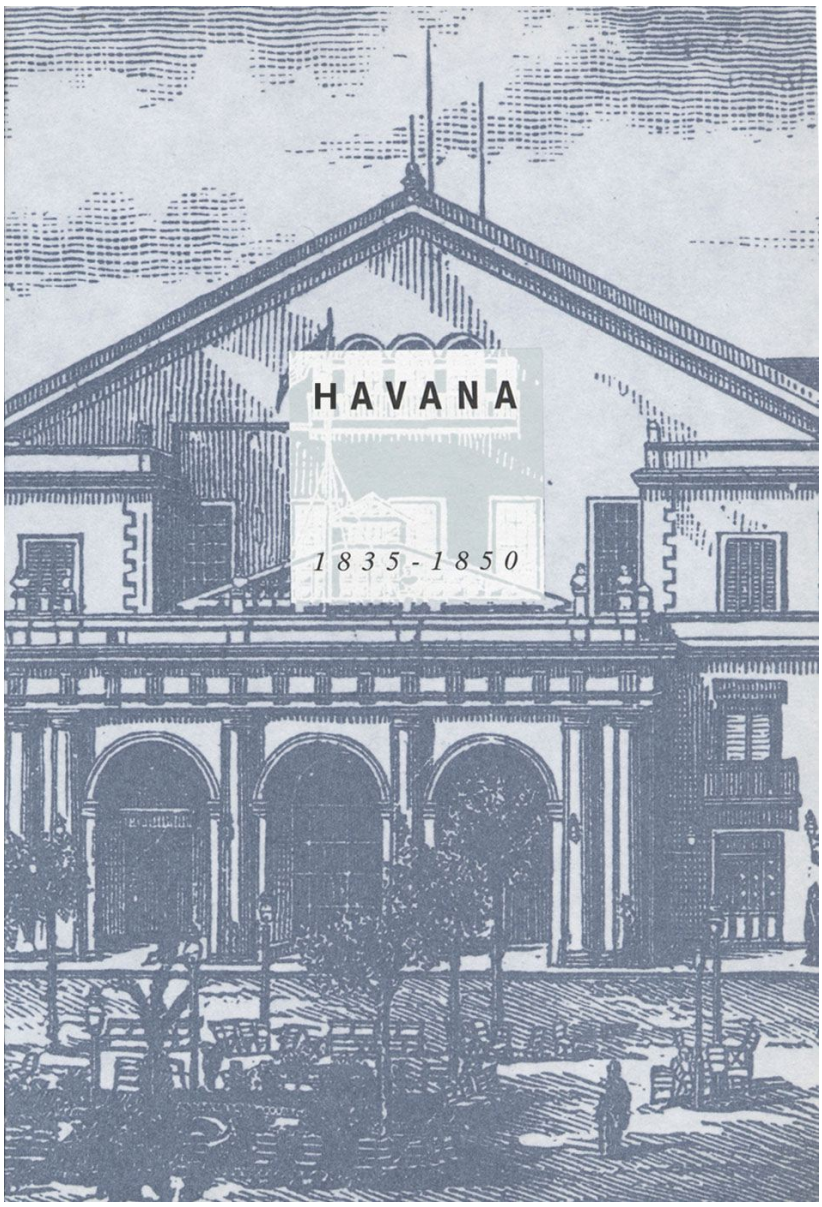

HAVANA
1835-1850

BEAUTIFUL AND FAITHFUL

"La mas hermosa tierra que ojos humanos vieron!" (the most beautiful land man ever laid eyes on!), *Christopher Columbus* exclaimed when, on 27 October 1492, he beheld the northern coast of Cuba, only two weeks after having sighted the first portion of land of the American continent, the tiny island of *Guanahani*, which he baptized *San Salvador*. Cubans still affectionately remember *'el grande almirante'* (the great admiral) or *'el gran genovés'* (the great Genoese) for these words of praise for their land, as well as because during the long Spanish dominion of the island (which lasted four hundred and seven years), Christopher Columbus was the only Spanish governor (with the exception of *Don Luis de las Casas*) who left a legacy of great humanity and respect for the island.

The statue of Christopher Columbus in the patio of the palace of the General Captains

Spanish dominion lasted much longer in Cuba than it did in the other colonies, as these attained independence at least three quarters of a century before Cuba did, namely by 1824. It is for this reason that Cuba, and Havana in particular, was known as *'la fidelísima'* (*the very faithful*), though it was not entirely immune from independence movements, as it was made to believe. However, it is a fact that, for several reasons, these movements proved to be less successful in Cuba than in other Spanish colonies, at least at first. The moniker *'siempre fidelísima'* (*always faithful*) - which the reader may have noticed in the heading of Havana's newspaper *Noticioso y Lucero*, but which appeared in all official documents regarding the island and, more specifically, Havana - was doubly deserved. Indeed, when Napoleon occupied Spain in 1808 and crowned his own brother *Joseph Bonaparte* king, all Spanish colonies grew very hostile towards the French. Furthermore, in 1810 they all revolted, with the exception of Peru and Cuba, though their aim was to oust the French as well as the Spanish. The same did not occur in Cuba, where the *Marqués de Someruelos*, the Spanish governor at the time, managed to keep his government in power even during this period in which the

homeland was under the French. Moreover, the messengers sent to Cuba by *Joseph Bonaparte* with the aim to obtain its subjugation were either chased away or killed. Thus, when the French occupation of Spain ended and *Fernando VII* was restored to power in 1814, and, even more so, later on in 1824, when the only colonies Spain was left with were Cuba and Puerto Rico, it became customary to call Cuba *'la siempre fidelísima isla de Cuba,'* while the capital was referred to as *'la siempre fidelísima Habana.'*

The *Marqués de Someruelos* was succeeded by other governors (*Cienfuegos, Cajigal, Vives* and *Ricafort*) whose main concern was to ensure that the island remained firmly under Spanish control. Hence, on 1 June 1834, almost a year and a half prior to the arrival of the 'Compagnia dell'Opera Italiana' in Havana, *Don Miguel Tacón y Rosique, Vizconde de Bayamo,* was appointed governor. In less than four years of rule (he left office on 21 April 1838), *Tacón* literally transformed Havana and the entire island, thus enabling the colony to achieve considerable progress in many fields, with the exception, needless to say, of political freedom. We will discover many of Governor Tacón's innovations with our newlyweds, Antonio and Ester, and their travel companions, whom we left on the *Coccodrillo*, as they sighted this *beautiful and faithful* land of the new world.

¡BIENVENIDA ÓPERA ITALIANA!

Havana welcomed the ship flying the flag of the Sardinian navy, on which famous Italian artists were sailing, by sporting the finest of its dresses. For one thing, the mid-December climate was the most pleasant of the year, as the so-called dry or cool season (which, from the outset, fools all foreigners, giving the impression of an eternal spring) had already begun. The signs of the damage wreaked by the heavy rains that fell until October-November were gone; the vegetation was recovering from the onslaught of the past hurricanes and filled the air with the sweet scents of tropical flora. The sunset (it was seven o'-clock in the evening) was mesmerizing. When the brig entered the *Canal del Puerto*, after having rounded the *Castillo del Morro* and sailed past the rugged heights of the *La Cabaña*, the town, seen from the starboard of the *Coccodrillo,* appeared like a huge chessboard, its low stone houses and many towering churches and buildings scattered here and there like chess pieces, dominated by the massive walls circumscribing the city over the entire western horizon. As the brig sailed further down the channel - and it took more than one hour to reach the docks - Havana seemed to drift past its guests like a queen crowned

by those city walls, in which its eleven bastions were set like gems and through which the setting sun showed its beams of gold and red - the colors of Spain.

Naturally, the passengers on board the *Coccodrillo* were ready to disembark: they had packed their luggage and donned the outfits they had saved for the occasion. However, now that the ship had slowed down, they immediately realized that, despite the last-minute touch-ups, their clothes were still much too heavy for this climate, even at that time in the evening. Yet, the providential sea breeze and the great excitement before disembarking took their minds off this minor setback. The voices of the people standing on the docks and the characteristic din of carriage wheels and hooves on the stone-paved roads could already be heard. These were then drowned by the loud voices of the crew engaged in docking the brig.

Bay of Havana (left) and the 'Canal del Puerto' (right)

A charming street lamp of the recent *'Quinquet'* type caught the attention of Antonio Meucci, who pointed it out to his wife. In fact a man was pulling it down after having undone the knot of the rope connected to the pulley; he added more oil, screwed the top back on and lit the wick. When he hoisted it up again and hung it on the hook fixed to the wall of the house, Antonio and Esther were bewitched by the variegated reflections of the glass which magnified the light and its beauty. In just a few minutes, many more were lit up near and far. Upon beholding such a sight, a thundering voice (a French baritone, also engaged by Don Francisco) was heard from behind the Meuccis: *"Parbleu! … mais la voici, la ville lumière!"* (*"My God! … but here is the «ville lumière»"* an appellative, this latter, with which was known Paris, for its magnificent public lighting). Actually, Havana's extremely modern public lighting system, adopted by governor Tacón in 1834, the first year of his rule, caused a sensation among tourists, of which there were many that season. This was not only to be ascribed to the rare beauty and practical nature of the street lamps themselves (which replaced the old-fashioned and reeking grease lamps), but also to their sizable number. In fact, Tacón had installed over five hundred lamps, scattered in the sixteen *'intramuros'* (intramural) city districts, ordering that they be lit one hour before sunset and stay lit until dawn. Naturally, in addition to embellishing the city and allowing it to keep busy for a longer time, good lighting was essential also to deter crime during the night.

Moreover, besides modernizing and extending public lighting, on 15 July 1834, Tacón, created an efficient *Night Patrol Corps* (*Cuerpo de Serenos*) for the *intramuros* districts, for which he personally drafted detailed rules. The *serenos* (*night watchmen*) were divided into four brigades - one for every four districts - covering sixty watch points overall. All *serenos* were

to be recruited either from the army or from the navy, namely the *Armada*. Each carried a gun, a whistle, a lantern and a pike. Some were often accompanied by trained dogs, just like the picture on the label of a popular box of cigars called *El Sereno*. The *serenos* had to reach their post one hour before sunset and could leave only after dawn. They had to announce the time at dawn and were authorized to arrest any suspect during their patrol duty. Furthermore, in order to eliminate all possible hide-outs for criminals, Tacón ordered that all main doors of the houses be locked at the sound of the *'cañonazo'* (gun-shot) - at 9:00 PM (or at 8:00 PM, in the winter) - and stay locked until dawn. He also issued a decree prohibiting civilians from carrying weapons and drafted rules for the guards regarding the use of arms.

Just one week prior to the arrival of the *Compagnia dell'-Opera Italiana* - more precisely, on 12 December 1835 - Tacón also set up the *'Cuerpo de Bomberos,'* namely the fire brigade, consisting in six thirty-men units, half of which served the *extramuros* (extramural) districts while the other half served the *intramuros* districts. The unit members were either bricklayers, carpenters or blacksmiths and were supervised by a commanding lieutenant assisted by a second lieutenant and a sergeant. The Fire Brigade depended on chief engineer *Don Manuel Pastor*, who, like Don Francisco Marty, was a good friend of Tacón's; an entrepreneur, he was involved in many of the public works that were implemented during the four years of Tacón's rule. The firemen used the emergency water outlets walled into the sides of the corner buildings and linked to the water-supply network of the new *Fernando VII* aqueduct. Said aqueduct was built by the *Intendente de Hacienda* (the Finance Superintendent), *Conde de Villanueva*, and had become operational only a few months before the arrival of the Italian Opera Company. The same water outlets were also used to wet the streets during the dry season, so as to prevent dust from being raised by passing vehicles, as well as to wash the few streets that were paved. During this period, Tacón also canceled the contract with the former—rather negligent—garbage collection company in order to ensure adequate cleaning and hygiene in the city. He called for tenders, demanding that the city streets be swept on the same day that garbage was collected.

Portrait of Don Miguel Tacón

This is exactly what was meant when it was said that Havana welcomed the Italian opera company sporting the finest of its dresses, or rather … with the dress that the tailor had just finished making, the tailor being, needless to say, *Don Miguel Tacón*. It is also worth highlighting that, not only did Tacón issue decrees one after the other, but he also saw to it that they were enforced, without admitting exceptions or concessions.

Moreover, he set up a considerable number of bulletin boards at the corners of the main streets, where decrees and notices were displayed, so as not to give potential offenders the possibility to claim they had no knowledge of his decrees. The bills of the *'Teatro Principal'* and the *'Gran Diorama'* theater as well as announcements regarding public dances and any other important city event, were also pinned up on these bulletin boards. That day, however, the people who crowded in front of the boards were attracted by a large caption framed by a lovely arabesque typical of all the bills of the *Principal*, which simply said: *"¡Bienvenida Ópera Italiana!"*

Unfortunately, at the docks there were no such boards displaying flashy welcome signs, which would have definitely flattered the Italian artists. There were, however, many horse-driven carriages and oxen-driven carts waiting to pick up members of the Italian opera company and to load their baggage, in order to bring them to the *'casas de huéspedes,'* (guest-houses) or, in the case of the more important artists, to the palaces and noble estates where they were to be hosted by the local aristocracy, who was eager to boast about having been chosen by such famous guests. The carriages in particular drew the attention of the Italians, on account of their unusual shape: they featured two huge wheels without mudguards that rose well above the heads of the occupants and which were particularly suitable for traveling on bumpy roads, where they were able to pick up speed. Perhaps it is for this reason that they were called *'volantas,'* meaning *'flying'* carriage. At any rate, it was amazing how fast the drivers could steer them, despite the narrowness of the streets, taking advantage of the impetus of the beautiful sandy-colored mules, which were much preferred to horses and were considerably more expensive. Indeed, their price was extremely high and ranged from two hundred to six hundred *pesos* (one *peso* was worth slightly less than a dollar at the time, about fifteen dollars in 1990). The version of the *volanta* featuring a folding top instead of the conventional fixed top was known as *'quitrín.'* In both cases, the black coachman sat on horseback and remained quite a distance away from the carriage body, also on account of the very long shafts (the *volantas* were nine meters long from the head of the horse to the tip of the big wheels), which also made the carriage look lighter and slender. There were also more traditional carriages, such as the ones of the nobles, which had four wheels, a closed carriage body and a seat for the coachman.

Tacón had set very strict rules for the disembarking of passengers from ships that arrived in the harbor. Normally, in fact, a government official went on board and collected the passports of all passengers, after which he brought them to the

governor. No-one was allowed to disembark until the passports were returned. In order to obtain landing papers, it was essential that a resident of the island personally requested authorization, thus guaranteeing for the visitor's demeanor during his or her stay in Cuba. However, since Don Francisco himself had guaranteed for all the passengers of the *Coccodrillo*, the procedure was somewhat streamlined, by his authority. Thus, the government official boarded the ship and simply ticked off the names on the list he had received from Don Francisco at the word of each passenger, without even asking them to show their documents. Since the eighty-one names given verbally matched the ones on the list, the official was perfectly satisfied and left after having saluted the Italians respectfully, by bringing the palm of his hand to the side of his beret and bowing slightly.

The 'volanta' and the 'quitrín'

'Hopping' off the ship proved to be quite an endeavor, especially for the ladies. The paving of the dock, the *'Muelle del Comercio'* (later named *'Muelle de Caballería'*), although it was the main dock of Havana, and thus situated opposite the harbor office, left much to be desired: not only were many stone slabs missing altogether, but the few that were left were so uneven placed that the careless were sure to trip. Restoration works had begun may years back, even before the Tacón government, but had never been completed. Tacón was to solve this problem too, but only a year after the arrival of the Italian opera company. As always, Tacón did this in a grand style. The entire area was paved with granite from Barcelona and a beautiful marble fountain, known as *'Fuente de Neptuno'* or *'Fuente del Comercio,'* which came all the way from Genoa, was placed at the center of the area. The main purpose of the fountain was to supply mooring ships with drinkable water. As shown in the engraving below, in addition to being used by the population, the fountain also gave a cheerful greeting to the tourists that arrived in Havana. Today, the *Fuente de Neptuno* can be admired at the *Parque Gonzalo de Quesada* (in the new *Vedado* quarter), which is formed by four streets: *Calzada, 5ª, C* and *D*.

The *Casa de los Condes de Santovenia* was the building closest to the harbor (it could be reached from the main dock by crossing the furthest and narrow section of *Calle del Obispo*) as well as the most coveted, as a residence, by the most important guests, for it was situated at one of the sides of *Plaza de Armas*, in the very heart of the city, opposite the Governor's palace. Between the two buildings there was a large square garden with bushes, protected by a low iron fence, at the center of which there stood the statue of King *Fernando VII*, who had died three years before the arrival of the Italian

company. It is now replaced by the statue of *Carlos Manuel de Céspedes*, the man who waged the *Ten Years' War* of Cuba's revolt against Spain. From the long balconies that stretched across the two upper floors on the façade of the Santovenia palace, it was possible to admire, in the garden and around the square, the most sophisticated *paseo* of Havana, that of the *Plaza de Armas*, which was populated by the most elegant ladies and gentlemen of the city. On the right, separated from the Governor's palace by *Calle de O'Reilly*, there stood the palace of the *'Intendente,'* which included the General Accounting and Treasury Office of the Army, as well as the Postal Administration. Today, this building is known as *Palacio del Segundo Cabo*, since, as of 1854, it also included the offices of the Vice Governor, or *Segundo Cabo*, while the Postal Administration was transferred to *Palacio del Marqués de Arcos* in the nearby *Plaza de la Catedral.*

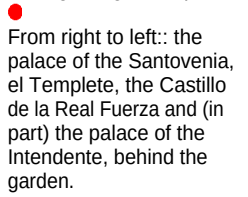
The main dock in old Havana, 'Muelle del Comercio' with the Fountain of Neptune after restoration in 1837

Looking up, the two bell towers of the Cathedral could be seen behind the Governor's palace, while on the right rose the walls of the *Castillo de la Real Fuerza.* At the top of the *Castillo's* tower, like a weathercock, there was a small bronze statue known as *'La Giraldilla,'* which, according to legend, portrayed the bride of *Hernando de Soto.* It was very similar to the *'Giralda'* of the tower of Seville, which was adopted as symbol of the city. Finally, to the right of those who beheld *Plaza de Armas* from the balconies of the Santovenia palace, one could admire the lovely garden with *'El Templete,'* the tiny temple erected in memory of Havana's first town council, *'el Cabildo.'*

All this has remained virtually unchanged since then and, today, tourists still have a picture of the city's ancient grandeur. The position of the *Santovenia* palace (in addition to its luxurious residential features) was so enviable that, within a few decades after 1835, it was transformed into Havana's finest hotel: the *Hotel Santa Isabel.*

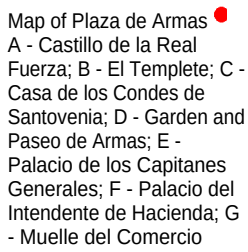
A few hundred meters from *Plaza de Armas*, in the northern part of town, there stood other noble palaces contending for the honor of hosting the most famous artists that had just arrived from Italy. These included the *Casa de los Marqueses de Aguas Claras* and the *Casa de Luis Chacón*, both situated on *Calle San Ignacio*, where it intersects *Plaza de la Catedral*, between *Empedrado* and *O'Reilly* (following the local custom of omitting the word *'Calle'* before the name of the street). The two noble palaces were adjacent to the brand new (at the time) *Casa de Baños* (bathhouse), of which there was an older version in town which dated back to the seventeenth century. Not too far away, there stood the aforementioned *Palacio del Marqués de Arcos*, also situated between *Empedrado* and *O'Reilly*, the entrance of which was

on *Calle Mercaderes.* Further north was the palace of the *O'Farrill* family (now the palace of the Archbishop) on *Calle Habana,* between *Chacón* and *Tejadillo,* and the *Palacio Pedroso* (currently *Palacio de la Artesanía*) on *Calle Cuba,* between *Peña Pobre* and *Cuarteles.*



View of Plaza de Armas in an engraving of the period

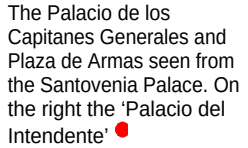
From right to left:: the palace of the Santovenia, el Templete, the Castillo de la Real Fuerza and (in part) the palace of the Intendente, behind the garden.



Map of Plaza de Armas
A - Castillo de la Real Fuerza; B - El Templete; C - Casa de los Condes de Santovenia; D - Garden and Paseo de Armas; E - Palacio de los Capitanes Generales; F - Palacio del Intendente de Hacienda; G - Muelle del Comercio

South of the *Plaza de Armas* there were the *Casa del Marqués de Monte Hermoso* (now *Casa de la Obrapía*), located on *Calle Obrapía,* between *San Ignacio* and *Mercaderes,* a few blocks away from the large docks of *San Pedro*; the *Casa del Conde Barreto* on *Calle Oficios,* between *Luz* and *Santa Clara,* and the *Casa de los Condes de Jaruco* with huge, exquisite mosaic windows overlooking the large open space between *Muralla, Teniente Rey, San Ignacio* and *Inquisidor.* The latter two palaces were situated very close to the *Alameda de Paula*, where the *Teatro Principal* was situated.

It is worth noting that, although the city inside the walls was circumscribed within a rectangle of one kilometer (from east to west) by one and a half kilometers (from north to south) and the streets were virtually all parallel to one or the other sides of the rectangle, nobody, except the slaves, walked the city streets. People got around by carriage or by horse, even to cover very short distances. The ladies never got off their carriages, not even to do some shopping or to have a cup of chocolate, and it was customary that they be served by special servants while remaining comfortably sit in their *volantas.* This custom was mainly to be ascribed to the pitiful conditions of the streets, most of which were unpaved and therefore too muddy in the rainy season or too dusty in the dry season, while the others were so badly paved that, although they were cleaner, it was more likely that people would trip on them.



The Palacio de los Capitanes Generales and Plaza de Armas seen from the Santovenia Palace. On the right the 'Palacio del Intendente'

For the foregoing reasons, the nobles who had offered hospitality to the most eminent members of the Italian Opera company were waiting for them in their *volantas* or at their palaces. Meanwhile, their black servants, donning top hats and colorful uniforms overladen with gold and silver ornaments, went around looking for the guests and calling out their names with stentorian voices: *Señora de Rossi… Señor Montresor… Señora Alboni… Señor Badiali… Señora Steffenone… Señor Lorini… Señores Meussi…* (from then on the Meuccis would seldom hear their name pronounced correctly). Due to the overlapping of dozens of stentorian voices, the confusion was such at first that the dazed passengers crowded at the bottom of the landing stage, their heads tuning left and right following the voices of the slaves. Then, after the first *volantas* had taken off with their guests, kicking up the few pebbles left on the paver, little by little the crowd disappeared. Only then did the crew of the *Coccodrillo,* which had watched the scene from bulwarks with a mixture of curiosity and innocent amusement,

begin to disembark, carrying their sacks over their shoulders, in search of more humble accommodations, perhaps further south, near the *San Pedro* docks. The *casas de huéspedes* closest to the main docks, where tourists got off the ships, hung notices for rooms to let, but the prices were much too high for a sailor: $24 *mensuales* (a month) per person plus 6 rs (*reales*) for dinner (*comida*) and 4 rs for breakfast (*almuerzo*). Moreover, the rent for a decent house, consisting of four or five rooms, was as high as eighty or even a hundred pesos a month. It is interesting to note that the symbol of the American dollar ($) was used also to indicate the Cuban currency, the *peso*, which was broken down into eight *reales.* However, that symbol also stood for the *peso fuerte*, whose value was considerably higher than that of the normal *peso* and which was equivalent to the American dollar, so that tourists (mostly North Americans) could pay for their purchases directly in dollars, especially in the districts around the harbor.

CUBAN CURRENCY AND UNITS OF MEASUREMENT

Currency

The main currency was the peso, *broken down into 8* reales. *A* ‘peso fuerte’ *was equal to one American dollar. There was also a* ‘real fuerte’ *equal to 1/8 of the* ‘peso fuerte.’ *A* ‘duro’ *was a silver coin worth 5 pesos. Later, in 1838, the* ‘centavo’ *(one hundredth of a* peso*) was introduced; it was a copper coin used in almost all South American republics. One* ‘onza,’ *that is to say a gold ounce, was a sort of universal trade currency used in all the countries of the world, whose weight, however, varied from country to country (see below). The English ounce, for instance, was equal to 28.35 grams of gold; instead, the Castilian* ‘onza’ *was equal to 28.7 grams of gold.* Bello *(see bibl.) relates that* “at the time [1840, Editor’s note] 5 ounces of gold were equivalent to 80 Spanish pesos,” *which means that, at the time, one* ‘onza’ *of gold was paid 16 pesos.*
Eguren *(see bibl., p. 248) also mentions the* ‘piastra,’ *which, compared to other currencies of the time, was allegedly equivalent to one U.S. dollar, as was the* ‘doblón.’ *The* ‘libra’ *(lira) is also mentioned, but its value is not specified. At the time, there were many types of* ‘libras’ *in the former Spanish colonies (for example the Peruvian libra) the value of which varied between 2.5 and 4.5 pesetas, probably equivalent to the English pound sterling.* Eguren *also mentions (op. cit., p. 272) the* ‘medio,’ *an old and essentially Mexican currency, also used in Cuba, which was worth 30 hundredths (about a third) of a gold* libra. *The great variety of currencies used in Havana is not surprising, since all sorts of currencies were exchanged, given that it was one of the world’s busiest international ports.*
To get a clearer idea of the prices mentioned in the course of the book, one should bear in mind that, according to González Del Valle *(see bibl.), from 1841 to 1963 inflation was at 3:1. This inflation ratio is almost equal to that of the American dollar over the same period of time (see Vol. 2, p. 185). Prior to 1841, at the time of the economic boom in the years of the Tacón government, prices soared in few years’ time. For instance, the price of sugar, which, until 1834, was 8 reales per bag (*arroba*), rose to 11 and 1/4 reales/arroba by April 1835 and to 15 reales/arroba by August 1836. So, in just two years, prices rose in the same percentage as in the following one hundred years. The above figures should be sufficient to follow the events of the years 1835-1850 when the Meuccis resided in Havana.*

Linear Measurements

The Cuban units of length were slightly different from the Castilian ones used in Spain, which, in turn, differed from the English units, being about 10% shorter of the latter.

Units of length	**English**	**Castilian**	**Cuban**
1 inch	1 inch = 2.54 cm	1 pulgada = 2.32 cm	2.36 cm
1 foot = 12 inches	1 foot = 30.48 cm	1 pie = 27.83 cm	28.27 cm
1 yard = 3 feet	1 yard = 91.44 cm	1 vara = 83.60 cm	84.80 cm

All followed the same division of a yard into 3 feet and a foot into 12 inches, Another unit of length used in Cuba was the 'cordel,' equal to 24 varas. Furthermore, the following English units of length were also widely adopted as shown in the following table below:

1 statute mile = 1760 yards = 1609.34 meters
1 nautical mile = 6080 feet = 1853.15 meters
1 nautical mile/hour = 1 knot (measure of speed of ship)
1 marine league = 3 nautical miles = 5556.1 meters.

Two different types of marine leagues were mentioned in a number of Spanish books: 'from 25 to the degree' *and* 'from 20 to the degree.' *The first type was equivalent to 4445 meters, the second to 5556 meters, therefore equal to the English marine league. The statute league was also used and varied from country to country, though it was never below 2 statute miles. In Cuba it was equal to 5000 varas, namely 4240 meters. The most widespread unit for measuring areas was the* 'vara cuadrada,' *which was equivalent to some 0.719 square meters. The* 'caballería,' *equal to the area of a square with sides of 18* 'cordeles,' *equivalent to approximately 13.42 hectares, was a unit of measurement used for large areas.*

Weights

Here again there was a slight difference between the Castilian units of weight, used in Cuba, and the English ones.
The 'arroba' *was a typically Spanish unit of weight, equal to 25 pounds (about 11.5 kg), and it generally corresponded to the weight of the sacks of wheat, sugar, rice, etc., transported by carts to the port of Havana. After all, even today, rice, for example, is sold in sacks of 10 kg.*

Units of weight	English	Castilian
1 dram	1 dram = 1.77 g	1 adarme = 1.79 g
1 ounce = 16 drams	1 ounce = 28.35 g	1 onza = 28.7 g
1 pound = 16 ounces	1 pound = 453.6 g	1 libra = 460g
25 pounds		1 arroba = 11.5 kg
100 pounds	1 hundredweight = 45.36 kg	

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The contract of the Meuccis with Don Francisco Marty which was valid for five years and could be renewed, should have earned them more than three thousand dollars a year, in addition to free lodging and servants for the latter (namely a minimum of two slaves), which was worth almost as much. According to a statement released by Esther Meucci in New York (see Vol. 2, p. 486), she earned a net salary of sixty dollars a month. It is easily deduced that Antonio Meucci's salary was not lower than Esther's. Considering the high cost of living, as the reader may have gathered, such a salary was not exceptionally high; at any rate, it was almost eight times more than what Antonio Meucci had received from Buongoverno of Florence and, moreover, there was Esther's salary and the free lodging. Furthermore, as we shall see in Vol. 2, Esther's salary (and probably Antonio's as well) was practically doubled by the bond granted by Don Francisco during the theatrical seasons.

We have no knowledge of where Mr. and Mrs. Meucci stayed from the evening of their arrival (16 December 1835) to the beginning of 1838 (or, perhaps, already the end of 1837), when the *Gran Teatro de Tacón* and the adjacent building—which is where the families of Don Francisco Marty and Antonio Meucci were to move, and the theater's tailor workshop and the props' laboratory were to be set up—were completed. However, it is likely that the Meuccis were hosted by Don Francisco Marty, one of the wealthiest men in Havana, who owned several buildings, not to speak of the markets and factories, thanks to which he controlled a large part of the food trade in the city. After their arrival in Havana, the members of the Italian Opera company soon realized how powerful the trading empire of the enterprising Catalan really was.

Indeed, on the evening of their arrival, the Italian artists received an elegant envelope containing an invitation to dinner for the following evening from Don Francisco Marty, which was presented to them by the slaves that went to pick them up at the docks. Dinner would be at the *Fonda del Neptuno*, owned by Don Francisco himself, which was situated in *Plaza del Vapor*. It was the *señor empresario*'s way of welcoming the artists he had engaged in the old continent, whom he had left three months before in order to close other business deals (or, not to fraternize too much with the artists, as was rumored), returning from Europe via *Le Havre* (or *Havre*, as this French harbor was sometimes called) a few days before the arrival of the Italian company.

AT PLAZA DEL VAPOR

Plaza del Vapor was situated a few hundred meters outside the city walls in the area which is currently occupied by the *Parque de la Reina*, that is to say in the square formed by *Águila, Dragones, San Luis Gonzaga* (currently *Avenida Simón Bolívar* or *de la Reina*) and *Galiano* (now *Avenida Italia*). It is worth highlighting that the end of *Calle de Dragones*, near the city walls, merged with the *Zanja Real*, the open aqueduct (*'zanja'* meaning ditch), which, since 1592, brought water from the mouth of the *Rio Almendares*, known as *'la Chorrera,'* into the city (thus avoiding transporting it by ship or by mule); as of 1835, the *zanja* was backed by the more modern (and hygienic) *Fernando VII* aqueduct, which featured underground cast-iron pipes. Precisely, near *Plaza del Vapor*, the *Calzada de Galiano* (the word *'calzada'* indicated a road that was paved, generally with stones) crossed the *zanja* by means of a bridge called *Puente Galiano*.

The *Fonda del Neptuno* was situated at the side of *Plaza del Vapor*, which was the continuation of the *Calzada de Galiano*, less than a hundred meters away from *Puente Galiano*. Its position was quite strategic, since, as of 1817, the entire square was used as a public market, attracting countless merchants and traders from the hinterland and from other towns on the island. Until 1834, all around the square, as well as at the center of it, there were many rickety wood huts (or *'casillas'*), used as shops to sell goods. However, there were also vast, empty areas where, from four o'clock in the morning, farmers heaped fruit, vegetables and grains, either directly on the ground or on sacks or ragged pieces of cloth. Oftentimes there were black men and women huddled on the ground who sold fruit they had bought from horsemen, which they arranged in small heaps on top of overturned wooden

boxes. However, in this same area Tacón was now building a modern market made out of masonry and marble, which was to be denominated *Mercado de Tacón,* but which the people actually called *Mercado del Vapor.* The owners of the *casillas* received the order to tear them down and to rent a stall in the large paved and closed market, framed by a double colonnade, winding along the entire perimeter of the square.

