

Gaetano Callido (1727-1813) Organbuilder in Venice

- by Francesco Ruffatti

One of the most famous organ building "schools" in Italy was founded in Venice during the first part of the eighteenth century by Pietro Nacchini, a monk from Dalmatia.¹ He established a factory and built over 300 organs mainly for the territories of the Republic of Venice [2] and for the Vatican State, which at the time comprised the largest portion of central Italy. Although his designated successor was Francesco Dacci, with no doubt his most famous pupil was Gaetano Callido, born in Este, near Padova, who established his own organ factory in Venice and built well over 430 organs during his lifetime [3], some of which were for very distant countries.[4]

In manufacturing his instruments Callido basically followed the style of Nacchini, with only a few changes, both from the standpoint of tonal composition and type of construction. He conceived an organ as a one-manual instrument, with a limited pedal division. This is confirmed by the fact that in the original list of his works [5] the relatively few two-manual instruments were designated as "double organs" and were given two consecutive opus numbers.

Callido's organs were by no means all alike, but their size was dependent upon the presence or absence of certain stops, all chosen among a limited pallet of stops from which the builder never departed [6]. By giving the tonal composition of the Great division of the largest organ by Gaetano Callido, built for the Cathedral of Feltre [7], a good picture of his "selection" of organ stops is given.

The first part of the list includes all Principal-scaled ranks that form the "Ripieno". The stops can be used separately in various combinations or all together, collectively activated by a "Tiratutti" consisting of a rotating handle placed on top of the corresponding stop knobs.

Principale (8') almost invariably divided, bass and treble

Ottava (4')

Quinta Decima (XV - 2')

Decima Nona (XIX - 1 1/3')

Vigesima Seconda (XXII - 1')

Vigesima Sesta (XXVI - 2/3')

Vigesima Nona (XXIX - 1/2')

Trigesima Terza (XXXIII - 1/3')

Trigesima Sesta (XXXVI - 1/4')

The last two ranks are often missing in the smaller instruments and are of full compass only in the larger organs, being normally limited to one or two octaves in the bass. The reason for limiting their compass is quite simple: since the highest pitched pipe in the ripieno of a Callido organ is C at 1/8', all ranks break back by one octave once they reach this limit. By doing so the "mixture" composition appears as in Table 1 (as an example I am considering a four-octave keyboard compass, C1 to C5). [9]

With this configuration, which is common to the majority of Italian historical organs (although the "breaking-back" points may vary at times), a number of pitch duplications are present from mid-keyboard up, to the point that, starting at F#4, only two different pitches are present while playing five pipes. In order not to extend the duplication of pitches towards the lower register and to avoid increasing the number of duplications at the treble, Callido normally ended the XXXIII and XXXVI ranks at the point where they would start breaking back (at F2 and C2 respectively) or further up the scale only by a few notes.

The "registri da concerto" or "consort" stops, as Callido called them, follow. First the flute scaled stops:

Flauto in Ottava (Flute in VIII - 4') often, but not always, divided, bass and treble. Normally built as a tapered flute, it is also found in the form of a metal stopped flute (with stoppers or caps made of leather-coated cork and inserted into the resonators of the pipes) or even as metal chimney flutes, with soldered-on caps.[10]

Flauto in Duodecima (Flute in XII - 2 2/3'), normally not divided in bass and treble (but it is divided for example in the Feltre organ). It was normally built as a tapered flute, although some examples of stopped pipes at the lower register and tapered at the treble do exist.

Cornetta (Flute in XVII - 1 3/5') - treble only, consisting of tapered flute pipes.

Voce Umana (principal-scaled, 8', treble only, tuned flat)

and finally the reeds:

Tromboncini (trumpet-like regal at 8') bass and treble

Violoncelli (regal with wooden resonators - 8') bass and treble

Another "consort" stop, not present in the Feltre organ but rather common in Callido's instruments, is the Violetta, usually in the bass only, but also as a complete stop, especially in the later instruments. It is a 4' string stop of narrow cylindrical scale, tuned to the unison.

