatory in Naples who leaps to his death from a balcony. If suicides occurred, such incidents do not seem to have been documented. Undoubtedly young castrati endured ridicule from their peers. Castrati who did not make the cut as operatic stars, might still have found a place singing in church choirs; one shudders to consider the fate of a boy whose voice and singing abilities failed to develop. Mozart comments in a letter to his sister, Nannerl, on the arrogance he found typical of castrati.²⁶ Such behavior might have been the byproduct of stardom or perhaps a compensatory mechanism for a lack of self-esteem. Indeed Farinelli referred to himself as being “despicable” and the 19th century castrato, Velluti, referred to the “utensils” missing from his “knapsack.” A celebrated castrato Filippo Baltari (1682-1766) left a verse autobiography, *Fruitti del mondo* (Fruits of the World), wherein he contrasts the material rewards his singing garnered with the sorrow he experienced as a result of his neutered sexuality

²⁵ James B. Hamilton & Gordon E. Mestler, Mortality and Survival: Comparison of Eunuchs with Intact Men and Women in a Mentally Retarded Population, *Journal of Gerontology*, 24, 395-411, 1969

²⁶ Elizabeth Anderson, ed. Letters of Mozart, Vol. I, Mozart to his Sister (88a) Rome, April 21st, 1770, pp. 191-192, MacMillan, London, 1988.

referring to himself derogatorily as a capon and because he was an *evirato*, he had to give up loving and longing for women.²⁷

The Voice of the Castrato

We are now in a position to understand how the physiologic changes associated with hypogonadism created the timbre of the castrato voice. The prepubescent length of the vocal folds in the castrato account for his ability to sing in a pitch range starting at E below middle C on a piano to C or D two octaves above middle C (E3 to D6).²⁸ The voice of the castrato possessed the resonance of an adult and was the product of the enlarged thoracic cavity as well as the vocal track above the vocal folds including the oral cavity and nasal sinuses. The increased thoracic cavity contributed to their ability to sustain individual notes or sing many notes without taking a breath. The extensive vocal training they received, allowed the castrati to cultivate a vocal technique known as *messa di voce* to a degree that became legendary. *Messa di voce* was the ability to start very softly on a given pitch and develop a gradual crescendo and subsequent diminuendo without varying the pitch. Testifying to the flexibility of their vocal folds, an aria sung by the famous castrato Farinelli included an extended passage lasting almost a minute with notes sung at the astounding rate of 1000 / minute. Castrati did not resort to the use of the falsetto, the technique employed by modern countertenors. This technique, referred to as second-mode

²⁷ *Evirati*, literally emasculated men, *musico*, plural, *musici*, musician or musicians were alternate terms used in referring to castrati.

²⁸ By way of comparison, a female soprano's range is from middle C to A in the second octave above middle C, (C4 to A5), a boy treble's voice is from A below middle C to C two octaves above middle C, (A3 to C6) and a countertenor's range is from C one octave below middle C to F in the second octave above middle C (C3 to C5). From, The Harvard Dictionary of Music, Don Michael Randel, editor, Fourth Edition, Harvard University Press, 2003 and Nicholas Clapton, Moeschi: The Voice of the Ccastrato, Haus Books, London, 2008, p. 233.

phonation, employs closure of the arytenoids cartilages and thinning of the vocal folds so as to allow them to vibrate at a higher frequency. Paradoxically this vocal technique was labeled ‘false’ while voice of the castrato was deemed “*naturale*.”²⁹

Considerable interest is being directed toward understanding the voice of the castrato, the *voce blancha* or *voce naturale* as it was called in the 18th century. The subject has been approached from several directions. There are the first hand descriptions of their singing and performance by musical connoisseurs. These accounts refer to the “heavenly or otherworldly sound” they heard as well as the profound effect the voice of the castrati had on their listeners. They also convey the impressive vocal techniques the castrati employed. This point can also be appreciated through the study of musical scores written specifically for castrati. Gramophone recordings made early in the 20th century of Alessandro Moreschi, the last surviving castrato of the Sistine Chapel choir, have been studied to understand the acoustical characteristics of his voice.³⁰ The information gained from this unique opportunity is limited by the primitive state of the recording techniques in the years 1902 and 1904. These recordings have caught the attention of acoustical engineers who now strive to electronically recreate the voice of the

²⁹ Falsetto is a vocal technique found in many cultures and dates back to antiquity. In Manuel Garcia’s 1858 paper describing his observations of the vocal folds, he attempted to distinguish their function when singing with the chest-register as compared to singing falsetto. Currently, highly sophisticated techniques employing fibre-optic stroboscopic observations and xeroradiographic – electrolaryngographic analysis are possible. The so-called chest voice is equated with first-mode phonation while falsettists and countertenors employ second-mode phonation that depends largely on the contraction of the thyro-arytenoid and posterior crico-arytenoid muscles.