In addition to the market in the square, many shops were opened at the two sides of the square, along the *calzada de San Luis Gonzaga* and the *calzada de Galiano,* with large windows displaying knickknacks and trinkets, as well as linen and fabric stores, nicely lit up at night by the *quinqués.* At the center of the square there was the market's meat section (*carnicería*) and a fishery (*pescadería*), which was run by Marty, as well as a fountain. It was later said that, with this market, Havana took an important step towards the modern concept of supermarkets and shopping centers.

Typical open market in a town in the Antilles

The contractor and manager of the works was the previously-mentioned Don Manuel Pastor, who also ran the two *intramuros* markets, which he had just finished building at the time; these were the *Mercado del Santo Cristo* in *Plaza del Cristo* (or *Plaza Nueva*) next to the *Iglesia del Santo Cristo,* and the *Mercado de Maria Cristina* or *de Fernando VII* in *Plaza Vieja.* With an investment of some one hundred thousand *'duros'* (one *'duro'* was worth five *pesos fuertes*) Don Manuel Pastor earned, from the *Mercado del Vapor* alone, about sixty thousand pesos a year for all the twenty-three years of the concession, after which the property of the market was transferred to the *Ayuntamiento,* namely Havana's Town Authorities. For the markets *del Cristo* and *de Fernando VII,* the *Ayuntamiento* demanded that Pastor pay a moderate concession tax of seven thousand five hundred pesos a year.

Rumor had it that these were all shady dealings of the so-called *'camarilla palaciega'* (the palace mob), alluding to the favors granted by Tacón to all those who financed the public works he had decided to implement with their own capital. On the other hand, practically none of these works could have been realized with the meager public funds which, what is more, were managed by Count *Villanueva,* independently of Tacón.

Therefore, Tacón had no choice but to offer some kind of return on the investments. Perhaps, what the people mainly resented was the fact that Tacón's *camarilla* was formed only by pure-bred Spaniards (that is to say, people born in Spain), while the Creole aristocracy (namely people born in Cuba with Spanish relatives or ancestors), like the *Conde de Villanueva,* were left out. In addition to the members mentioned already, Don Francisco Marty and Don Manuel Pastor, Tacón's

camarilla also included the wealthy *José Estava, Marqués de las Delicias*, the rich traders *Ramón Viada* and *Joaquín Gómez*, the Chief of Police *Pedro Moya*, the lawyer *José Ildefonso Suárez*, Judge of the *Real Audiencia* and Provisional General Councilor of the General Captaincy, and *Ramón de la Sagra*, a shrewd journalist (but also an expert botanist and a lover of science) who helped Tacón immensely by praising his initiatives and prestige in the local press.

EL MERCADO DEL VAPOR

The following is a translation of the description of the 'Mercado del Vapor' *by Bachiller and Morales (see bibl., 1841):*
"… In the evenings the colonnades of the square which face the wide street of San Luis Gonzaga are crowded by ladies who come to do their shopping, accompanied by their mothers or husbands … The rents charged by the owners of these shops are very high, due to considerable demand from merchants … Foreigners are stunned by the filthiness of black men and women selling the produce purchased from horsemen and by the multitude of African dialects heard simultaneously amid the confusion: this occurs in the mornings; in the evenings the attention of passers-by is attracted by the polite, educated and talkative fabric merchants. The curiosity of the ladies and the patience of husbands and brothers sitting through endless inventories, after which more often than not nothing is purchased: the habit of browsing through hundreds of objects in search of a very special one cannot be defined otherwise. Shopkeepers, however, continue to show their goods, in order to nurture the desire to purchase their merchandise, while little girls indulge in tearing apart useless objects…"

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For the reasons outlined above, the *Fonda del Neptuno* had many clients who could afford to spend a great deal of money. As the reader may know already, back then hotels provided not only accommodation and meals, but also lodging and cleaning facilities for carriages and horses, as well as fodder and forage for the latter, as was customary in the *Post* stations of the old continent. The *'fonda'* was such a hotel; indeed, the word brings to mind the *'fondaco,'* typical of Southern Italy. The names given to that particular *fonda* and to that particular square where it was situated, are tied to events that occurred fifteen years before the arrival of the Meuccis in Havana.

In fact, on 1 February 1819, an event took place in Havana which arose a great deal of interest both in that city and outside of it: the first steamship arrived from Philadelphia, PA. The Americans had named it *Mississippi,* but Cuban buyers had re-baptized it *Neptuno.* Cuba thus became the second country in

the world, after the United States of America, to own a commercial steamship.

EL NEPTUNO

The ‘Neptuno’ *was used to carry passengers and goods from Havana to Matanzas, a port about fifty miles east of Havana, which ranked second in terms of importance after Havana itself.*
The ‘Neptuno’ *made an inaugural tour of the Havana bay on 21 February 1819, for which the enthusiastic passengers, all dressed up for the occasion, paid a two-dollar ticket. The regular service with Matanzas began two days later, at the price of one dollar per person. The ship weighed some two hundred tons and the maximum speed that could be reached was of twelve knots. It was driven by a large side paddle wheel, like all steamships built before 1850, when these picturesque wheels began to be replaced by propellers.*
The ‘Neptuno’ *made two trips a week, leaving Havana at six o’clock in the morning and mooring at Matanzas between twelve thirty and one o’clock. It was later backed by the* ‘Megicano’ *(1820) and the* ‘Quiroga’ *(1823), both presenting similar tonnage and used for coasting.*
The service was given in concession for fifteen years to consul José Ricardo O’Farrill. *It is interesting to note that a* consul *was the equivalent of a minister, as the departments of Cuba were called* ‘consulados,’ *in homage to their dependence on Spain (the* ‘Real Consulado de Agricoltura y Comercio,’ *for instance). When the concession expired in 1834,* O’Farrill *failed to renew it, ostensibly on account of the fact that revenues shrank owing to the steamship psychosis, which the owners of sailing vessels also contributed to spreading and which had been triggered by the dramatic accident that occurred in Hull, England, in 1825. However, it was rumored that* O’Farrill *found it more convenient to deal in the trade of black slaves, which had allowed him to earn sizable profits in the past.*

The steamship Almendares, similar to the Neptuno, in an engraving of the period

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This was quite a novelty for the time, bearing in mind that the first trip by steamship made by the American *Robert Fulton*, from New York to Albany, dated back to 1807, not too far back. This was one of the advantages of Cuba's being so close to the advanced industries of the United States. A few months after the *Neptuno* was delivered to Cuba, the *Savannah*, another one of Fulton's steamships, left the United States and sailed across the Atlantic ocean for the first time, reaching Europe in only twenty-six days (from 26 May to 21 June 1819).

The arrival of the *Neptuno* in the bay of Havana unleashed everyone's imagination. Lengthy praises and even poems exalting the miracle of *windless* navigation (*así surcar la mar la vi sin viento - thus I saw it plowing the waves without wind*) were published in the newspapers and people flocked to the docks to admire it, despite the fact that it was considerably smaller than the large sailing vessels moored in the harbor. The many lovers of sailing vessels (sincere and insincere) immediately nicknamed it *'the iron'* (*plancha*). Don Francisco Marty readily seized the opportunity to take advantage of the almost morbid interest displayed by the people and commissioned a large oil painting of the *Neptuno*, which he hung on the wall of the restaurant of his *fonda*, so that anyone could admire it also from outside. From that day on, the *fonda* became known as the *Fonda del Neptuno* and the square took the name of *Plaza del Vapor*.

At ten o'clock in the evening, all the carriages with the guests had arrived. The carriages were spectacular in themselves, not only because there were so many of them, but also for the magnificent decorations on the hoods, trappings and uniforms of the drivers, enhanced by the beams of a huge white moon, which looked like it had just been painted up in the sky, for the occasion. In 1844, an American writer, *Mrs. Houston*, described one of these drivers as follows: "*The volanta is driven by a postillion, generally a black, dressed in the merriest way one can possibly imagine: gold and silver are generously scattered all over his uniform; red and blue and other lively, bright colors stand out from his ornaments. Compared to these braided blacks, the famous Postillon de Longjumeau would fall into darkness and misery …*"

In order to get a picture of the *Fonda del Neptuno,* where the members of the opera were to dine, the readers should envision an enormous square *patio*, similar to that of certain large Italian farmhouses, with porticoes reaching all around the inner perimeter and a large main entrance. Well then, at the *Fonda del Neptuno,* as in all other mansions in Havana, the porticoes adjacent to the main entrance on both sides were

used to park carriages; the ones on the opposite side, at the end of the patio, were used as stables for the horses; the lateral ones were used as entrances to the various apartments and to the kitchens, since cookers and ovens (the latter being widely used on the island) were situated outside, in a corner of the patio, obviously so as not to overheat the interiors, given the high temperature of the environment. Actually, since many of the guests were not spending the night at the *fonda*, it was not necessary to untie the horses and bring them to the stables at the end of the large patio. As a result, most of the carriages with their horses and colorful postillions were parked, one next to the other, under the wide vault of the porticoes to the sides of the main entrance, while those that arrived later were parked along the *calzada Galiano.*

In the middle of the patio, as in most of the houses in Havana that hosted more than one family, there were several bamboo cane roofings, which, during the day, allowed a large number of guests to have lunch in the shade. In the evening, however, they were removed, so as to give the guests to opportunity to enjoy the cool night breeze and the moonlight (during the dry season, of course). That night the moon shone brightly, as it drifted softly across the clear and starry sky. The light that glowed from the oil lamps, fixed in pairs on each of the columns of the porticoes around the patio, as well as from other lamps that hung on long zinc-coated iron wires above the tables, if perfectly useless on account of the moonlight, made that exotic scene appear like a somewhat absurd dream. Actually, the many black slaves, who stood motionless around the perimeter and looked rather satanic on account of the odd contrast between the darkness of their skin, the golden and brightly colored ornaments and the silvery reflection of the moonlight in their large, spell-bound eyes, evoked a magical rite, a rite that awaited the arrival of the high priest to begin …

Don Francisco Marty y Torrens stepped out of his carriage when everyone had already arrived, long before. The moon seemed to suspend its *paseo* in order to illuminate, in the silence that suddenly fell upon the crowd, the tall, thin, elegant if simply dressed forty-nine-year-old Catalan, born in Barcelona, who had emigrated to Cuba at the age of twenty-four. Don Francisco donned a Cuban tuxedo, consisting of a black jacket, white trousers, ivory white silk shirt, a bow-tie and white shoes. The jacket and trousers of a Cuban tuxedo were made of very light if stiff basket-weave fabric, which was particularly suitable to keep one's *à plomb* even in a tropical climate. Don Francisco wore a large blue silk ribbon around his neck, from where hung the Great Cross of Isabel I the Catholic and, just below the left jacket collar, close to the heart, the decoration of Knight Commander of the Order of

Charles III, the two highest Spanish decorations. These were, of course, more than enough, but, on similar occasions, many of his fellow countrymen used to cover their jackets with so may decorations (not as prestigious as his, mind you), as to resemble the window display of a custom jeweler, paying no heed to the badly concealed contempt of foreigners.

The bust of Don Francisco Marty y Torrens at the palace of the General Captains in Havana

But *Pancho Marty* (*Pancho*, like *Paco*, is the familiar version of *Francisco*), like a good Catalan, was by no means a show-off. He could, in fact, have flaunted plenty of decorations—all real and fully deserved. Indeed, just five years before, in January 1831, Marty had engaged in a tenacious battle against the pirate *Antonio Mariño*, whom he killed, taking away his loot. As a result, the King of Spain, Fernando VII appointed him sub-lieutenant (*alférez*) of the *Real Armada*. In 1834, Tacón promoted him lieutenant for the excellent job he did in building the *Pescadería,* for which he spent of his own money three times the estimated sum. He was later promoted honorary captain and appointed Secretary of the King's Chamber for the merits acquired in building the *Gran Teatro Tacón* and as a reward for having uncovered a band of smugglers.

The previously-mentioned colonel *Don Manuel Pastor*, member of the *Real Cuerpo de Ingenieros* and Chief Engineer and Inspector of the island's fortifications, who was also one of the members of Tacón's *camarilla,* appeared almost immediately at Don Francisco's side. He was short and stout and wore a pair of golden-framed spectacles with long, narrow lenses, which gave him a rather ambiguous appearance, also due to the fact that he often kept his eyes partly-closed. There were so many decorations pinned on the jacket of his tuxedo that it seemed as if he were just about to collapse under their weight. Under his jacket he wore a black vest over which the massive golden chain of his pocket watch stood out. He wore a huge diamond ring on the middle finger of his right hand and carried a cane stick embellished with precious stones and metals, which he would occasionally swirl with accomplished elegance.

Besides being exquisitely dressed, Don Francisco Marty and Don Manuel Pastor, like most Spaniards, immediately came across as unusually friendly, easygoing, open and educated men, even more so than the French. It was sufficient to observe them as they approached with sincere deference each of their guests, men and women alike, to whom they addressed their refined, polite expressions, which often included the word *'encantado,'* pronounced with greater charm than the *'enchanté'* of the French. This was part of the inborn respect of etiquette (which was also instilled from early childhood through education) which characterized the Spanish.

Indeed, the many nobles who accompanied the famous actors to dinner as their hosts, behaved in a similar impeccable way.

Don Francisco had arranged for Don Manuel Pastor to sit between Antonio Meucci and his wife, since, like the Meuccis, Pastor spoke French and could therefore comfortably converse with them, but also to give him the opportunity to discuss a few technical problems with Meucci who could, perhaps, help to solve them.

Dinner time arrived and, with it, the novelty of local food and customs. In 1841, a German writer, Eduard Otto wrote: *"… dinner … generally consists of numerous different dishes which are either flooded in oil or strongly flavored with onion and garlic. Service at the table is provided by appropriately trained slaves, who are as alert as dogs to the desires of the guests; one of them holds a bottle and is ready to fill up any empty glass; another stands with his arms folded and stares at the guests, ready to obey their orders; a third keeps clean plates and cutlery, which are changed with each new course. Only in the houses of the rich are slaves dressed with clean clothes. They generally walk barefoot. In the houses of the middle and working class, they are so filthy, as to make dinner guests lose their appetite, especially when they perspire and breathe in a disgusting manner. The cook, who is also black, cooks whatever he likes and in most homes the same dishes are prepared every day. At the table everyone eats whatever he or she prefers and asks the slaves for it. It is customary to eat in a hurry without holding lengthy conversations. As soon as one is full, one takes leave without ceremony …"*

DON FRANCISCO MARTY Y TORRENS

Francisco Marty y Torrens was born in Barcelona on 11 June 1786. He arrived in Cuba in 1810, still a youth. The people of Havana called him Pancho Marty, *Pancho being the diminutive of Francisco, while Marty was the old-fashioned spelling according to which the 'y' was used instead of an 'i,' which is currently used in modern spelling (Martí). Marty began working as a butcher and with his first savings he purchased a boat to go fishing every now and then. He then opened a shop in* Consulado e/Virtudes[1] *and thus began to build his fortune. He became Navy Inspector of the* 'Chorrera' *and of part of the coast, all the way up to the tip.*
Some claim that he gained his wealth by becoming involved in the slave trade, importing blacks from Africa and indios *from the coasts of* Mérida *and from* Belize *in the Yucatán peninsula (the southernmost peninsula of Mexico). This activity was viewed as patriotic by the governors of Cuba for it supplied cheap labor for public works and farms (see the publications on the history of the abominable slave trade by* Menéndez Carlos *dated 1923 and 1925). In January 1831, Marty engaged in a tenacious battle against the pirate* Antonio Mariño, *whom he killed taking away his loot. As a reward, he was appointed sub-lieutenant. In 1834, he won the contract to built the* 'Pescadería,' *(Fishery) which was completed by the end of 1835. He obtained the monopoly of the fish trade for twenty years, as a reward for having unmasked a gang of dangerous smugglers. He built the* 'Gran Teatro de Tacón' *which was inaugurated on 15 April 1838. He was also the impresario of the* 'Teatro Principal' *and the* 'Gran Diorama.' *Marty organized several tours of the Italian Opera in many cities of the United States and in Mexico City. On 6 May 1857, he sold the* 'Gran Teatro de Tacón' for *690,000 pesos. Many believed that Marty became extremely rich during the time when he gave Tacón his loyal and unconditional support.*
He became honorary sea-captain, received the Great Cross of Isabel I the Catholic and the Order of Charles III, and was appointed Secretary of the King's Chamber. Marty suffered from several attacks of yellow fever; nevertheless, he lived quite a long life and died in 1866, in Havana, at the age of 80. The bust of Don Francisco Marty was exhibited for many years at the 'Gran Teatro de Tacón.' *Around 1975, it was moved to his tomb, in the* Cementerio de Colón, *in Havana. Today, it is on display in the throne room of the palace of the General Captains.*

[1]The e/ (abbreviation of '*esquina a*') is used to indicate the corner between two streets.

CATALANS IN HAVANA

A French writer, Rosemond de Beauvallon *wrote: "… There are many Catalans in Havana, all very industrious, who constitute the healthy and active part of this inept city as for the rest of the population … They are dark-skinned, speak a language of their own that is very different from Castilian. For a Cuban, a Catalan is synonymous of work, trade, activity, cleverness and praiseworthy steadfastness. All qualities which they seemed to have inherited from their ancestors … It is a historical fact that, from the Middle Ages, Catalan traders used their own capital to create one of the first forms of maritime insurance and bill discounting … Some claim that they coordinated and propagated the code known by the name of* 'consulado del mar'*…" At any rate, without going back to such ancient historical events, Catalans controlled wholesale and retail trade in the city of Havana - from the poor devil selling ribbons or lard in the street for one* 'medio' *(probably equivalent to 1/3 of a peso) to the important traders who made million-peso deals. All shop-keepers and traders were Catalan. They held the monopoly of wool, fats, silk, smoked meat, lace and pepper - briefly of all foods and clothing items. According to the aforementioned* Rosemond de Beauvallon*, the Catalans were masters in the science of making a fortune in little time. He relates how, upon seeing these sober workers rise at down and work incessantly under the blazing sun - without sharing the Creoles' haughty disdain of work - he looked upon them with great respect. The Béarnaise in France are similar to the Catalans: they also often leave their country and undertake activities that would not allow them to make a living in their homeland. "However,"* Rosemond de Beauvallon *adds, "brothers in exile, they march together united and strong. There is a sort of Masonic association which embraces all, big and small, rich and poor as if they were (together with the Béarnaise) the Israelites of Christianity. Indeed, their unity is the one and only secret of their amazing prosperity. Even if the morals of the ruling class at the time forgave any type of legal or illegal earnings, it is certain that the wealth accumulated by many Catalans was, by and large, the result of their hard work."*

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As I see it, the foregoing description given by Mr. Otto does not actually apply to important dinners, such as the one in question, and tends to highlight mostly the negative aspects. Another description given by the aforementioned *Rosemond de Beauvallon* offers a different viewpoint. He mentions how the Cubans *"often use fricassees, love fish, eggs and spicy foods. Among the different types of meat, fish, chicken and pork are very good. Pork is preferred to veal and is often fried with bananas. Havana has nothing to envy to the rest of the world as far as preparation of fruit is concerned. The marmalades made here - especially coconut marmalade - are delicious. Ice creams are also very good, especially the 'chirimoya' (a sweet fruit having a buttery pulp and an exquisite smell) and 'guayaba' ice creams. The fish from the Gulf of Mexico, of which there are many species in abundance, are often brightly colored with tones ranging from red to yellow …"*

As for conversation, there was plenty of it that evening, also on account of the many questions presented by the Italian guests, who would overlap their language to the brisk speech of the Spanish. As a matter of fact, the idiom spoken in Cuba was slower and more supple than the Castilian spoken in the motherland. The Italians, who were not aware of this, immediately realized how difficult it was to understand the Spanish language, despite the fact that they were facilitated by the syllabic phonetics and sentence structure, which are entirely identical in Italian. At any rate, when worse came to worse, the guests as well as the hosts resorted to French, which was the international language at the time and, as such, was spoken by all cultivated people.

The main topic of conversation was the theater, and, in particular, the much-anticipated *Gran Teatro de Tacón.* Contrary to all expectations, the artists engaged by Don Francisco learned that not only had the *Gran Teatro* not been completed yet, but its construction had never actually begun. This was due to the fact that Madrid was reluctant to grant the construction permit - requested by Tacón on 30 June 1834, only a month after being appointed governor - because there were already two theaters in Havana, the *Principal,* which staged opera, and the *Gran Diorama,* which featured plays, Don Francisco Marty being the impresario of both. The Spanish hosts were certain that there was no need to be alarmed by such a delay and that the *royal authorization* would arrive any day (it did, in fact, arrive a few months later). Meanwhile, Tacón had already chosen both the site and the contractor. Don Francisco Marty was to be the contractor, given his experience as impresario of other theaters, but he, in

turn, highly relied on the technical skill of Antonio Meucci[2]. As for the site, the theater was to be built on a plot of land situated outside the city walls, adjacent to the new railway station, the *Estación de Villanueva* (named after its promoter, *Conde de Villanueva*), the construction of which was well underway.

The plot of land belonged to the old *Jardín Botánico* and was situated opposite the new *Puerta de Monserrate,* built by Tacón next to the old one so that the new gate, which formed the extension to *Calle O'Reilly,* served to exit the city in the direction of the new theater, while the old gate, which was the continuation of *Calle del Obispo,* would serve to access the city coming from the theater, thereby forcing traffic to flow one-way on both streets (another one of Tacón's innovations which prefigured the modern principles of urban traffic management). However, rumor had it that Tacón had chosen that solution so that he could go to the theater via *Calle de O'Reilly* and return to his palace via *Calle del Obispo,* since his palace was situated right between these two streets.

Forecasts regarding the *Gran Teatro,* discussed during the dinner, were soon to become reality. Spain's authorization arrived on 24 February 1836, and Don Francisco immediately won the contract for the construction of the theater, which was to be built entirely at his expense. The works began in July of that same year and after just one month the structure of the colonnade, the vestibule, the café and the hall were already completed.

Don Manuel Pastor got on well with Antonio Meucci immediately. He listened with great interest to Meucci's story about his studies at the Academy of Fine Arts in Florence and praised that city, which was universally viewed as the cradle of arts and sciences, from the Renaissance on. He called it *'la nueva Atenas del mundo,'* using an emphatic tone of voice, in homage to his guest. At any rate, Pastor consulted Meucci on a thorny issue, that of the waterworks, in connection to the problems that had been caused by the new aqueduct *Fernando VII* which had been built under his technical supervision. In particular, he gave a detailed description of the system of filters used to eliminate all foreign bodies and impurities and voiced his concern for the presence of foreign substances, which apparently were not retained by the filters, that rendered the water extremely *heavy.*

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[2] This is confirmed by Nestor Baguer (a relative of the Marty family), who writes (see General Bibliography): "Meucci arrives in Havana in 1835 and immediately engages in the introduction of the most advanced contrivances in the Tacón Theater…"

Actually, Pastor was an excellent civil and mechanical engineer, but, unlike Meucci, he had no knowledge of chemistry. In fact, Meucci explained to him that the *hardness* of the water (incorrectly referred to as *heaviness*) could not be eliminated mechanically, but only chemically. Therefore, according to Meucci, it was first of all necessary to submit the water to a chemical analysis, after which suitable substances, such as soda, could be added to it in appropriate amounts. It is worth highlighting that Florence boasted a long-standing tradition - from the sanitary as well as engineering point of view - in that which concerned the analysis and treatment of drinking water or water used for personal hygiene, also due to the fact that it is so close to the renowned Montecatini and Chianciano springs. Thus, it is likely that Meucci learned these techniques from his chemistry teacher at the Academy.

The two gates of Monserrate (the left one can barely be seen) seen from outside the walls. Notice the costumes and the carriages

Meucci's theories persuaded Don Manuel Pastor and the two agreed to meet in the following days to examine the filters and to inspect the water intakes, built near the *Husillo* waterfalls, a height located some ten kilometers outside the suburbs west of the city. The steps taken by Meucci as regards the filters of the aqueduct must have been very successful, since, in 1847, that is to say twelve years later, the Spaniards still looked up at him for it, as *Domenico Mariani* (a Milanese guitarist engaged by Don Francisco for the Tacón theater) testified at the Bell/Globe trial[3] in December 1885: "*… I heard from many Spaniard that he was a great inventor; he had invented water filters …*" Chronologically speaking, this was Antonio Meucci's first successful technical achievement in Havana.

[3]This trial (extensively dealt with in Vol. 3 of this book) was instituted in 1885 by *The American Bell Telephone Company* et al. vs. *The Globe Telephone Company, Antonio Meucci* et al., for alleged infringement of A. G. Bell's patents on the telephone.

HAVANA'S WATER

From the times of the early settlements (1519), the inhabitants of Havana were forced to get their water supplies at the 'Chorrera' *(the mouth of the Rio Almendares) whence they carried it to the city either in barrels, by boat, or in jars, on mule back.*
Around 1550, the city was able to stock up on drinking water thanks to a large reservoir called 'el jagüey' *(the well), built at the foot of the Cabaña heights, where rain water was collected, and also in a well situated near the* 'Campo de Marte' *(the parade ground), called* 'la Noria.' *It is worth noting that the rain water collected in the reservoir had an unpleasant taste, as it was poor in mineral salts. However, since there was not enough water to meet the needs of the population, many were forced to dig other wells, which turned out to be unwholesome, or to go fetch water from the* 'Luyanó' *stream, which flows into the southern side of the bay but which is dry during the winter.*
Although the idea of conveying water from the Rio Almendares to the city by means of a canal dated back to 1565, the project was not implemented until 1592, when the 'Zanja Real' *was built the latter being an open aqueduct ('*zanja' *means ditch in Spanish) which stretched from the* 'Chorrera' *to just outside the city walls. In 1648, a yellow fever epidemic killed two thirds of the population. Due to the spreading of other diseases and epidemics caused by water pollution, in 1771, the* Marqués de la Torre *banned the washing of people, animals and laundry in the* zanja*; nevertheless, such a provision was never fully complied with. Incidentally, it is worth highlighting that the ancient Romans avoided these problems by building elevated stone-covered channels supported by tiers of arches. Furthermore, Roman aqueducts ended in the city center with the so-called* 'water tower,' *also raised. Lead piping for drinking water branched off from the tower, while open channels were used only for watering gardens and for the baths. Therefore, the drinking water was not polluted.*[4]
In 1824, when large cast-iron conduits designed to withstand high pressures (the first ones were produced in 1800) were introduced, a project was elaborated with a view to convey water from the Rio Almendares to the city by means of underground cast-iron pipes. Upon the decision of Conde de Villanueva and under the technical supervision of chief engineer Don Manuel Pastor, work began in June 1831 (under governor Vives*) and ended in 1835 (under* Tacón*). The aqueduct was baptized* 'Acueducto Fernando VII.' *In 1833, before the aqueduct was completed, a cholera epidemic broke out that killed about 8000 people in just two months. As a result, the cemetery had to be enlarged.*

[4]Nevertheless, in modern times it was discovered that lead piping might have had the effect of a slow-acting poison to the detriment of the population.

Unlike the Zanja Real, *the Fernando VII aqueduct collected water from the Rio Almendares further upstream from the mouth (*la Chorrera*), that is to say where there were no human settlements and therefore the water was cleaner and where it was possible to take advantage of the considerable difference in altitude for the gravity-conduit to the city. Hence, the water from this aqueduct was basically used for domestic purposes, while the water of the* Zanja Real, *which, for 243 years, had been the only source of water for the city, was used for all other purposes. The water intakes of the Fernando VII aqueduct were built on a height, in the vicinity of a natural waterfall (*'caída' *or* 'represa del Husillo'*). The water of the Rio Almendares first flowed through wire-netting, which filtered out all floating bodies (branches and tree trunks) and then fell from a height of over six feet (one Castilian foot was equal to approximately 28 cm) onto the first clearing filter consisting of a foot and a half of gravel, coarse at the top and fine at the bottom. This was followed by a second tank and filter system, identical to the previous one. As the water flowed out of the last filter, it was conveyed into the first straight 18-inch (43 cm) cast-iron pipeline, 7.5 kilometers long, up to the* 'el Cerro' *hill (which is also the name of the south-west city district to which it belongs), and from here it flowed down to the city along the* 'Calzada del Monte' *through a 14-inch (33 cm) pipe and reached* 'Puerta de Tierra,' *from where it branched off to supply water to the various city districts. Unfortunately, some problems cropped up a few months after it became operational: during the first rainy season the filters were flooded, as a result of which the water reached the city murky and unwholesome, for it no longer was filtered.*

Furthermore, the water flow (less than 4,000 cubic meters a day) was not sufficient to meet the needs of the 180,000 inhabitants. To be precise, about 18 liters of water per capita a day could be supplied on average, without considering the water required by the fire brigade to put out the fires that frequently broke out. In addition, the problem of the hardness of the water remained unsolved. Since the hardness was of a permanent *nature - in other words it was caused essentially by the presence of calcium and magnesium chlorides and sulfates - it could not be eliminated by boiling, as is done with* temporary *hardness caused by calcium and magnesium bicarbonate content. It is worth noting that hard water causes damage in any process involving water, on account of the deposits that build up inside the pipes and containers. It also prevents the thorough cleaning of tools and people, for it prevents suds from forming (thus reducing the cleansing power) and makes it rather difficult to*

Remains of the filters of the Fernando VII aqueduct, as they were preserved at the beginning of the twentieth century

cook certain foods, especially legumes.
The cost of the Fernando VII aqueduct, bearing in mind that all the materials were imported from the United States, amounted to 808,724 pesos and 4 reales.
Fortunately, as there was a considerably high demand for water on the part of wealthy estate owners, as well as of hospitals, barracks and public facilities, in 1838 alone 22,019 pesos were collected thanks to the contributions for connections to the aqueduct. Culbertson *(see bibl.) relates that, in 1836, almost all families purchased water from the blacks, who would fetch it from public fountains and put it into containers which they carried on their heads. The water was then poured into the clients' tanks, charging* '3 centavos for every full bowl.' *However,* Culbertson *adds that it was so bad (despite the fact that it came from the Fernando VII aqueduct), that it had to be disinfected with pieces of sulfur, which remained at the bottom of the container for several months together with the sedimentation mud. It is worth highlighting that, despite his rivalry with Villanueva, Tacón personally inaugurated the aqueduct in 1835, perhaps also on account of the fact that Manuel Pastor had joined his* 'camarilla.' *This also explains Antonio Meucci's involvement, who, otherwise, could not have given his contribution to the works of Villanueva, unless Tacón approved, since Antonio was tied to Don Francisco Marty, another member of Tacón's* 'camarilla.' *As there is no direct historical evidence, it can be presumed that Antonio Meucci changed the filters of the aqueduct in order to solve the problems mentioned by* Culbertson *as well as to reduce the temporary hardness (by adding lime milk to the filters) and permanent hardness of the water, the latter being more difficult to eliminate. Indeed, in this case it is necessary to add soda to the water to be treated. However, the doses had to be calculated stoichiometrically, that is to say accurately. As a result, the water had to be submitted to chemical analysis repeatedly over a given period of time, so as not to exceed with the addition of soda.*

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BACCHUS, TOBACCO AND VENUS

Every so often Antonio Meucci glanced at the pocket watch his father Amatis had given him prior to his departure from Florence. It was not gold, but it had finely embroidered golden hands; moreover, as his father (who supplemented his salary by working as a watchmaker) used to say, taking on the air of a connoisseur, it was *a Roskopf*! He was suddenly overcome by a strong yearning for his family and Florence, which, the more they seemed unreachable to him, the more he missed them deep down in his heart. What saddened him most was the contrast between that abundance of food and those luxurious clothes and the poverty and hardships endured by his family. In addition to overindulging in wine, the Cuban hosts continually smoked excellent tobacco, judging from the smell, which seemed to mingle well with the strong scents of the tropical night. Antonio said to himself that he absolutely had to send a box of cigars to his father, perhaps through someone traveling to Italy. Who knows, maybe even Gigi and Beppe (now they were both over eighteen) would enjoy a few puffs …

With this thought in his mind he became serene again and came back to reality. He noticed that Esther was unusually restless in her seat, as if someone were bothering her. Was Manuel Pastor molesting her under the table? Don Francisco certainly was not: his cunning smile and his interest were focused elsewhere, in a more profitable direction, far from sensual temptations. On the other hand, lending credence to Mr. Culbertson, mentioned previously, who makes reference to 1836, it was a fact that *"… the morality of Cubans was non-existent, both in men and women. Their main concerns were dresses and public entertainment such as masked balls, theaters, gambling houses and bullfights, in which men and women took part, both old and young, as well as priests (with the exception of bullfights because they took place during the day). Nobody avoids talking about everything in front of children: they say that it is best that they learn about all the aspects of life, both good and bad … Women speak a bit of the French disease, go to church but seem indifferent, and flirt openly often creating considerable scandals …"* Although English writers of the time were not always objective when speaking of the Cubans, according to Culbertson, men could … dare without problems.

