

Restoring traditional bells in Spain

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1. Summary

There are in Spain many traditional ways of ringing bells. In València all are full circle rung, in Andalucía only small ones are rung in full circle and the biggest are fixed, in Aragón only the biggest bell turns while the rest are fixed. The full circle ringing is not as universal as it we thought in Spain is. In many places of Castilla, in Catalunya or in the Balears bells oscillate but this way of ringing is associated to the tolling chimes almost everywhere in Spain.

The many academic researches, in association with those made by the Government to inventory bells, are being good to know this sound instrument that has remained forgotten and in hands of the repair companies, without the smallest control.

In the last years, a new concept of bell restoration has arisen, enlarging the instrument concept. The bells, but also the accessories, the own tower and the chimes are an inseparable part of a unique musical concept, different in each place.

We want now that bells conserve the traditional installation, that motors and other mechanisms, computer driven, reproduce traditional chimes and do not impede manual ringing. The most recent example has been the tower of the Giralda of Sevilla, with eighteen full circle ringing bells and six fixed.

A growing movement of voluntary bell ringers exists in Spain that recovers the old chimes for the feast days. Those ensembles of bell ringers that arose in the cathedrals and now extend for cities and towns are the best guarantees for the conservation of the instrument.

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2. Restoring traditional bells in Spain

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For many years, we have worked on researching, ringing, and writing restoration projects about traditional ringing bells in Spain. This is one of the most singular aspects in the Cultural Heritage, so much material as immaterial. We have been for some time working for the Spanish Government, and now for the Generalitat Valenciana, the Government of the Land València, in Spain. We try to put the attention on those old instruments and their so different way of ringing them, who were almost lost

Before discussing the processes of study, restoration and of new ensembles of bell ringers in Spain, it is important to know three fundamental concepts regarding traditional bells, ringing, and property of those bells.

2.1. A community instrument

Bells, not alone for their sound power, but for their deep meaning, is an instrument to the service of the whole community. They build the collective time, not alone through the clocks, but of the diverse chimes that mark (or marked) lapsing of the day, of the week, of the year and of the life. They mark festival spaces or time of mourning, and they indicate with their chimes the relevance of certain people, well in the moment of their death, well in other extraordinary events.

For that reason, bells go beyond the religious meaning, without forgetting it, since they become the voice of a community, in a quite intuitive, symbolic and sonorous way. Some aim that the community reaches until the sound of the bells; it is not certain. Always our bells are our voice, while the other ones sound bad; other people do not know how to express with bells. Certainly, the bells of the neighbours are the invaders. When the city of València decides to participate in the cast of the Micalet (1420), the great bell of the hours of the Cathedral, they make a quite large bell (2,40 m diameter). Its sound must arrive until the walls of the city and further on, to show “the magnificence of such an illustrious city as this.” The sound therefore arrives beyond the confines, to communicate to

the other, and mainly to the neighbours, the importance of a community. Also the vitality of a group: a town without bells is dead or about to disappear.

3. Traditional bells in Spain

Traditional bells reflect the diversity of cultures in Spain, the third country for its size in the European Union. There are seventeen autonomous communities with their own parliament, government, and budget, with a quite similar degree of autonomy to a Federal Country.

Some of those regions, as Andalucía or Castilla and León, are bigger than Benelux, while others as Aragón or València have a similar surface to Belgium. However, in Spain, the mountains are quite high and communication has been difficult along the centuries.

Current Spain is the fruit of the union, more or less recent and real, of two big states, like Aragón and Castilla, with big differences about thinking and living. There are three official languages at least in Spain, apart from Spanish, and those languages are both officials in the corresponding autonomous communities. All these historical, linguistic and space differences are expressed in traditional ringing bells.

Because of the Old Spanish historical division (Aragón and Castilla), there are two big ways to play the bells that largely coincide with these old federations of Kingdoms. Indeed Aragón contributes with full circle ringing bells. This is a completely circular ringing, repeated more than once (not like change ringing).