The Pedal division includes, in the Feltre organ, the following stops:

Contrabassi, Ottava di Contrabassi and Duodecima di Contrabassi. These are three ranks of

open wooden pipes at 16', 8' and 5 1/3' pitch respectively, which are activated simultaneously. In smaller organs only the first two (16' + 8') are present, or just the 16'. In the smaller instruments the 16' pipes are often found as stopped.

Tromboni ai Pedali (a trumpet-like reed, with 1/2 length resonators at 8' pitch)

Of particular interest are the reed stops, for their unusual shape and sound. The resonators of the Tromboncini are made of tin and consist of a lower four-sided portion and a "bell" on top. Their four-sided lead sockets are inserted into walnut boots. The tuning wires are made of brass, with cow horn sledges to facilitate the sliding over the tongues for tuning. The stop at low C (8' pitch) is of 1/8 length, the resonator approximately one foot long.

The Violoncello is even more unusual and complicated. Its resonators are made of cypress wood in the form of a stopped wooden pipe, the stoppers or caps being made of boxwood. The shallots are also made of hand carved boxwood, while the tuning wires, which go through the resonators and their caps on top, are equipped with cow-horn sledges. Unlike the sound of the Tromboncini, rather "biting" and penetrating, the harpsichord-like sound of the Violoncello is very sweet and gentle.

For many of his instruments Callido left a series of "operational instructions" for the organist, intended to give suggestions on how to best use the organ stops in combinations. Several of them, if strictly followed, show us how different the musical taste of the time was from the present. For example, under the title "Elevazione," or stops to be used during Consecration, for opus # 10 Callido specifies: Principale, Voce Umana, Contrabassi . . . and Tromboni! Not the type of pedal combination that we would consider appropriate for quiet meditation. And under the title "Corni da caccia," or sound to simulate the hunting horns, he suggests: Principale, Contrabassi, full ripieno (tiratutti), Tromboncini and . . . Voce Umana! An off-unison stop used along with the ripieno! (Opus # 5, 7, 9, 12, with the addition of the pedal Tromboni in opus # 10). Other combinations of stops are closer to what a contemporary organist would choose to do.

From the standpoint of construction, the instruments built by Callido are of unsurpassed quality. Each pipe is a true masterpiece, with thin, regular, absolutely perfect solder joints. The windchests and all other parts are manufactured with the highest attention for details. Callido was quite obviously trained in a very strict way and demanded the same perfection from his workers.

The contracts with his customers contain a very meticulous description of materials: pure tin for the façade pipes "without any alloy" [11]; "the rest of the internal pipes made of lead with a 20% alloy of tin." [12] And he goes into detail to the point of stating that "the Contrabassi will be manufactured with spruce and painted inside and outside, and will be made of walnut at the mouth . . ." and also "the wind chests will be made with walnut from Feltre¹³ . . . with metal parts made of brass."

It is certainly worth examining in closer detail some of the manufacturing characteristics of Callido's instruments. I will try to do so by describing the most significant components of the

instrument in as much detail as it is possible within the reasonable length of a magazine article.

The keyboards

The most common compass of Callido's keyboards was C1-C5, for a total of 45 keys (with first "short" octave) [14] or C1-D5, for a total of 47 keys. For the organs featuring the "counter" octave the compass consisted of four complete octaves, plus an extension at the bass consisting of a short octave, real from F1 as in the case of the Feltre Cathedral organ, whose Great manual has a total of 57 keys. When two keyboards were present, the Great Organ division keyboard was always placed on top and the coupling of manuals (Positiv to Great) was made possible by sliding the Great keyboard towards the back by a very short distance (*drawer-type* coupling, as it is often called in Italy).

The natural keys were normally covered with boxwood and the sharps were made of walnut painted black, capped with a strip of ebony, simple or with boxwood or bone inlays.

The "breaking point" between bass and treble was normally located between the notes C#3 and D3, except for the instruments featuring the "counter-octave," where it was placed between notes A2 and Bb2 .