The other writer mentioned previously, *Eduard Otto,* relates that there were many *high priestesses of Venus* in the city and that *"some of them are very rich and own several thousand piastras. They are allowed to live on any street, so they choose the best ones, and to rent a house near the most important palaces of the city, often alone or with one or two*

friends. Their furniture is among the most luxurious and comfortable. They share the same habits of the most distinguished ladies. Since they never or seldom leave their house during the day, they peer through the iron bars of the windows [of the entresol, Editor's note] *in the evenings, with a cigarette between their lips. The windows remain open, so that it is possible to see inside, while they sit on their rocking chairs* [*mecedoras*], *in order to attract gentlemen with whom they feel eager to 'roll about'* [*columpiarse*]. *Spaniards or foreigners are not ashamed of stopping in font of their windows because nobody seems to consider it shocking, despite the fact that, it is possible to see everything from the houses opposite the street …"*

The famous Partagás cigar factory in Havana, near the Teatro Tacón

As for the consumption of alcoholic beverages—especially wine and cognac—the Cubans, men and women alike, definitely overindulged, considering the torrid climate of the island. Culbertson relates that: *"Almost all well-off ladies wake up between half past five and six o'clock in the morning, drink a cup of coffee, then go to mass or to confession and then return home an hour later. At eight o'clock they have a 'café fuerte' with cognac instead of milk and smoke a 'tabaco,' regardless of age. They only drink tea as a remedy. Breakfast* [*desayuno*] *is served between nine and nine thirty and they have wine instead of coffee, but not before having glanced through the 'Diario,' which is delivered at all houses at seven …"*

It may be assumed that the apparently excessive calorie intake of the people of the island was a way (for those who could afford it) of protecting oneself from the constant threat of infectious diseases caused by the island's poor hygienic conditions, which were exacerbated by the tropical climate. However, it is worth noting that the average working day in Havana was by far longer - and more tiring - than that of people who lived in areas characterized by milder climates. To begin with, it is common knowledge that the same job, performed in a hot climate, requires a greater effort than if it were carried out in a cool environment. Furthermore, for most people in Havana, the day began no later than five o'clock in the morning and did not end before midnight.

At the time, Eduard Otto wrote: *"People get up early in Havana. At six o'clock in the morning there are already many traders at the docks, breathing the fresh sea air and trying to catch up with the latest news. At seven o'clock everything has started moving: cranes containing sugar, sacks of coffee and tobacco. All goods are transported by carts driven by donkeys, horses or mules* [*or oxen*, Editor's note]. *These carts make such a deafening noise, that those who would like to continue sleeping, are forced to wake up… Everybody works until three*

o'clock in the afternoon and then returns home for lunch. Moreover, breakfast - generally eaten between eight thirty and nine o'clock - is a hot meal, like lunch [Editor's note: the same word, *almuerzo*, was often used to indicate both]. *In Spanish homes lunch lasts from one to one and a half hours PM …"*

Men did not always have a *'siesta'* after lunch, that is to say roughly between four and five in the afternoon. Women often took advantage of this time to chat, rather than to nap. One thing is certain and that is that as soon as the sun went down (as it were) an intense social life began for women and men alike. *"… Spaniards love to enjoy life"* - commented Eduard Otto - *"Once the working day is over, the Spaniards want to relax, strolling around, seeing people, listening to music …"* However, it is remarkable that, especially after Tacón's government, not even one drunkard was to be seen out in the streets, as *Robert Baird* related in 1849: *"only once did I see one, but he was either English or American."* It was not infrequent for men to return home after one o'clock in the morning. In conclusion, very few hours were devoted to sleeping.

TOBACCO

Tobacco growing and processing was introduced in Cuba in the early nineteenth century.
During the previous decade, under the government of Don Luis de Las Casas, *Havana's economy was based on the traditional products of the island (sugar, honey and coffee) - sugar being the major product - and on harbor and navigation activities (ships arriving and departing, ship maintenance and repair work, interest rates, insurance, leases, etc.). Economic development was boosted by the tobacco trade. In 1819, there were 387 tobacco factories in Havana, each of which employed an average of 16 workers. In 1836, the number of factories dropped considerably, though their average size grew, employing a staff of 50 or more workers. In 1836, the most popular cigar brands were* 'Dos Amigos' *and* 'Cabaña.' *There was also a fairly recent brand,* 'El Sereno,' *whose label depicted a night watchman (*sereno*) of the Corps created by Tacón. Eguren wrote as follows: "…* smoking - especially tobacco wrapped in white paper - is common practice among men and women and is done at any hour or in any place, even at the theater … The 'dulce' or 'delgado' type is very strong by European standards… Even little boys and girls seem to smoke, as soon as they have learned to walk… It is customary for men paying visits to women to offer cigarettes to the ladies on the threshold, before greeting them. Even priests behave in a similar manner except that when they offer a cigarette to a lady, they do the sign of the cross first. On the other hand, it would be highly insulting not to offer wine and refreshments to a priest paying a visit… Lighting each others cigars (*'cigarro'*) or cigarettes (*'cigarro de papel'*) is considered an annoying courtesy, while it is rude not to offer a light to someone asking for one, unless he is black. Often, if the requested cigarette was not been lit properly, the person requesting it puts it between his lips and puffs it, before giving it back, after having of course lit his own … Women… after the theater shows [*Editor's note: i. e. between ten and eleven PM*] dine with wine and smoke tobacco."

A Havana's artisan, manufacturing cigars

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Antonio Meucci glanced at his Roskopf again and, just to be sure, he winded it some more, as was customary, by turning the key he kept in another pocket (the winding pinion had not been invented yet). He then brought the watch up to his ear to hear its ticking. Everything is all right … or is it? It was two o'clock in the morning! … and it didn't look like any of the guests intended to leave. Quite the contrary, it seemed that they had been waiting all day for that fresh evening breeze, to make up for the exhausting heat of the daytime. Pastor offered him a large cigar saying it would help him stay awake. Antonio had learned to smoke half a Tuscan cigar from his father: *"… it helps you not to feel the hunger,"* Amatis would say, *"and it costs less than food …"* Esther was drowsy too, despite the fact that she was used to staying up late at the theater, after the performances. Nonetheless, they stayed on another half an hour after which they excused themselves and headed for their *volanta,* eager to reach anything that looked like a bed.

AN ALMOST ORDINARY DAY

When Antonio and Ester woke up, they were covered in sweat. The room was like an oven. Esther searched around with her eyes for the pendulum clock that her mother Assunta had given her before leaving Florence. What had she done with it? Oh, yes! she left it on the chest of drawers by the lamp… She remembered having put it there the night before together with the purse watch which she had brought from Florence. What? Seven o'clock? Was it morning or evening? Impossible, the sun was so high!… She called her husband by his surname, as was customary at the time: *"Meucci, … what time does your turnip say? …"* Meucci groped for his pocket watch on the bed-side table. *"My 'turnip,'"* he replied, acknowledging the taunt addressed to that jewel of technology, *"says twelve o'clock sharp!"* He enjoyed puzzling his wife, also because that way she would twist her lips, making an adorable grimace. The night before, Antonio had set his watch to that of Manuel Pastor, fully aware of the difference in time zone between Florence and Havana. On the other hand, every day at noon, when the latitude was measured on the *Coccodrillo,* he used to put the hands of his watch five minutes back, while Esther simply winded her clock every night before going to bed, as a habit, without even looking at it. *"So what's wrong with my pendulum then?"* Esther broke out, *"I bet the salt ruined it!"* *"There is nothing wrong with your pendulum Esther,"* Antonio replied, as he sat on the bed and began to put on his trousers, *"it works perfectly, only the sun rises later here than it does in Florence … seven hours later …"*

COFFEE

Coffee began to be grown in Cuba only after the English occupation in 1763. Further impetus was given in 1795, when Haiti was handed over to the French, by the numerous French and Spanish immigrants exiled from Haiti. As of 1819, coffee plantations began to grow in number and size; they even outnumbered sugar cane plantations, due to the higher profits they generated. However, in 1830, the United States, which up until then had purchased over 50% of Cuba's sugar, honey and coffee output, began to import coffee from Brazil, producing a crisis among Cuban coffee growers, who were forced to convert their plantations back to sugar cane. However, it is interesting to note that the trade balance was in favor of the United States, since the latter exported machinery and technology to Cuba for the most recent innovations, such as railways, steam ships and machines, printing machines, as well as devices for the dredging of Havana's bay and so on.

Although the Arabs had been accustomed to drinking coffee ever since the ninth century, and the Spanish were surely familiar with this custom, the latter preferred hot chocolate and helped spread its consumption in Europe, though they jealously hung on to their secret recipe. Also in Havana, ever since the late sixteenth century, it was customary to drink hot chocolate, although not in public establishments. The fashion of the 'café,' both as a beverage and as a meeting place, was imported from France towards the end of the eighteenth century, sometime before the French Revolution. The first coffee shop was opened in London in 1652. In Havana, the first 'Café' *opened in 1772, in* 'Plaza Vieja,' *at the corner of Calle Mercaderes, and was called* 'Café de la Taberna.' *Between 1804 and 1825, the following were also opened: the* 'Café de Los Franceses' *at Campo de Marte, the* 'Café de Las Copas' *on Calle de los Oficios, where independence fighters often met, the* 'Café de la Domínica' *on Calle del Obispo, where reformist Creoles gathered, the* 'Café de la Paloma,' *populated by Americans passing through and by traders in general, the* 'Café del Comercio,' *near the harbor, frequented, on the contrary, by the lower class, with its more modest customers, the* 'Café del León de Oro' *opposite Plaza de S. Francisco, famous for its merriness and a meeting place for rich traders, and, lastly, the renowned* 'La Lonja' *(which means* open space*), not far from Plaza de Armas, luxuriously furnished with mirrors, chandeliers, candlesticks and table clocks, which also had billiard-tables and newspapers from all over the world for a select clientele. This Café had two main entrances and two*

counters where all sorts of beverages and pastries were served. In 1838-1841, Eduard Otto wrote: "… From six o'clock in the morning [la Lonja] was full of Creoles, drinking coffee or chocolate with fresh white bread. Ice creams are served only until seven in the evening. During the day, customers arrived in their work clothes, but in the evening they usually wear dress coats, black ties and hats, with the exception of some Creoles who wear practical summer clothes and refuse to follow the fashion imported from Europe, according to which one has to put on one's Sunday's best. At the 'Lonja,' customers gather in separate rooms, according to nationality, except for ladies, who, as mentioned before, never get off their carriages and have their ice creams and fresh beverages served on board by waiters standing outside the café *…"*
It is also interesting to note that at the Teatro Tacón instead of the European-style 'buvettes' *there were two cafés one on either side of the patio (situated between the portico at the entrance and the doors of the main hall) one of which served ice cream for the ladies while the other one served wine for the gentlemen, and both seldom served … coffee.*

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Seeing that Esther did not follow him, he finished buttoning up his trousers and went over to the chest of drawers to fetch the lamp, which had a tube with a beautiful crystal sphere protruding in the middle. He took it with his left hand and, turning to face Esther, he mimed the position of the sun with his right hand. *"Pretend this sphere is the earth and my hand is the sun … Florence is here … and Havana is over here … When the sun rises in Florence, here it is still dark …"* Esther pretended she understood, but, generally speaking, her mind went blank when it came to anything that was technical or vaguely rational. Indeed, as a woman, she did not have a penchant for that kind of thing, and was more fascinated by art - the theater as well as other genres - than she was by technology. Furthermore, her job as a dressmaker allowed her to behold and enjoy beauty, harmony and enchantment, without ever having to ask herself what laws governed them. Of men's cunning inventions she only understood the trouble they caused rather than the advantages they entailed, provided there were any.

At last, the pendulum was set to the time of Havana, so the two clocks, Antonio's watch and Esther's pendulum, nostalgically began to tick the seconds, minutes, hours, days and years that elapsed from the moment they left Florence.

René gently knocked on the door: *"¿Permiso?" "Entrez,"* Antonio replied in French. Indeed, René, the slave that Don Francisco had assigned to Mr. and Mrs. Meucci, was from Haiti (which should be pronounced *Haití*, as is written in Spanish), where everybody spoke and speaks French. This suited Antonio very well, and was also fine by Esther who could understand some French. René brought a tray with *café fuerte*, a pot of piping hot chocolate, fresh white bread and a basket of biscuits fresh out of the oven. The coffee was not bad, it just tasted funny, as if it had not blended with the water, which was actually part of the reason. Italians are well aware that the coffee one drinks in some cities, like Rome and Naples, is especially good on account of the quality of the water (at least, so long as the water beds are not polluted). Esther spat it out. The chocolate, instead, was delicious. Clearly, it blended better with Havana's water, and that is why chocolate was so popular in this country.

Antonio and Esther were not the type of people who would easily treat themselves to a holiday, even if they deserved one. On the other hand, Don Francisco had already decided that the company would make its debut on 12 January consequently they had only three weeks to prepare and rehearse. There was

no time to waste. The *empresario* had decided to stage the opera *'The Capulets and the Montagues'* by Vincenzo Bellini, who had died a few months before at the age of thirty-four while traveling to Paris and London. Thus, Don Francisco thought it would be a good idea to take advantage of the general grief for the premature death of the great Sicilian musician by staging one of his early works (1830) based on a very touching story, that of *Romeo and Juliet*, which had been very much loved for two centuries, thanks also to Shakespeare's famous tragedy.

The Teatro Principal, which no longer exists, at the end of the Alameda de Paula
The interior of the Teatro Principal

They dressed quickly to go to the Teatro Principal, where preparations were underway for the debut. It was almost one o'clock. René rolled his eyes, somewhat alarmed: foreigners never left the house at that hour, not in the summer at least. That day the sun beat down, almost like in the summer, and precautions had to be taken. Many unwary foreigners suffered from sun-strokes, also because they did not wear a *sombrero*, or, better still, they did not carry a *sombrilla*, that is to say a parasol, or they did so only after having paid dearly for their carelessness. A clear effect of the climate could be observed - even in the so-called *cool* season - on fish which, purchased alive at ten o'clock in the morning, was already putrefied by four in the afternoon.

One way of fighting the heat was to race through the streets in a volanta, even though the benefits disappeared as soon as the volanta came to a halt. However, it was one way of cooling off, somewhat similar to the solution currently adopted by taxi drivers in Havana, which race across the city with all four windows down, thus providing an ecological air-conditioning.

Esther vanished into the dressing rooms of the *Principal*, while Antonio was stopped by a tall, bright-looking young man. *"I am Juan Alersi, Mr. Meucci… your unworthy assistant stage-hand … I have heard much about you… I hope you will teach me your secrets … You know, this is a colony, it is not like in Europe … And then, you see… we have to manage with what we have or what we can get …" "Hold on,"* Meucci replied, *"You must be Italian, or else your Italian is perfect, … but … did you say your name is Juan?"*

"Take no notice, Mr. Meucci, here it is customary to translate the first name of foreigners into Spanish. Everybody calls me Juan, instead of Giovanni, so that is why I introduced myself as Juan. You are lucky because Antonio stays the same in Spanish …" Juan answered with a magnificent smile.

Juan Alersi turned out to be an excellent property man. One might say that, as far as theatrical techniques are concerned, he almost outperformed his master, according to comments that appeared in local newspapers a few years later. On 18 June 1841, the *Diario de la Habana* reported, with regard to the

play in three acts *'de maquinaria'* (of mechanical art) *"El mágico de Serván y tirano de Astracán"* (The magician of Serván and tyrant of Astracán), staged at the Gran Teatro Tacón, where Meucci and Alersi were later transferred to: *"The transformations and visual effects created by Juan Alersi include: a tree which is transformed into a castle; a table with a mirror which is transformed into a funeral canopy; a garden with a fountain becomes a beautiful beach… El Pastelón* [a large cake] *out of which many doves fly, when Cavarrúbias* [the famous Cuban actor] *is about to eat it …"*

The Teatro Principal had recently been entirely rebuilt in masonry (it used to be a partially wooden structure) and enlarged, so that when the Italian company made its debut, it was practically brand new. According to the description of the previously-mentioned Eduard Otto, the Teatro Principal (or *'de la ópera'*) *"is beautifully decorated and is as large as the Berlin Schalspielhaus. It is elegantly furnished and there are four stories of boxes, that were all well illuminated. The first and second story of boxes have a railing, with such wide links, that it is possible to admire beautiful ladies from head to toe, with their exquisite evening gowns and small dainty feet covered by stockings and silk shoes, which they show off knowingly. Ladies never sit in the chairs in the stalls; those were reserved for distinguished gentlemen wearing frock-coats and white, silk gloves, even though these were no longer trendy. The entire hall was lit up by wax candles arranged in groups of three and fixed on the railings of the boxes …"* Otto relates that the price of a ticket was four reales (the rough equivalent of $7.50 in 1990) just to get in, that is to say, just to listen to the music from the corridors leading to the boxes or from the vestibule or the buffet. If one wanted to see the show, then the price of the ticket was one *piastra* (double the amount, that is, as a *piastra* was equal to one dollar).

Havana's leading newspapers, the *Diario de la Habana* (known as *El Diario*), *El Nuevo Regañon de la Habana* (or *El Regañon*), the *Faro Yndustrial de la Habana* and *El Noticioso y Lucero* of 11 and 12 January 1836, as well as the theater bills posted on the street billboards, announced the *"debut de la ópera italiana al Teatro Principal para el 12 de enero con 'I Capulleti e i Montechi'* [sic!] *de Bellini."*

It so happened that, although it was acknowledged that the Italians excelled in art in general and in the opera in particular, a certain resentment developed in Havana towards the Italian opera company for it had involuntarily ousted the Spanish company, which had been performing at the Teatro Principal for many years.

As *Andueza* wrote in 1836 in "Isla de Cuba pintoresca," *"… The Spanish opera company which included Muñoz,*

Domínguez and the two female singers Santa Marta and Galino, was replaced by an Italian company. Rossi, Albini and Montresor all sang at the Teatro Principal. They are excellent artists, better than the previous ones, but they are foreigners and we are supporting them much more than we do our own, even though they need it much less …" He continued, mentioning the Teatro Tacón, the construction of which had begun a few months before: *"… The Teatro Principal has already been rechristened the Teatro de la Ópera because that is what it is almost exclusively being used for. And so the Teatro Tacón is now called the Teatro del Verso* [Prose Theater]. … *The untiring Don Francisco Marty y Torrens… decided to build this theater under the protection of the General* [*Tacón*, Editor's note]*, who gave it his name. He will spare no energy or money until the building is finished …"*

However, when the long-awaited night of the debut finally came, on Tuesday, 12 January 1836, all doubts and misunderstandings were quelled by the overwhelming emotion generated by the performance. As had already occurred in other parts of the world, even those who did not particularly enjoy the opera were swept away by the extraordinary enthusiasm displayed by the audience, from the stalls to the boxes. At the debut in the Teatro Principal, as had already happened in the past in towns of important opera houses worldwide, the audience cried *Encores* and *Bravos* throughout the entire performance, there were standing ovations and people balancing on their tip-toes to catch one last glimpse of the singers beyond the sea of spectators seated in the first rows.

NEWSPAPERS

In 1723, the Belgian Charles Habré set up the first hand-operated printing machine in Havana, near the Plazuela de Espíritu Santo. In 1725, it published the first astronomical observations that were made in Havana during the previous decade. In June 1735, the first printing press was introduced. In 1764, Havana's first newspaper was published: 'La Gaceta.' Its name was later changed several times and, in 1810, it finally became the 'Diario de la Habana.' Another paper, 'El Nuevo Regañon de la Habana,' or 'El Regañon' came out in 1830. In addition to other less important newspapers, 'El Noticioso y Lucero' was founded in 1832; in 1844, its name was changed to 'Diario de la Marina.' Finally, the first issues of 'La Prensa' were published in 1841: this paper was often criticized for its anti-conformist news by the 'Diario de la Marina,' which was loyal to the government. In 1834, a modern printing press with a capacity of 1,500 copies per hour was imported from the United States. As steam engines did not exist at the time, the only energy sources that could drive machines of any kind were water and, at times, the wind - besides people's hands and feet, naturally. Therefore, almost all factories had to be located near a waterway, which was exploited as a source of power. This was not at all practical for newspaper printers, since it was preferable for the latter to be situated near large urban centers.

Cuban newspapers generally did not deal with politics. The only two that were nominally political were the 'Diario de la Habana' and the 'Noticioso y Lucero.' However, they did not publish any editorials or leaders, like the foreign papers did, and the writers were kept under strict control and censorship. Even theater bills and corrida bill-board posters were subject to the same censorship. Havana's newspapers almost exclusively reported royal decrees and covered colonial news. Just to give the impression of freedom of expression, they would also publish essays and polemics, almost always pertaining to artistic or literary topics. Tacón not only maintained the same censorship imposed by his two predecessors, Vives and Ricafort, but added a military censor to the two civilian ones. The military censor had the right to deny the authorization to publish already granted by the civilian censors. He also suppressed the 'Revista Bimestre Cubana,' which was considered hostile to his government.

In his "Impressions and Experiences of the West Indies and North America in 1849," Robert Baird relates that most newspapers in Havana consisted of only a

The slave trade (Diario de la Marina, 9 January 1850)

few sheets and were packed with announcements. "An Englishman's sensibility will be struck by those offering Negroes and, at times, Negresses and their children to be sold 'with or without their Negro.' Given the strict and rigorous censorship which Havana's newspapers were subjected to, it is surprising that there are so many of them and of such good quality." *In 1850 - over 35 years after the 1815 Vienna Treaty which decreed the abolition of the slave trade as of 1821 - Havana's newspapers still published announcements on the sale of slaves in the* 'Esclavos' *section (see figure on this page). Descriptions of escaped slaves came under the heading* 'Esclavos prófugos.' *Moreover, the section* 'Puerto de la Habana - Entradas y Salidas,' *specified the ship's cargo as well as the number of passengers, who were subdivided into* 'pasajeros' *and* 'reclutas,' *the latter being workers hired on a more or less voluntary basis (including slaves).*

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When the show was over, the elegant public strolled up and down the *paseo* of the neighboring *Alameda de Paula*, commenting on the unprecedented quality of the performance, but especially on the singers' exquisite and powerful voices and the excellence of the orchestra. On Friday, 16 January, *El Noticioso y Lucero* dedicated a long and enthusiastic review to the performance of the Italian singers. Considering the newspaper's censorship and its reverence towards the authorities, this was a clear sign that Tacón and his *camarilla* had appreciated the performance.

The more unbiased opinions of foreign writers on the company leave no doubts as to their excellence, although they were published in different years. The previously-mentioned German writer Eduard Otto judged the performance of the Italian opera *excellent*. Also the French writer *Isidore de Löwenstern* wrote about the Italian opera in Havana with much enthusiasm in his book entitled "Les États Unis et la Havane: Souvenirs d'un voyageur," published in 1838. In his words "… *it was a great joy for me, after all my ears had had to put up with in the United States! …"* Many years later (1850), referring to the same company, an American author named *Rosenberg* wrote: *"There is a very distinguished opera house in Havana, the Teatro Tacón, where an excellent opera company performs regularly. Singers from Italy and many other countries who have made their careers in the most famous European theaters have come here, attracted by the fame of the Teatro Tacón …"*

Up until October 1846, the Italian opera company had almost always performed at the Principal, although, on occasions, it moved to the Tacón where it would stage operas, and sometimes ended up spending a large part of the season there. When, in October 1846, the Principal was destroyed by a terrible hurricane, the company moved to the Tacón which, though seriously damaged by the hurricane, was rapidly restored, whereas the Principal was never rebuilt. However, the Italian company remained at the Tacón only until 1850, the year in which their contract - which had been renewed for the third time - was due to expire. Thus, fifteen years after their arrival in Havana, the company definitively left the city for the United States. Indeed, even before 1850, almost every year the Italian opera company would go on long tours in the United States during the Havana's hot, rainy season. At times they also traveled to Mexico City, which was then the second city in America - after Havana - to boast an outstanding theatrical tradition and excellent structures. This is confirmed by González del Valle in his book "La Habana in 1841": *"… the Principal was used for many years by the Italian opera company in the months from January to March and then from*

October to December [i.e. during the cool season, Editor's note]. *In the hot months, the singers used to leave Havana, for fear of the yellow fever …"* It is, however, to be remarked that most of the theaters around the world were (and are) closed during summer.

After the performance, Don Francisco congratulated all the actors, one by one, visiting them in their dressing rooms. He especially praised Esther who was to be credited for the rare beauty of the costumes. One can appreciate just how important costumes are in a performance from the fact that, today, a special *Oscar* is awarded for them. Don Francisco also congratulated Antonio Meucci for his work and commented on how the special lighting effects had enhanced the chiaroscuro of the silk and brocade fabrics and the armors of the knights. He then went over to *Luigi Tartarini*, who had painted almost all the sets, and expressed his great appreciation and satisfaction for the success attained. However, Don Francisco himself had to be congratulated, as he had managed to bring to Havana a company of famous singers, who had all lived up to their well-served reputations.

Before leaving, Don Francisco spoke to Antonio and set an appointment with him for the following day at the newly-built fish market, or *Pescadería*, a true architectural jewel, which he had finished building just a few months before and for which he had obtained a 20-year concession.

The Alameda de Paula in 1853, after the destruction of the Teatro Principal (note the 'Columna O'Donnell' at the center)

The *paseo* along the splendid *Alameda de Paula*, in the crisp night breeze - a show in itself - prolonged itself well after midnight. The comments of the spectators echoed in a dreamlike atmosphere, along the long and beautiful marble balcony that framed the bay, softly lit by the street lamps, which shone their quivering light on the waves that rhythmically broke against the bank.

FISH

In Havana, everything that had to do with fish was under Pancho Marty's control. One might say that Pancho Marty's wealth began with the construction of the Pescadería *or fish market, commissioned by Tacón at the end of 1834, which was completed in April 1835. Marty paid all the building costs but, in exchange, he was granted a twenty-year monopoly over fishing and was promoted to the rank of Frigate Lieutenant. Others (*Norman*) claim that Marty obtained said monopoly as a reward for having unmasked a gang of dangerous smugglers.*

It was actually quite common for the government to remunerate the capital invested by wealthy citizens in public works by granting them the rights to exploitation for a period of 20-25 years, depending on the case, after which the building became public property. Moreover, it is worth saying that Marty built the Pescadería *with special care, and spent more than three times the estimated budget. Indeed, the counters and pavements were made of marble, which is easy to wash and keep clean, besides being more attractive. Lodgings and offices for the sellers and for himself on the upper floor, were built with high-quality wood and materials, and he made sure that there was no dampness or dirt.*

In fact, in his report to the Ministry of the Interior, Tacón stated that it was necessary to build a new fish market on account of the absolute lack of hygiene and unbearable stench that characterized the previous one.

The Pescadería *was built on two levels in neoclassical style and featured a rectangular plan. The long side overlooked the* Empedrado*, the same street as the Cathedral façade, which it stood next to. The other side faced the* Canal del Puerto*, which stood some fifty meters away. Hence, the entire area of the building was allowed for good ventilation. Moreover, the main wharf could easily be reached by simply crossing the* Plaza de Armas*. The* Pescadería *no longer exists and the area on which it was built is currently occupied in part by the* Avenida del Puerto*.*

According to Ramón de la Sagra*, the* Pescadería *was 55 varas long, which would correspond to some 46.6 meters, and 26 feet wide, roughly 7.4 meters. Inside, the counter (*mostrador*) was lined with marble over the entire length. Sixteen square stone columns in Tuscan order supported the roof over the large selling area. B. M. Norman (1845, see bibl.) relates that "…* the Pescadería is the cleanest and most inviting building of this type that I have ever seen in any country of the world. Any traveler to Havana should go to see it. … [Marty] developed an extremely profitable business by

controlling the price of fish and today he is one of the wealthiest men of the island. He is also the owner, with a twenty-year monopoly, of the Teatro Tacón - one of the largest in the world - and has the assurance that no one else will be allowed to compete with him …"
The total cost of the Pescadería *amounted to 34,031 pesos, which was entirely borne by Marty. A warehouse where ice was stored stood opposite the* Pescadería*. It is likely to be the ice house set up by the American* Tudor *in 1816, which was later bought by Marty. Furthermore, Marty built a series of constructions near the Muelle de Luz,* [see bibl., Pezuela, 1863] *at the beginning of the Alameda de Paula, just behind the Teatro Principal, where the berths for his fishing boats were situated. The buildings included a dry dock for his boats, a fish nursery for live fish, four warehouses which he also used to store the materials used on his building sites, three brick and five wood and tile apartments, a large cantilever roof with three arches and a breeding pond for turtles. He also built a wooden wharf on poles along a 167 by 21 meter embankment, and had another wood and tile warehouse built on its pavement.*

The Pescadería at the beginning of Calle Empedrado, next to the Cathedral

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Marty had transformed that reeking and unhealthy corner, called *Boquete de la Pescadería*, which led to the *Canal del Puerto* just above the *Comercio* wharf, into a luxurious and bright 'salon.' The mixed cries and colorful expressions of the fish-mongers trying to attract clients (which reminded Antonio of the voices in the streets of Naples, when he was on a tour in that city with impresario Lanari) seemed to belong to many theater performances, only here the spectators were standing, rather than sitting, and they walked in front of the actors who performed their lines behind the counters. The best time to go to the *Pescadería* was early in the morning, when one could savor the sea scent that came from the fish, arranged in wicker baskets on a bed of sea weed, their colors bright and changing owing to the brilliance of the scales. Many fish-mongers would point out their still-writhing fish to the clients: *"¡Mira!… tiene azogue en el cuerpo!…"* (*Look at it!… It's got quick-silver in its body!…*). From the descriptions of many authors, I have gathered that Havana's *Pescadería* must have been very similar to the fish market of Catania, in Sicily (my hometown), one of my fondest childhood memories, and I also - like *Norman* - recommend that tourists visit it.

Antonio saw Don Francisco arguing with someone who had evidently forgotten to put the refuse in the covered garbage can which would be emptied by the garbage collectors late in the morning. The man obeyed promptly, showing evident signs of fear, for, as everyone knew, Don Francisco did not tolerate anybody disregarding his orders and would punish those who did not behave as expected, very severely. As soon as Don Francisco saw Antonio, he walked over to him and shook hands with him vigorously. Indeed, he did everything with vigor. His short hair (he did not have a beard, mustache or long side burns, which he considered bothersome, given that he had to spend so many hours under the sun) and his sun-burnt face, which never had a single drop of perspiration, gave him an authoritarian, almost military appearance. This allowed him to use a very calm and formally polite tone of voice. They climbed the stairs to the upper floor, where Don Francisco had a huge *escritorio*, namely an office, which, among other things, was also the box office for the theaters of which he was the impresario. Indeed, there were many brightly-colored billboards of the *Principal* and *Gran Diorama* hanging on the wall, as well as announcements of public balls held in the different Havana neighborhoods, also under Don Francisco's management.

"Monsieur Meucci," he said in French, the language they communicated in, *"we must now make a great effort to complete the project for the new theater I spoke to you about. We do not have much time: I hope to start building in a month or two at the very latest, as soon as the Royal Decree arrives from Madrid, so that we will be well advanced before the rainy season begins…*

ICE CREAMS

Iced beverages and foods made by mixing milk, water, fruit, honey and other ingredients with snow, were introduced in ancient China in 3000 BC. A Chinese poem dating back to the year 1100 BC also mentioned ice houses for storing ice or snow, for food-related purposes. These were small-scale precursors of the large American ice houses.