Castilla, on the other hand, affects more in the chiming of bells, that is to say the movement of the clappers inside the fixed bells. Those Castilian rhythms use another of the Spanish original contributions to the culture of the bells; "Roman bells." Those "Roman bells" that are only used in Castilla, in León, in the Euskadi and Navarra, are practically unknown in Aragón, Balears, Catalunya, and València, the Old Crown of Aragón. Those are bells of big dimensions, wide and not very slender, of very fine walls, and with very scarce resonance in their main harmonic, except in the "Hum" or Lower Octave that has a great duration. Bell ringers that play those Roman bells use technique rich of sound. People play the bells at great speed, but at the same time, they maintain clappers upon the bell. On one hand, bells produce many harmonics and on the other hand, those sounds are limited as the bell ringer maintains the clapper close to the brass. There is an interesting spatial characteristic in these Roman bells. In general, the lowest that is usually the biggest bell, is located at the bell ringer's right. However, in the old Crown of Aragón the smallest and sharper bell is usually here to the right hand of the percussionist.

In the Crown of Aragón, bells resemble more the European bells, that is to say to those that we listen mainly in the Benelux, and that are part of the carillons. However, there is a great difference: in any place of Spain, you do not think in melody, but in rhythm, and people do not know the note of their bells. Neither do they care.

There is another interesting difference. In Spanish, in Catalan, and in the other Spanish languages, we use the word “tocar la campana,” that is, literally, to touch the bell, to be in contact with bell. Bell ringers, in Spain, use to ring near the bell, not away, as for carillons, change ringing, or usual ringing. We do not play bells we touch them.

4. Traditional ringing bells in Spain

4.1.1. Ringing bells in Andalucía and in Murcia

In both communities, they follow a similar model: big fixed bells, while “esquilas” or small bells turn to compass of the other ones. The most characteristic pattern can be the Giralda or tower of the bells of the Cathedral of Sevilla, where there are four fixed bells, in the angles of the tower. Each fixed bell has four bells full circle ringing associated. There are also other bigger two bells in the centre and two other big full circle ringing bells.

In Murcia, something similar happens in the Cathedral, with three enormous fixed bells and some seventeen full circle ringing bells. However in the towns, as Caravaca, they turn all the bells, although not always jointly, because the three minor sometimes turn while the biggest sounds immobile.

4.1.2. Ringing bells in Aragón

In Aragón, some bells can turn completely. The pattern of ringing is (or it was, to be more exact) the Seo of Zaragoza or Cathedral of El Salvador. There are seven bells installed in the octagonal tower so that the biggest, “la Valera,” is in the centre, in a structure of wooden beams, while the six others occupy different windows. The greatest feast is the “repique de primera” (chime of first class). At the beginning the smallest bell turns alone, later the external bigger bell oscillates and in the third part, they peal the six bells at the compass of the biggest bell full circle ringing.

4.1.3. Ringing bells in Castilla and León

Traditional ringing is based on Roman, generally immobile bells, and pealing. They sometimes turn some, others peal, and the biggest even oscillates only, although there are not common rules, apart from the quick chiming, hitting the clappers to the bells.

4.1.4. Ringing bells in Catalunya

In Catalunya they only oscillate, without ending up giving the turn: they call the full circle ringing “to play as Castilian people.” However, in some areas around Lleida this circular form of playing is usual.

4.1.5. Ringing bells in València

In València, there is diverse ringing according to the feasts. The bells turn all although they can combine, like in Aragón, ringing in those that turns the biggest bell, while they peal all the other ones. In the Cathedral of València, with eleven bells, usually the five largest turn together for all the feasts, while the eleven is reserved for extraordinary occasions or for the feast of Corpus Christi.

