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Baptisms in Mixquiahuala, Hidalgo, 1681-1740[1]

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Resumen

Los estudios demográficos históricos de comunidades indígenas mexicanas tienen el potencial de dar información acerca de la estructura de la población precolombina y de las poblaciones coloniales que examinan directamente. Se revisaron 5 784 expedientes de los registros bautismales de San Antonio Mixquiahuala y de San Juan Tecpatepec, Hidalgo, del periodo 1681-1740, se examinaron los patrones de la variación anual y estacional de nacimientos y aunque había fluctuación anual en el número de nacidos, el aumento secular era mínimo, sugiriendo una población estable sobre este periodo. Según el censo de 1718 el número de habitantes era de 1 381, en el periodo de1716-1720, la media anual fue de 95.8 nacimientos, lo que es igual al 6.9 por ciento de población, con un 33.4% de matrimonios que tienen un niño por año. Los bautismos eran más comunes en invierno y primavera, y menores en el verano y el otoño, sugiriendo que la mayoría de las concepciones ocurrieron en la primavera y el verano. Para probar la correlación entre la población y el clima, se utilizaron los datos de los anillos de crecimiento de los árboles para establecer una correlación significativa entre la precipitación anual, según lo indicado por la anchura de los anillos de crecimiento en Río Verde, San Luis Potosí, y el número de nacimientos en Mixquiahuala dos años después. Debido a que los datos de los anillos de crecimiento están disponibles a partir del periodo precolombino, pueden ofrecer información respecto a la dinámica de la población prehispánica.

Palabras clave: demografía histórica, movimiento estacional, cambio poblacional.

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Abstract

Historical demographic studies of Mexican indigenous communities have the potential to shed light on Precolumbian population structure as well as that of the Colonial populations that they directly examine. Baptismal records from San Antonio Mixquiahuala and San Juan Tecpatepec, Hidalgo, for the period 1681-1740 were compiled, a total of 5 784 records. Patterns of annual and seasonal variation were examined. Although there was much annual fluctuation in number of births, the secular increase was minimal, suggesting a stable population over this period. With a census population of 1 381 from 1 718, the annual (1716-1720) mean number of 95.8 births equals 6.9 per 100 population, with 33.4% of the married couples having a child per year. Baptisms were more common in winter and spring, and less common in summer and fall, suggesting that most conceptions occurred in spring and summer. To test the correlation between population and climate, tree-ring data were used. There was a significant correlation between annual rainfall, as indicated by tree-ring width in Río Verde, San Luis Potosí, and the number of births in Mixquiahuala two years later. Because tree-ring data are available from the Precolumbian period, they may offer insight into prehispanic population dynamics as well.

KEY WORDS: historical demography, birth seasonality, population change.

Introduction

Several recent studies have used parish registers from European (e.g., Mielke 2003) and American (e.g., Madrigal 2003, Walker y Johnson 2003) populations as a data source to understand demographic patterns in historical populations. Before the development of modern forms of demographic registration, parish registers provide the best demographic information available, at least for those populations of European origin which have them. In few places are there adequate registers from prior to the eighteenth century. Fortunately, Mexico is one such place. And in Mexico, there are not only registers from populations of European ancestry, but also from indigenous ones.

One anthropologist who has used parish registers from New Spain is Phillip Walker, in a series of studies on the indigenous Chumash population of Alta California. With colleagues, he has tabulated records of births, marriages, and deaths to examine a variety of different demographic questions (García-Moro *et al.* 2000, Pascual *et al.* 2000, Walker y Johnson 2003). In Mexico to the south of California, the many registers have been

studied primarily by historians at a very crude level. There are several studies of one parish each, but few syntheses (for single parish studies see Calvo 1973, Carmagnani 1972, Lebrun 1971, Morin 1973; syntheses include McCaa 2000, 2002a, Rabell 1990).

