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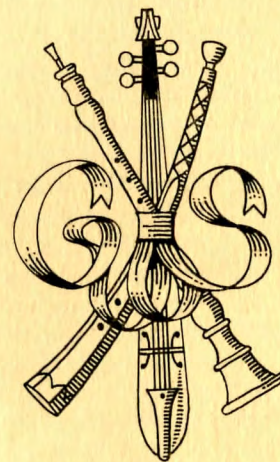
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LI

Sonido Rajado: the Sacred Sound of Chilean *Pifilca* Flutes

SOUTH Andean indigenous music is a poorly known subject. Investigations on the subject are now developing an original musical corpus both on the archaeological and the ethnographical level. This article adds to this knowledge one of the most intriguing South Andean musical cultural achievements – the so called: *sonido rajado* produced by certain southern Andean flutes. *Sonido rajado*, which means figuratively a ‘torn sound’,¹ is a descriptive term to designate the extremely strong, intense, complex and energetic dissonant sound that is characteristic of these flutes. This particular sound is produced by an acoustic tube composed of two sections of different diameters, the so-called ‘complex tubes’ (after Haeberli, 1979). I became interested in the subject during investigations on pre-Columbian instruments, when I realized that flutes having this structure appeared to be the most important in the pre-Hispanic South Andean area, both in number of specimens and in cultural relevance, and over a time-span of 1500 years or more.² What intrigued me was the consistency over space and time of this particular acoustic device, a fact that has not yet been explained satisfactorily by experimentation with archaeological instruments, or by the specialized bibliography.³ There is just one reference to it, in a short article devoted to 12 panpipes of ancient Peruvian Nazca culture, written by Haeberli (1979, p.61) where he states that

The acoustical properties of the complex tubes differ significantly from those of simple ones. For the latter the ratio of the frequency of the first overblown harmonic to the frequency of the fundamental is, as expected, about 3:1 (...). For the complex pipes the ratio is about 2:1. The frequencies of the complex tubes are, on the average, 32% higher than would be expected from calculation based

¹ *Rajado* means ‘tear’ in the sense of ‘tear a paper in two pieces.’ The sound and dramatic action associated with this adheres to the notion of *sonido rajado*.

² Bolaños (1988, p.19) cites the oldest of these flutes, dated 900 BC, from Paracas culture, in southern Perú, and my investigation shows the latest to be probably pre-Inca, AD1500, from San Pedro, Diaguitas, Aconcagua and Mapuche cultures in northern and central Chile. A second article is planned, dealing with the archaeological finds related to the *sonido rajado*.

³ Relevant bibliography is cited throughout this article.

on pipe length. The shape of complex pipes is unusual; its origin and reason for use, except for giving the octave of the fundamental as the first overblown harmonic is unknown but suggest experimentation.

Pre-Hispanic flutes with complex tubes capable of producing the *sonido rajado* comprise three distinct types: two types of *antara* (panpipes) and one type of *pifilca* (single-tube instrument: see Map 1).

COMPLEX TUBE FLUTES



MAP 1. Map of the distribution of complex tube flutes capable of producing the *sonido rajado*. The two patterned areas in the background show the two great Post-Tiwanaku pre-Hispanic instrumental traditions: the northern *siku* one, and the southern *sonido rajado* flutes, both divided between Arica and Iquique. The *sonido rajado* flutes comprise the *antara* and the *pifilca* types, both areas merging together (not shown on the map). Present-day *siku* tradition coincides more or less with the pre-Hispanic area, but the *antara* has disappeared, and the *pifilca* survives only in isolated regions (dark grey areas).

I also know about the use of this type of complex tube in present-day *pifilcas*, which are found in isolated regions spread over an extensive area of Chile. *Pifilca* is a unique organological type, presenting a great uniformity of musical uses linked with the ritual. It shares some common characteristics with the *siku*, the Aymara cane pan-flute with a simple tube, found in northern Chile, Bolivia and southern Perú.⁴ Both, *pifilca* and *siku*, show a South Andean tradition characterized by combining great rituals with specific flute-sounds in a specific way, a tradition of pre-Hispanic origin still poorly known.

The musical use of the *pifilca* is apparently very simple; each instrument gives only a single note.⁵ However, the central thesis of this article is devoted to the study of the *pifilca* in the ritual context. It is clear that the role of the combined sound generated from these flutes corresponds to a highly developed musical/ritual scheme in terms of timbre, harmonic and polyphonic systems⁶ whose main characteristics are pre-Hispanic in origin.

TWO PIFILCA TRADITIONS

We use the name *pifilca* as a generic one, using one of the most common Spanish translations. We find a major division between two distinct, but closely related *pifilca* traditions: the southern Mapuche one, and the northern one, separated by 1.000 km. Both employ essentially the same instrument played in two distinct cultural contexts. The Mapuche people have conserved their indigenous tradition, with negligible Spanish or Catholic influence, while in Central and Northern-Central Chile all ritual images and mythologies correspond to the Spanish Catholic tradition, in the absence of conscious memories of the indigenous past. *Pifilca* is the Mapuche name for the

⁴ For a more detailed account of musical similarities between *pifilcas* and *sikus*, see Pérez de Arce 1992 & 1995.

⁵ It must be noted that the description of the instrument by John M. Schechter in *The New Grove Dictionary of Musical Instruments*, based on that of Isamitt (1937:59), repeats some very serious inaccuracies. In his attempt to declare it a 'real musical instrument' in European terms, Isamitt had defined it as a 'chromatic instrument', claiming that he had obtained a complete scale of 26 sounds, tones and semitones, with blowing and lip variations, and had also discovered some universal proportions in the two instruments of his own collection which he used for his investigations. For more accurate descriptions see Pérez B. (1987a, 1987b).

⁶ Throughout this paper I use the term 'timbre' to designate one single instrument's voice; 'chord' as a superimposition of timbres; 'harmony' as a succession of chords; and 'polyphony' as a superimposition of different rhythms, melodies or chords.

instrument.⁷ The northern type has adopted the designation of *flauta de chinos* (*chinos*' flute) – see Fig.1. *Chino*, which is a colloquial term for 'servant' in Chilean traditional society,⁸ is used here to mean that the musicians are servants of the divinity.

The northern tradition shows a more refined musical use of *pifilca* than the Mapuche one.⁹ Northern tradition extends from the Aconcagua to

⁷ The Mapuche spelling of the instrument has varied from author to author: *pivilca* (Moesbach 1976:253, Currihuinca 1984:297, Lenz 1905-1910:618, González 1977:76); *pivilla* (Eric 1960:143); *pifilca* (Moesbach loc. cit., Plath 1955:106, Mena 1974:75; Henríquez 1973:37); *pifilla* (Joseph 1930b:60), *pifilka* (Juliet 1874:162, Robles 1911:563, Vega 1946:79, Dowling 1970:59); *pifilka* (Pérez B. 1987a:13, Jacovella et al. 1979:14, Pérez B. et al. 1980:16); *pif(e)lka* (Hilguer 1957:98); *pifêlka* (Augusta 1934:17); *pifalkka* (Augusta 1966:179); *pifilka* (Titiev 1968-1969:301, Grebe 1974:33, *pifulca* Currihuinca loc. cit.); *pifullka* (Titiev 1951:33, Augusta loc. cit.); *pifülka* (Isamitt 1937:59, Dowling loc. cit., INA 1981:68, Schechter 1984); *pifüllka* (González 1986:19); *pifuilca* (registered in the Museo Arqueológico Dillman Bullock, El Vergel); *pifuca* (Currihuinca loc.cit.); *püfilca* (Guevara 1927:387); *püfilca* (Guevara op. cit.:373); *püvillca* (Guevara 1899:243); and in Argentina, *pitacahue* and *huihueñihue* (Eric loc. cit.). In the past the name has appeared as *pivillcahue* (Valdivia 1887 s/n) and *pivillca* (Febrés 1764:598, Havestadt 1883:512, Guevara, op. cit.:1016). This variation in nomenclature has two main causes: first Mapudungun is an oral language with no standard orthography, (even today Mapuches do not agree as to which system to adopt), and second there are many different spellings in different zones and variations through time.

⁸ *Chino* is originally a Quechua and Aymara term for servant, and was used in Chile as generic for servants, either Indian or from lower classes.