It is also known that snow deposits in wells or caves, sealed by thick wood and straw, were in use in many countries, and they are still today. For example, in Madrid, in the seventeenth century, the so-called pozos de nieve *(snow wells) were built. They were holes in the ground, four meters deep, covered with wood and straw, where the snow transported to Madrid from the* Sierra Nevada *or the* Pyrenees *in winter time was kept.*

According to legends, Alexander the Great, *as well as* Hippocrates *and* Nero, *were great lovers of sorbets.* Nero *in particular liked sorbets made of fruit, honey and snow. The snow was brought from the Apennines down to Rome and sold to the patrician houses.*

It is also told that in the late Middle Ages camel caravans transported snow from Lebanon to the palaces of the Caliphs in Damascus *and* Baghdad, *or to the Sultans in* Cairo. *During the Muslim domination of Spain, between the 7th and the ninth century, the Caliph of* Baghdad *is said to have given the secret formula of his sorbets to the Caliph of Córdoba, Spain. In fact, the word* 'sorbet' *derives from the Turkish* 'scerbet.' *Ice cream became widespread in Italy in the fifteenth century. Some believe that this was because of the recipes brought back by Marco Polo from his journeys to China, a little more than a century before.*

In Spain, ice creams appeared much later, starting from 1607. Among the many specialties, garapiñas, *made of chocolate, almonds and milk, were especially famous. Ice cream became popular in France thanks to the Florentine* Procopio Coltello *who, in 1660, opened the* Café Procope *on 13, rue de l'Ancienne Comédie, in Paris, which became famous for its ice creams and sorbets.*

His school flourished to the extent that, by 1675, there were over two hundred and fifty ice cream makers in Paris alone. Two important books featuring a wide variety of recipes for iced creams were published in Spain, in 1824 and 1831, and the Spaniards obtained 15 patents for ice cream machines between 1884 and 1913. This explains the popularity of ice cream in the Spanish colonies, especially Cuba. Ice cream became popular in the United States as of the second half of the

nineteenth century. An ingenious ice cream machine which used ice and salt was invented by Nancy Johnson, *a farmer's wife, in 1846.*
In 1851, a man by the name of Jacob Fussel *began to sell ice cream in* Seven Valleys, Pennsylvania, *and later in* Baltimore, Maryland. *In 1890, the so-called* Sunday ice cream *was invented in* Wisconsin, *which consisted of hot chocolate, cream or fruit syrup, poured on top of normal ice cream. The name of this specialty was soon changed to* sundae ice cream *(as it is known still today), in response to a Puritan's accusation according to which the manufacturer had desecrated the name (Sunday) of the Day of the Lord.*
Iowa State College *first set up regular courses on ice cream making techniques in 1892.*

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Your lodgings will be there too, so it is in your best interest to follow the project with care… As regards the 'maquinaria' of the Principal, you can delegate part of the work to your assistant, Juan Alersi … what do you think?…"

"Con mucho gusto, Señor Marty," Antonio replied, showing off the few Spanish words that he had learned in the last three weeks. *"Please, feel free to speak to me in Spanish, so that I can get used to it… If I don't understand some words I'll ask you… As for the theater project… Do you already have the drawings?"*

"Por cierto! Hey, Paquito, go and get that roll that is on the table in the other room and bring it over here…" In the meantime, Antonio was admiring the splendid view of the harbor from the huge windows on the first floor of the *Pescadería …*

"Here! Señor Meucci, you can take them with you and study them… then come to see me down at the Muelle de Luz, near the Principal. Ask to see me … They will tell you where you can find me… Buena suerte!… Ah, before I forget … Paquito!… The fish for Señora Esther!… give it to René, tell him to take it to the Señora at once!… Hasta luego, Señor Meucci!" Before Antonio knew it, Don Francisco was already down the stairs. From the window of the *escritorio*, he watched

him jump on the saddle and spur his horse down the *Empedrado*, towards the *Plaza de la Catedral*.

Antonio decided he would have to learn how to ride, like all gentlemen in Havana, who left the *volantas* to the ladies, except when they had to go to the theater or to visit friends with their family. He also needed a nice pair of *botas fuertes*, that is to say riding boots, which, luckily, were inexpensive in Havana. At that time, both he and Esther used the same *volanta* driven by René, and they gave each other appointments to pick each other up. To be independent, it was also necessary to know one's way around the city and to speak the language. Well, after all, they had not even been there a month yet!

When he arrived home, Antonio began to unroll the drawings and studied them carefully. *My God!*… - he thought to himself - … *this isn't a theater!… it's… it's… a coliseum!* Actually, Antonio was not really worried about the architectural structure (more complex problems had been solved in Florence), rather his concern was for the acoustics. No matter how powerful the singers' voices were, they were bound to wane in that huge hall. Also, it would not be possible to use velvet for the curtains or to cover the walls, because of the climate, which made it necessary to provide good ventilation. It was also impossible to ensure good acoustic isolation from outside noises, as eighty windows had to be left wide open in order to allow the air to circulate. For the same reason, the boxes were open on all sides. All of these problems did not exist at the Teatro Principal, as it was much smaller and more intimate, but it is also true that it was extremely hot. By the way, today's reader must realize that in Havana windows had no panes. On the lower floors there were iron gratings that jutted out by a span over the street, which served to protect the houses from thieves as well as to allow the people inside to look up and down the street. Curtains were rarely drawn and were generally used to decorate the window and balcony frames. On the upper floors windows often had wood shutters and light loosely-knitted cotton curtains, always to facilitate the circulation of air.

Meucci, however, was not a kind of man to be discouraged. Here is what refers a reliable witness, Nestor Baguer (already mentioned), who was a relative of the Marty family: "Two [of Meucci's contrivances], among the many that he devised, that turned out to be very important, were the deviation of a nearby subterranean river, which flew into the [Havana] bay, with the aim of obtaining a sheet of water in the basement of the theater as part of a resonance chamber to improve the acoustics; also, a series of mechanical jacks to cause the floor of the stage to be at the same level of the theater's hall. As a result, the Tacón theater was considered, at the time, the third best theater of the world, after the Scala of Milan and the Opera of Vienna."

As we have already mentioned, in January 1836, even before authorization arrived from Madrid, Tacón had already officially put Don Francisco Marty in charge of building the new theater, given the excellent job he did with the *Pescadería*. It was agreed that the theater would be built at Don Francisco's own expense and that it would remain his personal property. The land, instead, would be sold *'a censo,'* that is with the right of use, and would remain the property of the Administration of Royal Revenues. Furthermore, none else would be granted permission to undertake other theater-related activities in Havana for a period of twenty years. This meant giving Marty another monopoly, in addition to the fish-market. As regards the site, a lot was chosen just outside the walls, almost opposite the two gates of *Monserrate*, where the southern end of the *Paseo Extramural* connected with the *Calle de Monserrate.*

This lot was adjacent to the so-called *Depósito de Villanueva*, situated on *Calle de Monserrate.* It was used as a warehouse for the railway station under construction, known as *Estación de Villanueva.* The area was part of a large lot which had previously been occupied by the *Jardín Botánico*; the latter had been moved a few months before in order to make room for the railway. Precious trees and shrubs were transplanted to a somewhat remote area along the *Paseo de Tacón* (or *Paseo Militar*, under construction at the time) in a locality known as *Los Molinos del Rey*. In the same area, Tacón built himself a small villa with a garden, which was later to be used as the private residence of the General Captains.

The Diorama Theater on Calle de Industria, behind the Gran Teatro de Tacón

An interesting fact is that the *Gran Diorama* of which Don Francisco was the impresario was located just behind the area chosen for the Gran Teatro de Tacón, on the block between Calle del Consulado (which was being built) and Calle de Industria. The entrance was on the latter street. In fact, the side of that block, which overlooked the Consulado, was occupied by the *Serenos* barracks, which had to be moved from nearby Calle de San José to make room for the Gran Teatro.

Diario de la Habana of 21 November(left) and 28 November(right) 1837. Note that the name changed from 'Teatro Nuevo' to 'Gran Teatro de Tacón'

On 21 July 1836, Don Francisco bought a lot with an area of approximately 5678 square varas (the *vara* was the Cuban yard, a little longer than the Castilian yard and somewhat shorter than the corresponding English yard, the Cuban yard being equal to 84.8 centimeters), delimited, from the front toward the *Paseo*, by the still-existing streets de San Rafael, del Consulado and de San José.

State map of the land used for the Teatro de Tacón (1853) Note the 'Antiguo Cuartel de Serenos,' left of the patio, and the new 'Cuartel,' above

To cover his first expenses and, in particular, to purchase the land, Don Francisco asked the government for a loan of hundred-and-seventy-thousand pesos, to be paid back by organizing six costume balls, free of charge, the earnings of which would go to the government, with the sole exception of the

first year's ball, for which Don Francisco would keep the profits as part of the government's contribution to his investment in the enterprise. Furthermore, Tacón agreed to supply him with free labor - resorting to slaves, prisoners and farm hands (*peones*) - as well as building blocks from a nearby government quarry.

Madrid's authorization to begin the works was granted by Royal Decree on 24 February 1836. The portico, hall, café and theater hall were already completed by August 1836. On 29 March 1837, when the structure and roof beams were finished, Marty asked the government to put it to the test. Although the theater (temporarily called *Teatro Nuevo*) was not fully operational yet, on 21 November 1837, the first season was announced, which was scheduled to begin on 23 November with the magician and ventriloquist *Herr Blitz*. The show was to be held in the lower hall, a large rectangular twelve-by-thirty meter hall built along Calle del Consulado, next to the back of the actual theater, as can be seen in the master plan shown above.

The Gran Teatro de Tacón, immediately after construction. Note the absence of surrounding buildings, the statue of Isabel II, and, on the left, the building with the residences of Meucci and Don Francisco as well as the laboratory-workshop (standing against the theater)

On 28 November 1837, the name *Gran Teatro de Tacón* - which was then kept for over a century - appeared in the press for the first time. About one year after the works were completed, precisely on 18 November 1839, the lot was accurately measured. It turned out to be about 500 square *varas* larger than the surface area initially purchased by Marty, for a total of 6176 square varas, which is the figure given by many historians, including the well-known *Jacobo de la Pezuela.*

The newly-built Gran Teatro de Tacón, a corner view with Calle San Rafael

THE NOBLENESS OF SMOKE AND NOISE

On Sunday, 19 November 1837, the rain came down in sheets over Havana. It had been pouring all night, and it didn't look like it was going to stop. Nevertheless, at dawn several hundreds of gentlemen and ladies were already crowding under the roof of a large wood construction, situated a good mile outside the city walls, in the stretch of Calle de Santa Rosalia between Estrella and Maloja. This construction served as the temporary railway station, which was going to be opened on that day.

The ladies had a difficult time getting out of their carriages without splashing mud all over their skirts and petticoats. A few thoughtful slaves managed to take some boards from the nearby railway construction yard to be used as foot-bridges. The yard was still in operation, as the last mile of tracks leading to the real station, in the center of the city, was yet to be laid down. The station, known as the *Estación de*

Villanueva, was being built on the land where the *Capitolio* (*Capitol*) currently stands, precisely on Calle de Cristina (today Calle de Barcelona, which had not yet been cut off in front of the Capitolio), thus, practically behind the Gran Teatro de Tacón, not exactly a convenient site for it.

The ladies, who had not renounced wearing their satin shoes, balanced acrobatically on the foot-bridges, which were placed lengthwise at the foot of the step of their *volantas*. They rested their hands on the palms of their escorts, who donned morning coats and top hats (and boots), while the slaves tried to protect them with large umbrellas, caracoling in the puddles from one side of the foot-bridges to the other.

The sun was eclipsed by long bands of dense clouds while rolls of thunder boomed fitfully like bursts of laughter above the heads of that small crowd, followed by sudden downpours on the tiles of that makeshift railway station. From the overhanging cantilever roof, decked with flags that were now mere sopping rags, sheets of water poured down, as if dropping a fine curtain between the bystanders and the object of the inauguration. The water crashed down on the wagons, which, alone, benefited from that rain shower that kept them sparkling clean.

The Intendente de Hacienda, Conde de Villanueva

Tacón had sent Manuel Pastor to represent him. There was no one else from his camarilla, whereas the Creole aristocracy - especially the owners of the sugar, coffee and tobacco plantations - were there, led by the Conde de Villanueva, promoter and chief supporter of the railway. Don Francisco had recommended that the Meuccis not take part in that ceremony. It would have been viewed as an unsuitable sign of appreciation for the man considered to be an enemy of the Gran Teatro, a personality who was compromised with the enemies of Spain. Antonio thought that, after all, he could travel on the second run, after the inauguration, which had been scheduled for two o'clock in the afternoon, or even on one of the following days. Besides, he was not really interested in the ceremonial pomp, rather, he was eager to take stock of the technical innovations.

The people of Havana had first grown accustomed to steam navigation eighteen years before, when the steamer *Neptuno* reached Havana. Yet, beholding now, on land, that huge funnel sustained by such a tiny locomotive, with every mechanical detail in sight, was somewhat surprising. What most attracted the curiosity of the more naïf were the crank gear mechanisms of the locomotive wheels: what were they for? How could the wheels roll rapidly down the tracks with that clumsy hindrance? The tall funnel, instead, was considerably appreciated, especially by the ladies who wanted to be sure that the smoke would not come in through the windows, which, needless to say, could not be kept shut. Not in Havana!…

The *yanquis* (as the North Americans were called in Cuba) had taken care of every detail, even the most formal aspects, as was their custom, in order to convey an image of absolute seriousness and precision. The brass door handles and window frames were beautifully polished, the wood interiors and benches of the wagons were also spotless and the conductor's and ticket controller's uniforms were impeccable, with *'Ferrocarriles de Cuba'* tags on their berets and pockets, a whistle on a chain and … departure at eight o'clock, on the dot, even though the watches of the time could not be that accurate. The event - thanks to eight years of experience in the United States - was sure to be a success.

Rows of tobacco plants in Havana's countryside

When the passengers were finally sitting in the comfortable wooden seats, sheltered from the rain, they heard the station master blow his whistle. He was showing off a watch that he held in his left hand and, judging by the way he glanced at it, it must have been a marvel of accuracy. Only after they were shaken by the first jolt of the piston, followed by a powerful *choo-choo* of the locomotive, did they see the large wooden board with the writing *La Habana* slowly fade into the distance. Indeed! they were leaving *La Habana*… and they were experiencing the excitement of their first train ride. Yes - they were saying - it wasn't at all like setting sail from a port … and the station was not like … a port at sea. It was different … But why was it different? … Because there was a deafening noise! … No, it wasn't the *choo-choo*, which might actually have been a pleasant background noise. It was the wheels clanging on the tracks, which made it seem as if one was rolling on them on one's ears …

And then there was the excitement of this promiscuity. Not that the people of Havana hated promiscuity, but it is a fact that the ladies never got off their *volantas* when they went to public places like cafés and they only appeared in public in theater boxes, where they were admired from a certain distance or during the *ferias* and public balls, when they were masked. So, there was always some sort of screen. Here, instead, they could be sitting right next to someone they had never met before, only because he had bought a first-class ticket. They said that sooner or later the railways would have to remedy this situation and organize things like at the theater, with reserved compartments, otherwise, only common people and tradesmen would travel by train, for they certainly would not!

The travelers on that first railway convoy wondered how many horses would have been needed to drag the train at that speed. Someone said that he would arrive faster on horseback and suggested organizing a race between the train and a horse, with bets. They learned from the station master that the power of steam engines was already given in horse… power! *"Horse*

power?… How absurd!… Which is the first station?" - asked a young lady whose huge petticoat gave her the right to occupy two seats. *"But its Bejucal… It was on all the papers yesterday…"*- answered an elegant gentleman from a seat behind her. He was sitting with a four or five-year-old boy (seemingly his son) dressed exactly like his father, down to the jeweled bamboo stick, gold watch and diamond ring (a must for Havana's high society). *"I beg your pardon,"* said the companion of the lady sitting in front of her, *"You have not seen the morning papers… here… Before coming to the station we stopped at the Café de los Franceses at Campo de Marte for a cup of hot chocolate and I glanced at the 'Noticioso'… There will be stops at all the 'ingenios'* (sugar plants) *between here and Bejucal, where they have organized celebrations … Only, with this rain… Let's hope it stops! …"*

Even for someone from Havana, the beauty of the landscape that unfolded before the eyes of the passengers, several miles outside the city, was beyond compare. At times they had the feeling of riding a monster which was slashing open a path in the forest with giant machetes, so close were the branches and leaves of the tall trees to the train windows. Then, all of a sudden, there would be open clearings with that soft, peaty red soil that was so incredibly fertile. Often they saw large plantations, with the characteristic rows of green and lush tobacco plants, which stood out against the brown earth. Between the rows they could see the straw hats of the slaves at work despite the rain, which, however, seemed less violent in the country than downtown.

The light yet intense green of the meadows slowly gained darker hues as it climbed up the surrounding hills, where the tree tops of thick woods alternated with the gray strips of steep rocky walls. As they approached an *ingenio*, there was a procession of large huts, with very tall and sloping roofs made out of mud and bamboo, which were held together at the top by a curious seam joining two opposite poles. Yes… they would have a lot to tell when they returned and especially a lot to remember.

In the meantime, in his office at the Palace of the General Captains, Tacón was writing a furious letter to the Spanish Prime Minister. He stressed that a year before he had warned Madrid against the North American and English maneuvers to take Cuba away from Spain. He also recalled the speech of the United States President *John Quincy Adams* on 25 May 1836, which mentioned the possibility of their military intervention in Cuba. As Tacón underlined, this ran counter to the *Monroe Doctrine* approved on 2 December 1823 by the previous President *James Monroe*, according to which *"all interventions of European states in the domestic affairs of independent*

American governments, and vice versa, are to be rejected." Obviously, according to Tacón, President Adams took it for granted that Cuba had nothing to do with that *'vice versa,'* of Monroe Doctrine: in other words, it was not involved in the domestic affairs of a European State. At any rate, Tacón's tirade aimed to prove that Count Villanueva's collusion with the English and Americans—which was clearly revealed by the construction of the railway—was to be considered a hostile act against the Spanish crown and, therefore, was not to be tolerated.

Havana's countryside

In turn, Villanueva added more arrows to his quiver. He reminded Madrid that Tacón was a good friend of the North American Consul in Havana, *Nicholas Philip Trist*, who had supported him in the black slave trade from the beginning of his government, back in 1834. According to Villanueva, this was proven by the fact that the highest number of black slaves ever to be brought into the island was registered in 1835. Villanueva accused José Estava, Don Francisco Marty and Joaquín Gómez, who all belonged to Tacón's *camarilla*, of being the main agents for this trade, which was supported by Mr. Trist.

THE RAILWAYS

In 1814, George Stephenson invented the first locomotive in England to solve the problem of transporting carts between mining centers. Eleven years later, on 27 September 1825, the fist passenger train traveled from Stockton to Darlington, always in England. Railways were later to spread throughout the world. In 1829, railways began to be built in the United States, followed by France in 1833, Germany and Belgium in 1835, Russia and Cuba in 1837, Austria in 1838, Holland and the Kingdom of Naples in 1839.

The advent of railways brought a revolution in the distribution of urban settlements, farms and industrial enterprises, for they concentrated on both sides of railway lines and, preferably, near the stations, in order to benefit from low-cost, easy freight and passenger transport. Railways also became an important sector for competition between the great capitalists, owing to the huge returns on investments that were expected.

The first railway in Havana was set up because of the high cost of transporting sugar and rice from production centers to the port of Havana, which was previously done on mule back or by using very slow wagons. One of these centers was Güines, about twenty-five miles from Havana, which produced more than seventy thousand crates of sugar a year in 1830. The idea had originally been to dig a navigable canal between Güines and Havana, in order to curb transport costs, but the final decision was to build a railway.

A commission was set up under the Vives government which included Intendente Villanueva and other distinguished personalities. They worked on a project, which was initially formulated by an Andalusian trader living in London, named Marcelino Calero y Portocarrero. The project was granted Royal approval on 16 October 1834. A first loan of two million pesos was obtained from investors in London and contracts were stipulated in New York for the supply of all necessary material and specialized work force. A group of 280 people, comprising highly-skilled workers and experts, arrived from New York and was supervised by Mr. Kruger, an engineer. Slaves were also employed (including white slaves from the Canary Islands) as well as prisoners, who were subjected to exhausting workloads. There was even a case of mutiny that ended in a blood bath.

The railway was completed in record time, and was inaugurated on 19 November 1837. The first stretch was twenty-seven kilometers long, from Havana to the town of San Felipe y Santiago de Bejucal (or simply, Bejucal) situated in the hinterland,

south of Havana. A wood shed was used as the provisional station, and was situated on what is now Calle de Oquendo, between Estrella and Maloja. The first railway convoy left that day at eight o'clock in the morning, under a torrential downpour with seventy passengers on board who paid twenty reales for a first-class ticket and five reales for the third class respectively. The train had three passenger wagons with 24 seats each and two freight cars, in addition to the locomotive and the service truck. A second convoy left at two o'clock in the afternoon of the same day, carrying the same number of passengers and under the same bad weather conditions.
The terminal station was completed only a few months after the inauguration and was called Estación de Villanueva. *It was located in the area where the Capitol currently stands, on Calle de Cristina, which is now called Calle de Barcelona. In 1838, the forty-five-kilometer stretch between Bejucal and Güines was completed, and this solved the old problem of freighting farm produce from the agricultural areas in the hinterland to the port of Havana.*
Almost every year after 1838, new railway stretches were added to the network, at a rate ranging from thirty to one hundred kilometers a year. By 1850, the island's railway network comprised ten lines, covering a total five hundred kilometers, including the important line between Havana and the port of Matanzas.
The railway line between Havana and Bejucal was the first to be built in Latin America and it actually preceded the first railway in Spain by eleven years.

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EL CONDE DE VILLANUEVA

Claudio Martinez de Pinillos, Conde de Villanueva, *was an influential member of the Creole aristocracy who had held the offices of Intendente de Hacienda - Financial Administrator of the Royal Revenues* (Rentas Reales), *and of Treasurer of the Army since 1825, under Governors Vives and Ricafort. He had also had a long career in the administration of the colonies and was esteemed and supported by the Spanish Royal Court. He had been awarded the* Gran Orden de Carlos III *and the* Gran Orden de Isabel la Católica, *as had Don Francisco Marty. At the beginning of Tacón's government, Villanueva tried to establish good relations with him, but he soon realized that the new governor had no penchant for duets, though he did respect the relative independence that had always been granted to the Intendente in his sphere. A strong competition developed between the two men, at first concealed and then increasingly overt, which, on the other hand, gave Havana the most impressive number of public works in its history.*

Count Villanueva is to be credited with three essential achievements in infrastructure: the bay dredging system, the Fernando VII aqueduct and the railways, which have already been mentioned, and, in all cases, state-of-the-art technology was used. Villanueva liked to keep abreast of modern developments and, oddly enough, he was helped in this by the governor's brother, Don Francisco Tacón, *who was the Spanish Ambassador to the United States and was paid, including all Embassy expenses, by the Treasury of Havana, therefore by Count Villanueva's offices.*
As regards the bay dredging system, in 1832, Villanueva had the pontoon, that was used until then, replaced with a new steam-powered dredger supplied by the United States, which could dredge down to thirty feet with its four grabs. A few years later, in 1838, Villanueva decided to contract the dredging of the bay to an American, C. Drake, *for a fee of 5 centavos per cubic foot of refuse removed from the bay.*
Pérez de la Riva *wrote that while Tacón was a full-fledged expression of the past century, Villanueva embodied the thrust of the industrial revolution. It was said that Tacón considered not only the railways, but all sorts of machinery built by Villanueva with the Royal revenues, little more than iron junk. Perhaps it would be more correct to say that while Tacón was passionately fond of stone, Villanueva loved iron, but this would not be entirely true. What is certain is that whenever one of the two men undertook a*

project, the other would immediately reply with another project, often of the same nature. For example, when Tacón had the Fuente de Neptuno *placed next to the Comercio wharf, Villanueva commissioned the* Fuente de la Noble Habana *(better known as* Fuente de la India*) and the* Fuente de los Leones. *The* Fuente de la India *was sculpted by the Italian* Giuseppe Gaggini *in magnificent Carrara marble and was shipped to Havana. As soon as it arrived, in January 1837, Villanueva had it placed right in front of the* Puerta de Tacón, *on the East side of the large rectangular Campo de Marte. The* Fuente de los Leones *was designed by the Italian architect* Tagliafichi. *It was placed in the center of the* Plaza de San Francisco de Asís, *in front of the San Francisco wharf. So Villanueva also became fond of stone, though perhaps this liking was induced by the other. In turn, Tacón commissioned a special six-hammer pounding machine (requiring six workers) to crush flint stone into tiny pieces, which were then rolled with a heavy road roller, as part of the vast plan to macadamize the streets of Havana.*

It was obvious to everyone that, while Tacón had the Gran Teatro built, Villanueva concentrated on the railways, when Tacón refurbished the palace of the General Captains, Villanueva did the same with the palace of the Intendente (his own, that is, which stands beside the palace of the General Captains). And so on and so forth, each one mischievously choosing times and places that would interfere with his rival's projects. Villanueva, for instance, set up all of the railway's warehouses in the area that once belonged to the Botanical Gardens, adjacent to where the Gran Teatro was being built. When the railway was inaugurated on 19 November 1837, just before the opening of the Gran Teatro, Tacón and Villanueva accused each other in public. Tacón even spread the rumor that he would soon get rid of his rival forever embarking him on a ship headed for Spain. Instead, the competition between the two came to an end on 21 April 1838, when Tacón was ousted. But Villanueva was soon removed from office, too. However, he managed to be re-appointed as Intendente in 1843, after which he returned to Spain in 1851, to hold the office of Overseas Councilor. There he died, two years later.

The church of S. Francisco de Asís and the Fuente de los Leones

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More precisely, he said that, in 1838, acting on behalf of the United States government, Consul Trist had provided documents to as many as sixty-one of the seventy-one slave trade ships which had entered the port of Havana that year. Mr. Trist, on his part, had motivated his action by saying that the United States could not tolerate any inspection on those ships by the English Navy. There is indirect evidence of this friction between the United States and England in a letter written a few years later, dated 15 July 1840, by the United States Secretary of State, John Forsyth, to the US Ambassador in Madrid. In relation to English claims over Cuba (concealed under the pretext of the continuing slave trade) he asked the Ambassador to reassure the Spanish government that it *"could count on military and naval support from the United States in case of any attempt to overtake the island from Spain."*

'GRAN BAILE' IN HONOR OF THE GRAN TEATRO

Don Francisco had taken a big financial risk in investing in the construction of the Gran Teatro, despite the 170,000 pesos loan and the subsidies received from the Government in the form of building stone and labor. He therefore had to try to pay back the expenses as soon as possible and one of the best ways to do so was to organize Carnival balls, which everyone took part in, regardless of social class. The tickets only cost one dollar each, but most of the money was made with the drinks, the prices of which soared on those occasions. In Havana everyone had a passion for music, singing and dancing; people would sing, play the guitar or the piano and dance in their houses, from the masters down to the slaves, from morning till late at night, every day of the year. So, when Carnival arrived …

On the night of Carnival Thursday, 18 February 1838 - Carnival night - although not all of the finishings were in place, the Gran Teatro de Tacón was opened for a series of masked balls. There were about seven thousand people inside the theater for the first ball, while other fifteen thousand crowded outside.

Otto Eduard thus describes his visit to the Gran Teatro that same year, during one of these masked balls: *"I went to the Tacón… at eleven o'clock in the evening, for the last and most spectacular masked ball that had ever been organized in*

Havana, as the billboards announced a few days before. Coming from the Principal where I had seen an Italian opera, I had to walk a long distance through quiet roads where all I met were serenos and patrols. As I neared the Tacón, the number of people in the streets began to increase. Masks of all types were observed with amusement by the onlookers who were not disguised. After having paid the ticket, I entered the theater foyer which was crowded with people with or without costumes. The cigar smoke was thicker than in Berlin's Wintergarten. There are rules concerning masks: anyone can enter except for Negroes and it doesn't matter whether they are clean or dirty and as long as they have paid the entrance ticket. Smoking was allowed in the stalls and everyone did so. Ten thousand tickets were sold on that occasion, and those who were not able to find a seat inside the theater would go outside with a token and breath in deeply the fresh air under palm and orange trees, and drink coffee or eat fruit which was sold in the square in front of the theater. The roads [*around the Paseo Extramural*, Editor's note] *looked like 'Plazas de mercados de abastos'* [open-air markets where, in the morning, food was bought for the day, Editor's note]. *Everywhere, food was being boiled or roasted. It was pleasant to see thousands of men wandering about in the night without a single one being drunk …"* According to what Otto Eduard relates, it seems likely that access was permitted through the gates of the wall during those balls, even after the *cañonazo* was shot, or that at least some were left open, like the two gates of Monserrate.

According to Fernando Ortiz (1941, see bibl.), the government permission granted by Tacón for the masked balls took effect one week before the three days of Carnival, and lasted through Lent, contrary to the Church precept calling for meditation and abstinence from amusements during that time of the year. This was yet another weapon in the hands of Tacón's enemies, who accused him of anticlerical behavior. Tacón retorted by accusing the clergy of quite frequently organizing *fiestas* and balls of their own in the cloisters of the convents.

After Carnival and Easter, and exactly on Thursday, 15 April 1838, the theater was officially inaugurated. The opening program included the drama *Don Juan de Austria* and a series of boleros performed by Doña Reyes Valenciano and Tiburcio López. Don Miguel Tacón went to the theater riding his austere black carriage down Calle de O'Reilly, which had been macadamized a few years before, crossing the walls through the new *Puerta de Monserrate*. As soon as his unmistakable carriage was seen to cross the gate from the terrace of the Gran Teatro, the military band stopped playing its usual repertory and began the Royal march, while thousands of Bengal lights

were fired, lighting up the majestic theater which was surmounted by six tall flagpoles, flying the Spanish flags. Meanwhile, inside the theater, the Royal box was given the finishing touches. It was said to be more luxurious than any of the Royal boxes of Europe's greatest theaters. As can be seen from the two prints shown here, despite the huge size of the Teatro Tacón, its basic layout was very similar to that of the Pergola in Florence, where the Royal box was in the classical position, in front of the stage.

The Royal procession then crossed the Paseo Extramural and Tacón's carriage stopped on Calle de San Rafael, in front of the entrance reserved for the Royal box (the Royal entrance). As soon as Tacón took seat on the throne of the Royal box, Don Francisco Marty went over to greet him and brought him refreshments. He then gave the order to begin the performance. This ritual was introduced by Tacón but was later adopted by most of his successors. Moreover, the corner of Calle de San Rafael right in front of the Royal entrance, became a meeting point for distinguished personalities and the center of many elegant social activities outside of the walls. In 1841, right on the corner between San Rafael and the *Paseo Isabel II* (formerly *Paseo Extramural*) the *Café Eucariza* was opened, which became a famous meeting place, where two circles, the theater and high society, would mix. It was later replaced by the *Hotel Inglaterra*.

The Hall of the Teatro della Pergola and that of the Gran Teatro de Tacón Note the similarities in style and the large central candelabra (araña)

Ironically, Tacón left the government of Cuba less than one week after the inauguration of the Gran Teatro, which was so important to him, and was certainly the most spectacular of his many accomplishments.

FERIAS, FIESTAS AND BALLS

The ferias were nine-day festivity periods that were organized in one or another of Havana's neighborhoods. They began on 7 September (the eve of Mary's Holy Name celebrations) in the Regla neighborhood. Regla was followed by the Merced quarter and then by all other neighborhoods, one after the other, so that for many months there was always one neighborhood in which the ferias were being given. Other famous ferias were the Guanabacoa for Candelaria (2 February) during which candles were blessed. The ferias mayores, instead, were celebrated during Holy Week. Ferias became very popular as of the nineteenth century. Large crowds of people were attracted to the neighborhoods where they were being held, but they were also often the occasion for disorders and crime. Tacón informed Madrid that his predecessors had incautiously given their consent to setting up gambling tables along the neighborhood streets and squares, and even around the churches or the sanctuaries where the religious celebrations were held, and, furthermore, that the people, excited by the music and dances, would get carried engaging in unruly behavior. Thus, Tacón moderated such fiestas, for the sake of law and order, which was jeopardized by the gatherings of people belonging to all social classes during the ferias. To begin with, he tried to steer people towards milder forms of entertainment such as strolling along the paseos and the theater and, at any rate, he severely prohibited gambling in the streets. But dancing remained the favorite amusement of the people of Havana, followed by the theater.

Masked balls, or Carnival balls, were generally six in number and were to be held in the months of February and/or March of each year. However, many other balls were organized such as the bailes de la Piñata, de la Vieja, de la Sardina, or de Figurín, which were later to become an important part of Havana's folklore. Culbertson relates that, in 1836, public masked balls were held every Sunday evening (and often also on other days) and were open to anyone who paid the one-dollar ticket and behaved appropriately. On those occasions people of the upper social classes - from the governor to the clergy - usually preferred to gather in private salons, which could host up to one thousand guests. The greatest expenses involved in attending a ball - which hardly anyone turned down - were the renting of costumes for the various evenings (the price would range from four to five dollars per evening for the costumes and a dollar and a half for the mask), the costs of

refreshments and dinner as well as any losses incurred in the authorized gambling halls. Quite often the gambler who lost (or was a criminal) would pull a knife out of his pocket, stab someone and rob him, without those present intervening in any way or even calling the soldiers who were present and alert at all times. Even the women would refrain from crying, and they would often whisper "sshhh …" to the onlookers, inviting them to pretend that nothing had happened.

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AT LAST A HOME AND … TWO LABORATORIES

In early spring 1838, the apartments in the annex of the Gran Teatro were completed and both Don Francisco Marty and Antonio Meucci moved in with their families. Antonio was happy at last to have a large laboratory-workshop for his tools and the theater machinery and so was Esther, to have a large laboratory for her theatrical costumes. Moreover, having the barracks of the *Serenos* right behind them (on Calle del Consulado) made them feel much safer, as they were living in a neighborhood outside the walls.