Demographic anthropology has developed in Mexico in recent years (Hernández 2004). In general, anthropologists have used osteological data to investigate demographic patterns. Even studies of colonial populations have not always considered parochial registers from the same parishes (e.g., Márquez 1998, Ceja y Hernández 1998). When anthropologists do consult parish records, they generally use the books of deaths and burials to compare to the age profiles of skeletal samples. However, the distribution of ages in a skeletal sample has a stronger relationship to birth rate than death rate (McCaa 2002b), and it would therefore be useful for osteologists to consider birth records as well. It should be noted that one recent study which did compare birth and death records from one parish to the paleodemography of a neighboring cemetery found significant differences between the results, and concluded that comparing them was very problematic (Ortega 2004). This relationship deserves further study.

Methods and materials

Baptisms were transcribed from microfilm copies of original registers from the parish of San Antonio Mixquiahuala, Hidalgo (Figure 1). The oldest books date to the year 1577. However, it is not clear if the earliest books are comprehensive, and there is a gap from 1632 to 1646. In 1670, San Juan Tecpatepec, a *sujeto* of Mixquiahuala, began its own book of baptisms. From 1680 on, there are parallel volumes from Mixquiahuala and Tecpatepec, with a gap in the latter series from 1713 to 1727. From these records, a database of 4 753 baptisms was compiled for Mixquiahuala, and one of 1 031 for Tecpatepec. The majority of these individuals were born and baptized in Mixquiahuala or Tecpatepec to parents from the same community. Some were born in small *sujetos*, such as Tepeitic, while others were born to foreign parents but were baptized in Mixquiahuala for unknown reasons. Initially these series were aggregated, because some individuals from Tecpatepec were baptized in Mixquiahuala, but during the course of analysis it became clear that the gap in the records

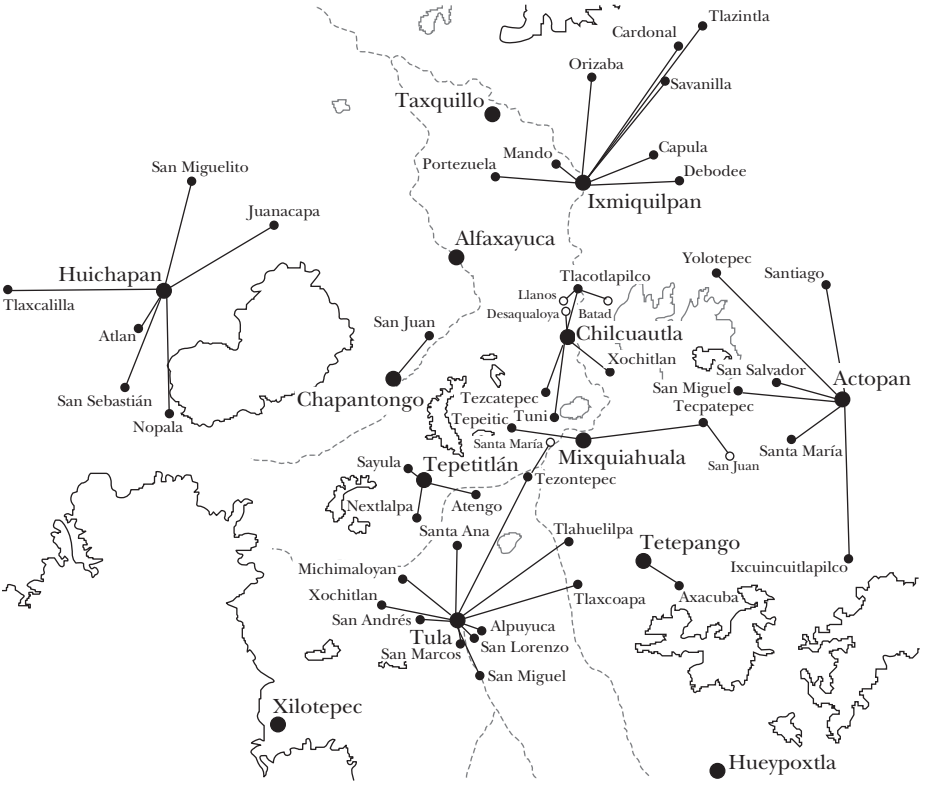


Figure 1. Cabeceras and *sujetos* in the Mezquital, 1718. Large circles mark *cabeceras*, or independent *pueblos*; small circles mark their subject communities, or *sujetos*.