⁹ This conclusion is based on the relative importance, in the two traditions, of the sound of *pifilcas* in social, musical and ritual contexts. Regrettably, no other study has been done in this area. Studies on the Mapuche *pifilca* (González 1986, Isamitt 1937, Pérez Bugallo 1987 & 1987b) have not focused on the structure of sound. Pérez Bugallo (1987b) briefly cites *pifilcas* sounding in a fourth- or seventh-interval chord; Isamitt (1937) gives a completely Western-oriented description of the possible sounds, apparently attempting to ascribe musical importance to the instrument. *The New Grove Dictionary of Musical Instruments* (London, 1984) has no entry for '*Pifilca*'; but under '*Pifülka*', John M. Schechter briefly describes: 'A small end-blown flute, or long whistle, of the Mapuche (Araucanians) of southern-central Chile and Neuquén, Argentina. It was formerly made of bone, clay or stone, but is now made from a piece of hardwood about 25 cm long, which is pierced vertically for half its length with a hot iron; the tube remains closed.' It is notable that there is no reference here to complex tubes. Without explaining how it could possibly produce additional notes, Schechter nevertheless goes on to make the implausible claim that: 'It is a chromatic instrument, overblowing at the 12th, and yet it is easy to play.' More acceptable, however, is his concluding statement that '*Pifülka* are often played in pairs, using hocket technique. They are widely used in ritual ceremonies.' In the same volume, under the headword '*Siku*', Schechter then describes these 'South Andean panpipes'; but here again he makes no mention at all of complex tubes.

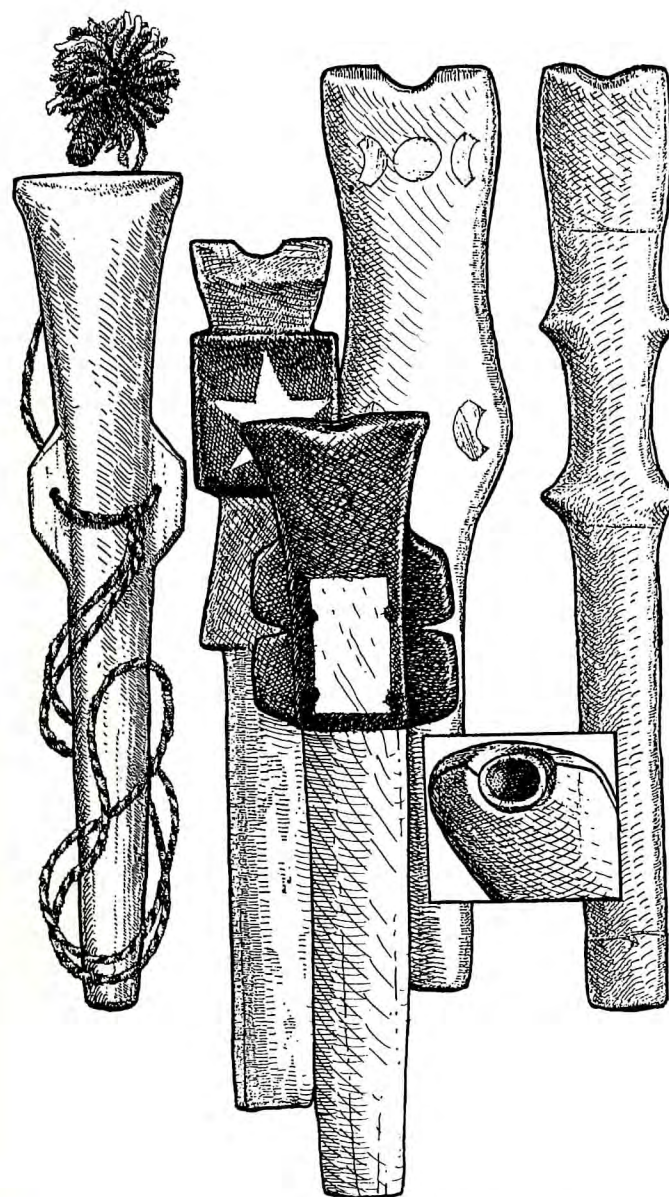


FIG.1. Mapuche *pifilca* (left), two wooden flautas de chino from central Chile (centre) and two cane flautas de chino from Norte Chico (right), with a detail showing the cane inserted into two wooden halves.

the Limarí valleys, and is also present in peripheral isolated zones of Lora, Isla de Maipo, Copiapó, and Iquique (see Map 2). Apart from these peripheral zones,¹⁰ the *chino's* tradition presents great uniformity, having in common the main musical and aesthetic ritual characteristics. The ensembles are ritual teams named *bailes chinos* (from *baile*, dance, because they dance while playing). They use *flautas de chino* and drums, and wear colourful garments and hats. They dance in acrobatic manner, and include a singer who improvises verses to the divinity.

Main differences inside this area are due to local versions of the ritual. The Norte Chico tradition (Illapel to La Serena regions) has quieter movements, fewer flutes and less defined choreographic and social structure. The rituals introduce *turbantes* (from *turbante*, turban) and *danzantes* (from *danza*, dance), ritual-type ensembles different from those of the *chinos*. The Central Chile tradition (Aconcagua to Petorca valleys) presents lively movements, more instruments, more defined and complex choreographic and social structures, and shows a *chino* ritual 'purity', even though it incorporated the Norte Chico *danzantes* during the '60s.¹¹

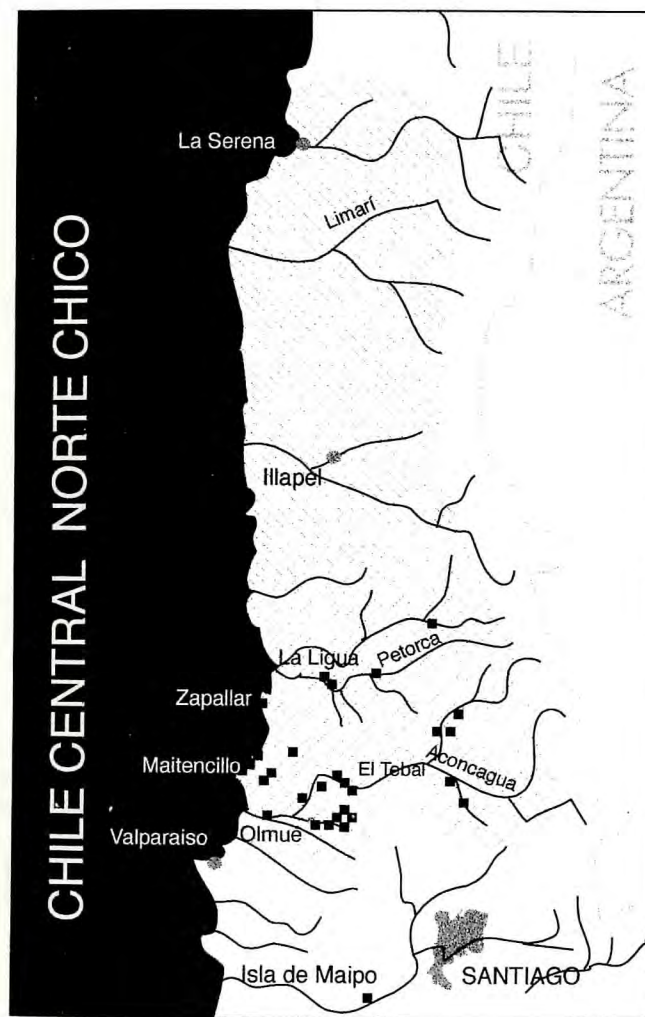
In order to answer the unresolved questions about the use and significance of the complex tube, I organized a research project with the collaboration of musicologists Claudio Mercado and Agustín Ruiz on the central Chile rituals of *chinos*.¹² Over a period of two years of research we learned how these flutes must be played, and which are the special sounds produced by them. We befriended the instrumentalists, some of us played with them in the rituals, maintaining a deep relation of friendship and mutual respect. For us, as investigators coming from the urban de-identified culture, the relation with these deep local cultural expressions was an overwhelming discovery: so close in geographical terms,¹³

¹⁰ In Lora (Curicó's coast), tradition shows some mixture of southern and northern traditions (Aguilar et al., 1985, p.55). In Isla de Maipo, south of Santiago, the tradition has little in common with *pifilcas*. In Copiapó, they do not have the *sonido rajado*, nor some of the main musical organizations and ritual costumes. Antofagasta and Iquique regions were reached by the end of the nineteenth century, with the migration of miners from the Norte Chico region.

¹¹ The *danzantes* with industrially manufactured military drums have altered the sonic equilibrium of the *fiestas de chinos*, based on the delicate balance of flute orchestras, debasing the whole ritual system. Today it is common that, during the ritual, *danzantes* are separated from *chinos* so as to avoid mutual interference. There still exist some minor fiestas where *danzantes* are not permitted and where only *bailes chinos* participate.

¹² Investigation sponsored by Concurso Nacional de Proyectos del Fondo Nacional de Ciencia y Tecnología (FONDECYT N° 92-0351) and Museo Chileno de Arte Precolombino for the years 1992 and 1993, with the collaboration of the ethnohistorian Milton Godoy.