However, in the parishes of the city and in the towns, the normal thing is that they turn the smallest bells for the feasts during the year. The biggest bell sounds only for five annual feasts: Christmas, Easter, Corpus Christi, the Immaculate, and the feast of the town. There is a curious opposition. In the city of València, the full circle ringing finishes and then the bells oscillate until returning to their original position (down mouth). However, in the towns around València, both ringing are linked, since people associates the oscillation of the bells to dead tolling.

5. The property of Spanish bells

In Spain, most of bells belong to the Catholic Church. In fact, a normal bell blessed by a priest becomes automatically by law an ecclesiastic property. It occurs the same with the bell towers. If they are associated to the Church (and most of them are), they belong to it. The problem increases if this building is a National Monument: in that case the civil laws have some kind of rights over it to assure the protection. It is difficult to solve. Usually the priests “allow” the Government to restore and to protect a building or a bell, but they make many problems if the Administration wants to ring those bells or to make the tower open to public visitors.

There is another interesting element to remember. In the XIV and XV centuries in Europe, the municipal towers had their own bells and carillons to mark the civil time of the Community. The towers show also civic and economic power of the city. In the same moment, in Spain, we constructed big ecclesiastical towers to locate, in different level, civil clock bells, and church bells that marked different ways to mark the time still conserved until our days.

Clocks usually municipal begun to work at the end of the XIV century, but liturgical ringing, adapted to the natural cycle of the day and of the year, were the time reference. Those liturgical

chimes marked the community rhythms, in a mixture where “the religious thing” and “the civil thing” are difficult to separate.

6. Bell tower as a musical instrument

We propose, therefore that bell towers are authentic musical instruments, formed by several elements. Bells, of course, but also their accessories that determine the sonority of bell and yokes, clappers.... The own tower is also an important part of the instrument: we do not forget that in Spain almost the entirety of bells is in the external windows of the bell chamber. There are also vaults and other architectural elements that increase (or diminish) the sonority of the ensemble.

However, this is not more than the principle: the bell will sound in one or another way according to the accessories, to the place where it is installed and in the way it is played. It is evident that those notes that some people call harmonics but that we prefer to denominate partials always sound the same, but not in the same way. According to the clapper type or to the yoke, some partials reinforce while other are muffled or even annulled. This explains the different sonority of the same bell with a traditional wooden yoke or with one modern of iron. Produced notes are the same ones but the metal reinforces the high partial ones and for that reason, they seem more metallic. We must add to this the different form of the counterbalance and of its axes. It is easy to understand why the wooden yoke allows that the same bell sounds with more power and at the same time in a more serious and more solemn way.

Therefore, bell and accessories influence mutually. The same occurs with the tower, its corresponding height, and the form of the room where the bells hung: all them modify the resonance again. Old architects had very in bill those things, and bell tower was not only a form in the landscape. It was also and mainly a sound object, because, in last end, the tower, with its bells and its installations, is the musical instrument. The vault that covers the room as well as the railings under the windows build a characteristic sonority of our bell towers that is necessary to conserve as much as its external aspect. It was usual also to locate two or three small bells on some wooden beams located in the centre of the room, since the sharpest notes, to simplify a lot, are heard better if bells are sawn. This location lacks importance for the largest bells. Said otherwise, the highest frequencies extend on-line straight line mainly Smallest bells must be in the high, while the sound of the lowest extend in all directions.

Bells, accessories, and towers are not the whole instrument; traditional ringing limits the possibility offered by the physical elements. The ringing adapts and creates the instrument: it is the sum and the cause of the ensemble. On the other hand, ringing does not only have formal, musical and

aesthetic elements; they are mainly communication objects. It is impossible to understand in Spain a ringing empty of meaning, as can be a carillon song whose interest is the own melody. A ringing, always, means something. In addition, it bases hardly ever on the melody, but in the rhythm.

In consequence there are not bells “out of tune,” either good or bad towers - there are ensembles that communicate (or that communicated) vital information for the social organisation of the community.