from Tecpatepec was a reflection of missing entries. The baptisms were divided by sex, legitimacy, and *raza* or *calidad*. While Colonial society divided people into multiple different categories according to their actual and perceived biological ancestry (Faulhaber 1976), these distinctions do not appear to have been very significant in Mixquiahuala. Here the primary distinction was between *indios* and non-*indios*, with the latter referred to as *gente de razón* or *castas* in the sources.

Baptisms serve as a proxy for births, the phenomenon of biological interest. While sacramental records may certainly under record actual biological events, this appears to be less of a problem for baptisms than it is for marriages and deaths. In Nueva España in general, children were

baptized immediately after birth. In 1718 in Mixquiahuala, Br. Sebastián Rubio recorded the birth and baptismal dates of 38 children. The mean time elapsed between the two was 6.8 days; the minimum was one day and the maximum 16. On the other hand, Nicolasa, daughter of Nicolás de Charri and Juana Cantú, was baptized the 23 of June, 1702. Her baptismal record states that her father was deceased. In reality, he had been buried the 15 of July, 1700, almost two years earlier. If both records are correct, and there is no reason to suspect otherwise, either the priest cooperated with a fictive paternity, or Nicolasa was at least 14 months old at her baptism.

These data were compared with the general patterns described by Rabell (1990), and specifically with the contemporaneous series of baptisms from San José Tula (Figure 1). A *padrón* of Mixquiahuala from the year 1718 provided information on the population size and composition (Table 1). This is one of a series of *padrones* of the years 1717-1718 which survive from several parishes in the Mezquital (Archivo General de la Nación, Ramo Bienes Nacionales 808 y 912). It is clear that these padrones cannot be treated in the same way as modern censuses, but they are much better than nothing, and offer basic information about the population.

To examine the relation between births and climate, the series of baptisms was compared with dendrochronological data collected by Therrell and colleagues (Therrell *et al.* 2002, Therrell *et al.* 2006). The most useful series was one of standardized measurements of annual rings from a grove of Montezuma cypress (*Taxodium mucronatum*) in Río Verde, San Luis Potosí, spanning the years 1574-1996 (data archived by the International Tree Ring Data Bank; see Therrell *et al.* 2002). These measurements are in the form of normalized means, with 1000 signifying that the average tree in the grove exhibited the average amount of growth that year. For comparison, baptisms were converted to the same format, with 1000 equal to the mean number per year.

Size of population and number of baptisms

Across the 60 years of this study, the number of baptisms in Mixquiahuala grew slightly, while that in Tecpatepec shrunk (Table 2). This is very different from other parishes of Nueva España, which generally exhibit clear growth in these years (Graph 1). San José Tula is a clear example of this