¹³ Many places where this tradition lives are about one hour away from Santiago, the capital city.



MAP.2. Present-day flauta de chino tradition. The Chile Central one, described throughout this article, shows the location of the *bailes chinos* detected through our investigations (black squares). Each *baile chino* location also means a *fiesta de chino* location. For distribution of peripheral isolated zones, see Map 1.

so close in external cultural parameters and so distant and unexpected in the internal perception of the sacred. This article presents a summary of these investigations over central Chile rituals.

For the purpose of our main theme I will ignore the incorporation into present day rituals of the *bailés danzantes*, also the Catholic church intervention. Today's *chinos*' rituals are inscribed in the Catholic religious system; they are held according to the Catholic ritual calendar, their images (both visual and written) are Catholic, the Bible is the source of sacred knowledge. Nevertheless, *chinos*' understanding and internal perception of the ritual is still greatly Amerindian.¹⁴

CENTRAL CHILE *CHINOS*

The *chinos* of Central Chile live in some inland valleys' rural communities such as Olmué, Granizo, Pachacamita, El Tebal or Palmas de Alvarado or in small coastal settlements like Maitencillo, Horcón or Zapallar. They are farmers and fishermen, having a *mestizo* style of life common to near-urban societies in Latin America, with no apparent links to the Indian past. They are descendants of the original local Indians, mixed with successive European, Indian and other immigrant groups. A lower class of Chilean society, they have been more or less apart from the main modernization trend of the country, in spite of the proximity of the capital, Santiago (more influenced by Western civilization from the beginning of the Spanish domination). The livelihood of the valleys communities is guaranteed by small-scale agriculture, charcoal production, collection of medicinal plants and other minor-scale production systems. The coastal *chinos* are fishermen.

The fishermen need a close divine protection because of the dangers inherent in their way of living, constantly threatened by the natural elements. They celebrate *fiestas* in honour of St Peter, the patron saint of the sea. The farmers from the interior valleys depend on good weather, rain and abundance of crops, and celebrate rituals in honour of the Virgin Mary, the strong and sweet Mother. *Chinos*' music and ritual are the most important cultural identity factors operating in these communities.¹⁵

These *fiestas de chino* have been described in very inappropriate terms by some authors, who have entirely missed the importance of the sound

¹⁴ Between the catholic authorities and the *chinos* there has been a long history of reciprocal differences: the Church perceiving the *fiestas* as Catholic rituals, with no 'pagan' elements; the *chinos* perceiving the same as ancient local rituals not well understood by church authorities. Most importantly, *chinos* do not need those authorities to be present during the rituals. For a more detailed account of church/*chino* relations, see Ruiz 1994. Catholic intervention also alters the sound system of *chinos*' ritual with clearly different approaches to sound.

¹⁵ Even while other rituals held in the same area, such as 'Lo Vásquez,' 'Lourdes,' or 'Santa Teresita,' are more massive, they do not contribute to local cultural identity, being more directed to urban society, organized by the central Catholic church.

of the flutes – our main subject – and made a few short, impressionistic comments, such as the following: 'strange, anguished, wild, like distressed seabirds'; 'dull, monotone, resembling the cry of geese or swans . . . since no two have the same pitch, the noise when 400 or 500 of these instruments are played together is infuriating'; 'monotonic and dissonant'; 'resembling the cry of an enormous flock of geese . . . deafening and at the same time captivating'; 'animal noises that have been compared with the braying of a donkey, the cry of a goose, and screams of frightened seagulls.'¹⁶ It is noteworthy that all these descriptions use the term '*ruido*' (noise) or animal call, and never the term music. This implies, tacitly, an unorganized, confused and chaotic situation.

This type of laconic comment contrasts strongly with the great knowledge about this sound and the great importance given to it among *chinos*, as we discovered through our research. We found that these apparently disorganized and confused aspects correspond in fact to a balanced and subtle musical style. This sound shows as a key factor for the understanding of the ritual as a musical object, and in relation to social mechanisms, with the ritual space, and with special states of consciousness.¹⁷ I will summarize this information at three levels: the instrument's sound characteristics, its musical context, and its ritual context.

DISSONANCE ÆSTHETICS

As stated earlier, *sonido rajado* is an extremely strong, intense, complex and energetic dissonant sound. To obtain it there must coincide two factors; a specially designed sound device (a good instrument), and a specific technique for sounding it (a good instrumentalist).

The instrument is made of wood, cane or *cifuta*, a local reed. The wooden type is the most popular in central Chile. Its secret for sound production lies in the sound device – the complex tube – a cylindrical tube having an upper broader section and a lower narrow one, both having approximately the same lengths.

¹⁶ 'Extrañísimo y angustioso, salvaje, como de pájaros marinos angustiados' (Uribe 1958:16); 'sordo, de un solo tono, que se asemeja al graznido de un ganso o un cisne . . . como no hay dos que tengan el mismo tono, el ruido producido cuando están sonando 400 ó 500 de estos instrumentos es desesperante' (Latham, cited in Uribe 1958, p.29); 'monotónico y disonante' (Henríquez 1973); 'se asemeja al graznido de una inmensa bandada de gansos. . . ensordecedora y a la vez cautivante' (Pumarino & Sangüeza 1968); 'sonidos animales que han sido comparados con el rebuzno de un burro, el graznido del ganso y también con chillidos de gaviotas asustadas' (Uribe, 1974).

¹⁷ For a comprehensive survey of these aspects, plus a social-cultural and historic perspective, see Pérez de Arce, Mercado & Ruiz (1994). For recorded examples of the sound of *fiestas de chinos*, listen to Pérez de Arce 1994a & 1994b.

Generally, sounds produced from closed-end tubes (for example in panpipes) are only composed by the odd-numbered partials of the harmonic series, h_1, h_3, h_5, h_7 , etc.¹⁸ Tones can be soft, loud, pure or with harmonics, always with great tonal definition. The *sonido rajado* has little resemblance to these, or with any other flute's sound. It is a dissonant cluster of great intensity, specially in the upper register, a harsh and very strong composite sound ranging from deep to high notes, with no recognizable fundamental or tonal definition. *Sonido rajado* must be played in short blows (about one second), with very strong attacks, stressing in that way their great timbre complexity.

Some *chinos* are very precise in the definition of the aesthetic principles related to this *sonido rajado*. There are no more than three or four artisans who know how to obtain good instruments, who share this rare and disappearing specialty.¹⁹ We had the lucky chance to meet Daniel Ponce, perhaps the greatest of them all, still treasuring the ancient acoustic knowledge of the *sonido rajado*. Thanks to his knowledge we could discover the secrets of the construction of the *flauta de chino*, and the precise formula for the best use of its sound during rituals.

To construct the flutes Daniel uses round sticks of local wood approximately 6 cm diameter and 50 cm long. The construction of the tube is technically easy: he bores the broader section with a manual drill, then introduces a hot round metal rod of the same diameter to obtain the interior smoothness of the tube, and then he introduces another narrower hot rod, coming out at the other end of the stick. The mouthpiece is carved to form a sharp edge on the outside of the instrument, normally slightly different in the 'front' and 'rear' part (see Fig.2).

The correct sound production results from a combination of three precise factors: the relative diameters of the two sections of the tube, the relative length between both, and the absolute smoothness of the interior walls. The first factor is determined by the 17 mm and 8 mm diameter metal rods that Daniel uses on all flutes.²⁰ The relative length between the broad and narrow sections is carefully measured to obtain a proportion close to 1:1. There appears to be no specific mathematical proportion involved in this measuring, but a fine adjustment with the introduction of the *tapón*, a plug closing the rear end of the tube (that shortens the narrower one). As minor differences in length make great ones in sound

¹⁸ Real relations are a little more complicated in closed pipes, due to certain factors as sound air pressure, blown angle, some mathematical deviations (see Bensaya 1989), but for our purposes we can disregard them.

¹⁹ For the cane and reeds flute of Norte Chico tradition there are more makers, but their knowledge does not compare favourably with that of makers from Central Chile.

²⁰ There are minor differences in diameter due to the burning process, not considered here.