According to the descriptions given by Domenico Mariani and by Antonio Meucci himself at the Bell/Globe trial of 1885-1886, the apartment of Antonio Meucci and his wife Esther was situated on the ground floor of the annex building, on the side that overlooked the Paseo Extramural, and it communicated with the theater itself through the laboratory-workshop. More precisely, as is shown in the figure on p. 271, the laboratory-workshop stood against the theater, but it had a door that led to the Meuccis' private apartment, as well as a second door that gave access to the back of the stage and a few doors opening onto a large courtyard (*patio*) situated in front of the annex building. Don Francisco Marty's apartment probably occupied all of the top floor of the annex-building and, as shown in the axonometric view below, it had a large balcony, covered by one of the two pitches of the roof, which looked onto the Paseo. One can also deduce that the back of the building's ground floor, which overlooked Calle del Consulado, was occasionally used as a hall for small performances or as a game-room (called *Salón bajo* or simply *Salón*, as shown in the plan dated 1853, reproduced on p. 253).

Old axonometric view of the Gran Teatro de Tacón showing part of the annex-building (top left of the figure) where Meucci (ground floor) and Marty (first floor) lived

According to Domenico Mariani's testimony at the above said Bell/Globe trial, the costume laboratory appears to have been situated at one end of the Meuccis' apartment. Indeed, Mariani stated as follows: [Answer no. 5] *"The rooms were three or four: the theater tailoress's workshop, then came the parlor, the kitchen and the bedroom …"* Therefore, according to Mariani, the costume laboratory came before all the other rooms. Putting these statements together with Meucci's - the latter accompanied by a drawing made by him during his testimony - it would appear that the laboratory-workshop came after all the other rooms, so that the two laboratories were at the two opposite ends of the apartment. Therefore, the location and layout of the apartment should correspond to those shown in the plan given on p. 271, which was pieced together by the author. The fact that Domenico Mariani did not mention the

laboratory-workshop in his description of the apartment, may be explained by the fact that the latter did not form part of the annex building but of the theater itself. In fact, Mariani mentioned the laboratory-workshop in another passage of his testimony, as we shall later see, simply referring to it as the *laboratory*.

At last Antonio Meucci could let his creativity run free: he had the means, time and opportunity to experiment in all technical branches. However, it goes without saying that in his first years in Havana he devoted all of his time to the theater's technical installations.

Indeed, probably due to the time required to prepare the equipment, the first full opera was staged at the Gran Teatro de Tacón only one and a half years after its inauguration, precisely on 26 October 1839. On that occasion, *Il crociato in Egitto* (The Crusader in Egypt) was performed with the participation of Teresa Rossi, Attilio Valtellina, Federico Badiali, Clorinda Corradi Pantanelli, Marietta Ellerman and others. This was the first time that the Gran Teatro appeared to the public in all its splendor.

Reconstruction of the plan of the Gran Teatro de Tacón, showing the apartment and laboratories of the Meuccis

An intelligent and active merchant from Como specialized in machinery and instruments, by the name of *Gaetano Negretti*, contributed to the success of the Tacón theater's technical installations. He was the owner of two famous companies; one was located in New York - *Negretti & Leoni* - which he managed himself, while the other had its headquarters in London - *Negretti & Zambra* - and was run by his brother, *Henry Negretti*[5]. In his frequent journeys between New York and Europe, Gaetano Negretti often stopped over in Havana, where he always did good business selling sophisticated machinery and equipment - imported from England or the United States - for many different uses and customers.

Antonio Meucci first met Gaetano Negretti at the Café de la Paloma, which was popular with American travelers and foreign merchants. Meucci often went there, also in the hope of meeting someone on his way to Italy, to give him a letter for his family, or simply to hear fresh news from his country. This was quite common at the time.

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[5] According to the Italian encyclopedia *Scienziati e Tecnologi (Dalle origini al 1875)*, Arnoldo Mondadori Editore, Milan, 1975, Vol. 3, pp. 674 and 705, Negretti & Zambra of London are credited as one of the major instrument makers of the time. They are specifically credited for having realized the first protected thermometer in 1857 and the first overturning thermometer that was used in 1874 by the ship *Challenger* for oceanographic explorations.

It was easy to become friendly with Negretti, owing also to the latter's cheerful character and rare ability to understand the clients' needs and suggest the right technical solutions, and, what is more, he kept his promises, both in terms of quality and delivery time of the supplies. This is how Antonio Meucci described Gaetano Negretti at the Bell/Globe trial:

[Answer no. 12] *"… He was… an importer of goods in New York whom I recommended to the theater impresario for the purchase and shipping of all of the objects that were necessary for the theater and Negretti was in relation with me for all the orders for which I wrote him on behalf of the impresario …"*

Negretti brought recent and reliable news on the latest technical developments, and had a good knowledge on the actual availability of related products on the market. Antonio Meucci also ordered some books from him, besides laboratory instruments, that were not available in Havana. For example, between 1842 and 1844, Meucci purchased: the "Traité de l'électricité et du magnétisme," in seven volumes, by *A. C. Becquerel*, published in 1840 by the *Librairie de Firmin Didot Frères* of Paris; the texts on electrochemistry by *L. J. Thenard* and *J. F. Daniell*, works by *Luigi Galvani, Charles A. Coulomb*, a French translation of publications by the German physicist *M. H. von Jacobi* and the "Traité de magnétisme animal" by the Austrian physician *Franz Anton Mesmer*.

Antonio Meucci had already studied - and made many notes on - the fundamental "Traité de chimie élémentaire" by Thenard, in four volumes, published in Paris in 1816. This text was widely used by the Accademia di Belle Arti in Florence, especially for its original indications on the chemical treatment of vegetable and animal substances, the formation of esters in organic chemistry and the notes on pigments (including Thenard's famous *cobalt blue*). These subjects were all very important for Florentine craftwork on leather, fabric and ceramics, which were compulsory subjects at the Fine Arts Academy. *Louis Jacques Thenard* was the son of peasants and later became an apprentice in a pharmacy. He was a self-taught chemist, and was first employed as a handyman in the house of the famous French chemist *Louis Nicolas Vauquelin*. Thenard is also to be credited with the invention of oxygenated water and important studies on potassium. The history of inventions, as we shall later see, records many cases of self-taught geniuses of the past century, like Thenard.

As already mentioned, Antonio Meucci was fascinated by chemistry, especially organic chemistry, perhaps also on account of his educational background. One of the first techniques that he wanted to experiment with in Havana was the perpetual electro-chemical preservation of dead bodies.

Procedures to block the putrefaction of corpses had been well known ever since ancient times (and were originally influenced by magical and religious beliefs), and they were practiced in all periods of history. However, the ancient art of mummification, which had been perfected by the Egyptians, had remained substantially unchanged until the first decades of the nineteenth century, when antiseptic chemical compounds such as phenol, formalin, alcohol and others were first introduced. Ocean navigation, which lasted many months, made the preservation of corpses very important from a commercial point of view, especially due to the need to take the bodies of people who had died in the New World back to their homelands in a good state of preservation.

In the early nineteenth century newspapers often reported on new methods for preserving bodies. In 1836, *Gerolamo Segato* from Belluno, who had been an explorer in Egypt and Nubia, died in Florence, without ever having revealed the secret of his method for the petrification of bodies, which had made him famous. Segato was not a charlatan, as proved by the fact that, up until the beginning of this century, at the Palazzo Vecchio in Florence visitors could touch the bodies petrified by Gerolamo Segato, which were still in a perfect state one century later.

A new system for embalming bodies, which was practiced by a Dr. *Nicolás José Gutiérrez*, following a patent held by the French physician Dr. *Gannal*, was announced by the prestigious medical review of Havana *"Repertorio Medico Habanero"* at the beginning of 1840. The Diario de la Habana of 8 February 1840 gave the following news: *"… The body of Nicolás Manuel Escovedo, which had been embalmed in Paris by Mr. Gannal in the month of May last year, arrived in this port at the end of July* [three months later, Editor's note] *in a perfect state of preservation …"* And, further ahead: *"… Doctor Nicolás José Gutiérrez has been authorized by Mr. Gannal to introduce his system to this island. His address is Oficios No. 40, and the price of embalming ranges from a minimum of 204 pesos to a maximum of 1,000 pesos."*

It was therefore a very good business indeed, as each embalmed body could be worth up to the equivalent of fifteen thousand dollars in 1990. In his testimony at the aforesaid Bell/Globe trial, Domenico Mariani reported that Antonio Meucci invested forty thousand pesos of then, without success, to try to solve the problem with Segato's approach, namely the petrification of corpses. This was said to have been the cause of the first misunderstandings with his wife, Esther, who did not appreciate the fact that Antonio should *waste* all of the money earned at the Teatro Tacón by purchasing extremely expensive materials and equipment for an endeavor that was

virtually impossible and, as such, almost certainly destined to failure.

Unlike Antonio, Esther was a wise administrator of her family's finances and she kept accurate accounts of earnings and expenses (in her mind, because she did not know how to write). Evidence of this was given in some of the hearings of the Supreme Court in New York, which shall be dealt with in Vol. 2 of this book.

As had already happened in Italy with the Italian impresario Alessandro Lanari, Don Francisco Marty organized many tours for the Italian opera company in the most important cities of Central and North America, that could be reached with one or two weeks' navigation from Havana. The nearest were New Orleans in the State of Louisiana - which boasted important theater traditions, brought in by the French - and Santiago de Cuba, in Cuba itself. Both destinations required about ten days' navigation from Havana. Fifteen days of navigation were necessary to reach Charleston, in South Carolina, and Veracruz, the port from which they traveled overland to Mexico City. The latter city boasted the second most important theater in the New World after the Gran Teatro de Tacón. A few years later, as we shall see, Don Francisco extended the tours of the Italian company all the way over to North America, reaching Philadelphia and New York (which required more than twenty days' navigation from Havana, at the time).

Some of the members of the Italian company are said to have rebelled against this exhausting program imposed by the Catalan impresario, but Pancho Marty was not tender-hearted. Indeed, the Diario de la Habana of 6 April 1841, wrote: *"… A sentence of the Governor's Lieutenant… in the suit brought by Francisco Marty y Torrens on the alleged breach of contract by Eufrasia Borghese, prima donna of the Italian Opera, summons her to appear before the Governor within three days to respond to the accusations made by Marty …"*

The tours in Santiago de Cuba were profitable, as they usually took place in the month of July, when Carnival was being celebrated there. This month corresponded to Havana's dead season, during which the climate was unbearable for those who were not native-born, although Santiago, if surrounded by the high mountains of the Sierra Maestra and over-shadowed by the two-thousand-meter high Pico Turquino, was three or four degrees hotter. For Antonio Meucci these tours - as had previously been the case in Italy - were an opportunity to meet many more people and to learn what was happening in other countries and what, sooner or later, was bound to have effects on Havana too.

In Santiago, in one of the usual cafés frequented by foreigners passing through, Antonio Meucci met a man called *Jim*

Mason. He was attracted by the fact that he saw him pile up sheets of printed papers, with diagrams that looked like machines, on top of an oval marble coffee table. He was showing them to a pair of distinguished-looking gentlemen who were sipping a cognac at the same table, and who did not seem to be interested in the least. Nevertheless, the vivacious American was giving them lengthy explanations and, as far as Meucci could tell, he spoke Spanish, French and English equally well. Actually… let's say that that was the impression one got, given his very odd way of speaking. He talked incredibly fast, almost gobbling up his words (no matter which of the three languages he was speaking, including his own). But his facial and gestural mimics were such that his listeners appeared to understand what he was saying. And then… he never stopped smiling and kept patting them on the back. Briefly, he was a perfect salesman, of sorts, and, at any rate, it was very difficult to get rid of him. When Antonio came up to his table and showed that he was interested, Mason's two interlocutors were more than happy to offer him a seat and quickly excused themselves, with an unambiguous sense of relief.

It took Jim Mason only one glance to understand that his new interlocutor was not the usual naïf, easy prey. His competence was also evident in his comments on the machine drawings and in the questions he asked. Not being able to discuss things at any depth, Jim Mason resorted to his reserve tactics which he fell back on in these cases. "*You're wasting your time here in Cuba, Monsieur Meiussi,*" he said in French, seeing that Antonio spoke this language well, "*You must come to the States. That's where your talents would be appreciated… Patents! Patents!… and manufacture on your own!… that's the secret! And then, with your important connections in Cuba, you would also have a safe market to export the products you invent, don't you think so?… For example, what do you say about beer?… Don't laugh, monsieur, a good 'lager' would earn you millions… Of course, you'd need someone who could give you a helping hand on site, someone who knows his way around… especially in New York… Here …*" he said pulling out his business card like a conjurer with set of cards, "*take this… write to me, or better yet come to the United States and visit me… We'll do great things together!*" And he left, in search of a new prey.

Another American he once met during a tour in *Santiago* was a man by the name of *John Anderson.* He was a wealthy tobacco dealer, but also a very cultivated and witty man who was to give substantial financial support to Giuseppe Garibaldi in the future. Anderson told Meucci that in the United States, and especially in New York, there were a great deal of Cuban

exiles and many of them were actively working for Cuban independence, which would soon be the talk of the town in Cuba. *"A landing is imminent"* he whispered, lowering his voice, *"In Charleston they are preparing boats and weapons, with hundreds of volunteers, even Yankees … It's a pity that the Cubans are arguing between each other… Some want Cuba to be annexed to the United States, including Gaspar Betancourt Cisneros, known as 'el Lugareño,' and the Venezuelan leader Narciso López who wants to organize an expedition to Cuba… But others want full independence … Believe me, Mister Miiússi, joining the States would be the best thing! …"* Antonio listened very carefully, but also with some hesitation. Then he asked: *"As you said, everyone speaks English in the United States, right? …" "No, not in all the States, Mister Miiússi,"* Anderson replied quickly. *"With the Guadalupe Hidalgo Treaty we have taken five states from Mexico, and Spanish is still spoken there …"*

Santiago de Cuba - Panorama from the 'Gran Piedra' (1226 m)

Anderson added plenty of interesting news on the community of Italian exiles in New York. He said that he often went to a restaurant on Fulton Street, near Broadway, owned by an Italian called *Lorenzo Ventura*. That was the meeting place of famous Italian exiles, but also journalists, scholars, artists and distinguished personalities of New York. *"Believe me, Mister Miiússi"* he concluded, as he said goodbye shaking his hand warmly, *"the cream of Italian intellectuals are in New York today! … I must go now … I hope to meet you again … Good luck!"*

O'DONNELL. NOT ALL THAT GLITTERS IS GOLD!

After Don Miguel Tacón left office in April 1838 (it was made to believe that he was forced to leave on account of his bad health), the governors that came after him - *Don Joaquín de Ezpeleta*, who governed up to January 1840, *Don Pedro Téllez Girón*, who governed until March 1841, and *Don Gerónimo Valdés*, governor till September 1843 - had no relation with Antonio Meucci, not even indirectly, according to the available documentation. A short government (which lasted only one month) of Don *Francisco Javier de Ulloa* followed *Valdés*, awaiting the arrival of the new governor from Spain: *Leopoldo O'Donnell y Jorris, Conde de Lucena*, who took office on 21 October 1843.

O'Donnell had been sent purposefully by Madrid to wield an iron fist, as his predecessor Valdés, a mild and peaceful man, who had been very permissive and had not stood up to the English, certainly had not contributed to bolstering the Spanish Crown's prestige on the island. At the beginning of

1844, a few months after taking office, O'Donnell met Madrid's expectations, ordering the bloody repression of what went down in history as the *conspiración de la escalera.* It was estimated that about three thousand people took part in the plot, mostly Creoles and people of color.

Leopoldo O'Donnell

This repression sparked a mass exodus to the United States of all those who had managed to escape from torture or were not killed by *garrota vil*[6], which is how many of the rebels were executed. However, not only subversives were arrested, but also people O'Donnell simply did not like, who were accused, without any evidence, of having taken part in the conspiracy. For this reason, some historians went so far as to claim that there never actually was a conspiracy, and that O'Donnell made it all up in order to get rid of his enemies.

Besides the shameful bloody repression of the *escalera*'s conspiracy, remain today, as mementos of the Governor O'-Donnell, the *O'Donnell Lighthouse*, situated on top of the *Castillo del Morro*, at the entrance of the *Canal del Puerto*, which was finished in 1845, and the *Columna O'Donnell*, which was erected in 1847 in honor of the Spanish Navy, on the *Alameda de Paula.* It should also be recalled that the *Liceo Artístico y Literario* was founded in 1844 by his government, which, in one year, was supplied with chemistry and physics equipment and laboratories, a drawing school, Chairs for Agriculture and Perspective Drawing and music archives, just like Florence's Accademia di Belle Arti. Considering that O'Donnell governed for some four and a half years, that is to say until 20 March 1848, it is fair to say that he accomplished very little, compared to the many important and impressive works completed under Don Miguel Tacón, who governed for less than four years. In a book on Cuban history written by Leiva y Marban, the following caption appears below the portrait of O'Donnell, which is shown here on the left: "*… the fine-featured and thoughtful face of this man of Irish origin does not reveal the man of action… who was authoritarian and despotic …*"

On one occasion, however, O'Donnell helped Antonio Meucci to launch a new activity.

Meucci had conceived his new project at the beginning of 1844 (only a few months before O'Donnell became Governor), drawing inspiration from the books procured by Gaetano Negretti: it had to do with electroplating, namely the electrochemical plating of non-precious metals such as iron, copper or bronze with gold or silver. But let us listen to Meucci himself, extracting a few passages from his testimony in the

[6]The *garrota vil* was a garrote by which the condemned person was slowly strangled, in order to prolong his/her sufferings.

already-mentioned Bell/Globe trial. Bear in mind that the questions of the lawyers of both sides were asked in English and translated into Italian by an interpreter appointed by the court, while Meucci answered in Italian, and his answers were then translated into English by the same interpreter.

The Columna O'Donnell and the Alameda de Paula as they appear today

The answers were then reported in the official deeds of the trial in both languages, so that the Italian corresponds faithfully (unfortunately with many printing mistakes) to the words actually pronounced by Antonio Meucci and transcribed by an Italian stenographer appointed by the same court. The answers are in very lively, colloquial Italian, despite Meucci's fifty-year absence from Florence, which is evidenced only by a few words borrowed from Spanish or English. In the following, we will utilize the English translation of the deeds of the trial, as long as it complies with Meucci's answers in Italian; if not, we will report our own translation.

[Answers no. 10 and 11] *"Now I must first state how I began with electricity. About the year 1842 to 1844 I obtained several treatises on electricity, regarding galvanoplastics and galvanism of the authors Becquerel, Jacobi, Mesmer and others, and the idea came to me to dedicate myself to that branch of industry. Around the year 1844 a certain Gaetano Negretti was with me. He suggested that he could have all the necessary instruments for such an industry sent from England by his brother. Upon said Negretti's offer I gave him an order to have all that was necessary sent to me, and after a few weeks I received everything I had ordered, including many Bunsen batteries and other tools, and insulated-copper conductors, and all that was needed to undertake said industry."*

Indeed, confirming the above, Gaetano Negretti testified in the same court case that he had sold a certain number of galvanic batteries and other electrical components to Antonio Meucci, which had been supplied by his late (at the time of the trial) brother Henry Negretti, of the Negretti & Zambra Company in London. But let us go on with the story, taking another passage from an affidavit released by Antonio Meucci himself in that same period (1885), of which some extracts are given in the Appendix in the original English version:

"… I had familiarized myself with galvanoplastic electricity, and Captain General O'Donnell, then governor of the Island of Cuba was anxious to save expense in galvanizing buttons, sword-hilts and such other things used in the army. I told the general that I could do it at lower price than he was then paying, if I could procure the proper batteries for that purpose. These could not be procured at that time in Havana, but in the year 1844, Gaetano Negretti brought to Havana some galvanic batteries and other electrical supplies

that I needed for galvanoplastic purposes. I purchased the batteries and other articles needed of Mr. Negretti. I then made a verbal contract with the Governor General to galvanize the articles required by the soldiers. I found that I was able to galvanize satisfactorily with the articles I purchased of Mr. Negretti. I opened a factory for this purpose, and employed several men - as near as I can remember about 12 or 15. I did not have sufficient batteries for my work and Mr. Negretti, in a year or two after, sent me further supplies from New York, which I purchased of him. For about four years I continued supplying the army as by previous agreement …"

Entrance to the port of Havana with the Castillo del Morro and O'Donnell Lighthouse in the background; the Castillo de San Salvador de la Punta is in the forefront

Incidentally, it is worth highlighting that, whereas many documents related to *Tacón's* government are kept in Havana, the ones concerning O'Donnell's government, instead, are kept at the *Museo de la Marina* of Madrid or in the *Archivos de las Indias* of Seville, in Spain. However, as Meucci said it was a *verbal* agreement, it seems unlikely (though not impossible) that there should be any evidence of it in the official deeds of O'Donnell's government.

Several authors reported that Meucci gained (as gross income) an incredibly large amount of money from the four-year contract with the Army, more precisely about sixty thousand dollars (or *pesos fuertes*) of then (about one million dollars of 1990!). However, the expenses incurred by Meucci in purchasing materials and paying the workers must be subtracted from that sum. As Meucci himself stated in a letter sent to the *Commercio di Genova*, published on 1 December 1865, these expenses were enormous. Indeed, he wrote as follows: *"… I was one of the first to work with all assiduity in the art of electricity as well as galvanism since the time of their first discovery; at the time I lived in Havana. Having abandoned this branch of activity because of the huge expenses, I devoted myself when I came to the United States to other branches …"* It seems likely that O'Donnell made a better deal than Meucci. As a matter of fact, in all probability, prior to entrusting the work to Meucci, O'Donnell was forced to send the objects to be galvanized to Paris (passing through Spain), where the electroplating industry was first developed in 1840 and later consolidated, thanks especially to *Charles Christofle.* There were no competitors worthy of note in that period, not even in the United States. In fact, according to what is reported by Williams Haynes in his book *American Chemical Industry* (Van Nostrand, New York, 1954, vol. 1, pp. 281, 388), the first electroplating industry of the United States was set up in Boston, Massachusetts, in 1869. Therefore, Meucci's small electroplating workshop in Havana was the first of the kind in America. As an additional confirmation of that, the lawyer

David Humphreys declared, at the trial instituted by the Government of the United States against The American Bell Telephone Company, Alexander Graham Bell et al. to annul the two fundamental Bell's patents on the telephone (extensively dealt with in Vol. 3 of this book), referred to, in the following, as the US/Bell trial, that Antonio Meucci was the first to introduce electroplating to America (see also the Appendix "History of electrodeposition techniques" on pp. 388 seq.).

Obviously, the cost of raw materials, especially that of precious metals needed for galvanic baths, was extremely high, so that, as we said, O'Donnell ended up saving time and money with his contract with Meucci. Luckily, though, there were also orders from private citizens, in addition to the supplies to the Spanish army, as shown by Meucci's statements at the Bell/Globe trial:

[Answer no. 13]: *"… When I began to put in operation the said discoveries of the above-mentioned authors, I had occasion to obtain through the Captain General O'Donnell the job of galvanizing* [*electroplating,* Editor's note] *various furnishings for the troops of the regiment, - such as swords, helmets and other things in metal, - it being very useful that said articles could be galvanized by me in Havana, instead of those coming from foreign countries; in that I served the government for some years. In addition, I manufactured for other persons in Havana several different objects in galvano-plastics, medals, statuettes, etc., as well as gilding and silvering of chandeliers, etc., for private houses."*

Meucci's popularity in Havana grew so much that on 16 December 1844 a special evening was dedicated to his honor at the Gran Teatro Tacón. Indeed, *Francisco Rey Alfonso* wrote in his book entitled *"Gran Teatro de la Habana - Cronología mínima 1837/1987"* (translation from Spanish):

"16 December 1844

For the first time the harmonica is presented as a concert instrument in a theater of the island. The pianist Mauro Faina plays the air 'L'alma innamorata' from the opera Lucia di Lammermoor and an andante from the same opera during a performance in honor of Antonio Meucci, machinist of the Gran Teatro"

Announcement of the evening in honor of Antonio Meucci (Diario de la Habana, 16 December 1844)

On the same date, the Diario de la Habana wrote (translation from Spanish):

"Gran Teatro de Tacón - In honor of Mr. Meucci

… We applaud the choice of the intelligent stage-hand and as of now we wish him the best of luck. Havana's public always knows how to honor good and worthy performances with its particular appreciation."

ELECTRICITY AND MAGNETISM

Electrostatics

A few electric phenomena had been known since ancient times. However, the first treatise on electric and magnetic properties of bodies (which were then both defined as magnetic*) was only published in the year 1600, and was entitled "De magnete magneticisque corporibus," by the London physician* William Gilbert*. Prior to this, precisely around 1300, the only relevant discovery in this field was the invention of the compass by* Flavio Gioia *of Amalfi.*

The chronology that follows indicates the dates of the inventions of various electrostatic machines, which lasted almost a century, from the mid-seventeenth to the mid-eighteenth century. It is important to mention the first hypothesis on the existence of two types of electricity, which was put forward by Charles François de Cisternay Du Fay *around 1710, and also the classification of bodies in electrical conductors and insulators by* Jean Théophile Désaguliers*, in 1739. Also important is the concept of* 'electric fluid' *introduced in 1743 by* J. A. Nollet*.*

The first serious attempts to develop an electro-technical science were only undertaken in the second half of the eighteenth century. In that period (1752) Benjamin Franklin*, the well-known inventor of the lightning rod, demonstrated that the electricity produced by electrostatic machines was exactly the same as that produced by the natural atmosphere and lightning. He said that there was only one type of* 'electric fluid,' *contrary to what* Du Fay *had previously claimed. The publication by the Italian* Giovan Battista Beccaria *in 1753 entitled "Dell'elettricismo naturale e artifiziale" (On natural and artificial electricity) was also very relevant, on the same subject. The important (experimental) discovery of the laws of electrostatic and magneto-static actions, made by* Charles Augustin de Coulomb *between 1795 and 1799, concluded this first period, which may be identified as 'the electrostatic era.'*

Animal Electricity and Electrotherapy

In the last two or three decades of the eighteenth century the scientific community shifted its attention from electrostatics to so-called animal electricity*. Interest was so lively that by the end of that century, publications on electricity by physicians outnumbered those by physicists. In particular, studies conducted by the school of Montpellier (*François Boissier de Savages, Théophile de Bordeu, Paul-Joseph Barthez *and others) led to the conclusion that the transmission of impulses along nerve fibers - or the*

transmission of ‘nervous fluid’ *as was it then called - could not be mechanical, but instead had to be electrical and, moreover, there had to be some not-better-defined* ‘electric fluid’ *in all animate bodies, which performed the fundamental functions of life. Another line of research focused on the role of electricity in muscle contraction. Studies on the physiological effects of electricity had already been undertaken towards the mid-eighteenth century (and even earlier) by scientists such as* G.B. Beccaria, T. Laghi, L.M.A.Caldani *and* F. Fontana *in Italy,* F. Glisson, T. Willis, W. Cullen, R. Whytt *in England and also in Montpellier, France and in Germany. This was the context in which electric shocks were first used for therapeutic purposes, for example to stimulate the paralyzed limbs of patients. The shocks were obtained from a* Leyden jar*, which was invented by* E.J. von Kleist *and* Peter van Musschenbroek *in 1746. Among the many publications in this sector, the following warrant special mention: “An issue on the Vital and other Involuntary Motions of Animals” by* Robert Whytt *in 1751; “De functionibus systematis nervosi” by* Georg Prochaska *in 1784 (Prague and Vienna); and finally the famous work by* Luigi Galvani*, professor of Anatomy at Bologna University, who, in 1791, published “De viribus electricitatis in motu musculari commentarius,” (Commentary on electricity’s forces in muscular motion) which will be discussed below.*

Parallel with the studies on animal electricity, a theory concerning animal magnetism was developed by the Austrian physician Franz Anton Mesmer. *According to this theory (also known as* Mesmerism*) every living organism possessed a* ‘magnetic fluid,’ *which emanated a special form of energy that was dispersed throughout the universe and which was important for the state of health or disease of living bodies.* Mesmer *obtained remarkable therapeutic successes in Paris, using natural and artificial magnets. In 1778, he published the “Traité de magnétisme animal,” illustrating his theory and the results achieved. He claimed that the recoveries were not to be attributed to the magnets per se, but to the fact that they were conductors of the above-mentioned magnetic fluid which he called* animal magnetism. *He also argued that physicians could operate directly with the emanation of their own magnetism, or by using suitable (magnetic) conductors, to bring the patient’s magnetism back into a proper state of balance with cosmic magnetism.*

A number of commissions were set up in many countries

to assess Mesmer's alleged miraculous remedies through animal magnetism. Benjamin Franklin was a member of one of these commissions during his stay in London (he was to return to United States in 1785, two years following the British recognition of American independence). The English Royal Commission which Franklin took part in denied the validity of Mesmerism, not so much because it did not recognize its therapeutic benefit as because it considered the theory used by Mesmer to explain it to be incorrect. An assessment of Mesmer's work in a modern key has led experts today to believe that Mesmer (though wholly unaware) was actually using methods linked to hypnosis.

Many scholars of animal electricity dealt with the relationship between the micro and macrocosms a few years later. Among these was the Abbé Pierre Bertholon, author of "De l'életricité du corps humain dans l'état de santé et de maladie" (On the electricity of the human body in the state of health and disease) in 1780, which re-echoed Mesmer's magnetic theories, in the field of electricity. There was a continuous shift back and forth between magnetism and electricity, which was due to a lack of knowledge on their true nature and their links. The fact that foregoing studies on electrotherapy were not simply the work of charlatans is proven by the successful use of electrotherapy throughout the entire nineteenth century, which still continues today. For example, in the Telegraphic Journal and Electrical Review published on 14 May 1886, there is mention of an English patent held by a certain A. T. King, with the title "An Improved Electro-Medical Apparatus" which is similar to the medical apparatus used in 1846 by Antonio Meucci, described in the following. The beneficial effects of electrotherapy have received a scientific explanation in the last few decades of our century. This is largely thanks to the so-called 'gate control theory,' developed by R. Melzack and P.D. Wall in 1965 (see bibl.). According to this theory, electro-stimulation triggers the production of endorphins (so called because they perform an endogenous function that is similar to the effect of morphine), which have a natural pain killing action. The analgesic properties of electrotherapy have been clinically verified in many countries of the world, and are effective in patients suffering from headaches due to arthrosis or muscle tension, coxalgias, rheumatisms, neuralgias, sciaticas, lumbagos and gonalgias. Electrotherapy is currently performed on an outpatient basis (with the electric current regulated on the

patient's threshold, which corresponds to what Antonio Meucci used to do in Havana), as well as by means of commercial electro-stimulators, which provide about 15 millisecond impulses that can be regulated in amplitude (generally between 10 and 50 volts).
Getting back to Galvani's studies, they were appreciated so much by the scientific community that since then all research in nervous physiology or pathology began to refer to 'galvanic fluid' and to 'galvanism' rather than to 'nervous fluid' and 'electric (or 'magnetic) fluid.' The German scientist Alexander von Humboldt claimed that galvanic fluid was a very effective agent in chemical processes linked to vitality. Another German scholar, J. Ritter, supported the role of galvanism in the entire natural system, including inorganic matter, in his 1798 publication "Beweis, dass die galvanische Aktion, oder der Galvanismus, auch in der anorganischen Natur möglich und wirklich sei" (Proof that the galvanic action, or the galvanism, is also possible and effective in inorganic matter).