Ringling did not only call to mass. They marked, with the Angelus, the beginning of the day, noon, and the beginning of the night. They announced the class of the following day (since they transmitted a Latin notion of time, beginning the day at noon of previous day and not at twelve in the night like now). They also indicated, with the diverse tolling ringing, the age, the sex, the space location, the social class of the deceased. In addition, other ringing marked sacred or profane spaces, places of tragedies and fires, of feasts and processions. Without forgetting the magic protective function of the bells and their sound, even used in Castilla to assure that the storms don't fall in our town... but in the town of to the side.

7. Traditional bell ringers

We have spoken of traditional instruments, formed by bells, installations and ringing. Traditional bell ringers that we have known until the last nineteen seventies made this ensemble. Bell ringers were professional paid by the community to transmit messages according to some very strict codes, generally written. The church or the city council paid them for their work, sometimes in species (the house, for example) or in money.

In big churches (cathedrals, city parishes) bell ringers were professional that lived only playing bells, although some had other occupations like tailors or shoemakers. However, in small towns, bell ringers were also sextons, poorly paid and that often had a main occupation to be able to live.

Traditional bell ringers, as journalists today, had in their hand the possibility to control the community. However, they did not use that power, and the last ones that we knew had a great self-control not “to play bad,” nor “to play out of time.” They tried to look for a harmony, not always easy, between the communication and the artistic creation. They could not vary their ringing a lot, for not confusing the neighbours, but they tried to make variations for not to bore neither to get bored.

8. Electrification of the sixties

In the sixties occurred several facts against the bell ringers in many of the countries of Spain, as the Comunitat Valenciana. The Ecumenical Council II supposed the simplification of the liturgy of

the Catholic Church. Until then, in many cathedrals and parishes the prayer of the choir was made (sixth, none, vespers, complete, matins), four or five times a day, and each prayer had a different ringing according to the “class” of the day. The Council reduced the classes to three or four, and the prayer in community disappeared in many places. In Cathedrals, they passed from praying four or five daily times to only one... or none. In consequence every time the ringing was less necessary.

It was also the time of the development: they make us believe that to be European it was necessary to forget the traditions that didn't suppose more than a loss of time and of effort. In Europe, they said, they are modern because they have put an end to the history. In addition, continuous motors appeared. The so-called wash machine motors were associated to progress: “it is no longer necessary to ascend to play the bells, these play alone.”

At the same time cost of life ascended and bell ringers requested more salary. However, their work, increasingly useless, fell into disrepute. A bell ringer was always “expensive” while a motor was “cheap” (although it cost a hundred times more), because they say “it is forever.” However, they forgot to say that motors should be conserved, and with the bell, ringer's disappearance grew cost of maintenance and bad conservation of the installations.

Motors supposed, mainly, and from the perspective of the progress, the death penalty for differences of traditional ringing. Companies of bells, from a situation of prestige and of self-sufficiency, never asked which was the tradition neither of what way was it played in some place.

Their mechanisms, already old in that moment, could not adapt to necessities of clients. Bells turned to constant speed, always in the same sense, and without differentiating feasts neither tolling chimes. In face of the necessity of maintaining some chimes of bells, companies developed some mechanical teams to substitute bell ringers. However, instead of adapting to existent accessories, they invented much simpler teams to make more than music, noise with bells.

They substituted the wooden yokes, some older than the own brasses, for others of iron, and they installed continuous motors that could only turn the bells in a sense and to constant speed. The installation of external, very slow electric hammers produced the practical disappearance of traditional chimes. Those mechanisms, very primitive, were almost impossible of programming. At the same time, they impeded all type of traditional ringing, since the motors braked almost completely to the bells, and all the accessories to play manually had disappeared.

Industrial electrification supposed an important paradox: old chimes were substituted, to avoid the effort, for other monotonous, repetitive and very simple, and to they called to that progress. However, in other places like France or Belgium, the motors, some installed at the beginning of the

XX century, were adapted to the wooden yokes. By means of ingenious electric mechanisms by impulses, they try to imitate the effort of the bell ringers.