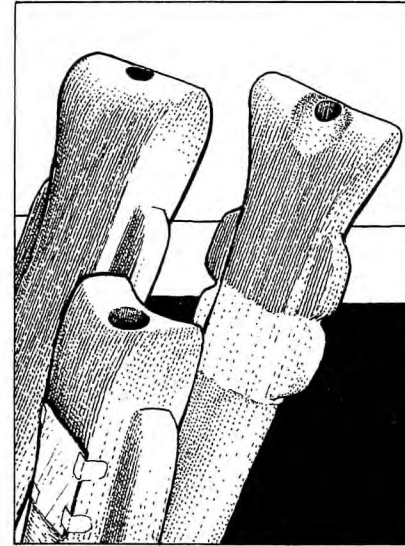


FIG.2. Embouchure. The mouthpiece is formed by the opening of the acoustic tube, with little differentiation between the 'front' and 'rear' part (upper, left). Sometimes, for stylistic purposes, or to reduce the broader section of the tube, the upper part of the instrument is 'u'-shaped (bottom). It is common that *chinos* adapt the embouchure to suit their own particular form of playing, by carving with a knife (upper right).

production, there is a chance factor to obtain the correct proportion. It is possible to change this proportion by enlarging the broader section by means of the burning metal rod, or diminishing the length of the broader section by carving the mouthpiece, or the narrowest section by means of moving the *tapón* (Fig.3).

The interior smoothness of the tube is obtained by the use of the hot metal rod, also by the act of pouring water²¹ inside each time the flute is used, because when dry it does not give the *sonido rajado*. This water also serves to clean out every particle, because the slightest imperfection in the tube causes the sound to fail.

The flute maker spends hours trying to obtain the right sound. It is not uncommon that, after many unfruitful attempts, he has to give up and throw the failed flute into the fire. Rough as they seem, flutes are indeed very fragile; a moth, an internal scratch or the weakening of the *tapón* (plug) can modify the sound quality, and even destroy it. Utmost care must be taken over the storage of flutes during the periods between fiestas.

²¹ Also *aguardiente*, wine or other alcoholic drink.

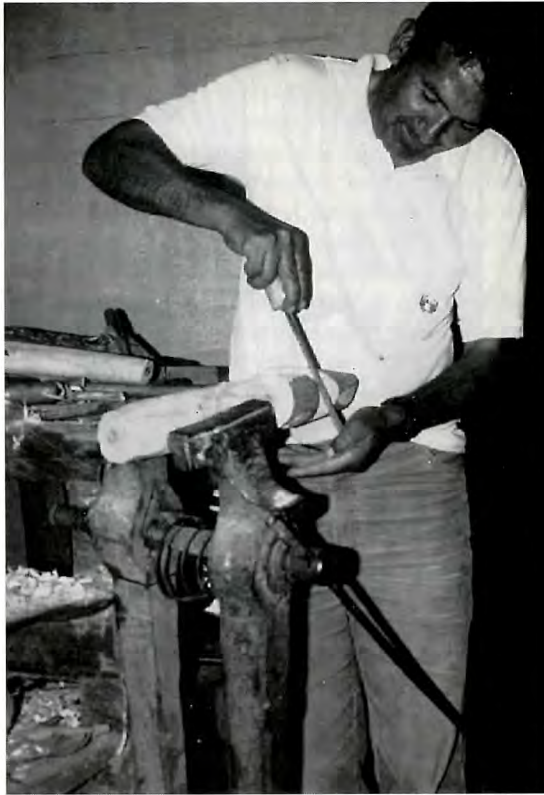


FIG. 3. *Flute construction: after the wood has been dimensioned and bored, and the quality of the sonido rajado tested, Daniel shapes the exterior form of the instrument by carving, rubbing and polishing.*

There is a constant preoccupation among *chinos* about the sound quality of the *baile*. Good instruments are rare and highly appreciated. People speak of rare flutes being handed down from father to son, their special sound acquired through long-forgotten secrets of craftsmanship and many years of playing, serving as an important proof of the musical superiority of a particular community.

The performance technique, which is learned by imitation from *chino* to *chino*, consists of a short attack, giving the instrument a sudden and enormous amount of air with great force (Fig.4). The violence of this blowing is greater than in any other known flute, so as to produce a strong response of the upper harmonics, but maintaining the lower tones.

The analysis of the *sonido rajado* is very complex. Serious research in this direction has yet to be undertaken. I can anticipate, however, based



FIG. 4. *Some chinos from the Baile de Granizo playing. The complicated headdresses, the colour of the bands crossed over the breast and of the cane flute covered with plastic bands, are the main characteristic of this baile. (Loncura, 1993. Photo by Patricia Rodríguez.)*

on the *chinos'* theoretical understanding, and on some preliminary sound analysis that I undertook with Professor Luis Brahim of the Universidad de Chile, that the tube's upper and lower sections appear to work acoustically as two independent ones. The pitches of the two do not coincide, but form an interval of near $\frac{1}{4}$ tone, that is, near the maximum dissonance range.²² Because of the overemphasized attack, the tubes are forced to give a strong harmonic response that multiplies the dissonance up to the upper register (Dowling/Harwood 1986, p.83) making the sound to be heard as a cluster sound²³ (Fig.5). The *gorgoreo* or *ganseo* is produced probably by the strong beats between the adjacent tones.

²² According to Dowling/Harwood (1986, p.84) dissonance augments between 0 (coincidence) and $\frac{1}{4}$ tone abruptly, then reaches a high peak near $\frac{1}{2}$ tone and then lowers near a whole tone.

²³ This does not explain the extraordinary loudness of the *sonido rajado* according with the 'critical bandwidth' theory (Dowling /Harwood 1986, p.49), in which $\frac{1}{4}$ tone separation between complex tones is expected to diminish their combined loudness. In the *sonido rajado* the contrary occurs. After this article was written Prof. A. Gerard (1997) wrote an interesting paper about the sound *tara* used in certain Bolivian flutes. He found the same principle of two pitches colliding not only through research on the sound itself, but also in the theoretical understanding of it by Indian musicians.

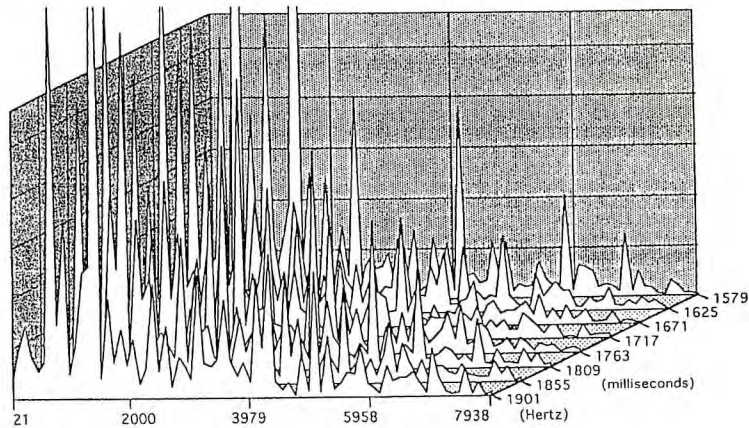


FIG. 5. Sound analysis of *sonido rajado*.

A sampled sound (22Khz., Soundwave 1.0 program) shown in several stages at 46 milliseconds each. Each stage shows the harmonic composition of the sound (Herz scale, horizontal axis) and the relative intensity (vertical axis).

Note the chaotic aspect, with no apparent regularities of musical sounds, produced both by the attack - technique of playing and by the two sounds from the 'complex tube', in collision. (Played by Claudio Mercado; analysis made in Museo Chileno de Arte Precolombino in September 1995.)

There is a precise idea about what constitutes the 'good sound' among *chinos*, involving both the good instrument and the good instrumentalist. The result has to be the most powerful in amplitude as possible: in Daniel's words, a sound 'strong, with volume and body'.

The most appreciated quality of the *sonido rajado* is the *ganseo* or *gorgoreo*, a quick and noticeable vibrato caused both by intensity and timbre change. Good flutes have some amount of *gorgoreo* (it depends also on the musician's ability to obtain it) but there is one special kind of flute, called *lloronas* or *catarras*, specifically designed to produce a highly vibrated quality of sound named *catareo*, which merits special description, to be presented later when discussing the orchestral organization of sounds. The timbre of each flute is quite different, according to its construction, and the player's technique, and normally each instrumentalist has to be familiarized with his own instrument.

It is not easy to obtain a good *sonido rajado*; a low level of breath pressure produces a faint and false sound known as *pitar* or a play of pure harmonics, known as *sonido de botella*; a bad lip position produces no sound at all, or an unbalanced sound, with no bass harmonics.

The *sonido de botella* (bottle sound) is produced by blowing with less

force than the normal one. It consists only of some of the upper harmonics, without dissonances, and is softer than the normal sound. This is considered a false sound, the one produced by apprentices, children and women (in fact, the only *baile chino* consisting entirely of women players, *Baile chino de Pueblo Nuevo*, sounds as *botella*, without the force and volume of the other *bailes*), but sometimes it is considered as an ornament or a special effect during harmonization, thus being named *bombero*, as we will see when reviewing orchestral organization.