Electrodynamics

Count Alessandro Volta, a secondary school teacher in Como and later Professor at the University of Pavia, was a pioneer in modern electricity studies, and not only because of his discovery of the electric battery. Volta developed the battery on the basis of Galvani's publication in 1791. Galvani reported that he had observed that a freshly skinned frog had violent contractions when its lumbar nerves were put in contact with the muscles of its legs through a bronze compass which rested on one end on the iron plate where the frog was placed. While Galvani attributed this phenomenon to animal electricity, which was very popular at that time, Volta, instead, focused his attention on the contact between the two different metals constituting the bronze-iron arc. He conducted a series of experiments and demonstrated the existence of opposite electric charges on the two metals, whose entity did not change, no matter how the external circuit of the bimetallic arc was closed. This was how he discovered the first permanent electric current, that is a current that did not vanish so quickly as the discharge of electrified bodies, as that supplied by rubbing machines or Leyden jars. This marked the end of the era of electrostatics, that is of systems with a static electric charge, and ushered in the era of electrodynamics, that of electric current and circuits.
The very first discovery made thanks to Volta's battery was electrolysis, first performed in 1800 by A. Carlisle and W. Nicholson. This gave rise to a

new branch of electricity - electrochemistry - from which the applications of electroplating and galvanoplastics developed, which latter will be described later in the appendix "History of electrodeposition techniques." Even more important was the discovery of the relationships between electricity and magnetism, unknown till then. In fact, using a Volta *battery which powered a conductor in a circle on a vertical plane,* Hans Christian Oersted, *Physics Professor at Copenhagen University, demonstrated in 1820 that a compass needle placed at the center of the circle was deviated* perpendicularly *to the conductor whenever it was traversed by a current . If the direction of the current was inverted, then the compass needle would deviate in the opposite direction.* Oersted's *experiment was the first example of an electromagnetic phenomenon. It disproved the* Newtonian *(or* Coulombian*) interpretation of actions at a distance, according to which every force is exerted along a straight line, linking the two elements involved.* Oersted's *experiment stimulated new interpretations of these interactions, which were said to be exerted along curved (or* tangential*) lines. One of the most important developments was the field theory introduced by* Michael Faraday. *It had already been difficult for the scientific community to advance from the pre-Newtonian mechanical action implying contact, to the Newtonian actions at a distance. When electromagnetic actions were discovered, their mechanism of operation appeared to be shrouded in deep mystery. Luckily, phenomena have often been applied without their mechanisms necessarily being understood in depth. Among the first inventions to exploit the magnetic field produced by an electric current was the galvanoscope developed by* J.S.C. Schweigger *in 1820. He showed (for the first time) that the intensity of the electromagnetic action could be enhanced by the use of a coil with many turns. As it will be shown later, the galvanoscope gave rise to the first compass needle telegraphs. Prior to the invention of the galvanoscope, skinned frogs were the instruments for electric measurements, such as in Galvani's case. They were very sensitive detectors and were used by Volta himself who later replaced them with the* condenser electroscope *he invented. Following Oersted's studies,* André Marie Ampère *demonstrated, between September 1820 and the end of 1822, that two parallel conductors attracted or repelled each other depending on whether the current flowed through them in the same or the opposite direction. In*

other words, Ampère showed the existence of motive forces between conductors crossed by current. Ampère also advanced the hypothesis that the magnetism of permanent magnets was to be attributed to innumerable circular electric micro-currents present in the molecular structure of the material. Ampère *and* F. Arago *are also to be credited with the invention of the solenoid (with or without an iron core). Ampère presented this as proof of his theory on the generation of magnetic fields by means of an electric current. In 1825,* W. Sturgeon *invented the horseshoe electromagnet (which was the union of a solenoid coiled on an U-shaped iron core, with an anchor) which was perfected in 1828 by* Joseph Henry*, who for the first time used insulated copper wire. The transformer, instead, was invented many years later, and precisely in 1840, by* A.P. Mason *and* L.F. Breguet*. A further step forward was made in the field of electrodynamics in 1827, with the discovery of the laws of electric conduction by* Georg Simon Ohm*, a Professor of Physics at the Köln Gymnasium. He introduced the concept of electric* resistance*, whose measurement unit bears his name. Soon after,* George Green *extended the concept of* 'potential' *to electricity and magnetism in his publication in Nottingham entitled 'Essays on the Application of Mathematical Analysis to the Theories of Electricity and Magnetism.' Subsequently, in 1841,* James Prescott Joule *discovered that the heat developed by the flow of electricity was proportional to the resistance and to the current squared, and together with* J.R. von Mayer *he determined the mechanical equivalent of heat.* Michael Faraday *began his career in 1813, as a young twenty-year-old handyman of the physicist* Humphry Davy*, then Director of the* Royal Institution *in London. In 1821,* Faraday *introduced the concept of* lines of force *to which he then gave a material significance, as he explained in his paper "On the physical character of the lines of force" in 1852. He denied the possibility of actions at a distance, if not for very small distances. He used to say that "… The magnetic lines of force… which can be visualized through iron filings, are curved lines to which a very small compass needle would be tangent…" In 1837, he introduced the concept of* electric lines of force *which were analogous to the magnetic ones. In 1831, having studied the publications by Oersted, he discovered the electromagnetic induction*[7]*,"*

[7] Recall that:
— *electrostatic induction* consists in the appearance of opposite charges on a conducting surface placed in

noticing the appearance of electric current in a spiral wrapped around an iron toroidal core, when a second one, wrapped around the same core, was connected to a battery. The current was inverted when the battery was disconnected. He showed that the same thing happened if a magnet was rapidly introduced (and then extracted) from within a solenoid. He then claimed that he had found a way to transform magnetism into electricity and put his theory into practice building the first rudimentary dynamo in history. He explained his first experience on the basis of a hypothetical electrotonic state *(that is a state capable of inducing electricity) which was created in all of the iron material of the core, due to the electric current flowing through one of the spirals wrapped around it. The modern explanation of electromagnetic induction, instead, is that there is induced current in a spiral every time it is crossed by a magnetic field which is* variable in time*. This can be obtained both with a variable current flowing through a nearby (coupled) spiral or by moving a magnet along the axis of the spiral itself. Thus, Faraday had shown the existence of an inverse effect to that discovered by* Oersted*, that is the conversion of the magnetic force into electric force.*

In the years following the discovery of electromagnetic induction, Faraday worked in the field of electrochemistry and discovered its two basic quantitative laws in 1833, which come under his name. He also developed a specific terminology which was universally adopted and is still in use today.

Independently of Faraday, the Florentine Carlo Matteucci *had already discovered the two laws of electrolysis in 1830. In 1833, Faraday finally demonstrated the identity between electricity produced by electrostatic generators and electricity produced by Volta's battery, which had been the subject of*

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front of another electrically charged surface;

— *magnetic induction* consists in the magnetization of a soft iron bar when it is placed in a magnetic field, for example in the space between two magnetic poles of opposite polarity;

- *electromagnetic induction* consists in the appearance of an electromotive force (hence, in a closed circuit, of a current) in a circuit placed in a magnetic field that is *variable in time*. This *variable* magnetic field may be produced either by a variable current flowing in another circuit (which is said to be *coupled* with the first) or by a magnet that moves rapidly enough with respect to the circuit considered;

- *electromagnetic auto-induction* consists in the appearance of an electromotive force in the same circuit through which a *variable* current flows, and which therefore generates a *variable* magnetic field.

interminable debate among scientists till then.
It was only in 1873 that James Clerk Maxwell*, after having assimilated the essence of Faraday's ideas, elaborated a unified theory of electricity and magnetism, which he illustrated in his famous book "A Treatise on Electricity and Magnetism". His theory was confirmed by innumerable experiments. However, the method followed by Maxwell was disconcerting to many of the scientists of the time, who for many years could not understand Maxwell's method of* jotting down *equations (differentials, with partial derivatives) and verifying a posteriori that they were true. This meant proceeding without any demonstration or deductive logic process, as if the equations were a principle to themselves, the result of an intuition. The fact that was most striking was the prediction of the existence of electromagnetic waves. This existence was confirmed thirteen years later in the famous Berlin experiment by* Heinrich Rudolf Hertz *on 13 November 1886.*
Unfortunately, Maxwell was not able to rejoice in the experimental confirmation of his brilliant hypothesis as he had died in 1879, at only 48 years of age.
Let us conclude this brief overview on electricity and magnetism recalling that the first university course with a diploma or a degree in electrical science was set up in the United States in 1882, and that only with the discovery of the electron by Joseph John Thomson *in 1897 was the first step made towards the basic understanding of all electric and magnetic phenomena.*

Chronology

1300 - Invention of the compass by Flavio Gioia
1600 - First treatise on electricity and magnetism ('*De magnete*') by the English physician William Gilbert
1665 - First electrostatic rubbing machine, constructed by Otto von Guericke. Many others were to follow, up to around 1750
1710 - (approx.) Hypothesis advanced by C. F. de Cisternay Du Fay on the existence of two types of electricity
1727-9 - Stephen Gray discovers electrostatic induction
1739 - Classification of bodies in electric conductors and electric insulators, by J. T. Désaguliers
1746 - Invention of the Leyden jar by E. J. Von Kleist and P. Van Musschenbroek
1752 - Invention of the lightning rod and demonstration of the identity of natural and artificial electricity by B. Franklin
1778 - Therapy based on animal magnetism developed by F. A. Mesmer
1791 - Communication concerning the first experiments on animal electricity conducted by L. Galvani in 1780
1795-1799 - Discovery of the laws of electrostatic and magnetostatic action by C. A. Coulomb
1799 - Invention of the electric battery by Alessandro Volta
1800 - Discovery of electrolysis by A. Carlisle and W. Nicholson

1820 - (July 21) - Discovery of electromagnetic action by H. C. Oersted.
1820 - Discovery of magnetization of soft iron by surrounding current, by J.F.D. Arago
1820 - Construction of the first galvanoscope by J. S. C. Schweigger, who observed that the Oersted effect was enhanced by the number of coil turns
1821 - Discovery of electrodynamic action by A. M. Ampère
1822 - Invention of the solenoid (with air or iron core) by A. M. Ampère and J.F.D. Arago
1825 - Invention of the horse-shoe electromagnet by W. Sturgeon
1827 - Electric conduction laws formulated by G. S. Ohm
1828 - G. Green introduces the concept of potential, mathematically
1828 - Improved electromagnets obtained by using insulated copper wire by Joseph Henry
1830 - Florentine Carlo Matteucci discovers the quantitative laws of electrolysis, three years before Michael Faraday
1831 - (November 24) - Discovery of electromagnetic induction by Michael Faraday
1832 - Discovery of electromagnetic auto-induction and invention of the relay by Joseph Henry
1833 - Michael Faraday discovers the two quantitative laws of electrolysis independently of Matteucci
1833 - M. Faraday demonstrates the identity of electricity produced by electrostatic generators and that produced by Volta's battery
1835 - Observation of the effect of an electrostatic charge on iron filings by W. Munck
1837 - Discovery of the inverse effect of magnetostriction by C. Matteucci
1837 - M. Faraday introduces electric lines of force, analogous to the magnetic ones
1837 - Production of magnetic sounds due to magnetostriction (the so called Page effect[8]) by C. G. Page
1840 - Invention of the transformer by A. P. Mason and L. F. Breguet
1841 - J.P. Joule discovers that the heat generated in a conductor is proportional to the resistance and to the square of the current
1851 - Invention of the Ruhmkorff coil by H. D. Ruhmkorff
1860 - Development of the first secondary battery or accumulator by G. Planté
1873 - Unified theory of electricity and magnetism (*"A Treatise on Electricity and Magnetism"*) by J. C. Maxwell
1882 - First university degree course in Electrical Science in the United States
1886 - (November 13) - H.R. Hertz produces electromagnetic waves predicted by Maxwell's equations, which propagate in his laboratory up to a distance of 1.5 meters
1897 - Discovery of the electron by J. J. Thomson.

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[8]This effect is due to a phenomenon known as *magnetostriction*, according to which a ferromagnetic material subject to variable magnetization undergoes small variations in length, that are isochronous with the magnetization. These vibrations are transmitted to the air and therefore can be heard.

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THE FORTIES, YEARS OF FIRE

All of this occurred between 1844 and 1848, while the entire world, and Europe especially, was in the throes of struggles for independence and rebellions against the powerful monarchies, which had been restored to power after the defeat of Napoleon Bonaparte in 1815. The way in which the newspapers of Havana reported the execution of the *Bandiera brothers* near Cosenza, in 1844, gave Antonio Meucci the distinct feeling that, although this land had given him safety and affluence, it would have ended up burning under his feet. The Mazzinian rebellion, which the *Bandiera brothers* had tried to foster in Calabria, was depicted by Havana's press as a mere act of brigandage, whereas the enlightened rule of the Bourbons in the Kingdom of the Two Sicilies was praised. *Birds of a feather…* - Meucci thought, reflecting on the fact that the Queen of Spain, *Isabel II*, and the King of the Two Sicilies, *Ferdinand II*, both belonged to the dynasty of the Spanish Bourbons and were direct descendants of *Charles III*, who had been King of Naples from 1734 to 1759 and King of Spain from 1759 to 1788. At any rate, even if they were not next of kin, the attitude of all reigning royal houses towards the so-called *Republicans* (which was a generic name used for all enemies of the monarchy), whether they were followers of Mazzini, Carbonari, Liberals, Masons, or else - could only be the same.

Still in 1844, in nearby island *Hispaniola* (which, following its independence from France and Spain, achieved in 1804, had taken the name of *Haiti* and after many domestic events was finally unified in 1822), a revolt broke out in the eastern part of the island, where Spanish was spoken (whereas French was spoken in the western part). As is common knowledge, the eastern part broke away from the rest of the island and gave birth to the *Dominican Republic*.

In the face of these upheavals, Cuba seemed to be an idyllic oasis, far away from the rest of the world and its conflicts. Meucci was doing very well there, thanks to the earnings reaped with electroplating. Moreover, according to *The Sun* of Baltimore (which, on 19 October 1889, published an obituary on Antonio Meucci's death, featuring a detailed biography), in 1844 Antonio and Esther were blessed with the birth of a baby girl. *The Sun* wrote as follows: *"… In 1850 Meucci came to New York from Cuba, where his only child, a girl of 6, had just died …"* Many other details contained in this article appear to

be the only reliable pieces of information, as compared to the many groundless extrapolations made by other newspapers, which were later blown out of proportions also by Italian authors. For instance, *The Sun* also wrote that: *"When Garibaldi was driven from Rome by the French troops in 1849, Meucci aided him with large sums of money. He also did the same for Gen. Avezzana, Gen. Bovi and many other prominent Italians …"* Others, instead - as we have already mentioned in Section One (Florence) - went so far as to claim that, in 1849, Meucci left Havana to go and fight side by side with Garibaldi, winning a Lieutenant's commission and then returning to Havana. Indeed, this is a passage from the obituary notice published by the authoritative *The New York Times* on 19 October 1889: *"… Returning to Italy in time to take part in the revolution of 1844-1848, he won a Lieutenant's commission. To avoid capture by the Austrians he went again to Havana …"* These debatable (or ill-informed) praisers of Meucci did not even ask themselves why Garibaldi - who had written about Meucci at length in his autobiography - had not mentioned such an important episode as would have been Meucci fighting by his side, had it been true. Conversely, it is quite plausible that Meucci, being well-off and close to the ideals of the insurrectionists, may have helped the 1848 revolution with large sums of money.

Another detail reported by *The Sun* - which did not appear in any other newspaper - was the place where Esther was buried, namely the *Woodlawn Cemetery* near Tompkinsville, NY (Staten Island). *Daniel Santoro*, chairman and founder of the *Staten Island Italian Historical Society*, boasted of having discovered Esther's burial site by chance on 29 March 1938, and it was exactly in the place indicated by *The Sun* fifty years before. For all these reasons, we consider *The Sun* a reliable source of information. Indeed, we assume that their reporter must have gathered news from someone who was very well acquainted with the Meucci family. It may have been the *Nisinis*, a couple who had assisted Antonio Meucci in his cottage in Staten Island in the last few years of his life, from 1884 until his death in 1889. Thus, lending credence to *The Sun*, the news concerning the birth of a baby girl to the Meuccis in Cuba in 1844 appears accurate, and, as we were not able to trace any other evidence of her existence, we shall give her the fictitious name of *Juanita*.

As said in the Appendices of Section One (Florence) the fact that in the first ten years of their marriage Antonio and Esther did not have any children may be ascribed to the incipient form of syphilis contracted by Antonio at the age of 21, which may have damaged the seminal tubules of his testicles, responsible for the production of sperm. According to

a qualified physician consulted by the author, this may have induced a certain degree of infertility, while still consenting the subject to have normal sexual relations.

When Juanita was just two years old, on the night between 10 and 11 October 1846, Havana was struck by an unusually violent hurricane, which was recalled as the worst in the city's history. It was even more devastating than the previous hurricane, which had occurred in 1844, the year Juanita was born. Thus, the sweet and delicate baby must have undergone two terrible shocks at a very early age. Eye witnesses, including the keepers of the *Torreón de San Lázaro*, reported that from the Ocean to the North of the city, from the Straits of Florida that is, a huge black twisting plume rapidly advanced towards the coast and turned into a screeching wall of water, over one hundred feet tall. The water came down over the city like a maul, there where Havana had no natural barriers, while the Cabaña heights only served to channel the water and wind - which, owing to its destructive fury, was described as the breath of Satan - towards the wharfs of the port, thus wreaking havoc on the moored ships.

According to reports of that period, 114 were killed, 76 wounded, 216 ships were destroyed and 77 damaged; 872 houses were left roofless and 5501 were seriously damaged. Considering that, according to the census of that year, the city of Havana had a total of one hundred and eighty-five thousand inhabitants, including the outskirts, the impact of that unprecedented disaster on the population can be easily reckoned. The hurricane, like many others before, also uprooted and destroyed the taller trees lining the paseos, which were later replaced by young trees taken from the nurseries of the *Jardín Botánico* that existed for that specific purpose. The foreigners who often complained that the skinny trees along the paseos did not offer much shade, as they were little more than bushes, were unaware of the fact that it was hard for them to grow tall because of the frequency and violence of hurricanes.

The 1846 hurricane only damaged the roof of the solid Teatro Tacón, but the Teatro Principal and the Gran Diorama were literally razed to the ground. Don Francisco immediately decided not to rebuild the Principal and to concentrate all his efforts on the Tacón, due to the imminent opening of the season, and he transferred the Italian Opera Company, which had performed primarily at the Principal up until then, to the Tacón theater. The restoration of the Tacón began promptly (on 27 October 1846) and this opportunity was also taken to introduce gas lighting, imported from the United States, and new equipment, furnishings and costumes.

The Tacón theater opened again on 18 November 1846, with a simpler roof (two hipped ends instead of four) which, in

the opinion of experts, was more apt to withstand future, equally violent hurricanes.

On the billboard of the Tacón, which announced the opera *Ernani* by Giuseppe Verdi, new names appeared: *Luigia Corranti*, *Teresa Rainieri*, *Giovanni Battista Severi*, *Natalia Perelli*, *Pietro Novelli* and *Carlo Rossi*. Along with the new singers, that year Don Francisco also engaged a talented and likable guitar player from Milan, who was almost the same age as Antonio Meucci (he was born in Milan on 27 May 1805). His name was *Domenico Mariani*; he became a great friend of the Meucci family and later also secretary and administrator of the assets of the tenor *Lorenzo Salvi.* On his arrival in Havana, Mariani heard marvels about Meucci's outstanding inventive genius. Besides his great skill with theater mechanics, he was also told about the water filters, as we have mentioned above, and the electroplating factory. Among the Spaniards who told Mariani about Meucci's talents there was a *Antonio Jané*, who, as we shall see, was to finance two of Meucci's patents in the United States a few years later.

When the theater season was over on 18 April 1847, the restructuring of the theater resumed, as it had been interrupted only to avoid losing all the season's box office earnings. This time, Antonio Meucci was entrusted with the direction of the works, as referred by *Francisco Rey Alfonso* (op. cit.). At the beginning of the new season, precisely on September 25, 1847, the Tacón opened with new decorations and technical contrivances: the ceiling was smooth and white, with gold decorations in relief. A large clock supported by two putt, specially imported from Paris, was placed at the center of the stage arch. Meucci had also conceived a new set of curtains and a new ventilation system, always according to Rey. A new machine was imported from the United States which made it possible to raise or lower the stage in a few minutes' time. Finally, toilets for the ladies were also added, which facilities had never existed before in the city's theaters.

While the Teatro Tacón was being refurbished, wars and rebellions continued to inflame the rest of the world. We shall not summarize the famous events of 1848 in Italy, which were such that the word *quarantotto* (forty-eight) entered the language as a synonym for unprecedented turmoil. But it is worth highlighting that, besides the Italian insurrections, in the same year France's king *Louis Philippe* was forced to abdicate, handing France over to the so-called *Second Republic*, while the Hungarian Liberals, led by *Lajos Kossuth*, fought for the independence of their country from Austria, and furthermore, Austria's emperor *Ferdinand I*, after having fled twice from Vienna, following insurrections, was forced to ratify a Constitution with many liberal concessions and on 2

December, to abdicate in favor of his nephew, known as Francis Joseph I. Finally, from 1846 throughout 1847, war broke out between the United States and Mexico, on account of a controversy over the southern borders of Texas, only one year following the annexation of this State to the United States. As known, the war ended with the Treaty of *Guadalupe Hidalgo*, signed on 2 February 1848, with which the United States not only obtained the coveted recognition of the borders of Texas, but also vast territories in the northern Mexican states of *Chihuahua*, *Coahuila* and *Tamaulipas* (which were paid for in part with the sum of fifteen million dollars). These lands then formed the new states of *California*, *Utah*, *Colorado*, *Arizona* and *New Mexico*. Moreover, having established the borders between their country and Canada on the 49° parallel, with the *Oregon Treaty* signed with the English in 1846, the United States had at this point completed its geographical expansion, calling the attention of the world to its great and fearsome power.

The Gran Teatro de Tacón rebuilt following the 1846 hurricane
Note the roof and, on the left, in the background, the residence building

The year 1848 also went down in the history of United States for the *Gold Rush* which followed the discovery, on 24 January 1848, of a gold mine at a California sawmill (today known as Sutters Mill, from the name *Sutter* of the owner) on the South Fork of the American River, near Coloma, CA. It was estimated that some eighty thousand gold-seekers or improvised miners flocked to the West in the year 1849 alone, (indeed, they were called the '49ers' or 'forty-niners') when California's population numbered only of fifteen thousand inhabitants. Hardly any one of them discovered gold, but, on the other hand, this is how the population of the State of California climbed to one hundred thousand inhabitants in a single year and to hundred and fifty thousand in four years, that is to say by the end of 1852.

While the *Gold Rush* broke out in California and liberal concessions were won in Vienna, the throne of the Lorraines in Florence was in jeopardy. In February 1849, *Leopold II* was forced by the Republicans, who had proclaimed the *Republic of Tuscany* and the *Constituent Assembly*, to flee to Gaeta in voluntary exile. Antonio and Esther Meucci rejoiced, also because this gave new life to their hopes of being able to return to their homeland without risking political persecution. Unfortunately, in the month of July of the same year, *Leopold II* returned to Florence with the support of Austrian troops. But, unhappily for him and for all Tuscans, he became subject to Vienna. Indeed, not only were all the concessions that had been granted abolished, the Parliament suppressed and freedom of press restricted, but a youth was executed in Pistoia, an event that had never taken place before in the history of the Grand Duchy. In the same month, on 28 July

1849, king *Charles Albert of Savoy* died in Oporto, Portugal, a few months after the defeat inflicted on him by Austrian Gen. *Radetzky* in Novara. His successor, *Victor Emmanuel II,* was forced to sign a peace treaty with the Austrians in Milan in the month of August of that same year. Therefore, all dreams of independence and of a united Italy seemed gone forever.

Notwithstanding all this, needless to say, life in Cuba went on in what appeared to be the utmost calm, if no attention was paid to the secret night-time irruptions by the police in the houses of the conspirators and the clandestine leaflets introduced to Cuba by exiled Cuban, supporters of independence. As for the rest, fiestas and balls continued as usual. In particular, the celebrations that took place in Havana in 1849 for the Spanish Queen Mother's birthday were spectacular, even more so than in the past. The writer Robert Baird described them as follows: *"… The city was transformed for the event, which was felt in the Spanish spirit and with Spanish pomp; in particular, the Plaza de Armas and the Paseo Isabella Secunda, as well as the other public meeting places, displayed great splendor and cheer. That night a reception was held at the residence of the General Captain* [*Roncali,* Editor's note], *where uniforms of scarlet, green, purple and all possible hues paraded, enriched by as much gold and silver as they could hold. What is more, those uniforms were dazzling rather than in good taste (for European taste) and many of the 'notables' who were inside them looked more like servants than like senators or generals. Add to this the unusual proportion of short men and the fact that the ones who were most insignificant in terms of height were generally also the ones donning the uniforms most heavily decked and covered with medals. This, however, only applies to Cuban gentlemen, and it would be an injustice to say it of the ladies who, conversely, are remarkable for their beauty and elegance…"*

THE TELEGRAPH

The Optical Telegraph

The most important ancestor of what we know as the telegraph today (namely the Morse telegraph), was the optical one. In a way, it was already used since ancient Greece, with fire as a source (in the form of bonfires or simply torches or even reflected sunlight) and the human eye as the receiver. In 1684, the English physicist Robert Hooke *came up with the simple idea of raising large tables in succession, each one of which had a large letter of the alphabet printed on it which could be read at a distance with the naked eye. This method was perfected in 1690 using the telescope (invented by Galileo in 1609), which made it possible to exchange conventional sentences rather than just letters of the alphabet.*
In 1783, the German Bergstrasser *invented another communication system - also based on sight - with a code that used pre-established positions of a soldier's arms. The French Abbé and Physicist* Claude Chappe *and his brother* Ignace *came up with the idea of replacing human arms with mechanical arms and they invented the so-called* semaphore *system. It was a new form of communication based on sight, in which the receiver observed the position of three wooden arms that were oriented according to a pre-established code and raised on a pole on top of a tower on the transmitting side. There were one-hundred and ninety-six different combinations, half of which were devoted to service communications. This system was presented on 22 May 1792 to the French Legislative Assembly, which authorized its adoption. Chappe semaphore was first implemented in 1794, on the Paris-Lille tract, some 230 kilometers long, with sixteen stretches, each of which covered a distance of about fourteen kilometers. Also in this case the message could be read more easily at the receiving station by using a telescope. This made it possible, in certain geographical situations, to have even longer stretches, measuring up to fifty kilometers. One important feature of the Chappe system was its speed, which was exceptional for the time. In fact, a simple signal could be transmitted from Lille to Paris or vice versa in about two minutes. From Paris to Lyon (with 116 repeaters) it would take about twenty minutes. The speed of communications, made possible by Chappe optical telegraph, was said to have greatly contributed to some of the successes achieved by the French troops. Incidentally, during the inauguration of the Paris-Lille line, on 1 September 1794, a message informing of the victory of the French Army over Germany at* Condé-sur-l'Escaut *was transmitted. The Chappe*

system rapidly spread from France to the rest of Europe, and covered distances of up to 1,500 kilometers on each single route, with stretches between two consecutive towers of about ten kilometers, on the average. It was in use in France up until 1852, that is until almost a decade after the invention of the Morse telegraph. That year, in France the Chappe network covered a total of 4,830 kilometers with 556 stations, and served 29 cities. And even in 1844, the year in which the Morse telegraph was inaugurated in the United States, L. Breguet *invented a compass needle telegraph (see below) which imitated the Chappe semaphore signals. The Chappe telegraph was abandoned because it could not be used at night, nor in the case of fog or of heavy rain on one of the stretches. Oddly enough, one of the first newspaper agencies, the* Havas *of Paris, after having experimented with the Chappe system, returned to using carrier pigeons, for reasons of confidentiality it was said, and continued to do so until 1840.*
Still today, the Armies and Navies of many nations use various sorts of optical telegraph, based on flags or intermittent lights (obtained from the sun or lamps), usually adopting the Morse code. The practicality and success of the various optical telegraph systems is due to the extreme sensitivity and perfection of that natural receiver that is the human eye.

Compass needle telegraph

It is easy to understand how any code can be implemented in a variety of ways, by exploiting almost any known physical phenomenon. Thus, it comes as no surprise that other electrical properties were experimented with before the electromagnetic telegraph was implemented, including electrostatic and electrochemical properties, which had been discovered many years before. For example, in 1754, Georges Lesage *from Geneva built an electrostatic telegraph model featuring 24 wires (one for every letter of the alphabet), each of which was put in communication, at the receiving terminal, with an electroscope consisting of an elder pendulum. Beneath the series of pendulums there was a strip with the letters of the alphabet impressed, which were indicated by the opening of the two little spheres of the electroscope above them. Another electrostatic telegraph model was developed by Sir* Francis Ronalds *in 1816.* Thomas Von Sömmering *built the first electrochemical telegraph in 1809 in Munich, Bavaria. He too used a number of conductors that was equivalent to the letters to be transmitted. Placing one of the conductors on the*

transmitting end in connection with a battery, it provoked the electrolysis of water in a little tube on the receiving end, causing the emission of bubbles that raised a rod bearing the corresponding letter of the alphabet. Among the applications of the chemical effects of electric current, the famous 'pantelegraph' *invented by the Sienese Abbé* Giovanni Caselli *must be mentioned. In 1855 he developed a system that made it possible to faithfully transmit written texts and drawings (the first fax in history, as it has recently been defined).* Caselli's pantelegraph *was used with success also in France and Russia until about 1870.*

The invention of the galvanometer by J. S. C. Schweigger *in 1820 was essential for the creation of the compass needle telegraph, for it gave the idea of using electric current to deviate one or more compass needles at a distance by a pre-fixed angle, in one direction or another. By 1820, both* A. M. Ampère *and* J. Cummings *had predicted the feasibility of such a telegraph, using 25 wires connected with an equal number of compass needles. Baron* Schilling, *a Russian diplomat, developed a magnetic telegraph with five compass needles, later reduced to two, but he died in 1837 before the Czar granted him authorization to experiment with it on the field.*

In the same year Karl August Steinheil *developed the first telegraph link between* Munich *and* Bogenhausen, *which was based on the same principle as Schilling's and was six miles long.* Steinheil *was also the first to imagine a telegraph writing on a paper tape.*

In the same year, Sir Charles Wheatstone *and* William Cooke *built the first public telegraph line near* Birmingham. *It was 60 kilometers long and used a system with five compass needles that were deviated in the two senses by current flowing through the five-wire lines. In 1839,* Charles Wheatstone *perfected the system with a quadrant having the 26 letters of the English alphabet placed around the circumference of a circle with the compass needle placed in the center.* Werner von Siemens *also built a quadrant telegraph, putting identical transmitters and receivers in series with an ingenious synchronization system. It is worth highlighting that quadrant based telegraphs used a system of impulses to advance the indicator by one step on the quadrant, similar to the future 'stepped' telephone selectors.*

The very first telegraph lines had two wires, as the possibility of replacing the return wire for the current with grounding (obtained through a buried copper plate) had not yet been

discovered. Grounding of telegraph lines was first introduced by Steinheil in 1827. Others, however, attribute this to M.H. Von Jacobi in 1832. In any case, using a ground return in 1833, J.K.F. Gauss and W.E. Weber set up the first single wire telegraph line linking their two laboratories in Göttingen.

The Morse Telegraph

As seen above, until 1837 the history of the telegraph was entirely European. Up until then, the contribution of the United States had been irrelevant. But this state of affairs changed suddenly and dramatically when Samuel Finley Breese Morse, a painter by profession, came into the picture. He had a good knowledge of Europe, as he had traveled there often for his work. Morse was born in Charlestown, Massachusetts, on 27 April 1791. He graduated from Yale University, and then went to England to study art. He also painted many pictures of the Roman landscape. As a portrait painter, he contributed to the foundation of the National Academy of Design in 1826. In 1832, on board the ship that was taking him home from one of his many trips to Europe, he thought of a new type of electromagnetic telegraph, featuring an anchor, and of the intermittent and writing type - thus a very different concept from that of the compass needle telegraphs invented in Europe - which he developed in 1835. After many experiments and modifications, he obtained a patent for it in 1837. The advice of Professors Joseph Henry and L. Gale, consulted by Morse in the years prior to the granting of the patent, was quite relevant. It is also said that the father of one of the students in his drawing class, Mr. A. Vail, gave him the money necessary to run his experiments and build his equipment. Morse continued to teach Drawing at the University of New York while he was working on his telegraph.

The machine built by Morse in 1837 used a point code, which was transmitted by a cogged wheel. Morse tried to obtain a subsidy from the United States Congress but to no avail, and also attempted without success to gain support in England and in France, where he had presented his telegraph to the Académie des Sciences in 1838. However, his French friend L. J. Daguerre, the inventor of photography, authorized him to market photography in the United States, which could have earned him plenty of money to be used for his telegraph experiments. In 1840, Morse perfected his model and introduced his 'dot and dash' code, that is universally known today as the 'Morse code.' In detail, a manipulator was used to

transmit, giving short and long current interruptions (to reproduce dots and dashes), while on the receiving end an electromagnet was used with a writing point that was lowered to touch a ribbon of paper running beneath it, in a form of dry writing. Later on, Morse substituted the writing point with an ink roll, and this was the final model which was adopted worldwide for over a century.

Finally, in 1843, the US Congress granted Morse a subsidy of 30,000 dollars, to build a link between Washington and Baltimore. This was inaugurated on 25 May 1844, with the transmission of the famous message 'What hath God wrought?' It is interesting to recall that the experiment failed at first because Morse insisted on implementing the link with an underground cable. Afterwards, given the good results achieved in Europe with bare iron wire stretched between poles, he adopted this solution and met with full success.