The total width of a full octave was practically constant at 167 mm and the length of the keys was considerably smaller than in today's keyboards: 71 mm for the sharps and only 39 mm for the front portion of the naturals.

The pedal board

It was always made with short, parallel and tilted pedals, common to the vast majority of historical pedal boards in Italy. It featured a first short octave and was always permanently connected to the corresponding keys of the manuals (of the Great, when two manuals were present). Its compass was of 17 notes, C1 to G#2, plus a pedal for the "Rollante," or drum, a device simultaneously activating a number of harmonically unrelated wooden pipes, thus reproducing the sound effect of the rolling of a drum. The compass of the pedal division in essence consisted of a full octave, since the notes of the second octave activated the corresponding pipes of the first.

The pipes

The façade pipes were made of pure or almost pure tin and all internal metal pipes were made of a tin/lead alloy with high lead content (about 80 to 85%). The metal was not poured on the table over cloth or marble, but over sand, and then planed by hand. Both the inside and the outside surfaces of the pipe resonators were made perfectly smooth. For the smaller internal pipes a laminating machine was used to roll cast metal into thinner sheets.

Since a few Callido organs, especially in the former territory of the Vatican State, have been found almost intact, [15] it has been possible to identify not only the voicing parameters used by the builder but also, in some instances, the original tuning temperaments and wind pressures.

The flue metal stops were invariably voiced with some kind of wind control at the toe. Toe openings were generous, but the voicing could not be defined of the "open toe" type. Consequently, the flue was rather wide and this determined the need for nicking of the languids in order to avoid an excessive transient at the attack, which was obviously considered not desirable in 1700s Venice. Languids were nicked all the way to the smallest pipe in the ripieno ranks, but the nicks, although numerous, were very lightly marked and in some cases almost invisible. This created a precise, clean attack and still a clear and beautiful sound. This voicing practice has one exception: the languids of the Viola pipes were left totally unnicked. And no tonal bridges or beards, which were unknown to the Venetian tradition of the eighteenth and early nineteenth centuries, were used. Consequently, their sound features a very prominent transient at the start, intended to simulate the "noise" produced by the bow of the orchestral Viola when hitting the strings.

The low wind pressure was also a determining factor for obtaining a rich, unforced sound. It was usually set between 48 and 55 mm at the water column, with only a few verified examples of slightly higher pressure.[16]

Tuning was strictly done by cutting the pipes to length and adjusting with the cone, except for the façade pipes, which were cut close to length and subsequently fine tuned by further carving the back of the resonator at the top in a curved shape. These cuts are called "lunette", or moon-shaped cuts by Italian organ builders.

Wooden pipes were always made of spruce, painted with a composition of light hot glue and red clay powder, with lower lip and upper lip made of walnut. The lower lip "cover" was fastened with hand-made iron screws. At 16' pitch these pipes could be stopped or open, depending on the size of the instrument. All open pipes were tuned with the cut-to-length method, with an occasional end correction made by applying small pieces of lead sheet or wood on top of the resonator to "shade" the note.

The wind chests

The builder exclusively used the conventional slider chests, with table, top boards and sliders made of walnut. The sliders were all built parallel and of constant thickness.[17] They always worked "wood-on-wood," without any form of leather seal or any other device intended to avoid the sticking of sliders. This of course required the use of high quality materials, but also a very clever choice of manufacturing techniques. It must be said, from this standpoint, that the "table" or the portion of the chest located under the sliders, which includes the note channels, was made of a solid board of walnut, 40 to 45 mm thick, on which the note channels were carved. This procedure is quite common in historical Italian slider chest construction, and differs substantially from techniques used at the time in northern Europe. Carving out channels from a single piece requires much more work than building a frame and creating the channels by means of inserting dividers, but this technique has a number of advantages. First, and most important, the whole unit is made from the same piece of wood, and this avoids warping and cracking due to contrasting tensions from different pieces of material. Also, the risk of air bleeding between note channels caused by an imperfect gluing of the different elements (table and dividers) is totally avoided, since gluing is not necessary, the elements being built from the same piece of

wood. But since no tree would be wide enough to form a wind chest table all in one piece, several portions were joined together for the purpose, with alternating direction of the grain in order to compensate for the tendency of warping all in one direction.[18]