Pitear (from *pito*, a small whistle) is considered a defective sound produced by a bad flute or instrumentalist, and it consists of a sound with many upper harmonics, but lacking the lower ones. It is not musically used.

DISSONANT HARMONY

These flutes are used exclusively in ritual orchestras named *baile de chinos*, referred also as *hermanación* or *compañía*. Organizational and participational roles are based on knowledge, talent and social prestige. Family networks have great influence in the constitution and organization of the *baile*. In recent times *bailes* had a patriarchal system of organization, but in a similar trend to historical changes in the country, this has been replaced by more representative organizations based on models such as the sports clubs or communal organizations.

Traditionally, the *baile chino* is a strictly male institution. The playing techniques, the dance, the resistance and physical strength accommodate to male characteristics.²⁴ There is a need to be in good physical condition to participate in a *baile*.

The *baile de chinos* comprises about 20 flutes, one or two frame drums, and one big drum. Flute players are organized in pairs, forming two parallel lines. Their flutes are structured from biggest to smallest, from front to rear, with the drums in the centre. The social organization of the ensemble involves different roles: the flautists, organized by age, experience, physical vigour and size in each line, and the drummers organized in a third, middle line between the two lines of flutes: the first frame drummer in front, who directs the dynamics and the dance, the apprentice frame drummer behind him, and the big drummer at the rear (Figs 6 and 7). Costumes and colours of the flutes are the main normative visual aspects of the *baile*, differing from one *baile* to the other. The drums have also the name of the *baile* (the place of origin) and a sign or drawing.

²⁴ That active ritual participation is restricted to men is probably a pre-Columbian factor. Today this situation is changing with the intervention of *danzantes*, a female-oriented devotional system much more supported by Catholic church authorities because of their easier mutual relation (as against *chinos*). There is also the *baile chino de Pueblo Nuevo*, formed exclusively by women, and others with one or more active women. In these cases, dance and sounds have a 'soft and feminine' quality, which is not considered good by traditional *chinos*.

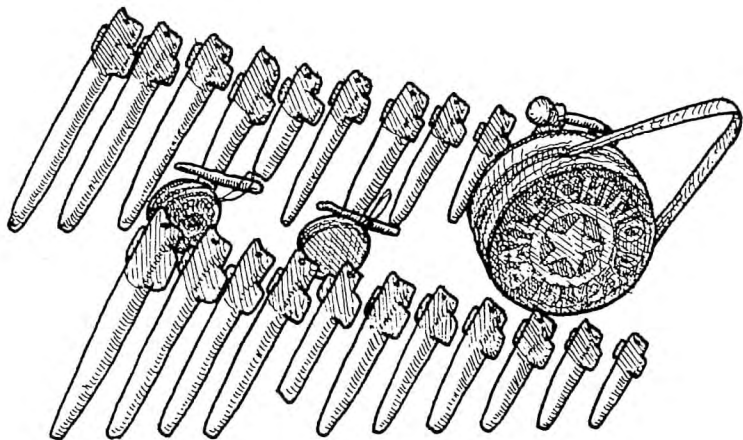


FIG. 6. Spatial configuration of the instruments of the baile. Two rows of flutes (10 each, in this example) organized by size (with *catarras* in fifth place, in this example), plus two frame drums and the big drum at the centre.

The frame drums are small, constructed from a metal can or from a flat, curved piece of wood, covered by two pieces of sealskin (at the coast), or donkey- or cowhide (in the valleys), played with a small stick (see Fig. 8). A small leather handle is used to hold the drum with one hand, while the other strikes the drumhead. The importance of this instrument relates more to its directive function over the dance, than to the music, because its sound is rather weak and dry.

The big drum is made from a petrol can, with two pieces of leather arranged in a similar fashion to the frame drums. Donkey leather is considered the best because of its resistance to intensive use during the *fiestas*.²⁵ Some big drums have interior wires which give a vibrating quality to the sound, adding some harmonics to it.

The spatial organization of the flute players follows two rules: the relative decrease in size from front to rear in each line, and the similarity of sizes between the side-by-side pairs of flutes of the two lines. In terms of sound, this signifies two similar chords extending parallel through space, in a gradient of pitch. The first flautists, called *punteros* (from *punta*, meaning the first position),²⁶ are the better instrumentalists, directing and giving an example to the sound quality and the energy of the dance through the procession time without decaying. From there to the back

²⁵ Big drums are rather new among *bailes chinos*, having appeared approximately twenty or thirty years ago, as a response to the intense rhythmical chaos introduced by the *danzantes* (see the procession description).

²⁶ Names of the flutes are the same as the instrumentalists: *punteras*, *segunderas*, *terceras*, etc. till *coleras* at the end.



FIG. 7. Partial view of the Baile Chino de Cai Cai. The first drummer is leading the dance based on jumps and turnings. (Photo by Patricia Rodríguez.)

follow the rest of the *chinos* (*segunderos* - from *segunda*, second - *terceros*, etc.) ending with *coleros* (from *cola*, tail), usually children.

MUSICAL FORM

Strange as it must seem to outsiders, within each of the two lines of players, their ten contrasting single notes are not used sequentially at all, to produce any kind of melody. All ten players in the same line blow their notes together at the same time, producing a great dissonant chord, which is repeated incessantly.

The two parallel lines of flutes are not sounded simultaneously however: they are timed against each other in very close alternation, using an Andean *hocketus* technique which permits only short blasts. The *chinos* use variations of this technique, named *tañios*, to be described later in this article.²⁷ Each player repeats his single note, alternating with that of his neighbour in the other line, forming thus a minimal melodic scheme of two notes. The tonal difference between pairs of flutes is usually so close to unison, however, that the alternation is not perceived as a melody, but as a continuous, slightly vibrating note, a much appreciated effect by the *chinos*.

In order to define a precise concept of the sonic configuration of the

²⁷ For a description of this technique as used in *siku* orchestras, see Valencia 1982.

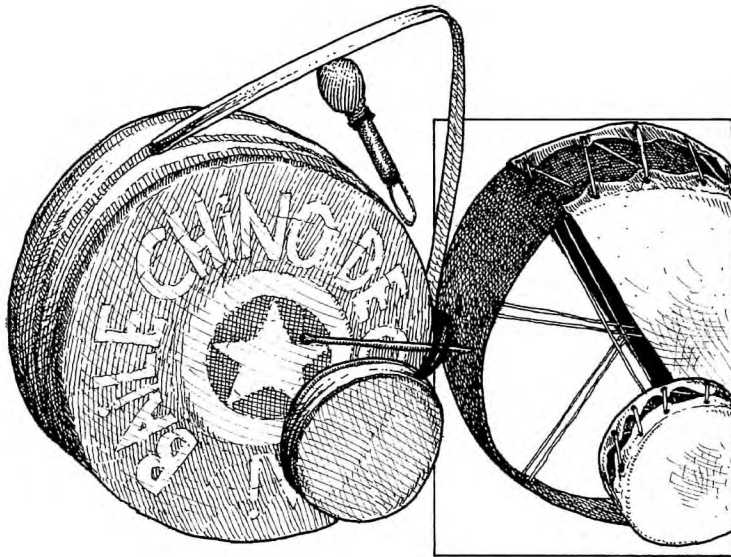


FIG.8. Typical frame drum and big drum. Leather and structure are rough, more adapted to their intensive use through violent beating than to give a great sound. A piece of textile covers the leather lacing used to tighten the skins. At right, both instruments are shown without the textile to show the skin attachment, and the big drum has half the skins removed to show the internal metal wires that resound with percussion.

baile we commissioned Daniel Ponce to manufacture for us a complete set of flutes, as if to form a new *baile*.²⁸ After studying these flutes we had the opportunity to introduce them to a new *baile*, directed by the same Daniel. In this way we fulfilled all our expectations of observing an ideal configuration of the sound of a *baile* directed by one of the best masters in this matter.

He constructed a double set comprising ten instruments each - the interval relationship between the flutes being determined by their differences in length, as we have already mentioned (see Fig.9). These sonic intervals are difficult to measure, because they are not produced between pure sounds, but between the dissonant chords produced by two sounds close to a quarter tone interval. There is a tendency, however, to maintain the same pitch difference between pairs of adjacent flutes. The size of the flutes in each row varies from 688 mm to 313 mm, in a series of almost equally stepped differences in length. In musical terms, this

²⁸ This is the normal procedure when a new *baile* is being formed.