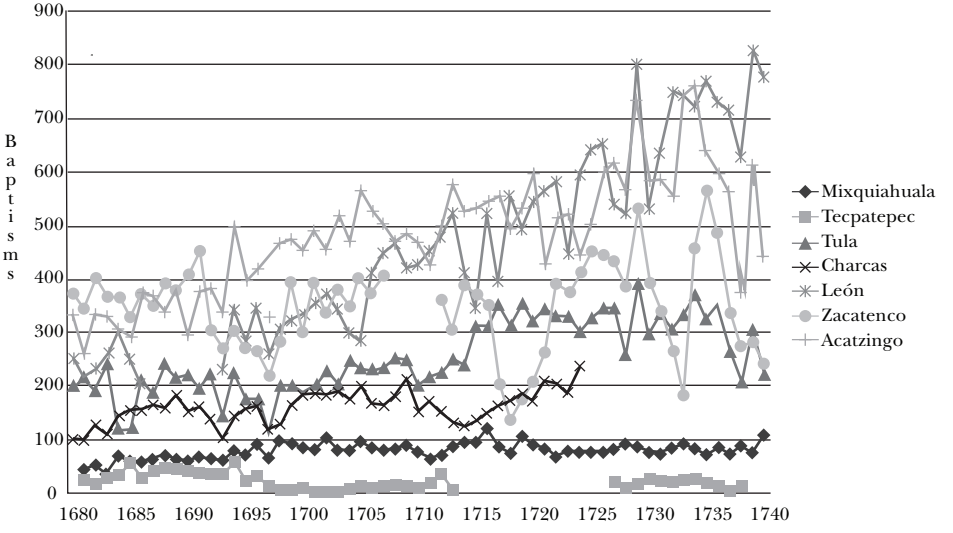
Table 1
Padrón of Mixquiahuala and Tecpatepec in 1718

Padrón of 1718	*Casados*	*Viudos*	*Viudas*	*Solteros*	*Solteras*	*Muchachos*	*Muchachas*	Total
Indios								
Mixquiahuala	194	4	31	32	29	72	49	411
San Nicolás	144							
San Pedro	12							
San Antonio	38							
Tecpatepec	270	8	29	59	63	110	126	665
Nestlalpa	116							
Teapa	60							
San Juan	94							
Barrio of the Reyes	28	1	5	7	8	10	9	68
Hacienda of the Pozos	46	3	11	15	16	20	20	131
Total *indios*	1 002	16	76	113	116	212	204	1 275
Gente de razón								
Mixquiahuala	10			10	13			33
Tecpatepec	16			5	9	6	3	39
Barrio of the Reyes	10			5	3	12	4	34
Total *gente de razón*	36			20	25	18	7	106

Table 2
Baptisms in Mixquiahuala and Tecpatepec by decade, 1681-1740

Mixquiahuala	*Indios*				*Castas*				Total
	♀		♂		♀		♂		
	I	L	I	L	I	L	I	L	
1681-1690	56	210	48	246	2	5	1	7	575
1691-1700	57	296	79	319	3	8	6	18	786
1701-1710	80	340	65	339	1	14	3	19	861
1711-1720	71	352	84	315	4	23	6	38	893
1721-1730	54	277	42	283	15	46	18	63	798
1731-1740	76	253	58	246	18	98	17	73	839
Total	394	1 728	376	1 748	43	194	51	218	4 752
Tecpatepec	*Indios*				*Castas*				Total
	♀		♂		♀		♂		
	I	L	I	L	I	L	I	L	
1681-1690	25	163	23	151	0	5	0	2	369
1691-1700	22	114	18	109	0	1	0	0	264
1701-1710	8	34	8	51	0	0	0	0	101
1711-1720	9	27	7	21	0	0	0	0	64
1721-1730	5	17	5	25	1	11	3	11	78
1731-1740	12	54	9	51	1	16	3	8	154
Total	81	409	70	408	2	33	6	21	1 030

I = illegitimate, L = legitimate.



Graph 1. Baptisms in six parishes of New Spain, 1680-1740.

growth. The degree of growth, or secular change, was examined with linear regression. When the mean number of baptisms was standardized at 100/year for the three communities, Tula exhibited a stronger correlation with time, comparable with previous studies of the parish (Table 3).