At that point, Morse's life changed rapidly, but he risked to become very unpopular because of his ill-temper and capricious personality (he even argued with Prof. Henry, denying that he had ever received help from him), as well as because he supported the Confederation and approved slavery during the Civil War (1861-1865). Morse died in New York on 2 April 1872, a wealthy and honored man.

Unhoped-for Development

The Morse telegraph spread rapidly thanks to its simplicity and to the practical nature of both the equipment and the code. It entailed an enormous increase in transmission capacity compared to Chappe optical telegraph, and reached the rate of 1000-1500 words per hour, regardless of the distance. With the Chappe semaphore it would take about twenty minutes to transmit a single character from Paris to Lyon or vice versa.

Telegraph networks developed rapidly in all countries of the world. Telegraph lines were first made out of bare iron (later replaced by copper-plated iron wires, and then by copper wires), and were generally stretched between poles along railway lines, also because railways were the main users of the telegraph. Relays began to be used in 1850 (they had been invented by Joseph Henry in 1832) with the aim to regenerate telegraph signals along the line. A relay was operated by the current generated by the distant batteries and fed the line with the current supplied by local batteries. In this way, with a 30-40 kilometer regeneration range, the telegraph could transmit over almost unlimited distances, without ever having to pass through a human operator.

In those years, a large number of competitors struggled to gain control over the free market of telegraph service in the United States. Morse founded the Magnetic Telegraph Company *with* Amos Kendall *(who had been a Postmaster General) in 1845. By 1850 there were twenty competing companies. Two years later they increased ten-fold (there were fourteen in the State of Ohio alone). Thus, profits tended to be reduced and the quality of service declined. Two companies emerged from this confused situation: the* American Telegraph, *which gained control over the telegraph network in the East and South of the United States, and the* Western Union, *which controlled the transcontinental lines towards the West Coast. At the end of the Civil War, however,* Western Union *prevailed and acquired a virtual monopoly of the telegraph service.*
The first telegraph lines in Italy were installed in the Grand Duchy of Tuscany in 1844-45, under the guidance of Prof. Carlo Matteucci. *In 1852, England had a 6,400 kilometer telegraph network, which was under State control. This was also the case in the other major European countries, differently from the United States.*
In Cuba, in 1851, Samuel Kennedy *stretched an experimental telegraph line between Plaza de Monserrate (in front of the Teatro Tacón) and the Teatro Villanueva (the location of which is not indicated), according to the reports of Prof.* José Altshuler *(see bibl.). The* Casa del telégrafo, *as shown in a plan of the* Teatro de Tacón *drawn by the city surveyor in 1853 - year in which the first regular telegraph service between Havana and Bejucal was inaugurated - was situated right in front of the second Puerta de Monserrate.*
Following the success of land connections, the need was felt to develop undersea telegraph links. The first was laid between Dover and Calais, Great Britain, in 1850. Crossing the Atlantic was more difficult, both owing to technological reasons and to an insufficient theoretical understanding of cable transmission over long distances. In the years 1857 and 1858, Morse collaborated with an American investor named Cyrus Field, *the President of the* American Telegraph Company, *to develop the first transatlantic cable. The latter was finally laid in 1858, but the cable only worked for a short time and had to be abandoned on account of faulty insulation. Meanwhile, in 1856, Sir* William Thompson *(the future* Lord Kelvin*) observed the negative effect of the cables' capacity on attenuation; Kelvin solved the problem by slowing down the telegraph transmission speed and increasing the sensitivity of*

the receiver. More precisely, he invented a sending key that moved sideways very slowly, while, on the receiving side, he introduced his highly-sensitive mirror galvanometer. Furthermore, the German engineer Werner von Siemens *developed a procedure for watertight cable protection using gutta-percha, which yielded excellent results. A few years after the failure of the first transatlantic cable, new efforts were made and finally met with success in 1866, when the first transatlantic telegraph cable was laid, which worked perfectly. In 1865, the* Union Télégraphique Internationale *was founded in Paris, marking the international character of telegraph services with the agreement of all governments involved. Two later developments of the Morse telegraph are worthy of mention. In 1855,* David Edward Hughes *(who was born in London but lived in the United States for many years) managed to double the transmission speed. In 1875,* Émile Baudot *of France raised the transmission speed four-fold by adopting a multiplexing system. However, the latter was used only on heavy-traffic routes, as the operators had to be specially trained. Furthermore, owing to growing traffic both on land and across the ocean, the need was soon felt to convey more messages along the same wire. The first idea of a multiplex (a bi-directional telegraph) is attributed to the German* Wilhelm Gintl *in 1853. Discussing the history of the telephone in Vol. 3 of this book, we shall see how the research on telegraph multiplex contributed to the birth of the telephone itself.*

Chronology

1684 - *Robert Hooke* suggests using tables with large letters that can be read at a distance with the naked eye

1690 - Using a telescope, *Hooke*'s method is perfected, allowing transmission of conventional phrases

1774 - Demonstration of an electrostatic telegraph, by *Georges Lesage* of Geneva

1783 - The German *Bergstrasser* invents a coded communication system based on the position of the arms of trained soldiers

1791 - *Claude Chappe* invents a mechanical arm system called *semaphore* based on the same principle as that of *Bergstrasser*

1794 - September 1 - Inauguration of the first link (Paris-Lille, 230 km long) using *Chappe*'s semaphore optical telegraph

1809 - Demonstration of an electrochemical telegraph by *S. T. von Sömmering* in Russia

1816 - Development of an electrostatic telegraph by Sir *Francis Ronalds*

1820 - Prediction on the feasibility of a compass needle telegraph by *A. M. Ampère* and *J. Cummings*

1832 - Ground return of telegraph lines introduced by *M. H. Von Jacobi*

1833 - Demonstration of a single wire telegraph line with ground return between two laboratories by *J. K. F. Gauss* and *W. E. Weber*

1837 - Transmission using a perfected compass needle telegraph over a distance of six miles demonstrated by *K. A. Steinheil*

1837 - Patent for a five compass needle telegraph granted to *C. Wheatstone* and *W. F. Cooke*
1837 - First demonstration of a writing electromagnetic telegraph in New York by *Samuel F.B. Morse*
1839 - First compass needle telegraph with quadrant by *Charles Wheatstone*
1840 - Patent for the writing electromagnetic telegraph and introduction of the *dot-and-dash* code by *Samuel F.B. Morse*
1844 - (May 25) - First land telegraph link between Washington and Baltimore, 40 miles long demonstrated by *Samuel F B. Morse*
1844 - *L. Breguet* invents a compass needle telegraph imitating the *Chappe semaphore* signals (*Foy-Breguet* system)
1844-45 - The first Italian Morse telegraph lines are installed in the Grand Duchy of Tuscany
1850 - First undersea telegraph cable between Dover and Calais
1853 - Invention of the bi-directional telegraph by *Wilhelm Gintl*
1855 - *David Edward Hughes* perfects the telegraph, increasing the transmission speed to 1500 words per hour
1856 - The negative effect of the capacity of telegraph cables is discovered and the mirror galvanometer is introduced on the receiving terminal by *Lord Kelvin*
1865 - Foundation, in Paris, of the *Union Télégraphique Internationale*, to become the well-known *International Telecommunication Union* (ITU)
1866 - First successful transatlantic telegraph cable inaugurated
1874 - Introduction of the *Baudot* system featuring speed of 6000 words per hour

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THE HISTORICAL EXPERIMENT

It was in the course of his electrotherapy experiments that, in 1849, Antonio Meucci discovered the possibility of transmitting speech electrically, thus becoming the very first pioneer of the electric telephone in history.

Naturally, as was the case for many inventors in various fields, this discovery happened by chance. And, as was also natural, the first result was imperfect, though it sufficed to convince Meucci that he was on the right track.

Antonio Meucci immediately gave his system the name of *telegrafo parlante* (*speaking telegraph*). The telegraph was still in its youth, as only five years had elapsed since that famous 25 May 1844, when the Washington-Baltimore link was inaugurated. Moreover, it was considered a technical marvel, especially because of the possibility of instantly conveying written messages to very distant places thanks to electricity. The famous sentence transmitted by Morse on 25 May: "*What hath God wrought?"* gives a good idea of the enormous impression generated by that… divine invention worldwide.

So, it is 1849. Although the telegraph is five years old, another seventeen years will pass before it could cross the ocean and twenty-seven years before the first telephone patent was granted to Alexander Graham Bell.

For about a year, Meucci had been experiencing a period of relative calm. The Teatro Tacón had been inactive since 1 February 1848, and was not to host any new performances until 12 January 1850, for various reasons that are explained in detail in the Appendix "Gran Teatro de Tacón." Moreover, the contract with Governor O'Donnell for the galvanization of military supplies expired in 1848 for two reasons: firstly, O'Donnell was about to leave office (which he did on 20 March 1848) and then because his contract with Meucci had a four-year duration starting from 1844. In fact, Meucci stated, as referred above: *"… In the year 1844… I then made a verbal contract with the Governor General … for about four years I continued supplying the army as by previous agreement …"*

For these reasons, in the Spring of 1848, Meucci did not have much to do, with the exception of galvanizing objects for private citizens. It so happened that some of his friends who were physicians discussed with him about *Mesmer*'s therapeutic successes, which Meucci had read much about. The physicians asked him to test the method on some patients, mostly suffering from rheumatism.

But let us turn to Meucci himself, who gave the following statements in his testimony in the Bell/Globe trial:

[Answer No. 14] *"Having read the treatise on Animal Magnetism, by Mesmer, the idea came to me to apply it and*

make experiment, applying electricity to sick persons, by order of some friends of mine - doctors, - to see if what was said by said Mesmer was right; and while I had not much to do I devoted myself also to giving electrical shocks to various persons employed by me - Negroes - and sometimes to my wife. In the same time I had laid from my laboratory to a third room an electrical conductor and I produced the electricity by a series of batteries of Bunsen that I kept in my laboratory. One day a person known by me appeared, who was sick with rheumatism in the head— then I put him in the third room; I put in his hands the two conductors, communicating with the battery, and at the end of said conductors there was a utensil — insulated from the conductor — made of cork — of the form I illustrate here [at this point, Meucci draws Fig. 1, shown below, Editor's note];

Fig. 1 from Antonio Meucci's testimony at the Bell/Globe trial.
It shows a copper tongue (left) to which two twisted copper wires, passing inside a cork handle, are soldered

Above said cork, [was] *a small metallic tongue soldered to the conductor of copper insulated wire, which passed in the interior of said cork and communicated with the battery. In my laboratory (Fig. 2) where I kept an instrument identical with the one he held in his hand, I ordered him to put the metal tongue in his mouth, in order that being in communication with me by the electric fluid, I wished to ascertain where was his disease. I put the same instrument to my ear. The moment that the sick person introduced the little tongue between his lips, he received a discharge and yelled. I obtained in the same moment, in my ear a sound. I interrupted the operation, and to prevent the case of the electrical shock being received by the person, the idea struck me to remedy such accident. I took the two instruments, the one that was in the hand of the person, and mine, and I covered them with a funnel of pasteboard so as to render the little tongue insulated from contact with the flesh (Fig. 3)*

Fig. 2 from Antonio Meucci's testimony at the Bell/Globe trial
The patient is in the 'third room' (first, from left); in the second room there is a reel of wire. Meucci was in the laboratory (right) where the Bunsen batteries were located

I ordered the sick person to repeat the operation made before, and not to have any fear to be affected by the electricity and to speak freely into the funnel.

He did so immediately. He put his funnel to his mouth, and I put mine to the ear. At the moment that said individual spoke, I received the sound of the word— not distinct— a murmur— an inarticulate sound. I caused it to be repeated several times in the same day. Then, I tried it again in different days, and I obtained the same result. From this moment this was my imagination, and I recognized that I had obtained the transmission of the human word by means of conducting-wire united with several batteries to produce electricity and I gave it immediately the name of 'Speaking Telegraph.' This was about the end of 1849 to 1850 when I stopped my experiments on said object, reserving them to my arrival in New York,

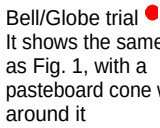

Fig. 3 from Antonio Meucci's testimony at the Bell/Globe trial
It shows the same device as Fig. 1, with a pasteboard cone wrapped around it

because I was due to leave Havana between 1850 and 1851. I had an immense quantity of batteries; about sixty."

It should be recalled that Meucci's testimony was printed a few years before the appeal of the Bell/Globe case to the Supreme Court, as a document of the *US Circuit Court, Southern District of New York.* The book contains the 214-page deposition of Antonio Meucci, in addition to 108 pages consisting of annexes (affidavits and copies of various exhibits) along with 111 pages with the English translation of 61 publications regarding other two claimants for the invention of the telephone, the French *Charles Bourseul* and the German *Philipp Reis.* A few parts of Meucci's testimony concerning the experiment described in this chapter are included in the Appendix "From the Bell/Globe trial - Excerpts from Antonio Meucci's Deposition (1885-1886)." This Appendix also contains some excerpts of the affidavit sworn by Antonio Meucci on 9 October 1885, shortly before the first hearing of the Bell/Globe trial, which was held on Monday, 7 December 1885.

This affidavit was drafted in English and it included drawings made by Meucci, *'with my own hands,'* as he stated in the affidavit. Although the drawings contained in the affidavit are very similar to the ones shown above (which were hand-traced by Meucci before the *US Commissioner, John Shields,* at the time of his testimony), they are very interesting because they integrate the information contained in the latter and help to clarify a few points, besides being more accurately drafted. Of them, three have been chosen which are reproduced below.

The reader may notice that next to each of these three drawings Meucci indicated the year they refer to. The first drawing, on p. 309, shows the plan of his apartment and laboratory, together with the diagram of the experiment, and the date, 1848, is clearly indicated. The date in the second drawing (Fig. A) is somewhat blurred but also seems to be 1848. The third drawing (Fig. B - Instrument with pasteboard cone) carries the date 1849. In the text of his affidavit, Meucci declared that he had performed the experiment *'somewhere about 1849'* and, further ahead, he stated as follows: *"I know the date of 1849, when I first conceived the idea of a speaking telegraph, is correct."* The previously-mentioned painter Luigi Tartarini declared that the experiment was performed *'in 1849.'* Meucci himself, during his cross examination, replied to Question No. 161: *"When and where did you make the invention which you claim in this case?"* as follows: *"In Havana in the year 1849."*

From the above, we can be fairly certain that the experiment of the first speaking telegraph was conducted in 1849, whereas the date 1848 on one of the two drawings would seem to refer to the electrotherapy experiments, which

preceded the speaking telegraph experiment. It is, however, to be borne in mind that Antonio Meucci began his electrotherapy experiments much earlier than 1848. Indeed, in his affidavit Meucci stated: *"During the time that I ran this factory* [*for electroplating*, Editor's note]] *I had constructed an electrical machine for the purpose of using it on persons who where sick …"* Domenico Mariani, who had reached Havana from Milan in 1846, confirmed Meucci's statement in his deposition to said trial: [Mariani's Answer No. 5] *"… I remained for five years… In all these winters I always amused myself watching these* [electrotherapy] *experiments repeated …"* As the electroplating laboratory set up by Meucci started to work with an army contract in 1844, it can be deduced that the electrotherapy experiments began in the period between 1844 and 1848, in agreement with the above testimonies.

Having established the period, let us now examine the place where the historical experiment was run. Firstly, we must take into account that Antonio Meucci's reply to Question no. 162: *"You have spoken of a workshop in Havana; was that at the theater or in your house where you lived, or where in Havana?"* was: [Answer No. 162] *"In the theater, because I lived in the theater, and in the same place I had my workshop."*

The first drawing of Antonio Meucci's affidavit, showing his three-room apartment, his laboratory and the courtyard, as well as the layout of his experiment of 1849 in Havana

Moreover, in his affidavit Meucci declared: "*This factory* [*for electroplating*, Editor's note] *was connected with my residence … the rooms in which we resided which were four in number …"* (the fourth room being Esther's laboratory, as shown on p. 271). In the first drawing of Meucci's affidavit, shown above, the layout of the rooms where the experiment was performed is shown, and, in particular, the location of the *'third room'* where Meucci said he had placed the patient with head rheumatism to treat him with electric therapy. The same drawing also shows a *'Grande Cortile'* (*large courtyard*), through which Meucci made the return wire pass, from the patient to the negative pole of the Bunsen battery. This battery was placed in the room indicated in the same drawing as the (Meucci's) *Laboratory*, which had two doors, one overlooking the courtyard and the other leading to the apartment of the Meuccis. This proves that the apartment and the laboratory were on the ground floor, practically on the same level as the courtyard. It also shows that the laboratory was perpendicular to the apartment and formed part of the theater building (which also was perpendicular to the residence building), thus allowing easy access to the proscenium equipment[9].

[9]In the plan on p. 271, we added a communicating door between the laboratory and the proscenium and another one leading to the two prop rooms where the small electroplating workshop was probably situated.

Affidavit of Antonio Meucci, Figures A and B

It is worth noting that the masonry structure, which jutted out on the left side of the theater building, and where Meucci's laboratory and the theater's prop rooms were located, is clearly visible in the picture on top of page 254.

In his testimony at the Bell/Globe trial Domenico Mariani stated that: [Answer No. 5] "*The rooms were three or four: the theater tailoress's workshop, then came the parlor, the kitchen and the bedroom. In the* [Antonio Meucci's] *workshop he had these wires with the two handles attached. Sometimes he gave the shocks on the doorsteps of the house, sometimes behind the stage* …" This confirms our hypothesis on the existence of a door between the laboratory and the proscenium, since through it (when the private apartment of Meucci was not available, for instance) the wires could be extended from the battery in the laboratory to inside the theater, precisely *'behind the stage,'* as Mariani said.

That the batteries had to be kept in a separate place is justified by the fact that the Bunsen batteries gave off nitrous vapors, since nitric acid was used as a depolarizing agent, and that they required accurate and frequent maintenance, which needed to be performed in an ad hoc room (See the Appendix "History of electrodeposition techniques"). On the other hand, this was quite normal, for instance, in telegraph offices, which always had a special room where to keep the batteries.

It is also worth to be remarked that the Bunsen battery presented excellent electric characteristic, as it developed about 1.9 volts per voltaic element (one of the highest available levels) and was capable of providing relatively intense current. Meucci used many, as he needed them for electroplating. In fact, in his testimony at the Bell/Globe trial he stated:

[Answer no. 540] "*In the first experiment I used many; I had 60 and I think I put them all together; but then sometimes I took the conductor away from the negative pole of the last cell and put it in communication with just 4 or 6 cells, since by experimenting I found that I didn't need a current so strong…"*

Since the sketch of the medical apparatus (Fig. 17 of Meucci's deposition, reproduced on p. 313) clearly shows that the batteries were connected in series, not in parallel (as in electrodeposition), this leads us to believe that the patient in the first experiment received a whack of 114 volts, whereas the following experiments were conducted with a voltage reduced to 7.6 volts or 11.4 volts approximately ("… *4 or 6 cells, since by experimenting I found that I didn't need a current so strong* …"). Incidentally, this sentence pronounced by Antonio Meucci, together with the previously quoted one ("… *I caused*

These doors were not indicated in Meucci's drawing in the affidavit, for they were irrelevant for the layout of his experiment.

it to be repeated several times in the same day and then I tried it again in different days …") brings back to memory Galileo's teaching of '*provando e riprovando'* (*'trying and trying again'*), which was the motto of the *Accademia del Cimento,* founded in Florence by the followers of Galileo, in 1657. Meucci had often heard this motto from his teachers at the Accademia di Belle Arti in Florence. In the 214 printed pages of his testimony, there are many other references to the Galilean method because, every time the adverse lawyer, *James J. Storrow*, tried to make Meucci fall in a trap, attempting to demonstrate his ignorance in the field of electricity (which was much less than that of A. G. Bell, as he himself confessed) he referred to this method. One example among many others:

[Cross-Question No. 254] *"What was the advantage of having the hole opened and closed by the tongue?"* [This question refers to one of the many telephone models contrived by Meucci in the United States]

[Answer No. 254] *"They were experiments I made to see if it was better to have a hole in the center of the membrane, instead of having the membrane without hole, in order to see if it was better for the transmission of the word."*

[Cross-Question No. 255] *"Why did you think that it might be better?"*

[Answer No. 255] *"I wanted to try; I tried so many, and I wanted to try this one also."*

[Question No. 256] *"But what made you think it might be better?"*

[Answer No. 256] *"To try, but I didn't find much difference between the closed membrane and the one with the hole."*

Note how, despite the insidious insistence of the lawyer Storrow, Meucci - here as elsewhere - did not grasp the malicious nature of the questions that were being asked, and his answers were always spontaneous and straightforward.

With regard to the voltage level employed in the experiment in question, it is interesting to note that a modern-day generator for electrotherapy uses between 10 to 50 volts, regulated according to the patient's sensitivity, as experienced by the author in a physiotherapy laboratory. I recall that the operator increased the voltage, asking me to say at what level I found it still bearable, in order to adjust the current. The fact that electrotherapy is important in the treatment of pain has been widely demonstrated in clinical practice and given a theoretical basis with the *gate control* theory, illustrated in greater detail in the "Electricity and Magnetism" insert, on p. 284. Indeed, the fact that Meucci used electrotherapy on his wife Esther, who already suffered from intense rheumatic pain, shows that she must have derived some benefit from it.

According to the Cuban historiographer Fernando Ortiz, a famous and beautiful singer, *Consuelo Ispahan*, was saved by Meucci's electrical apparatus as a consequence of which she developed a *fond friendship* for him. Perhaps, however, Ortiz was referring to an exceptional event, like a heart block. In that case the medical apparatus, which was right behind the stage, may well have been used to perform emergency cardiac stimulation. Or maybe this was only one of the many legends that spring up around famous men, although Ortiz has always proven to be very well documented.

Diagram of the medical equipment used by Antonio Meucci in Havana (Fig. 17 of Antonio Meucci's testimony)

Meucci precisely described the layout of his medical apparatus in Fig. 17 of his testimony, shown above, where the drawing and captions were both made by his own hand. In this diagram, the two devices that Meucci applied between two different points on the patient's body are indicated as (translation from Italian) *"insulated wooden tubes to be held in the hands, with a sponge on top communicating with the conductor to be applied to the sick part of the body"* (this is exactly how electrodes are applied in electrotherapy today).

"I then put this copper of my instrument to my ear…"

The ingenious *"apparatus to break the current in giving the electric shock,"* schematized in the same Fig. 17 above, is illustrated in greater detail in the Appendix on p. 422. As we will see, it made it possible to send to the patient electrical impulses of calibrated duration, thus avoiding having to depend on the time required for manual connection to the battery clamp, which could have been unbearably long. It is quite likely that the duration of the impulse was similar to that used in modern electrostimulators (ten to fifteen milliseconds), as such a duration is typical of electromechanical relays.

In the case of the famous patient who suffered from head rheumatism, Meucci probably asked the patient to hold one of the electrodes in one of his hands, while he asked him to put the other electrode in his mouth, on the copper side - holding it in his other hand with the cork handle - when he was told to do so, so that the electric current would pass through the ailing part of the body. But this is when the most incredible (for modern science), though fortunate, thing happened. The reader might recall from the "Electricity and Magnetism" insert that both Mesmer and the Abbé Bertholon (who applied Mesmer's *animal magnetism* theories to electricity) claimed that to diagnose a patient's disease, the physician had to be in electric and/or magnetic communication with the patient. In fact, Meucci stated that the reason why he was holding a device similar to that of the patient in his hands was that [Answer no. 14] *"… being in communication with me by the electric fluid, I wished to ascertain where was his disease."* Although such an expedient was absolutely groundless, in the light of modern-day theories (whereas it was surely a way for the physician to

ensure that the shock given to the patient was not too strong), it was precisely thanks to it that the favorable conditions for the discovery of the speaking telegraph came about.

Now, in order to be *"in connection… by the electric fluid,"* Meucci had to be inserted in the patient's circuit, and this was the reason why, standing in the laboratory, he *"kept an instrument identical with the one he* [the patient] *held in his hand."* When Meucci wanted to be inserted, all he had to do was to touch the copper tongue of his instrument with one hand and a pole of the battery with the other hand. The Bunsen batteries were probably placed on the floor, on wooden table, or were slightly raised, since they were to be used for the galvanic baths. Every so often, Meucci would adjust the current by bending down and shifting the conductor from one clamp to another of the battery ([Answer no. 540]: *"… sometimes I took the conductor away from the negative pole of the last cell and put it in communication with only four or six cells …"*). It would appear logical to think that while shifting the clamp, probably with his right hand, Meucci would hold his instrument in his left hand.

Therefore, when he established the contact with the 60 Bunsen batteries (ca. 114 volts), causing the patient in the third room to scream, he probably heard the famous yell in his left ear that was closer to his left hand, which must have been slightly raised. His above quoted expression *"I put the same instrument to my ear"* is not to be interpreted, at least in that first experiment, in the sense that Meucci deliberately put the instrument next to his ear (there was no reason for this in electrotherapy). Rather, it must mean that he casually heard the cry coming from the copper tongue of his instrument, which just happened to be close to his ear, after which he raised it up to his ear. This is proven by Meucci's affidavit, where he was much more precise on this point: *"… I thought I heard this sound more distinctly than natural. I* ***then*** *put this copper of my instrument to my ear and heard the sound of his voice through the wire ..."* It must be pointed out that, since Antonio Meucci had prepared his affidavit before the trial, and the same was exhibited by his lawyer during the trial itself (as *Defendants' Exhibit No*. 120), Meucci's testimony and affidavit integrate each other.

We may note that if Meucci had not followed the absurd indication of Mesmer and Bertholon, that is of placing himself in electrical communication with the patient, he would not have discovered his speaking telegraph, for he would have had no reason to hold a device similar to that of his patient in his hands. However, Meucci himself stated in his affidavit that another reason why he had a duplicate of the patient's instrument with him was that he wanted to know how strong

was the current that he was using ("… *wishing to know how strong a current I was using … I had a duplicate of his instrument with me …"*).

Another surprising circumstance in this experiment was that the voice was transmitted according to two principles that were entirely unknown back then and began to be understood and exploited only after 1876. The two principles are the *variable resistance transmitter* and the *static telephone*. Indeed, when the patient shouted on account of the shock, in the first experiment, he introduced a *variable resistance* in the circuit, which consisted in the wobbly contact of the copper tongue with the saliva on the tongue in his oral cavity, similarly to what would happen in the so-called (Gray's or Bell's) *liquid transmitter*. As is known, *variable resistance transmitters* (particularly the *carbon microphone* invented by Thomas Alva Edison) are the most powerful telephone transmitter that exist, and—perhaps as much as the magnetic receiver introduced by Alexander Graham Bell—must be credited with the success of the telephone, having rendered long-distance transmission feasible.

The second principle, that of the *static telephone*, is only known to experts of the sector today. However, we can explain how it works to the non-specialized reader by referring to the principle of the *leaf electroscope*. Indeed, it is known that if two adjacent gold leaves, hinging on one side, are charged with a certain voltage with respect to any other surface (the ground, for instance), they will move apart because the identical charges on the two leaves repel each other. If the voltage applied is variable in time, the two leaves will vibrate, according to the variations of the applied voltage. Therefore, this device acts like a modern *condenser telephone receiver.* The same principle may be used in the transmitter, similarly to a *condenser microphone*, that is utilized today for special purposes.

More precisely, in Meucci's first experiment (in which the patient shouted after having put the copper tongue in his mouth), the voice was transmitted due to the variable resistance effect in the patient's oral cavity, as previously stated, and was received due to the variations in static potential of the copper tongue of Meucci's instrument, which had a very high average (bias) voltage (114 volts). Indeed, the copper tongue of Meucci's instrument, which must have had a surface area of several square centimeters and must also have been very flexible, acted like the armature of a condenser with respect to the rest of the circuit, and was also subjected to a variable voltage due to the effect of the already-mentioned variable resistance (of the patient) in series with the fixed resistances of the circuit, namely that of the stretched wires,

that of the reel of wire in the second room, and the internal resistance of the batteries.

After Meucci introduced a pasteboard cone to avoid the inconvenience of the shock, both at the transmitting and receiving ends (second experiment), the voice was transmitted by static effect on both sides. This set up resembled the *'static telephone'* which was to be demonstrated many years later by Prof. *Amos E. Dolbear*. The reader who wishes to know more about this device will find an appendix on pp. 437-438, which provides a summary of a conference on this subject, held by Prof. Dolbear himself in 1883. He reported having tried out this system between Boston and New York, obtaining excellent results. It can be seen that the system experimented with by Prof. Dolbear in 1883 was substantially identical to that used by Meucci in 1849, and illustrated in Meucci's Fig. 18 of his testimony, which is reproduced below. This is how Meucci described it:

[Answer No. 538] …

"*No. 1 Apparatus to transmit the human word*
No. 2 The same to receive
No. 3 The same to transmit
No. 4 The same to receive
No. 5 Large reel of conducting wire to have more resistance and more distance
No. 6 Series of Bunsen batteries as in the preceding.

This apparatus I used in the first experiments of my invention in Havana that I repeated with the same apparatus at Staten Island in 1851. The person speaking with me kept in his hands two instruments Nos. 2 and 3, one to transmit and the other to receive as for the same purpose I kept in my hand Nos. 1 and 4.

Looking at Fig. 18, one can't help but reflect once again on the fact that Mesmer's prescription, according to which the physician was to be inserted in the patient's circuit, suggested to Meucci the first scheme in history whereby to realize a *bi-directional* and *simultaneous* telephone conversation. The second observation is that in the experiments performed in Havana, no bobbins or magnets of any type were used, neither permanent nor temporary (namely, electromagnets), which Meucci began to use only in 1853 in New York.

Finally, it is worth highlighting that the quality of voice transmission in the first experiment (that of the famous shout heard by Meucci when he had not yet added the pasteboard cone to the instruments) must have been much better than that of the second experiment (the one with the pasteboard cones). This is because a variable resistance transmitter is definitely more powerful than a condenser microphone. Furthermore, after applying the pasteboard cone to the instrument (despite

the increased acoustic pressure provided by the cone itself), no matter how loud the patient spoke, he certainly would never have screamed like he did the first time when he received a 114-volt electric shock. The memory of that distinctive scream, so loud and clear (unlike the *'murmur, an inarticulate sound'* he heard after the application of the pasteboard cone)—must have stayed with Antonio Meucci and encouraged him in his following experiments, which he continued to carry out for over twenty years thereafter.

Diagram of the telephone conversation, used by Antonio Meucci in Havana in 1849 (Fig. 18 of Antonio Meucci's testimony)

Whenever in the following years Meucci thought back to the origins of his discovery, he recalled the scream of that patient, who held the conductor between his teeth. For example, when, in 1865, the press gave the news that a telephone had been invented by *Innocenzo Manzetti* from Aosta (whose biography is included in the Appendix on p. 439 seqq.), Antonio Meucci claimed the priority of his discovery in a letter that he sent to the Editor of the *Commercio di Genova* on 13 October 1865, and which was published by this paper on 1 December of the same year. In it Meucci stated:

"… I was one of the first to work with all assiduity in the art of electricity as well as galvanism since the time of their first discovery; at the time I lived in Havana… I came to discover that with an instrument held to the ear and with the aid of electricity and a metallic wire, one could transmit the exact word by holding the conductor in the mouth and pressing it between the teeth, and at any distance two persons could put themselves in direct communication, without the necessity of communicating their secrets to others …"

Note that here Meucci used the sentence *"transmit the exact word holding the conductor in the mouth"* instead of the expression *"the sound of the word— not distinct— a murmur— an inarticulate sound"* [Answer no. 14], which latter referred to the experiment in which the pasteboard cone was added. Incidentally, Meucci immediately grasped the true advantage of the telephone over the telegraph, which was linked to the fact that two people could *"put themselves in direct communication* ***without the necessity of communicating their secrets to others."*** Note also that the above letter, written about twenty years before the Bell/Globe trial began, shows that Antonio Meucci quoted his Havana's experiments long time before he was summoned to defend his rights before a jury.

The story of *'the conductor between the teeth,'* which Meucci quoted every time that he wanted to recall his pioneering work on the telephone, could not but be used by his enemies to ridicule him. For instance, Prof. *Charles A. Cross* (who was a consultant and witness of the opposing side to Meucci in the Bell/Globe trial) gratuitously interpreted the

foregoing letter to the *Commercio* to mean that it was necessary also for the person at the receiving end to hold the conductor between his teeth (receiving with his teeth!), and he even had the bad taste to add in his affidavit, which will be amply discussed in the Appendix on pp. 432÷434, that, also under such conditions, he had verified that words could be understood thanks to mechanical transmission of sound or, using his words, *"upon the principle of the string telephone or lovers' telegraph."* Note that the English definition of *lovers' telephone* (or *telegraph*) is associated to the fact that lovers need to avoid having to communicate their secrets to other people, as illustrated in the figure on p. 93.