FIG.9A

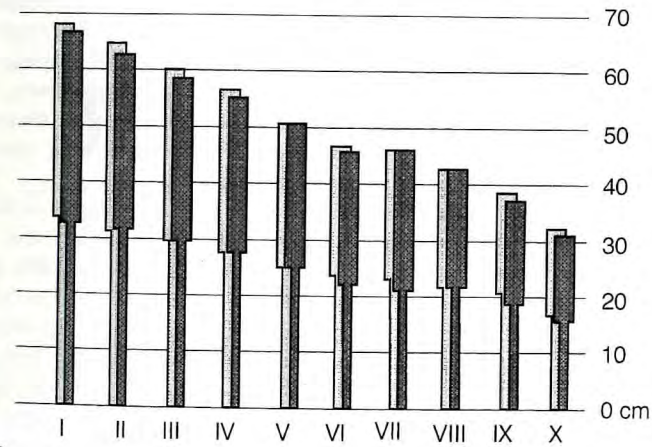


FIG.9B

FIG.9. (a) A set of 10 flutes, corresponding to a complete row (half the *baile*) as constructed by Daniel Ponce in El Vénado, Olmuè, in 1992, before being painted. (Photo by the author.) (b) Comparative table showing the lengths and internal measurements of the complex tubes of the complete set of 20 flutes from one *baile*, as constructed by Daniel Ponce. As can be perceived, differences in size (and hence, in pitch) do not correspond to any predetermined scale. The tubes of each pair of flutes (light and dark grey) show little or no differences. Note the similar sizes between broader and narrower sections in each tube.

STYLISTICS

In good *bailes*, *chinos* command at least four types of *tañíos*, or manners of playing. We do not know vernacular names for these other than *tañío*, so we will use the names *tañío rajado corto*, *tañío rajado largo*, *tañío rajado largo-botella* and *bombeo* for the four manners of playing.

– The *tañío rajado corto*, the most common, is a quick succession of strong and short *rajado* chords marking the two beats.

– The *tañío rajado largo* is softer and more *legato*, and is produced making a *rallentando* from the first, making each sound longer so as to connect both chords. To produce it, the first drummer must give an indication by lowering the drum and making a pendulum movement with it, indicating a slower rhythm, a not so intense sound maintaining the *catarreo*. There must be a gradual movement in pulse and intensity from the *tañío rajado corto* to the *tañío rajado largo*.

– The *rajado largo botella* is similar to the previous one, but includes some *sonido de botella* at the end. This *tañío* is produced gradually coming from the *tañío rajado largo*. It consists in a *tañío rajado largo* of low intensity that dissolves in a soft, multiple and changing harmony formed by *botella* style melodies. These melodies are produced by way of a lesser intensity of blowing and by movements of the lips, forming short melodies using some of the harmonics. These melodies, when superimposed with the other's flutes, provoke a suggestive atmosphere of subtle sounds, whose greatest musical importance is appreciated by the *chinos* who produce them.

– The *bombeo*, used more rarely, as when entering a temple, is softer than the previous one, and consists only of soft melodies in the *sonido de botella* style. The superimposition of *botella* melodies produces an auditive space – plenty of soft and sweet sounds that make a strong contrast with the long space of intense playing during the procession.

During normal playing of the *tañío rajado corto* or *tañío rajado largo* type, individual differences in playing technique contribute to a very subtle play between two or more flutes (either paired or not) that can be heard in what we have called 'ghost melodies'. These are produced by the succession and superimposition of the multiple sounds existing in each chord, but their perception depends on the intensity, articulation, dynamics and spatial relation between two or more sounds from two or more flutes, and on the auditive capacity to hear them as melodies. As sound relations between flutes are alleatory, there are many possibilities of these 'ghost-melodies', but actually one can hear only some of them. Sometimes they are very evident, being a rather specific *baile* sound identity, sometimes one can hear them by paying special attention to any *baile*.

DANCING

Chinos dance while playing. Music and dance are in close relationship, forming an indissoluble unity. Each *tañío* must be considered a dance-music technique. Dance consists of a series of *mudanzas*, feet movements based on a violent exercise of acrobatic jumps and turnings made in unison by all the musicians. The first drummer acts like the dance director of the *baile*; he marks the beat and shows each *mudanza* that the *chinos* must follow in unison. The drummer performs a series of *mudanzas* in succession, an exhausting exercise for the *chinos*, then have a moment of rest, just necessary to resume with another series of *mudanzas*. The succession of *mudanzas* and rest intervals creates a sequence of pulses and dynamics, a succession of slow and *legato* periods alternated with more quick, *staccato* and strong ones. There is a specific technique to go from one period to another, which we will describe when reviewing the polyphonic competition.

Dancing also alters the colour of sound, because of the enforced movement of the instruments. For example, if all the musicians are facing inwards towards the inside of the *baile* (their normal position), and then in unison they jump and turn outwards, there is an intense modulation of the sound to be heard from outside the *baile*, which is very noticeable in the upper register because of the more directional mass of harmonics. When this occurs, the sound is heard as an alternation of very intense high clusters, and others more soft and balanced in the lower register.

POLYPHONIC COMPETITION

Bailes chinos perform exclusively in the rituals known as *fiesta de chinos*.²⁹ When coming to a *fiesta* each *baile* must be accompanied by an *alférez*, a person who plays no instrument, and does not belong to the *baile*, but whose role is to sing improvised verses to the divinity in some parts of the *fiesta*. The *alférez/chino* relation is the confluence of two separated and complementary expressions. *Chinos* are specialists in flute sound; the *alférez* is a specialist in the spoken word, in a polished poetic sung language. Both, *chinos* and *alférez* exist independently, but during the rituals they constitute an indissoluble unity. The *fiesta* is composed of three parts: *saludos* sung in the morning, an instrumental procession at midday and sung *despedidas* in the evening. Both *saludos* and *despedidas* are the responsibility of the *alférez*. Our attention will focus only on the instrumental parts.³⁰

²⁹ Strictly speaking, we have detected some exceptions to this rule, such as the intervention of *bailes* in funerals or other religious events other than the *fiesta de chinos*, but these seem to be rare exceptions to the rule.

³⁰ The poetics of the *fiestas* and the role of the *alférez* have been extensively treated by Uribe (1958).

Fiestas de chino are one-day rituals held to celebrate the local 'sacred image', and are the main communal festivities in rural communities in Central Chile. Several communities or villages participate with their respective *bailes chinos*. The *fiesta* is an inter-community encounter in the indigenous ritual manner, where the sacred is merged with the profane, the pleasure with the sacrifice. There is a fair with stalls, mechanical plays and improvised eating places as an indispensable complement to the ritual. The traditional role for women during *fiestas* is to oversee the preparation of the place, and to arrange to receive the guest *bailes*.³¹

The central structure of the *fiesta* is based on the celebration of the 'sacred image,' which in the inland valleys generally is a representation of the Virgin Mary and, at the coast, of Saint Peter, as we have mentioned. He or she is given a walk over the place, during which there is an alternation between two contrasting parts: a quiet and sung one, when each *baile* sings in turn, guided by the *alférez*, and a dynamic and strenuous instrumental one, when all the *bailes* play simultaneously. This basic scheme of two contrasting sub-systems operates at different levels: in the quiet one the image is placed on one altar to honour it through sung verses, to salute and worship it, to ask for good wealth, and so on. In the movable one the image and the procession of *bailes* move through a ritual path, among the strenuous sound of flutes and drums, the energetic dancing, the competition and sacrifice.³² We will focus only on the procession, where the great flute sound system occurs.

The processional spatial structure is lineal: different *bailes*, each with their sacred image at the rear, go one by one, separated by a space. Normally the sequence of *bailes* follows the order of their arrival at the *fiesta*.³³ A procession can last from 15 minutes to a couple of hours.

³¹ Normally women oversee the ornamentation with paper banners and flower arches over the ritual scenario, the adornment of the altars and changing the sacred image's clothes. Also they organize the reception of the guest *bailes* with the preparation of a place for dinner, do the cooking and serve the meals to all invited *bailes* and friends. Women also search for ways such as selling food or drinks, to obtain money to pay for the great expense each *fiesta* incurs.

³² Contrasts are more numerous; the sound media are vocal in the first case, instrumental in the second, its organization is successive and soloistic in the first, superimposed and simultaneous in the second; place distribution is quiet for the first and movable for the second, the *alférez* guides the first, the *chinos* the second. Delimitation of sound forms is precise, as guided by the *alférez* contrasted with the open, alleatory and free form of the instrumental part, with the superimposition of different *bailes* regulated by chance and every *baile* in complete independence. In the sung parts there is a climate of cooperation and cohesion around the sung proposals; in the instrumental parts there is a general climate of competition.

³³ In some *fiestas* this is altered, to separate the *chinos* from the *danzantes*, and sometimes there is also a rotation of the *bailes* in front of the image during the procession.

during which all the *bailes* are performing simultaneously, and together forming an extensive column of collective sound and movement, about 100 to 200 metres long, progressing slowly and steadily along their appointed route.