The population of Mixquiahuala in 1718 was 1275 indios and 106 castas, or *gente de razón*; using the mean of 84.4 baptisms of indios for the years from 1716 to 1720 produces an estimate of 66 births per thousand ("crude birth rate"), while the mean of 11.4 births of castas per year equals

Table 3
Secular change: number of baptisms and population growth

	R^2	p	Mean annual growth rate
Mixquiahuala	0.228	0.000	0.54 for 100
Tecpatepec	0.240	0.006	-1.38 for 100
Tula	0.533	0.000	1.19 for 100

108 births per thousand. Of the married couples, 33.4% had a child each year. The big problem with this calculation is that, according to the *padrón*, more than half of the population lived in Tecpatepec, but no baptismal register survives from Tecpatepec from these years. In turn, this raises another problem: If more than half of the population was in Tecpatepec, why are the baptisms in Tecpatepec only a fraction of the total? It is possible that some people, possibly those from one or two barrios listed in the *padrón* as part of Tecpatepec, were regularly baptized in Mixquiahuala without specifying their barrio of origin? For now, we do not know. Also, these values are higher than those reported by Rabell (1990:15-16), and higher than the normal range in traditional populations of 35-55. This may be a reflection of the absence from the records of the youngest children, possibly those that had not yet received communion.

The higher birth rate among *castas* may be a reflection of a rapidly growing population. Across the 60 years of this study, the number of baptisms of *castas* grew from 2.6% to 24.6% of all the baptisms, while in 1718 they were 7.7% of the population. This indicates a mestization of the population.

Sex ratio and legitimacy

Normal human populations always exhibit a slightly male-biased sex ratio at birth, with approximately 105 boys born per 100 girls (Hernández 2004: 63). In Mixquiahuala, nonetheless, we find an almost equal ratio, for *indios* and *castas* both (2 898 boys for 2 884 girls). It is not clear why this is so; one possibility is elevated antenatal mortality among male fetuses. It is possible that the same stresses that reduced the index of masculinity contributed to the lack of population growth.

In the Mixquiahuala sample, 82% of baptisms are legitimate. This figure does not change when separated by *calidad* (82% *indios* and *castas*) or sex (82% female, 83% male), nor by time (80-84% per decade). In other parishes, rates of illegitimacy exhibit much variety among both *indios* and *castas* (Rabell 1990: 21-22). In general, *indios* have significantly lower rates than that found in Mixquiahuala, around 10% or less, while the rates among *castas* can be as high as 45%. This suggests that *indios* and *castas* lived in very similar socioeconomic conditions in Mixquiahuala.

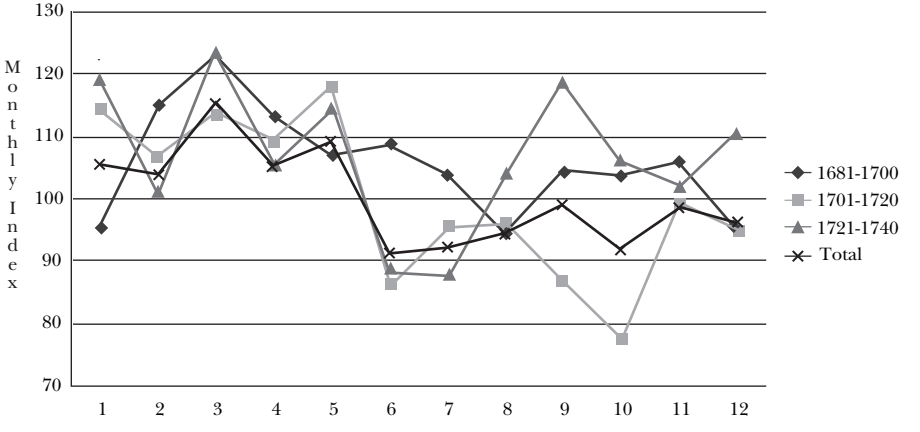
SEASONALITY

There is clear seasonal variation in the number of baptisms (Graph 2). Baptisms were more frequent from January to May, resulting from conceptions from April through August, with a sharp decline in June and July, from conception in September and October. The number from August through December was generally higher, but below the winter and spring peak. However, there was more diachronic variation in the fall than in other seasons, for no clear reason.