The channels were always of generous size in order to provide adequate supply of air.[19] Wooden dividers were placed inside the channels to avoid interference and wind supply instability between the larger pipes of the façade and the reed stops, which were invariably placed in front of the façade, exposed to facilitate tuning by the organist. The pallets were always made of light, straight-grain spruce from the Alps. Their seal consisted of a double layer of sheepskin leather, and the surface on which they rested was also covered by leather. This provided a very effective seal for the wind and apparently did not affect in any way the precision and sensitivity of the tracker action.

The Pedal division consists of only one wind chest, located at the back of the organ case. The stop knobs for the Contrabassi pipes open or close a large valve located inside the wind line, which controls the air flow to the chest. The reed, when present, is activated by a slider. In practical terms this means that the Tromboni cannot be played separately from the Contrabassi, because the Contrabassi stop knobs, and consequently the air valve, must be open to feed the whole wind chest.

The mechanical action

Callido always used the suspended action, which is the simplest and most direct mechanical transmission mechanism. When a Positiv division was present, always located at the left side of the keyboards, the corresponding keyboard worked in the same fashion, except that the keys in this case pushed down the trackers instead of pulling them.[20]

The roller boards for the manual divisions, for the stop action and for the pedal, were made with forged iron rollers fastened to spruce boards by means of brass wire. The "swords" pulling the wind chest sliders were also made of forged iron.

The winding system

The most common winding configuration in Callido organs includes two multiple-fold bellows (consisting of five folds) made entirely of spruce wood. They were normally placed one on top of the other and were activated by ropes through a system of pulleys. Their size was rather standardized: larger size bellows were used for the larger instruments, and smaller size for instruments requiring less wind.

Restorations are conducted in such a way that the original winding system is always preserved and carefully restored and, where not present, in many instances built new as a replica of the old.[21] A modern blower is usually connected to the system, in such a way however as to keep the hand pumping system operational. This makes it possible to make a very interesting comparison between the original wind supply, slightly irregular due to the small but detectable differences in pressure caused by the manual pulling of the reservoirs, and the more stable supply furnished by the blower. "Flexible winding" as it is referred to today is a different matter: it has to do with the response of the wind and, in practical terms, the drop in wind pressure at the

use of certain combinations of stops or notes. From this standpoint, although the phenomena of the so-called "flexible" wind is present in Callido organs, the design of the wind supply system, starting from the size of the bellows all the way to the generous dimensions of the wind chest channels, indicates that Callido was trying to avoid instability in the wind supply.

The tuning system

As far as we know Callido never used equal temperament, already present in other parts of Europe at the time. Already well known for a few centuries, it was considered uninteresting and not desirable, especially due to the unpleasant "wide" tierce intervals which are present even in the most commonly used keys. An interesting statement on this subject is given by Giordano Riccati.²² In his book, "Le leggi del Contrappunto" written in 1754, he states: "Practically speaking, I have never been able to find an organ or a harpsichord tuned with the equal 12 semitones." In 1780 and 1790 he stated the same concepts again. But equal temperament continued to be rejected in Italy well into the 19th century. Giovan Battista de Lorenzi, a very ingenious builder from Vicenza, in 1870 created a "moderate temperament" which, although very close to equal, was intended to reduce the "out of tune" effect of the most used tierce intervals.

We know that Callido's master, Pietro Nacchini, for some of his works used a tuning method which consisted in tuning the 11 quint intervals from Eb to G# flat by 1/6 comma each, a method which was very close to the practice of Gottfried Silbermann.^[24] Callido may also have used this method, but he departed from it at some point and he adopted a variety of similar systems,^[25] among which the temperament invented by Francescantonio Vallotti, Music Director at the Basilica of St. Anthony in Padova, and Alessandro Barca in 1779, which avoided the wide G#-Eb interval, making it almost pure.^[26]