As the various *bailes de chinos* that have been invited represent different communities, this results in competitiveness among them, expressed at various levels (visual, social, sound, knowledge and other). Competition between *bailes* forces identity through difference. This implies a double relation competition (outside the *baile*) – cooperation (inside it) with many shades, reinforcing sometimes long friendships or reviving long enmities among communities. The procession gives an opportunity for musical competition that can, when occurring between long-term enemies, degenerate from time to time into ground battles using the flutes as hand weapons.³⁴ Some *bailes* have the reputation of being fighters, proud and arrogant, while others are known to be peaceful and quiet.

The competitive aspect of the procession consists in the fact that each *baile* tries to be the best in terms of agility, resistance, and sound superiority. From this point of view, the *fiesta* is like a great sporting event, and it is common for the *chinos* to speak of the *bailes* like sports clubs representing their communities in the *fiestas*. In ancient times the competition was more intense. There are many stories of old *fiestas* in which two *bailes* collided for long periods of time till one was defeated by the other. Today this is not so noticeable, as tradition loses strength against other sporting events, the mass media diffusion and the communication with urban reality. But, although not so fierce as in the past, the musical competition between flute sounds that interests us here, still survives.

Musical competition consists in each *baile* trying to suffocate the sounds of the other ones through higher amplitude plus differences in pulse and tempo. When two *bailes* are playing near each other, their normal tendency is to coordinate both pulses so as to synchronise, but good *bailes* know how to avoid this, differentiating their pulse from the neighbouring ones, slowing down or speeding it up in a coordinated *rubato*. This technique tends to cause the other *bailes* to lose control of their own pulse. It is rare that this forces a *baile* to stop playing, but there are some histories about it in several *fiestas*, when the *alférez* realizes that his *baile* has lost the pulse coordination, and indicates with his banner that they must stop playing and begin again. This is a most humiliating experience for the *baile*, and a great deal of preparation is devoted in order to avoid it.

³⁴ These flute-battles seldom occur, being exceptional to the *fiesta's* cheerful and positive mood. However, we have seen some flutes specially covered with metal rods for their occasional use as weapons.

This special technique relating to the musical competition is not an easy one; the *chinos* need to concentrate strongly on their coordination, so as not to be affected by the pulses of other *bailes*. The first drummer must guide the general pulse and must avoid synchronisation with other *bailes*, speeding up the pulse in a vivid and dynamic way, or slowing it down so as to permit the *chinos* to rest while walking. One can distinguish an experienced *baile* from a newly formed one by their mastery of this aspect. A new *baile* sounds with a quick, nervous pulse and tends to follow the neighbouring one, never slowing down, finally exhausting the *chinos*. An experienced *baile* can change the speed of its pulse in complete independence from the neighbouring ones and give the *chinos* time to rest, while at the same time provoking discoordination among the other *bailes*.

This implies a musical system where different independent groups interact without seeking for uniformity, but in fact deliberately avoiding it. The resulting rhythmic relationship is rather like musical anarchy, but, as we will see later on, it has its own strict rules.

Each *baile* plays according to its own musical criteria. The simultaneous aggregation of various instrumental ensembles (from between two and ten), each with its independent internal coordination, and each sounding different from the rest in terms of rhythm (tempo, beat changes), sound configuration (timbre, harmony), dynamics and spatial conformations, creates a complex polyphonic web.³⁵ The superposition of different harmonies and rhythms, may give the listener the impression of polyharmonies and polyrhythms in permanent change. This we will call 'multi-orchestral polyphony', and it is quite unlike Western musical parameters.³⁶

For practical purposes, 'multi-orchestral polyphony' depends on each one's own particular 'point of hearing'. In fact, for each participant there is a special musical configuration of multi-orchestral polyphony. For *chinos* the musical form is very simple; they do not hear anything but their own flute and *baile* sound. The group of companions carrying the *baile* images between two *bailes* hear the balance of the two-orchestras' polyphony. Rhythm changes are produced by a constant interaction

³⁵ I prefer the term 'polyphony' over the term 'heterophony' to name this sound situation, in order to emphasize its intentional aspects (ritual and social situations, musical competence, see later). For a detailed study of this aspect, see Pérez de Arce (1996).

³⁶ This 'multi-orchestral polyphony' appears to be one of the main characteristics of South American music, but there are almost no previous references to it. Evidence came almost exclusively from personal data collected in Chile. The only discographic examples I can cite are a short passage in an Mapuche cassette (González 1984), and three Aymara ones (Bellenguer 1983: track 10; and Flety/Martínez 1992: tracks 5 and 13). For a detailed description and analysis of *chino's* polyphony, see Pérez de Arce (1996).

between the two beats, for example a 12 against 13 beats that changes to 11 against 12, 10 against 11 and so on, and then reversing this movement until reaching a rhythmic unison, then beginning again a similar series. Superimposed harmonies sum up intensity, total energy, atonality, dissonance, sound spectrum's amplitude and tonal non-coherence. The sum of two pairs of *bailes* that sound as two gigantic instruments create a more complex timbre and harmonic structure, with increased chances to hear 'ghost melodies' of more complicated melodic contour, length, melodic range and intervals.

While for someone participating in the processional movement the polyphony can be so complex, for an outside observer it is an even more dense and fascinating sound system. For those outside the processional movement, there are many possible musical configurations depending on the mutual spatial position and movement between hearer and orchestras. As *bailes* are organized in a long procession (from 20 metres long to a couple of kilometres) that moves slowly through a ritual path, music changes depending on the spatial position and movement of it, and on the place and movement of the hearer. Spatial changes occur continuously between musicians and their environment. As *fiestas* occur in ample spaces and over long time periods, there are multiple possibilities of acoustic perception, reverberation and colour phenomena to be perceived differently by each hearer.

Processional movement occurs through a defined ritual path: it usually begins in the temple, follows the main streets of the village, climbs over a hill or follows a beach (depending whether it is a coastal or valley-type ritual). This produces a constant acoustic modulation due to the variety of acoustic ambiances through which it goes, each acting like a filter to the sound spectrum, each adding a different reverberation characteristic to it. This acoustic modulation is different for each *fiesta*, because it depends on geographical and architectonic characteristics of the place. At the end of the procession, when *bailes* come into the church, reverberation becomes a main element in the sound system. Generally outside the temple there is a *plaza*, an open space without reverberation, thus producing a maximum contrast with the intense reverberation of the Temple. Christian temples are usually great wooden structures with empty walls that increase reverberation, and thus harmonic and timbre complexity, and decrease melodic and rhythmic definition, enhancing the main configuration of this polyphony. For the musicians, who have been playing for a long time, this is the most dramatic sound perception change. Successive sounds tend to merge, to connect, summing up the synchronic complexity (timbre and harmony) and lowering its sequential definition (melody and rhythm). The sound spectrum saturates from the deepest notes of *punteras* and *bombo* to the high pitched harmonics. Total effect is of a dense and continuous sound mass that pulsates with great intensity.

The relative position and movements between hearer and sound sources create multiple possible musical forms to be perceived. Sound movement depends on the ritual circuit, that supposes a displacement of the sound mass through spaces, and the individual movement of each hearer. We can attend the procession by the edges of the circuit, or move along the procession, or away from it, thus creating as many different sound forms as we wish, selecting the sound sequences. We can define this music as a complex sound system that extends and moves through space, permitting us to walk inside and outside it.

The most commonly heard sequence of sounds is what is audible at the edges of the procession, where the sequence of instruments of each *baile* begins with *punteras* and drums, followed by *segunderas*, etc., until *coleras* and big drum, then two orchestral polyphonies, until re-enacted by the instrumental sequence of the new *baile* with differences in timbre, dynamics or harmony. Inside each *baile* the sound of flutes is energetic, strong and broad at the front and more acute and weak to the rear part. The drum sound is reversed, the weak and high pitched frame drum at the front and the bass sound of the big drum at the rear. The hearer can appreciate characteristics and differences inside and between consecutive *bailes*.

If we walk we perceive changes in instrument intensity, sound colour, sound perspective and reverberation, depending on our path in relation to the ritual path and the movement of the procession.

Change in intensity occurs mainly by differences in the distance between hearer and instrumentalist, from around 50 cm to as far as the sound can reach (seven or more kilometres). Sound colour changes depending on the geographic configurations of the ritual circuit, normally including such places as a beach, a mountain and local architecture.³⁷ Reverberation changes from one scenario to other, the greater contrast occurs between the inside and outside of a church, at the beginning and the end of the rituals, as mentioned.