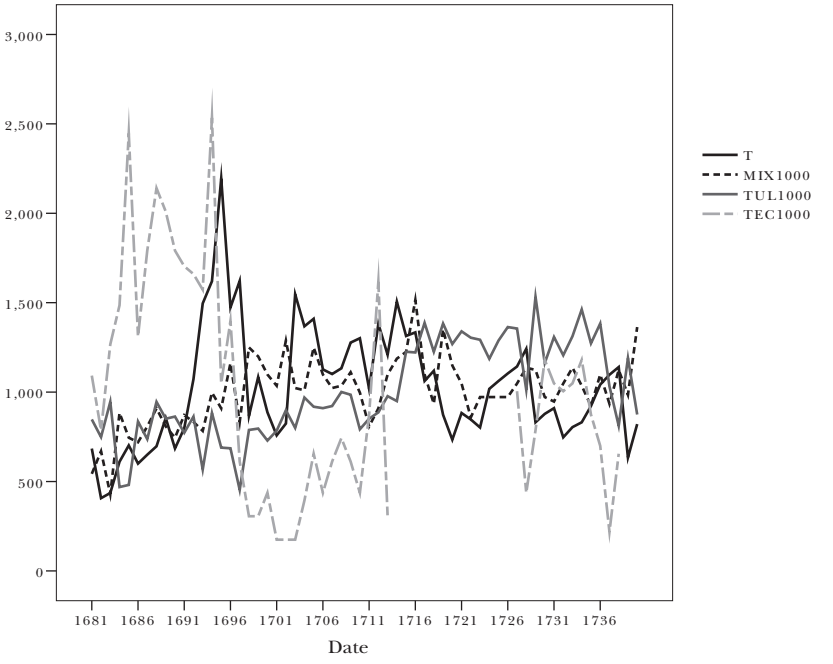
This pattern is similar to that encountered by Pascual and colleagues (2000) in Alta California and by Rabell (1990) in Zacatelco, Acatzingo, and San Luis de Paz. A primary peak of births in the spring and a secondary one in the fall is the traditional pattern in farming populations in Europe and elsewhere.

Relationship with rainfall

Visually, it appears that the annual variation in rainfall (as quantified by tree growth) bears some relation to that in baptisms (Graph 3). In this graph, each series is standardized with 1 000 as the mean of the series. For



Graph 2. Seasonal variation in baptisms in Mixquiahuala and Tecpatepec, 1681-1740, by twenty-year period.



Graph 3. Ring size of trees in Río Verde, S.L.P., and baptism in Mixquiahuala, Tecpatepec, and Tula. See the description of units in the text.

each population, the correlations between annual number of baptisms and three years of tree growth were calculated –the year of the baptisms, the year before, and the year before that. For Mixquiahuala, the strongest correlation was between baptisms and annual rings from two years before. For Tula, no correlation was significant –the secular change was too strong. However, when the annual growth from two years before was combined with the date in a multiple linear regression, both variables were significant, even in Tula (Table 4). As a result, rainfall can explain a portion of the variation not due to secular change. It is probable that this correlation reflects agricultural productivity, and therefore the overall health of the population, particularly in more rural communities like Mixquiahuala. It is clear that this correlation needs more work in the future, with data from other dendrochronological series and other communities. Interestingly, there was not a strong correlation with the Cuauhtemoc la Fragua, Puebla, tree ring data that Therrell *et al.* (2006) have used to reconstruct Central Mexico maize yields. This suggests that local climate annual varia-

Table 4
Births and climate: baptisms and growth rings. Results of regression with one and two variables

		Climate	Date
	R^2	p	p
Mixquiahuala	0.226	0.000	
	0.389	0.000	0.000
Tecpatepec	0.137	0.007	
	0.234	0.017	0.015
Tula	-0.016	0.767	
	0.553	0.060	0.000

bility was more important than broader patterns. It is worth noting that Therrell *et al.* (2006) have explored the correlation between their data and records of change in maize prices over time (e.g., Florescano 1986) and found little relationship, concluding that many factors other than climate affected prices.