Electrification had also an important repercussion in our historic heritage. There is now an excess of chimes. It is easy now to push a button and bells ring alone. New accessories produce more efforts on bells. There is also a great lack of maintenance. “Repiques,” played very quickly on several bells, and the tolling ringing, usually rapid, was lost; they said it was the price of progress. In addition, manual bell ringers disappeared: motors, new installations and bells, could only work in an automatic way, substituting “poor ignorant, useless and little artists bell ringers” forever. In front of creation and difference, motors announced repetition, monotony, and an end of all traditions.

There was another even worse consequence. New installations, not well calculated, broke clappers, bells, and towers. It was the price of progress and the disappearance, until the first nineties, of important bells and historical installations.

9. New ensembles of bell ringers

At the end of the eighty years, a movement grows bigger: the new ensembles of bell ringers. Those are not paid professionals, but other kind of people: historians, anthropologists, archaeologists, friends of the traditions, or simply people that discovers the pleasure so intense to be able to play large and dangerous bells. New bell ringers meditate on their work, investigate, publish postcards, books and disks, and make small congresses.

There are two big movements in Spain: in Catalunya and in Castilla, where there are still traditional bell ringers, the encounters are good to share knowledge, to make small competitions where the old men teach to the youths.

In València, however, with almost 80% of the bells electrified, bell ringers want to play bells again, restoring installations, removing motors, and replacing wooden yokes. As it is natural, the phenomenon developed starting from the cathedrals. Segorbe and València, with bell ringers' ensembles, formed an association in 1989, the “GREMI DE CAMPANERS VALENCIANS.” In the guild there are today near two hundred bell ringers, that investigate, play and restore bells, and have a constant information in Internet (<http://campaners.com>).

This urban phenomenon, little by little, extends to small towns, and there are some twenty ensembles in the whole Comunitat Valenciana that play manually bells.

10. Restoring bells

Traditionally, when a bell was broken, an itinerant bell founder came, recast it by the foot of the tower, and local artisans installed it. Later, with the appearance of the companies and the improvement of the means of transport, the bell founder took the bell. He recast it in his factory and installed it again. He took advantage, if it was possible, to change the installation and to put new accessories and ringing mechanisms (iron yokes, motors, electric hammers...). The last interventions have supposed the almost absolute disappearance of a rich legacy of centuries.

However it is necessary consider the bells again, the accessories, the bell ringing and the bell tower like an unique musical, very peculiar instrument, to the service of a community. Any modification of one only of these elements supposes such a big cultural loss, as it could be the substitution of a Gothic altarpiece for a picture, although it was three-dimensional. We would have the appearance, but not the own cultural element.

Generic bell ringing rules, built during centuries, had in each place a peculiar, personal and differentiated way of ringing. Bell ringer transmitted messages, some common aesthetic, and cultural conceptions.

Electrification put an end to this wealth. We propose, therefore, the application of a restoring strategy, already normal in the world of the architecture or of Artistic Heritage, applied to bells.

10.1. *Basic conditions in a restoration*

In consequence, to restore a bell tower three necessary conditions should be given: the bells and original accessories must be conserved; installed automatic mechanisms must reproduce traditional bell ringing; those mechanisms don't impede manual bell ringing.

The times in that the electrification supposed the end of the bell ringers, or an answer before the lack of these professionals have passed. Now motors are supposed to support bell ringers, like a substitution, but never like a replacement. Groups of bell ringers: grow in all Spain, acting on bells again. From a perspective of cultural recovery, they are the best guarantors of their conservation and use. Those bell ringers, at the same time, recover the social and aesthetic use of some bells that were the main instrument of co-ordination from the community as a cultural fact, assumed, and shared.