A unique example of a non-codified temperament comes from the organ built by Callido's sons Antonio and Agostino in 1813 (the year of Gaetano's death at age 86) for the Parish Church of Tai di Cadore (Belluno). This instrument was restored by Fratelli Ruffatti in 1980-81. Prior to restoration, the pipes were found in almost perfect condition, due to the fact that the organ had been left untouched early in its history when the access stairway to the balcony was removed. After cleaning, the pipes were almost in tune and it was relatively easy to identify and restore a type of unequal temperament which did not follow codified methods and which represented one of the many "variations" introduced by the tuners at the time for a "sensitive" tuning of the instruments.^[27]

The tonal ideals and manufacturing techniques of the Callido factory were carried on, primarily in the Veneto and Marche regions, by a number of organbuilders: in Venice by Giacomo Bazzani, a former worker in his shop, and by his successors; in Padova and its province, among others, by Gregorio Malvestio, a priest (1760-1845), by his nephew Domenico, by Domenico's son Giuseppe and grandson Domenico. The closing down of this shop originated the beginning of the Ruffatti firm.²⁸

In the Marche region Callido had a number of followers including Vincenzo Montecucchi from Ancona, Sebastiano Vici (Montecarotto, 1755-about 1830), Vincenzo Paci (Ascoli Piceno,

1811-1886) and others, who in some cases produced organs so close to Callido's techniques that sometimes their identification as non-Callido instruments requires an expert examination.[29]

Notes

1. His real name was Peter Nakic, born in Bulic, near Skradin, north of Sibenik, in present Croatia, a former territory of the Republic of Venice. As was customary during the time, his name was "Italianized" and became Pietro Nacchini.
2. The Republic of Venice during the eighteenth century was a large State, including parts of Slovenia and Croatia and the present Italian regions of Veneto, Friuli Venezia Giulia and eastern portions of Lombardy.
3. See *Studi e Documenti di Storia Organaria Veneta* by Renato Lunelli. Ed. Olschki, Florence, 1973, and also *Gli organi di Callido nelle Marche* by Ferrante--Quarchioni, Ed Villa Maina, 1989.
4. Opus numbers 13, 185 and 393 were built for churches in Istanbul and opus number 424 for Izmir, Turkey.
5. The original list or catalogue of organs built by Gaetano Callido survives. It consists of three panels made of canvas on which the opus number, year of construction and location of the instruments were marked in India ink by the builder. Although water damage washed away the names of 88 of his instruments, between the years 1789-91 and 1794-98, it still gives accurate information about 342 organs manufactured in his factory. The last opus number is 430, built in 1806, after which the list was discontinued. In recent years many of the "lost" instruments have been identified.
6. Only at the turn of the nineteenth century, when Callido's sons Antonio and Agostino were active in the factory, a limited number of "variations" were introduced, in the form of new reed stops (but still of the commonly used "regal" type) and flutes. Times were changing in Italy and a more "orchestral" style of sound, requiring highly characterized solo stops, was being introduced in churches, in the wave of the predominant influence of opera even in the music composed for organ.
7. This exceptional instrument, built in 1767 (opus numbers 37 and 38) and restored in 1979-80 by Fratelli Ruffatti of Padova, is practically equal in size to another organ, built for the Parish church of Candide (Belluno).
8. The Great keyboard of the Feltre organ is extended by one octave at the bass. This "counter-octave" as it is commonly called, consists of a short octave (C-D-E-F-G-A-Bb-B) of which only the notes from F up are real, the preceding ones activating the corresponding notes of the higher octave. In essence therefore the Principal starts in this case at 12'F, the Octave at 6', the Fifteenth at 3', etc.

9. This is the normal system used in Italy to designate not the pitch but the position on the keyboard. F3 for instance designates the note F of the third octave of the keyboard.

10. Due to the absence of the "beards," which makes tuning adjustments possible when the caps are soldered, it is quite obvious that Callido must have had a very precise scale for cutting the resonators of these flutes to length before soldering the caps. Minimal tuning adjustments were however still possible through cone tuning of the chimneys.

11. i.e., without the addition of lead, as reported in the spec

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