Discussion

The baptismal registers of Mixquiahuala exhibit patterns similar to those published earlier by others, but with some differences. One important difference is the very low growth rate in Mixquiahuala. The combination of a high crude birth rate and such a low growth rate indicates a high rate either of mortality or of emigration. The second appears more likely, because the growth rate of the next parish to the south, San José Tula, was higher, and variation in migration rates in neighboring communities is more likely than variation in birth rates. Baptismal records alone are insufficient to study migration rates; future work on marriage registers from the Mezquital may provide evidence to support this hypothesis. Due to the poor quality of the burial registers from Mixquiahuala and neighboring communities, which dramatically underreport deaths, variation in mortality cannot be directly observed. It appears from these data that *indios* and *castas* in Mixquiahuala had similar conditions of life, but that the

population was rapidly mestizizing. Another important conclusion is the relation between births and rainfall, which no one has investigated in this form before. In the future, I hope to continue to study this relationship in other regions of Mexico. Because tree-ring data extend into the Precolumbian period, their analysis may offer information about Precolumbian population growth as well.

It is clear that there was much variability between pueblos in Nueva España. In this study, the demographic trajectories of three adjacent pueblos, Mixquiahuala, Tecpatepec, and Tula, appear very different. The growing number of anthropological studies of colonial populations (e.g., Camarillo Sánchez 2007, del Castillo y Karam 2007, Meza Manzanilla *et al.* 2007, Osorio Dávila *et al.* 2007) must pay attention to this variation. At the same time, paleodemographic studies of Precolumbian populations must consider the demographic patterns observed in Colonial indigenous communities.

Referencias

Calvo, T.
1973 *Acatzingo: demografía de una parroquia mexicana*, Instituto Nacional de Antropología e Historia, México.

Camarillo Sánchez, O.
2007 Los materiales del templo of San Juan Bautista (1757-2005) en Caltimacán, Hidalgo: Una interpretación multidisciplinaria, Presented at the *XIV Coloquio Internacional de Antropología Física Juan Comas*, San Cristóbal de las Casas, Chiapas.

Carmagnani, M.
1972 Demografía y sociedad: la estructura social de los centros mineros del norte de México, 1600-1720, *Historia Mexicana,* 21: 419-59.

Castillo Chávez, O. del and C. E. Karam Tapia
2007 Los "angelitos" del Convento de Santa Isabel. Un acercamiento a la mortalidad perinatal e infantil en la Ciudad de México virreinal, Presented at the *XIV Coloquio Internacional de Antropología Física Juan Comas*, San Cristóbal de las Casas, Chiapas.

CEJA, M. AND P. HERNÁNDEZ
1998 Algunos datos demográficos de la población novohispana de la Ciudad of México, en L. Márquez Morfín and J. Gómez de León (eds.), *Perfiles demográficos de poblaciones antiguas de México*, pp. 126-154, Instituto Nacional de Antropología e Historia, México.

FAULHABER, J.
1976 El mestizaje durante la época colonial en México, en J. Romero Molina (ed.), *Antropología física: época moderna y contemporánea*, pp. 69-119, Instituto Nacional de Antropología e Historia, México.

FLORESCANO, ENRIQUE
1986 *Origen y desarrollo de los problemas agrarios de México*, SEP-Era, Lecturas mexicanas, México.

GARCÍA-MORO, C., J. PASCUAL, D. I. TOJA, AND P. L. WALKER
2000 Birth seasonality in the early Spanish-Mexican colonists of California (1769-1898), *Human Biology*, 72: 655-674.

HERNÁNDEZ ESPINOZA, P. O.
2004 *Demografía y antropología demográfica*, Instituto Nacional de Antropología e Historia, México.

LEBRUN, M.
1971 *Esquisse démographique d'une paroisse mexicaine de la période coloniale. San José de Tula (1561-1815),* Master's thesis, Université de Montréal.

MADRIGAL, L.
2003 The use of archives in the study of microevolution: changing demography and epidemiology in Escazú, Costa Rica, en D. A. Herring y A. C. Swedlund (eds.), *Human Biologists in the Archives*, pp. 11-31, Cambridge University Press, Cambridge.