10.2. *A project is necessary*

This global perspective cannot come exclusively from the companies: a previous project is necessary to determine the necessities and the conditions of the performance. Nobody conceives today any architectural intervention in a Monument made without a project carried out by a professional.

That project must be properly authorised by competent authorities. The companies or the bricklayers cannot carry out arrangements without control, but rather a process exists, more or less long. This is good to guarantee the conditions of the intervention. For bells, it is the same thing: a previous process is required that not only has in bill the acoustic or cultural necessities of the bells, its accessories, or its bell ringing. The project must include the current demands in cultural matters or of protection of the heritage. The budget must be also reasonable, affordable, and divided in phases.

The project, therefore, should be independent of the companies, and authorised before beginning any work in the bells.

10.3. *Limits of the project*

The conservation of the patrimony, or the recovery of original values, often spoiled by electrification or worse recasts, has some limits imposed by the peculiar characteristic not only of bells but our ways of playing them

- **Acoustics** – Acoustics are above any other consideration, except security. This supposes the maintenance of historical bells whose sonority can repel to our current hearings, but that it is the best relating sound of a past time. We cannot forget that bells, installed and used in certain way, are the only living sound of the past. String rope instruments; wind instruments change their sound through the time, and depend on the pressing of the air or of the strings to change the original sound. Bells continue sounding equally through the centuries, and there is not another sound of the past preserved to us. Therefore, in the case of historical bells, they should not be retuned, neither less recast: the technique of the welding used for these old bells, gives excellent results, and allows to recover lost voices. On the other hand, and not less important, when making new bells in a historical group, or recovering lost bells, new ones should have the same musical structure of the pre-existent. That is to say, they should be harmonised with these, still when they do not have the modern tuning. In this sense bell ringing that are result of acoustic processes, conserve better, although it seems contradictory, by means of computers, once programmed, even in an automatic way.
- **Security** - This is the main limit to the conservation of the original elements: a wooden yoke, some metallic fixations, some brass bearings will be maintained, while they are in the limits of security required for the use of the bell. However, if other new ones substitute them, these will maintain the conditions that determine the sonority of the object: counterbalance relationship, size of the clapper or location in certain place of the tower.

- **Aesthetics** - This element is not quite important, although many times it prevails on the other ones: bells should sound, in a sure way. The rest is incidental, and depends on the local traditions. For that reason, iron yokes very much alike wooden yokes, are a great lie. They do not have the sonority of the other ones, although they look, very from a distance, quite similar. Sonority cares, not the external aspect.

10.4. *Last restorations*

From 1988 phenomenon of new bell ringers had important administrative repercussions. The Spanish Ministry of Culture and some Regional Governments, as the Generalitat Valenciana took charge the inventories of bells that gather epigraphy, decorations, Conservation State, installations, and even ways of ringing.

Surprisingly inventories in Spain do not pick up the note of bells - it is also certain that still today the bells are sold to weight and not for the musical note. This is beginning to change. Musical research has begun to know the traditional rules, if any, of according bells, looking for the five partials.

Starting from the inventories and of some congress the necessity of a new concept of restoration is born. If the instrument is the ensemble (bells, installations and ringing) it is necessary to make a restoration project. That project should include the conservation or the reinstatement of the traditional installations, the possibility of reproduction of the old ringing without the mechanisms impede the manual ringing. Naturally this conservation idea is limited to the historical towers, since there are new bell towers where they are introduced another type of bells.

The congress of Cheste 1989 is a good example. There was a round table where Spanish bell casters say that restoration was impossible. You could not put new wooden yokes, weld bells, make tuned bells, introduce motors that reproduce the old ringing and don't impede the manual ringing, control all by computer. The same day we inaugurated a restoration of six restored bells. One of them welded by Lachenmeyer of Germany. Two new harmonised with the other ones cast by Eijssbouts of Holland. Wooden yokes made by a Catalan artisan and motors and computer manufactured and installed by FRANCE CARILLONS. After Cheste and the Cathedral of València, new bell ringers, and new motors appeared.