Mr. *George F. Durant*, who was another witness against Meucci, and was obviously following the instructions of American Bell's lawyers, played on the same misapprehension as Prof. Cross, referring to a conductor between the teeth, also on the receiving end. Durant's testimony concerned a visit paid by Antonio Meucci and his friend *Angelo Bertolino* in spring 1872 to Mr. *Edward B. Grant*, Vice President of the *American District Telegraph Company* in New York.

BATHING IN THE SEA

The English writer Robert Baird wrote that bathing was one of the most pleasant memories of his journey to Havana in 1849 . "There were many establishments of this type in the city as well as on the outskirts. One could bathe in warm or cool water for a price of 25 centavos or half a dollar. Only in a climate such as Cuba's was the pleasure procured by these baths fully appreciated. Bathing in the sea deserves special mention; one can swim along the northern coast, where many establishments are situated near the road that leads to the cemetery. The Cuban coast is made up of a bee-hive type of rock. This rock is cut or transformed into small 20-square-feet pools which are 3 to 6, or even 8 feet deep. The wall is interrupted by a breach which allows the current to flow freely in and out of the small pools, while at the same time preventing bothersome foreign objects from passing through. In no other island of the archipelago are there baños *comparable to those in Havana. Only those who have experienced the delight of bathing in the tropical seas and know the dangers of swimming in the open sea that surrounds these islands can fully appreciate the advantages that the people of Havana enjoy by having such places where to bathe. Naturally, there are also separate* baños de mar *for women; there exist some so large that more than one person can bathe at a time, although a client may always ask to have one all to himself. The small pools are covered with a wooden hut. Bathing generally costs one* peseta, *and the price for the use of the towel is one* real." [translated from the Spanish Edition]

A pool for sea bathing

Meucci and Bertolino had asked Mr. Grant to have the latest model of Meucci's speaking telegraph (which, in the meantime, had been re-baptized *telectrophone*) tested in the laboratories and on the telegraph lines of that telegraph company. Durant said that he assisted that presentation and, as Mr. Grant had died shortly before the beginning of the Bell/Globe trial, he gave testimony on that meeting, as a witness in favor of American Bell[10]. In particular, he stated that he vaguely recalled the two Italians illustrating something

[10]George F. Durant was appointed Vice-President and General Manager of the *Bell Telephone of Missouri* shortly before the beginning of the Bell/Globe trial.

of this sort (see extracts from Durant's testimony in the Appendix "From the Bell/Globe trial" on pp. 433÷435) and that [Answer No. 16] "*… the device being placed in the mouth, and the other man having it in the mouth, some sensations were produced …"* Durant also added: [Answer No. 17] "*I think it was in Cuba. My recollection is that this man* [Meucci] *was a dentist and an experiment was made with his assistant …"*

Overlooking the ill-disguised derisory tone, which was typical of a certain old-fashioned English, what Durant basically testified was that the system illustrated to Mr. Grant by Angelo Bertolino and Antonio Meucci (who, during that meeting, had remained silent owing to language difficulties) was, once again, that of the first experiment made in Havana. The description, however, was distorted, by stating that also the receiving person must hold the conductor in the mouth, nor did he mention any of the (thirty) different models developed by Meucci in New York. When cross-questioned by Mr. Humphreys, the lawyer of the Globe Telephone Co. and of Antonio Meucci, Durant admitted that Mr. Grant was given a description of Meucci's invention on ten or twelve legal cap sheets, written on both sides, and these sheets were then passed on to him. He did not comment on the content of those many pages, other than the ridiculous aspect he had chosen (or invited) to mention.

We would prefer not to insist on these skirmishes of the trial, which, quite often, instead of helping to discover the truth only serve to exasperate feelings. On the contrary, we would like to see that shout in Havana go down in history as the pioneer of electrical voice transmission, for, as Meucci testified: [Answer no. 14] "*… From this moment this was my imagination, and I recognized that I had obtained the transmission of the human word by means of conducting-wire united with several batteries to produce electricity, and I gave it immediately the name of 'Speaking Telegraph.' "*

TIME TO LEAVE

One of the delights offered by Havana was sea bathing. Antonio, Esther and little Juanita, on board their *volanta* driven by the attentive René, would choose one of the many bathing establishments along the *Malecón* (the road that runs along the coast), in search of some relief from the hot Havana summer, even more than once a week. The *baños de mar* (sea bathing establishments), like the city's cafés, were meeting places, where also foreigners would go, saying they had never enjoyed

such a delight in any other part of the world. It was on one of those occasions that Antonio met a wealthy Cuban whom he was later to come across again in the United States, *Augustus A. Samanos*.

Samanos, as *Jim Mason*, *Antonio Jané* and *John Anderson* had done before him, insisted - especially after having heard the description of Meucci's experiments - that there was no better place for Meucci to take full advantage of his talents than the United States, and the New York area in particular.

There were, however, other reasons that convinced Meucci to leave the city he had grown so fond of, not last among them was the fact that Esther suffered from arthritic and rheumatic pains elicited by the excessively humid climate. Meucci stated in his affidavit: *"… I gave currents of electricity to my wife. I once gave it at an unfortunate period, which affected her quite seriously …"*

One Autumn evening of 1849, shortly before the opening of the theater season (which was to be the last in Cuba for the Meuccis and for the Italian Opera company) Don Francisco invited the Meuccis to his house after dinner.

The Marty family lived on the second floor of the residence building, in a large apartment right above that of the Meuccis. It offered a beautiful view to the East that was not hindered by the wall surrounding the *Grande Cortile*, which, instead, blocked the view from the apartment of the Meuccis on the ground floor. One could behold the majestic statue of Isabel II, which stood in Plaza de Monserrate, in front of the theater, just behind the homonymous paseo that crossed the square with six rows of willows and grew larger around the statue of Isabel. Beyond the last row of trees there rose the large city wall with the two gates of Monserrate.

The two men sat down in the large and very long veranda, enjoying the cool of the evening and the soft, sweet hues of the autumn sunset, without the heat that accompanied them. Indeed, the veranda faced East and was in the shade at that time of the day, as was most of the courtyard, at the center of which a beautiful octagonal fountain gurgled, which greatly contributed to the coolness of the place. Don Francisco withdrew with Antonio by a lovely round Viennese-cane table at one end of the veranda. Juanita played tag with Don Francisco's children and the women chatted inside the house, as they prepared cakes and cold beverages. The two men thought that the voices of the women and children were among the most beautiful things in life.

Paseo de Extramuros, later called Isabel II, in 1841, seen from the sea (The Teatro Tacón is in the background to the left)

"Querido amigo Antonio," Don Francisco began in a calm yet somewhat distressed tone of voice, *"mira estos Habaneros!* (*look at these people of Havana!*) *… "* After which he began to talk about that city's lack of interest in the theater and he re-

minded Antonio that already in the last but one season, that of 1847, the people had gradually stopped attending the theater, so much so that it was no longer a profitable business and he was being forced to end the season earlier than planned. Indeed, that year the season ended on 31 January 1848, with the performance of *'Columbus in Cuba.'* From then on, Don Francisco decided that the theater would remain closed to the public. He was not disappointed so much by the economic loss endured, as by the people's lack of appreciation for that large and expensive gift (the theater) that he, Don Francisco, had made to the people of Havana with his own money. He was also somewhat embittered by the negative comments that were reported in some newspapers about him, starting from 1848, which dug up, with veiled recriminations, episodes of *'Pancho Marty*'s *turbid past.'*

It goes without saying that the new Governor, *Federico Roncali*, had had something to do with this. Roncali, who succeeded Leopoldo O'Donnell, took office on 20 March 1848 and governed until November 1850, in a period rocked by riots, revolutions, invasions and related repressions. On the contrary - Don Francisco went on - the tours of the Italian Opera Company (which he himself had re-baptized *The Havana Opera Company* for the occasion) in the United States, which had begun in the summer of 1847, had always performed to a full house, wherever it went. In *New York*, *Philadelphia*, and *Boston* (where the Italian opera had never been staged before) and in other cities of the United States, the interest of the American public for the Opera was rapidly growing.

Thus, Don Francisco had decided to leave Havana, if not forever, at least for a long period of time. He would focus on organizing performances in the United States. He also told Meucci that, before leaving Havana with the opera company and with his family, it was his intention to re-open the Gran Teatro in grand style, featuring a few top level premières, such as *Lucia di Lammermoor* and *La Favorita*, so that the people of Havana would realize what they had lost after his departure. *"Your great friend Lorenzo Salvi, who is such a great success at Covent Garden in London, will be there* - Don Francisco added - *and then we will all leave for Charleston, where I've been asked for a long time now to organize an opera. We will then go to New York to Castle Garden, and to Philadelphia and after which … we shall see. But… as for Havana… it is a chapter I intend to close."*

What Don Francisco did not tell Antonio - and which certainly also contributed to his decision to leave the Gran Teatro and Havana - was that there were only a few years to go before his (twenty-year) government concession would expire. With

said concession, Tacón had given him the exclusive management of all theater performances in Havana for that period. Thus, Don Francisco thought it would be wise to prepare alternative solutions, and also to play hard to get, since he could not trust Governor Roncali's whims (but Roncali will have to leave too, sooner or later - Don Francisco thought to himself - just like all his predecessors, in a few years or so).

However, Don Francisco was very explicit on one point concerning Meucci. *"Antonio"* he said, lowering his voice, *"do you actually think that the Governor was not informed about the money you sent to Garibaldi?… And how do you think he took it?… Don't you know that in all the former Spanish colonies of America Garibaldi is considered to be the patron saint of independence fighters and that Cuban exiles are doing their best to get him to organize the invasion and liberation of Cuba from Spanish dominion?"* He grew quiet and thoughtful. Then, after a moment's hesitation, he suddenly decided to speak out: *"Take a look at this"* he said, pulling out of his pocket a folded piece of paper signed *El Lugareño*. He pointed to a sentence written in italics *"Un valiente sabe siempre encontrar un arma"* (A brave man can always find a weapon). *"This"* he said, handing the piece of paper over to Antonio, *"is a clandestine manifesto that is circulating in Cuba and this is a sentence pronounced by Garibaldi, which Gaspar Betancourt, known as El Lugareño, is using from New York to encourage Cuban independence supporters to rise up against Spain. Do you understand me now?"*

There was no anger in Don Francisco's words, although he felt Spanish down to the bone, as he had been born in Barcelona. In fact, Don Francisco was a very open-minded man, for, besides working in the theater, he had traveled around the world, and was therefore able to look upon the events going on in his home country with a certain detachment. Antonio was suddenly overcome by that strange feeling of danger which he had not felt in over fifteen years. It was like a shiver down his spine, cold on the nape of his neck and a void that seemed to pull him in from inside his stomach. For a moment he almost thought he heard the echoing steps of the guards outside his home, and felt the dampness of the prison cells in his bones, only now also his wife Esther and little Juanita were in danger. But, instead of increasing his fear, this last thought gave him strength and determination.

The cakes and cold beer brought in by the cheerful and oblivious wives lightened up the grave atmosphere that had set in. Don Francisco changed the subject: *"What do you think about this ice-cold lager?" "Excellent!"* Meucci replied, *"Why do you call it lager?" "Because it's stored in a cold place all winter prior to being marketed. It's German stuff, nothing like*

the English beers that are more like piddle…" He took a long sip of lager, enjoying the shining gold beams of the setting sun reflecting on the frosted crystal of his glass and then continued: *"You know Antonio … About what I was saying before, you don't have to worry … You're not in danger now, as long as you don't get yourself caught sending any more money to the independence fighters. In the United States they would raise a monument to you, but over here…"*

Antonio Meucci remembered that the following year, that is to say 1850, his contract with Don Francisco was going to expire. Indeed, fifteen years had passed since he had been engaged, back in Florence in 1835, with a five-year contract that had already been renewed twice. Don Francisco's words might mean that he did not intend to renew his contract and that of his wife a third time. Fortunately, he thought, thanks to Esther's caution and wise administration, they had saved up more than twenty thousand pesos, therefore not only could they manage for a long time, but they could also invest the money in some profitable enterprise. Yet, they still had to find a job.

Don Francisco Marty, like Alessandro Lanari before him, was very much concerned about the future of the Meuccis. He assured Antonio that he would never have reason to regret moving to the United States, even if he wanted to continue working as a technical theater manager, besides devoting his time to his experiments. Indeed, he said that he was personally acquainted with another famous impresario, an Austrian by the name of *Max Maretzek*, who lived in New York and had much in common with Don Francisco in terms of competence and spirit of initiative. *"My friend Max Maretzek"* he said reassuringly, *"will be more than happy to help you both find a good job at the Astor Place or at the Castle Garden in New York and might even offer you better conditions than my own …"*

"Daddy Daddy…" Juanita broke in, clasping her father's knees, *"no quiero dejar la Habana, no… no… prometido, papito?"* Apparently, despite the fact that she was only five years old, Juanita had picked up parts of the conversation between her father and *el Señor empresario*. Children understand much more than adults can imagine. As she was born and raised in Havana, she mainly spoke Spanish. She just made sure she did not say *Florencia* instead of *Firenze* when her Daddy was around. *"I don't want to leave Havana… promise, Daddy?"* Daddy didn't answer, he just stroked her long blond hair (but where did she get that blond hair, since both her father and mother had dark hair?). He then picked her up in his arms, held her on his knees and hugged her tightly, kissing her on her cheeks and eyelids, the way she liked it …

"Hey!… Antonio!… Antonioooo!… Esther!… Where are you?!"

Antonio rushed out of the laboratory in his shirt-sleeves, his hands covered with grease, and headed for the large courtyard, wondering who was calling. He was holding a rag with which he was trying to dry himself as best he could. He squinted to see better against the sunlight: then he opened his eyes wide and ran towards his friend, hugging him and hitting him on his back: *"Lorenzo… the devil take you… where in the world have you been?… successes eh?… always successes!… and always spoilt by beautiful women…" "What about you?"* Lorenzo Salvi asked in turn, *"what diabolical inventions have you come up with now?… And Esther?… How many dozens of children do you have now?…"*

Esther came round the other corner of the courtyard, where her dressmaking room was situated: *"Oh Salvi, we knew you were coming, but we didn't expect you quite so soon… you're like sunshine in our home… come… come on in… you must be tired after your journey… Juanita!… hay un amigo de papá… ven mí amor!…"* Juanita ran over to the little group, as Lorenzo rushed towards her and picked her up in his arms, lifting her high up in the air: *"What a blond darling!… But you're an angel… and your name is Juanita… what a beautiful name… almost like Anita, Garibaldi's companion… Here, I've brought you a Christmas present!"* And, turning to Antonio and Esther: *"I have come early on purpose, to spend Christmas with you…"*

Antonio raised his eyebrows slightly and placed his index finger straight up in front of his nose: *"Lorenzo… whisper when you talk about him here… its not a good time for the friends of those who are fighting for the independence of the colonies…"* He briefly told him about his conversation with Don Francisco. But Lorenzo Salvi, who had just arrived from London on an American sailing ship, said to him: *"Antonio, the sooner you leave here the better. Think about Esther and the little girl. I heard that two months ago, in September, while they were celebrating the Queen Mother's Birthday here, a 'Junta Cubana' was set up in New York with Narciso López and Cirilo Villaverde, who managed to escape from prison in Havana. Less than six months from now a legion of well-armed Cuban volunteers will land, backed by many Yankees… Listen to me, Antonio, let's leave, no later than March or April… or else we will find ourselves in deep trouble…"*

In 1941, Fernando Ortiz related that the Meuccis left Havana essentially owing to Antonio's desire to exploit his inventions industrially, which was not possible in a country where *"the only industrial venture capitalism was in sugar."* Ortiz also remarked that the Cuban government, alarmed by

the separatist plots, did not trust Meucci, *"a Mason and a supporter of Garibaldi,"* even if there was no direct evidence of his involvement in politics in Cuba. Yet everyone knew that Cuban separatists were inspired by Mazzini's liberalism and, as Ortiz pointed out, both Mazzini and Garibaldi wrote letters in which they openly supported the island's independence. We must recognize that Fernando Ortiz was one of the few historians that did not recount the tale according to which Meucci left Havana on account of a fire that broke out in the Teatro Tacón (which actually never took place). Of course, as we have shown in the foregoing, there were also other reasons that led him to leave Havana.

The last Christmas of the Meuccis in Havana, that of 1849, was a very joyful one indeed, and it was all the merrier thanks to the presence of their great friend, Lorenzo Salvi. The latter devoted to them all the spare time he had from the rehearsals of *Lucia di Lammermoor*, in which he played the role of *Edgardo* magnificently. The Tacón opened in January 1850, exactly two years after it was closed, and it recorded an unprecedented triumph, thanks especially to the exceptional performance of Lorenzo Salvi, whose fame (and correspondingly high remuneration) proved to be well deserved. *Lucia di Lammermoor* was staged nine times, with *encores* and standing ovations for Antonio's blond friend, as reported by the Diario de la Marina on 15 January 1850.

The tenor Lorenzo Salvi

On 31 January 1850 another success was gained by Don Francisco and another great triumph by Salvi. Donizetti's *La Favorita* was staged for the very first time in Havana, featuring prima donnas Angiolina Bosio and Balbina Steffenone, the tenor Lorenzo Salvi, bass Ignazio Marini and baritone Cesare Badiali. On 31 January the Diario de la Marina wrote (translation): *"Italian Opera - There is no doubt, ladies and gentlemen, there is no doubt; tomorrow, Thursday, in the evening, the opera in four acts by Donizetti entitled 'La Favorita' will be staged in Havana for the first time ... Madame Steffenone and Mr. Salvi, Mr. Badiali ... it has been announced that all the sets are new and were painted specially and the costumes were made expressly."* And furthermore, in the same issue: *"Gran Teatro de Tacón - La Favorita - ... Mr. Antonio Meucci is in charge of stage equipment ... Mrs. Esther Meucci is in charge of costumes …"*

The last opera to be staged was *The Huguenots* by Giacomo Meyerbeer, from 2 to 6 March, only a few weeks prior to the departure of the opera company. The newspapers then began to prepare the population for the unpleasant news that they were soon to lose their stable opera company. On 3 March 1850, the Diario de la Marina reported on a (translation) *"Project envisaging an Italian Opera Company for the main towns of*

the island," a piece of news artfully published so as to prevent vexation on account of the imminent departure of the entire Italian company, announcing that another one was being set up which would travel to the main cities of the island. The Diario de la Marina of 20 March reported, with the benefit of the doubt, that the *Courier of Charleston* had announced the imminent arrival of Havana's Italian Opera in that city. All doubts were dispelled (but only as a *fait accompli*) by the Diario de la Marina on 24 March 1850, which wrote as follows (translation): "*Steamship Isabel. Last night, this beautiful American steamship weighed anchor, destination Charleston, carrying ninety members of our Italian Opera Company and the family of the Impresario …"*

Passenger list of the 'Norma,' which arrived in New York on 1 May 1850

Thus, Don Francisco carried through his plan to leave Havana. On 23 March 1850, all ninety members of the Italian Opera, together with the family of the impresario, left for Charleston, SC on board the *Isabel*, which flew the United States flag. The journey presumably lasted 13 days and they arrived around 5 April. We were not able to find the registration of their arrival, for the Charleston port registrations for those years are missing from the *United States National Archives*. Instead, the New York port registrations are all there. According to the testimony of *Peter Ambrose Parodi*, a friend of Antonio Meucci's who recorded the latter's confidences in a manuscript (see General Bibliography), Don Francisco Marty's company broke up in New York after a last performance at the *Astor Place Theater*. During his absence from Havana, though still the owner of the theater, Don Francisco handed over its management to others. A few years later, just before his 20-year concession expired - precisely on 6 May 1857 - Don Francisco sold the Gran Teatro de Tacón for a total of 690,000 pesos. He spent the last years of his life in Havana, where he died in 1866.

Antonio Meucci did not leave with the other members of the Italian company on board the *Vapor Isabel* on 23 March of that year, as was also confirmed by the testimony of *Peter Ambrose Parodi* (see bibl.). He left for New York one month later, on Tuesday, 23 April 1850, on board another American ship: the *Norma.* Other authors, including Daniel Santoro and Fernando Ortiz, say that Meucci and his family arrived in New York together with Salvi. This is not true, as can be seen from the list of passengers traveling on board the Norma, which is reproduced here, as well as from the testimony of Domenico Mariani, who stated that when Meucci reached New York, he went to live on Leonard Street in the house of Mr. Mario Rallo "*where he* [Mariani] *and Salvi already were living."* The question is, why didn't the Meuccis join the others?

The reason must probably have been the sudden death of Juanita, which occurred just before their planned departure, according to what was reported by the *Sun* of Baltimore.

To begin with, the child must have been frail, for many of the previously-mentioned reasons which had prevented the couple from having children in the first ten years of marriage. Her sudden and inevitable death might have been caused by yellow fever, for which there was no cure and led to death in three or four days from the onset of symptoms, in the vast majority of cases. Had it been another disease for which there existed a cure, the Meuccis would have been able to afford the very best treatment for the child, also due to the fact that Antonio was acquainted with many physicians for whom he had carried out electrotherapy treatment. Besides, although the couple led a very healthy life from the point of view of hygiene, the swampy lands surrounding the theater (which are mentioned also in the deed of sale of the theater's land, see p. 369) teemed with thousands and thousands of mosquitoes, obviously also of the dangerous species called *Aedes aegypti*, whose bite transmitted yellow fever.

Passenger List - Ship Norma
272.7 tons; Capt. R. H. Ellis; arrived in New York 1 May 1850

	Name	**Age**	**Sex**	**Country**
1	Lucia(?) S. Seymone(?)	45	female	Spain
2	Dr. P. Millet	60	female	Spain
3	Dusina M. de Gallol	24	female	Spain
4	Cayetana Bermuda	30	female	Spain
5	Dolores Gallol	6	female	Spain
6	Soleda(d) Gallol	5	female	Spain
7	Rengenetra(?) Gallol	3	female	Spain
8	Salvador Gallol	1	male	Spain
9	Bernardo Gallol	4	male	Spain
10	Henry Millet	34	male	Spain
11	Antonio Meucci	39	male	Italy
12	Estera Meucci	30	female	Italy
13	Chs. H. Heath	20	male	United States
14	Polgeaste (?) Del Roy	18	male	Spain
15	Dick (?) Benedict	45	male	United States
16	Dano J. Kohler	36	male	United States
17	Elene González	40	female	Spain
18	Cayetano Gallol	42	male	Spain
19	José Parten (?)	18	male	Spain

YELLOW FEVER AND CHOLERA

Yellow fever and cholera had always been the terror of Havana. The most terrible epidemics were the 1648 yellow fever epidemic, which reduced the population to one third, and the 1833 cholera epidemic which killed eight thousand people in just two months.
Flies and contaminated water transmit the cholera vibrio, which was discovered by Koch in 1883, that is to say more than thirty years after the Meuccis left Havana. The disease can be easily contracted, simply through contact with an infected person or, as is more often the case, through infected food and water. In the mid nineteenth century the only possible treatment was symptomatic, including cardiotonics and astringents (lemons) to stop the dysentery. Today, sulfonamides and antibiotics such as streptomycin are used effectively.
Yellow fever is caused by a virus that is transmitted from sick subjects to healthy ones through the bite of the female of a specific mosquito, 'Aedes aegypti.' *It is characterized by three phases: the early or red phase which lasts 3 to 4 days, the symptoms of which are very high fever (above 40 °C), shivers, headaches, nausea, vomiting and nervous disorders. The patient's face becomes very red, especially around the cheekbones, and his/her skin has a burning sensation. This phase is followed by a short, temporary recovery, after which the terminal or yellow phase sets in, during which the very high fever returns along with all the other symptoms, accompanied by bleeding (nasal, gastric, intestinal, renal, uterine, etc.) and an intense yellow coloring of the skin caused by the onset of a severe state of jaundice.*
Throughout the previous century and for a good part of our own, there were no effective remedies against yellow fever. The only possible therapy was symptomatological, including cardiotonics. Ice would be used to soothe the burning sensation and to stop the hemorrhage. In acute forms, mortality was one hundred per cent and the patient died only three or four days following the onset of symptoms. However, even in the less severe forms, mortality still averaged fifty per cent. For this reason, very few foreigners stayed in Havana during the summer, when the risk of infection was higher. Obviously, due to selection linked to the numerous epidemics, the local population had become much more resistant. Starting from the 1970s, different vaccines with live viruses have been produced, which have proven effective in the prevention of this terrible disease.

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THE CEMETERY

The first neoclassical building in Havana - prior to Tacón's building works in this style - was Havana's cemetery, called Cementerio de Espada *(also known as the* Necrópolis de la Habana*). It was inaugurated in 1806 by Bishop* de Espada y Landa*, and put an end to the unhealthy practice of burying the dead inside churches, which had been filled to their capacity by then. Said bishop also financed and supervised the project. However, in 1847, respect for the dead was still in a very primordial phase, as witnessed by* William Cullen Bryant *in his touching* Carta de un Viajero *(Letter from a Traveler). Bryant wrote as follows (translation from Spanish):*
"That evening I also visited the enclosure where the inhabitants of the city are taken when the game of life is over - the Campo Santo, as it is called, that is to say the public cemetery of Havana. As I exited the city passing through the gate closest to the sea, I rode down a road that presented the most miserable houses I had ever seen: to my right the Ocean roared over the coral rocks that form the coast. Soon leaving those dirty dwellings behind me, I saw the waves blown by a fresh wind [it was the beginning of the year, Editor's note] *spraying their foam almost onto the road. I then entered a short tree-lined path and a few minutes later my volanta pulled up in front of the cemetery gate. In a tiny garden by the entrance there grew some sparse European flowers, while in the fertile area that surrounded it, the plants of the woods flourished in profusion. The cemetery was surrounded by a heavy wall with rows of niches where the coffins were placed one on top of the other, which is where the wealthiest dead are buried. The coffin is introduced at one end and the opening is then closed with a marble plaque bearing an inscription. Most of these loculi are already occupied, consequently in Havana the dead are generally buried in the ground, without a monument or a tomb where their bodies can rest longer than the time that it takes for their bodies to be consumed by the quicklime that they covered over with. New ditches are dug every day, and the bodies are thrown in, generally not in a coffin. Two of these ditches along the cemetery walls were ready for the funerals. I could see where the hoe had moved the bones of those who had been buried previously and had pulled up the scattered fragments mixed with lumps of lime, locks of hair and shreds of fabric. Outside the walls there was an area where skulls and other large bones were heaped, covered with the dark mold of the ditches. Upon our arrival there were only two or three people walking in the cemetery, but later in the day, the funeral*

processions began to arrive. First a rough-hewn black coffin was carried in. It was very large on the side where the head was and, after placing it on the edge of a ditch, the men quickly pulled out a hammer and nails to fasten the lid on before lowering it into the ground; then they realized that the coffin was not very high on the narrower side. So they took the lid off the coffin, revealing the body of an old man donning an austere black coat, white trousers and boots. The Negroes who were carrying it took the bottom off with a hammer in order to be able to close the lid up over the feet. Then they hammered it shut with large nails and the coffin was lowered into the ditch and covered over with dirt shoveled onto it. A middle-aged man who appeared to be a member of the dead man's family led a child up to the ditch and watched the coffin being covered over. They talked to each other and smiled, and stayed there until the ditch was completely covered over and the burial workers had gone This was one of the most respectable burials seen. Usually the bodies of the deceased were heaped one on top of the other in the ditches, without coffins. Now the number of burials increased. The body of a child without a coffin arrived, and then another - a young man, who had cut his throat for love, I was told - and who was taken to one of the niches in the wall. I heard cries that seemed to come from the east side of the cemetery, and which at first I thought were coming from some funeral ceremony, but no ceremony was being celebrated near those tombs. A moment later I understood that the cries were coming from a long building that overlooked one side of the cemetery. It was an insane asylum. The patients, exasperated by the sights they had to behold, were gesticulating from their windows, the women were shrieking and the men were shouting out loud, but no one paid any attention to them."

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We shall spare the readers a description of the despair Antonio and Esther sank in and the still primordial practices to which the tiny lifeless body of little Juanita inevitably had to be subjected, devastated as it was by the extensive bleeding which sets in during the final phase of this lethal disease. In fact, those who died of yellow fever were buried in common ditches, filled with quicklime.

With all probability, during the child's short-lived disease Don Francisco supplied all the ice necessary, which was regularly delivered, crushed, from his deposit in front of the *Pescadería*. It was used to soothe the burning of the skin during the first few days and to curb the effects of bleeding thereafter. One can imagine how Antonio, Esther and Lorenzo Salvi watched over sweet little Juanita, taking turns by her bedside, showering her with love and affection. Juanita passed away, taking all of their love with her.

We can imagine Lorenzo Salvi, who had immediately loved her like a daughter, repeating to himself: *"She was an angel… she was an angel… and God has taken her with him…"*

Antonio tried, without success, to take the tiny body of his daughter away with him to have it buried in New York near his future residence, but Captain *Ellis* of the *Norma* was politely unwavering: the child had died of yellow fever, therefore, even if he had agreed, the New York port authorities would have never let the corpse off the ship and would have put all the crew and passengers in quarantine.

WITH SADNESS TOWARDS NEW YORK

On Sunday 7 April 1850, the Diario de la Marina announced the forthcoming departure of Antonio Meucci and his wife as follows (translation from Spanish):

"Mr. Meucci

It seems that Mr. Meucci, who worked as stage-hand at the Gran Teatro for many years and just recently left his job, will leave for New York together with his wife, who was costume-maker for the Italian Company."

The *Norma* was scheduled to leave on 16 April. Indeed, the Diario de la Marina of 9 April 1850, wrote (translation):

"Destination New York.— The new and fast American frigate Norma, captain Ellis, coated and bolted with copper, will be leaving on the 16th of this month; it has taken up most of its cargo; it accepts to charter a total of 400 crates of sugar, processed tobacco and passengers, who will be lodged and treated well. The captain or his representatives, Brothers Drake & Co., will welcome them on board."

However, the departure of the Norma was later postponed to 20 April and finally to 23 April, which is when it finally set sail, according to the Diario de la Marina. However, already on 16 April all of the boxes containing the personal belongings of the Meuccis and most of the electric equipment of the laboratory - including the sixty Bunsen batteries - had been hoisted on board the Norma. Good old René had personally seen them on board, and when the time came to bid farewell to his masters, there were tears in his eyes. Never again - he said - would he find a gentleman like Antonio Meucci and a sweet woman like Esther who would treat him with the same respect and humanity. There were also a dozen workers (all blacks) from the galvanoplastic workshop on the docks. They stood there in silence, their large eyes engaged, resigned to their fate … Who knows whether they still had the strength to love!

The Norma looked very much like the Coccodrillo, the ship that had brought the Meuccis and the Italian Opera Company to Cuba, but it had almost twice as many sails, which allowed it to reach much higher speeds. Its tonnage was almost identical, around 275 tons. Few passengers were traveling on that trip but their number was to increase in the following journeys of the Norma, which, especially during summer, sailed back and forth from Havana to New York. With their arms wrapped round their waists and their elbows leaning on the handrail of the larboard parapet, Antonio and Esther looked on for a long time as they watched the stretch of the Malecón between the *balnearios* - where Juanita had often rejoiced, jumping and playing about in the water, full of *joie de vivre* - and the cemetery - where her tormented body had been swallowed up by the destroying quicklime - fade away into the distance. *"… No quiero dejar la Habana!… I don't want to leave Havana!…"* The child's wish, which still echoed in the ears of her distraught parents, along with the agonizing tolling of the Cathedral bells that accompanied the funeral procession, had come true, but not the way she would have hoped …

The cathedral of Havana in the second half of the nineteenth century

Of the nineteen passengers traveling on board the Norma, only five were not Spanish: Antonio and his wife and three Americans, a twenty-year-old youth and two middle-aged gentlemen. There was a large family with five children, the eldest of which was named *Dolores* and must have been the same age as Juanita, whom she greatly resembled. Antonio and Esther kept staring at her, to the extent that her father, Sr. *Cayetano Gallol*, walked over to them, introduced himself and politely asked why they were so interested in his daughter. When he learned the reason, he grew very sad and told them that he too had lost a child and that the Lord had blessed his family with another birth one year later, and he hoped that the same would happen to them. Listening to his words, Antonio suddenly

recalled his father Amatis. He remembered his three little sisters Maddalena, Giuseppa and Assunta, and his little brother, Roberto, who had all died at a very early age, they were not even five; and he remembered the grief of Amatis and his mother Domenica. With this thought Antonio realized that in that moment he had become, not older, but another man, more like his father, for, like him, he could feel the pain of losing a part, which is part of oneself ...