³⁰ A CD produced by Pearl (Opal CD 9823) is available including an informative booklet and features transfers of 17 discs that comprise Moreschi’s recorded legacy.

castrato. The music for the sound track in the 1994 film *Farinelli* combined the voice of a countertenor with that of a soprano to create a single voice.³¹

Acoustical engineer David M. Howard in the recent BBC documentary *Castrato*, describes a similar project that attempts to recreate the voice of a castrato by fusing solely male voices singing Handel's famous aria *Ombra mai fu* from the opera *Xerxes*. He recorded separately in an acoustically anechoic room the singing of this aria by an unaccompanied York Minster boy chorister and a high tenor. Through electronic manipulation referred to as "morphing" he produced a single "voice" that was then played and accompanied by a live chamber ensemble to produce a complete musical number (the reverse of a 'music-minus-one' recording). Our understanding of the castrato voice is further enhanced by rare instances of "natural" castrati; individuals born with the syndrome of hypogonadism who have become professional vocalists. Finally, there are studies of the opera culture in the 18th century attempting to understand what has been called, the "period ear."³² Nicholas Clapton, the author of *Moreschi and the Voice of the Castrato*, commenting on the recordings of Alessandro Moreschi's voice notes that to our ears the repertory and style of singing in these recordings is foreign to modern tastes and not necessarily appealing. He points out that there is no way of knowing if we could hear the actual voice of the castrato as it sounded in the 17th and 18th century opera, that we would necessarily like it.

³¹ The movie, *Farinelli* was released in 1994 by director Gérard Corbiau, the musical tracks were prepared by workers at IRCAM in Paris (L'Ircam - Institut de Recherche et Coordination Acoustique/Musique).

³² Naomi André, *Voicing Gender: Castrati, Travesti, and the Second Woman in Early-Nineteenth Century Italian Opera*, Indiana University Press, 2006.

Twilight of the Castrati:

The twilight of the castrati begins with the writings of French authors including Voltaire and Rousseau. The latter observed: “In Italy there are barbarous fathers who sacrifice nature for financial gain and hand over their children for this operation.” Even in Italy, the arrogant and outlandish conduct of famous castrati came under attack. In 1720, the composer Benedetto Marcello penned one of the most racy satires, *Il teatro alla moda* (The Fashionable Theater), specifically targeting the castrati for his bards. John Rosselli points to the economic revival beginning in 1730 following a period of prolonged depression that reversed a trend toward “Christian asceticism and tipped the balance away from gambling a son’s virility on success as an opera singer or tenured position as a church singer.”

Mozart included roles for castrati in his operas *Idomeneo* and *La Clemenza di Tito* both examples of *Opera seria*. But *Opera seria* was being eclipsed by the public taste for *Opera buffa* with its emphasis on real people in ordinary situations and not suited to the voice of the castrato. This trend is reflected in Mozart’s three great Da Ponte operas and his singspiel *Die Zauberflöte*. Also important was the rise of the *prima donna* during the 17th and 18th centuries a result of easing the prohibition and the stigmatization against women appearing on the stage. With the ascendancy of what Henry Pleasants labeled “A New Kind of Tenor”, there was little room left for the castrati.³³ Gilbert-Louis Duprez (1806-1896) became the first “king of the high Cs.” He is said to have learned his art from Domenico Donazelli (1790 – 1873), who had discovered a technique of lowering the larynx

³³ Henry Pleasants, *Great Singers: From the Dawn of Opera to Caruso, Callas and Pavarotti*, Chapter X, Simon & Schuster, Inc. NY, 1981

to produce a darker and more powerful tenor voice that also allowed production of the “notorious top C.”

By the beginning of the 19th century the demand for castrati on the opera stage was in steep decline. Rossini’s only opera for a castrato, *Aureliano in Palmira*, was produced in 1813 and Giacomo Meyerbeer is generally considered the last composer to write an operatic role for a castrato, that of Armando in *Il Crociato in Egitto* of 1824. Richard Wagner, who heard some of the last castrati and was very impressed with their singing, is credited with giving them a final passing glance. Wagner is said to have contemplated casting a castrato for the role of Klingsor, the evil sorcerer in his final opera, *Parsifal*, who emasculated himself to control his sexual desires and thereby gain admission to the Knights of the Holy Grail (Klingsor if castrated after puberty, would not have had the voice of a castrato).

Conclusions:

There is still an active interest in the castrati. No account of 18th century opera history is complete if it fails to mention the castrati. Nor is the history of the voice complete without recognition of their contribution to the art and pedagogy of *bel canto* singing. Scholarly books and articles still continue to appear in print. January this year saw the release of two CDs devoted to the art of the castrati. The first, titled *Sacrificium*, by Italian soprano Cecilia Bartoli features a collection of arias composed for famous castrati of the 18th century. The second release, *Mozart: Arias for Male Soprano*, is by Michael Maniaci, an American born

countertenor, whose larynx failed to develop allowing him to sing in a soprano range without sounding like a countertenor.

The phenomenon of the castrati as described in this paper raises ethical issues that leave us shuddering. Today, ‘child abuse’, would seem to be the term we would affix to these practices. The daily newspapers tells us that child abuse is still with us and the promise of financial gain still leads parents to exploit their children: witness the spectacle of childhood beauty contests. Today it seems incomprehensible that children 8 to 10 years of age would be deemed capable of giving written consent for castration while we struggle to find the appropriate age a minor might sign a consent form for a legitimate medical intervention. Lest we feel too smug, we should remind ourselves that castration and sterilization were authorized for eugenic purposes well into the 20th century, that the United States was the first country to legalize this practice, a fact cited by Nazi propaganda in defending Germany’s forced sterilization program in 1936 and would be raised yet again in their defense during the Nuremberg trials. Even today, there is complicity by members of the medical profession in ethically questionable procedures, witness those who would exploit the poor by the harvesting of organs from living donors for kidney transplantation.

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