The case of the Cathedral of València is significant. There are eleven bells, from 1305 up to 1735, with medieval and baroque scores to play them. In 1968 they substituted the last bell ringer with motors for six bells: two big, two medium and two small (although traditionally they sound or the five big or the six small, but not mixed).

From 1988, the motors are disconnected. There is only an electric bell for the daily ringing; the hundred fifty feasts ringing that request from five to eighteen bell ringers played by hand, for an ensemble of volunteers. However, they recover lost ringing as the Angelus three times to the day or the ringing of closing the walls. “Useless” chimes, but full with cultural meaning. A computer plays those “useless” chimes. In 1992, six gothic bells exhibited in the Expo of Sevilla, transmitted music already alive in the XV century. Starting from that moment, bell ringers are no longer considerate workers that throw of the rope, but artists that make concerts.

The phenomenon repeats, in each place in a different manner. For example, in Massanassa, a small town near València, they put wooden yokes and new motors of impulses again, but they leave the biggest bell without motor, to play it exclusively by hand, and never more with a motor.

An important restoration market develops in Spain as consequence of these changes. Ten years ago nobody looked for a wooden yoke, the bells cast by weight and the motors did not reproduce the traditional ringing.

Starting from those demands of the market there are new motors, of which the most complete is the Movotron of Clock-O-Matic, new computers, and an important demand of traditional, but expensive installations with better sound and historical quality.

Bell founders in Spain (there are still six or eight foundries) begin to think about music. Their first idea was to produce carillons, but now, some of them, analyse existing bells and try to make new according ones. In addition, bells begin to be considerate, again, as musical instruments and not as noisemakers.

10.5. *Some recent restoration processes*

We have participated in the processes of restoration of some Cathedrals, to try to recover the importance of the musical instrument in their integrity: València, Sevilla, Murcia.

Sevilla is exemplary. We elaborated a project keeping in mind existent full circle ringing bell (17), another one lost, and six fixed for chiming. The plan proposed to recast six bells, with the musical reference of the existing. Other four bells, cast later than 1850, were tuned again. Other bells were welded, because they had lost much brass during the centuries. The new wooden yokes were based in local model of Sevilla (since the previous ones had been substituted by others of strained iron). The full circle ringing motors reproduce the traditional ringing and do not impede the manual playing. The mechanisms for fixed bells use their same clappers and not other external apparatuses.

After approving the project, a public offer was made, to ten companies of the European Union (six Spanish). The offers better adapted to the necessities of the restoration were a Belgian company

for the accessories and Dutch foundry for the bells. Restoration works began lowering the bells of the tower, and transporting them to the work places (Belgium, Holland). Like this companies can guarantee more exact and controlled restoration.

Bells, with the yokes, were installed for their exhibition and blessing in the square in front of the bell tower, so that people had direct contact with the bells, during several days.

Meanwhile it was carried out the programming of the diverse bell ringing, in accordance with some Historic Rules, of 1533 and 1633. The programme adapted to current necessities: for example, vespers only was programmed the days that this liturgical act takes place.

Finally, bells were installed in the tower. There was a presentation concert that was good to know the diverse recovered bell ringing: from the Carrañacas (or rattles, for Lent) until the diverse bell ringing. The bell ringing for burials, adapted to current necessities, are not programmed in an automatic way.

It is of highlighting that in the project we have recovered the old ringing (some lost more than sixty years ago like the prayer ringing for the deceased, every night), and mainly, the bells can be played manually again. Of the whole restoration process it has not cared that bells were recast, neither that returns the old ringing, neither that has to almost be the people of Sevilla one year without bells. The most important thing, for the Press, has been that the bells of the Giralda can play manually again, and that motors are an assistant, but not the bell ringer's substitute.