To the relative displacement of the sound sources and the hearer there sums up changes in spatiality of sound (as the described choreographic movements) and changes in spatial structure of the sound (*bailes* and instruments' sequence and distribution changes during procession) that creates other perceptual changes.

One of the main characteristics of multi-orchestral polyphony is that, being extended in space and moving through it, one is almost denied the opportunity to hear it as a total event. As we can choose which part of the polyphony we want to hear, we can, to a certain point, choose the polyphonic form. Normally we hear only the part of it that is nearby. This has to do with acoustic perspective, due to the distance between us

³⁷ For an exhaustive analysis of the sound/space relations in the *fiesta de chinos* see Pérez de Arce (1993).

and the sound source. In every *fiesta* there is also a walk through the streets of the village, that obliges us to attend from near the sound, distinguishing the described sequences of instruments and *bailes*. But there are open places that permit us to go away and perceive the merging of sound of the different orchestras; at ten metres one cannot distinguish individual instruments but can perceive each *baile* as a single instrument, and from there to a broader distance the different *bailes* merge more and more. Some *fiestas*, as San Pedro in Loncura, include a long walk along the beach that permits one to move from the greater closeness to far away, perceiving all changes in sound perspective.³⁸ In others the procession climbs a hill, as Fiesta de la Cruz de Mayo in Cai Cai, Fiesta de la Virgen del Carmen in Petorquita and Fiesta del Niño Dios in Palmas de Alvarado.

Usually there are also places to listen to the polyphony from far away, outside the movement of the procession, such as a hill where families gather for lunch and take a *siesta*; or the beach, where people usually go to walk. We can hear the sound of *bailes* several kilometres away; as we go away, we perceive the sound of the *fiesta* more and more like the sound of hundreds of birds, merging with the surroundings in a diffuse and beautiful way.

Sound perspective also alters timbre, as the predominant sound in proximity is the acute sound of flutes, and in the distance it is the bass sound of big drums; proximal sound is marked by polyharmonies, and distant sound is more marked by polyrhythm. At a certain distance from the rear end of the procession we can hear the polyrhythm between the big drums clearly above the flute sounds. Sound perspective is always changing because of the movement of sound sources and that of the hearers. It also implies some other changes in acoustical perception similar to the so called 'ghost melodies' but in terms of harmonies; we can hear changes of the harmonization in a cyclic way, producing a sense of alternation of different harmonies.

One has to bear in mind that this sound system is integrated in the festive surroundings, including the noise of the people, of the market place, of mechanical plays, etc. During a procession there is a high level of sound mixed with people's chat, vendors voicing their products, and general movement. The market place is an important complement to the *fiesta*, contrasting the ritual circuit with a profane surrounding, extending towards the neighboring areas as an alternative circuit, and highlighting the festive aspects of the ritual.

All these aspects are essential to the perception of the ritual sound system as one extended both in space and in time, moving in both. Space shapes the colour structure of the sound, and time shapes its sequence

³⁸ Some coastal *fiestas* as San Pedro en Zapallar y en Horcón include the water procession into the sea, meanwhile *bailes* remain playing on the beach.

and movement. This makes *fiestas* a unique experience, depending on geographical, visual and operative characteristics of each particular *fiesta* and of us attending it.

THE SACRED SOUND

The ultimate goal of the sound system of the *fiestas de chinos* is to honour the divinity, restoring the sacred connection between man and the divinity. Thus, the participants make pleas, ask for favours, or offer a *manda* (sacrificial ordeal). The religious sentiment among fishermen and farmers is profound as they depend directly upon nature for their living. In the interaction of flute playing and dancing, the singing and the sacrifice, some favours are expected from the divinity, such as rain, good crops, good fishing, protection and health.

The two sub-systems of the ritual offer different ways of devotional behaviour: processional catharsis with its great sounding masses in movement contrast with the devotional silence and concentration expressed through the sung poetry of the *alférez*. The latter is close to a Catholic way of expressing devotion, with one person guiding it through his words. The former is a characteristic Amerindian devotional expression, where every one guided his own experience amidst the general movement.

Flutes are related to the cathartic expression of ritual. As flutes are used exclusively for sacred purposes, they are considered by some *chinos* as sacred objects.³⁹ One of the ritual uses of these flutes is to permit the *chinos* to achieve special states of consciousness. For the *chino*, immersed in this sea of sounds of incredible intensity and forced to the limit of his resistance and strength, the *fiesta* is a ritual sacrifice. For him, to reach higher states of consciousness is one of the deepest rewards, a sacred relation linking him to the divinity.

Although as yet we have not found a theoretical corpus explaining or giving clues to this aspect of the ritual, we have experienced its incidence in ourselves and other *chinos*.⁴⁰ Through it we have detected many factors that provoke changes in the state of consciousness. During all the flute playing the body of the player is in a prolonged state of hyperventilation because of the effort of blowing necessary to obtain the *sonido rajado*, their ears are saturated by the intense sound, their muscles are stressed because of the effort of blowing while doing strong exercises, their

³⁹ This is a common practice among indigenous people through South America. The flutes being the most developed area of organological diversity, they are commonly linked with the sacred.

⁴⁰ During our research, Claudio Mercado participated actively in several rituals playing *flautas de chino*. His personal experience, and his confrontation with the experiences of other *chinos* gives the clue to defining the data we present here. For a complete description of these aspects, both from an 'outsider' and 'insider' perspectives, see Mercado: 1993.

rational minds must maintain the strong concentration over pulse and coordination of their own *baile*, while stressed by the great competitive factors. Their imaginative minds are confronted with the sacred, and affected by strong emotional factors, such as the expected cure of a relative as a reward for their sacrifice. Sometimes there is also some alcohol drinking involved.⁴¹ All these aspects interrelate forming a web that, acting at different levels, creates the necessary conditions for a change of consciousness. We will analyse separately those aspects that are closest to the use of the flutes, but always bearing in mind that they act simultaneously with the rest of them.

Hyperventilation is a physiological state that provokes an increase of emotion. Its presence alone can produce great changes in mental behaviour, and it is present from the beginning of the flute playing, along with the great strength and violent exercises needed to play the instrument. The blowing pressure required is greater than in any other wind instrument and produces a prolonged state of hyperventilation during all the instrumental sections.

The strong excitement produced by the intense saturation of the sound spectrum also appears from the beginning. This saturation results from the timbre structure that is similar to a very intense 'white noise,' but less homogeneous and ever changing. Also these phenomena, sustained over a long period of time, help in creating perceptual and mental changes. The sound of each flute is of the greatest intensity, more powerful than any other type of flute or wind instrument. *Chinos* perceive its maximum intensity, while immersed in a sea of sounds composed of hundreds of sound layers produced by their own *baile* and by all the other flutes surrounding them, in a powerful and changing cluster conjuring up plenty of 'ghost melodies' and harmonies. This sound situation is so intense, that it affects also the people who participate from the borders of the procession. From the experiences of some people in that situation we know that it can produce profound physical and neurological effects such as loss of consciousness, vomiting, or dreaming about it for several days. Normally, however, it only gives the brain a rather intense 'sonic massage' that determines some special state of mind, indefinable in its psychological characteristics and different from one person to another.

The combined activity of intense blowing, and dancing with vigorous exertion, may provoke a condition of muscular stress so intense that it can last for days after the *fiesta*. This factor implies also a good physical condition of the *chinos* who participate. The strong concentration on pulse and coordination during the competition of the polyphony creates a state of mental stress augmented by the exhibition of pride in one's own *baile* among the general public.

⁴¹ Alcohol is strictly prohibited in some *bailes*, in others some *chinos* keep some *aguardiente* inside the tube for use during the procession.

It seems impossible to go further into the understanding of the consciousness-altering properties of sound, because of its individual character, and because of the cultural differences between us, the investigators, and them, the performers. This is a main theme of this particular investigation, because despite the fundamental difference between *chinos* and us, our close proximity in terms of geographical settlement and general culture patterns obliges us to revise the whole of our cultural identity. We can now perceive a neglected cultural stratum of pre-Hispanic origin, of indigenous structure, that surrounds us in many layers of consciousness and ways of living. Our internal experiences have touched us deeply enough to change our cultural vision of our own social culture.

The *chinos* represent a developed musical structure of an ancient cultural heritage. From the archaeological remains to the present there is an uninterrupted flow of cultural knowledge, which we have presented here only in its last expression. The study presented here is but a minimal part of a dense history of cultural processes, some parts of which we already know, and many we ignore. It is necessary to conduct further investigation into some processes already disappearing, as main cultural expansion erases local identity, a process we share with many other geographical areas all over the world. Fortunately there seems to be a deep strong cultural identity trait that maintains continuity through the cultural changes, as *chinos* have shown for over 700 years.

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