MÁRQUEZ MORFÍN, L.
1998 Los parroquianos del Sagrario Metropolitano: panorama sociodemográfico, en L. Márquez Morfín y J. Gómez de León (eds.), *Perfiles demográficos de poblaciones antiguas de México*, pp. 95-125, Instituto Nacional de Antropología e Historia, México.

McCaa, R.
2000 The peopling of Mexico from origins to revolution, en M. R. Haines y R. H. Steckel (eds.), *A population history of North America*, pp. 241-304, Cambridge University Press, Cambridge.
2002a El poblamiento de México: de sus orígenes a la revolución, en J. Gómez de León Cruces and C. Rabell Romero (eds.), *La población de México: tendencias y perspectivas sociodemográficas hacia el siglo XXI*, pp. 33-77, FCE/CONAPO, México.
2002b Paleodemography of the Americas: From ancient times to colonialism and beyond, en R. H. Steckel y J. C. Rose (eds.), *The backbone of history: Health and nutrition in the Western Hemisphere*, pp. 94-124, Cambridge University Press, New York.

Meza Manzanilla, M., F. A. Osorio Dávila and C. E. Karam Tapia
2007 La población colonial de Santa María Texcalac, indígena o mestiza?, Presented at the *XIV Coloquio Internacional de Antropología Física Juan Comas,* San Cristóbal de las Casas, Chiapas.

Mielke, J. H.
2003 War and population composition in Åland, Finland, en D. A. Herring and A. C. Swedlund (eds.), *Human Biologists in the Archives*, pp. 216-233, Cambridge University Press, Cambridge.

Morin, C.
1973 *Santa Inés Zacatelco (1646-1812): contribución a la demografía histórica del México colonial*, Instituto Nacional de Antropología e Historia, México.

Ortega Muñoz, A.
2004 La paleodemografía: ¿un instrumento para simular el comportamiento demográfico del pasado? *Estudios Demográficos y Urbanos,* 19:181-214.

Osorio Dávila, F. A., R. A. Martínez Hernández and F. González Hernández
2007 Nobleza indígena de Santa María Texcalac, un caso de estudio. Presented at the *XIV Coloquio Internacional de Antropología Física Juan Comas*, San Cristóbal de las Casas, Chiapas.

PASCUAL, J., C. GARCÍA-MORO, D. I. TOJA, M. HERNÁNDEZ, M. ESPARZA AND P. L. WALKER
2000 Estacionalidad de los nacimientos en familias hispano mexicanas de California (1742-1876), L. Caro Dobón, H. Rodríguez Otero, E. Sánchez Compadre, B. López Martínez, and M. J. Blanco (eds.), *Tendencias actuales de investigación en la antropología física española*, pp. 327-33,3 Secretariado de Publicaciones, Universidad de León.

RABELL, C.
1990 *La población novohispana a la luz de los registros parroquiales*, Cuadernos de Investigación 21, Instituto de Investigaciones Sociales, Universidad Nacional Autónoma de México.

THERRELL, M. D., D. W. STAHLE, M. K. CLEAVELAND, J. VILLANUEVA DIAZ
2002 Warm season tree growth and precipitation over Mexico, *Journal of Geophysical Research,* 107(D14): 4 205.

THERRELL, M. D., D. W. STAHLE, J. VILLANUEVA DÍAZ, E. H. CORNEJO OVIEDO, M. K. CLEAVELAND
2006 Tree-ring reconstructed maize yield in Central Mexico: 1474-2001, *Climatic Change*, 74: 493-504.

WALKER, P. L., J. R. JOHNSON
2003 For everything there is a season: Chumash Indian births, marriages, and deaths at Alta California missions, en D. A. Herring y A. C. Swedlund (eds.), *Human Biologists in the Archives*, pp. 53-77, Cambridge University Press, Cambridge.