10.6. *The resource to European companies*

The participation of Spain in the European Union is not only an economic or political process: it is also a process of cultural integration. Surprisingly, until very little ago, Spanish companies were accustomed to change bells for weight, rejecting all their cultural characteristics: so much acoustic as historical, documentary or ornamental. In addition, the companies destroyed systematically bell-ringing accessories, without any justification more than the own technical and cultural limitation of those companies.

However, for the restoration a more modern mentality is required, usual in other fields of the patrimony, but almost non-existent in the bells. Respect to the historical elements, properly authorised performance project, justified documentation of all the carried out performances (until a change of screws!), conservation of those historical elements that are irreparable or whose use has been out of step.

In a special way, we must control the recast of all type of bells. Historical tuning or carillon tuning is not the best: each case requires an authorised performance, motivated, and then executed by

the companies that should adapt to project. Same thing happens with the accessories or the location of the bells that assure the original sonority if maintained.

Probably this it is the only future alternative. Few companies will adapt to this strict conservation of cultural elements, in very wide sense. There are Spanish companies able to make new bells accorded. This is very valid for new or empty bell towers, in no way for restorations. For restoring previous acoustic studies are required, as well as a capacity to produce bells with their entire five controlled harmonised partials (but those five partials not necessary in the same place as carillon bells).

It is necessary to conserve; to restore, to listen, to adapt to the quite rich local traditions that can still be recomposed and valued.

The restoration concept goes quite beyond a simple substitution or repair. We try to recover the original sound, and aesthetic values of a group of bells, restoring their old accessories, installing them in the tower for which were thought, and interpreting the chimes of that community again.

More than a hundred of bell-towers in the Comunitat Valenciana have already been restored. Those actions show that it is possible to co-ordinate the conservation of the traditional accessories with the installation of mechanisms controlled by computer. They reproduce traditional chimes and do not impede the manual ringing. It is prominent, equally, the appearance of numerous teams of bell ringers, that have again recaptured the person's important paper next to the bell, to express through the chimes the feelings of the community. In most of the bell towers restored, the first ring, the presentation of the bells, consists on an interpreted concert in a manual way.

In summary, the new processes of restoration of bells are based on the respect of tradition, and in the possibility of reproducing mechanically traditional ringing that were so different from a town to another. Restorations, an impossible phenomenon ten years ago, are now becoming an important process in Spain. Those restorations come accompanied by inventories and a bigger respect toward bells, installations, and historical ringing. Of course, those are not “well tuned bells” - or maybe they are. We should remember that “perfect tuned bells,” like those of carillons, just installed in Spain, seem to many of us, “weak bells”, “not serious bells”, “foreigner bells”. In any case, we try to preserve our traditions, which are also an important part of the culture of bells in the whole world.

10.7. *Wooden bells*

In a recent travel to Eger, in Hungary, we discovered, in the Cathedral, an old quite interesting rattle. We thought that instrument, used in our country to substitute bells during Holy Week (from Maundy Thursday till Easter Saturday) were used only in Spain. They receive, there, many local

names as “Carraca” (in Castilla), “Carrañaca” (in Sevilla), “Tenebres” (in Catalunya), “Batzoles” o “Matraques” (in València). Those names are, usually, onomatopoeia of the rhythmical noise produced by the rattle. Those wooden instruments replace bells during the death of Christ, and they were located at the top of the bell towers. We included them in restorations, because their sacred noise is also an important part of the bell tower as a musical instrument.

It was a great joy to discover it in Eger, where we expect it will be restored and put again in use.

11. Spanish bells in Internet

The web <https://campaners.com>

Inventory of bell founders <https://campaners.com/php/fonedors.php>

Inventory of bell <https://campaners.com/php/inventaris.php>

Inventory of Cathedral bells <https://campaners.com/php/catedrals.php>

Inventory of clock <https://campaners.com/php/rellotges.php>

Videos (in format MP4) <https://campaners.com/php/videos.php>

Chimes (in format MP3) <https://campaners.com/php/sonor.php>



















