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Henry F. Dobyns

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INDIAN EXTINCTION IN THE MIDDLE SANTA CRUZ RIVER VALLEY, ARIZONA

By HENRY F. DOBYNS*

THE MIDDLE Santa Cruz River Valley south from *Punta de Agua* to near the modern boundary between the United States and Mexico supported a large prehistoric population of northern Piman Indians. The number of ruins recorded in the area attests to the former density of Indian population, which was also documented to some extent in early Spanish records dealing with frontier affairs in northwestern New Spain. Yet, no native Piman Indian population remains in the middle river valley today. The only Indians currently living there are immigrant Papagos, Yaquis and a scattering of Indians from other tribes who inhabit migrant labor camps built by non-Indian farmers, primarily engaged in cotton production.¹ Nor has there been more than seasonal occupation by northern Piman Indians (a group which includes the contemporary Papagos) for over a century, except in immigrant settlements satellite to Anglo-American mining or farming enterprises.

The disappearance of the native inhabitants from most of the riverine and much of the upland area of southern Arizona opened many stretches of river, mountain springs, and the grass lands whose use they permitted, to Spanish and later to Mexican settlement. Gradually during the 18th century and rapidly during the final golden age of Spanish imperialism on the Sonoran frontier after Apache pacification, and even more quickly during the early years of Mexican independence when colonial regulations were swiftly relaxed, Spanish and then Mexican entrepreneurs moved in on lands and water resources vacated by the original northern Piman Indian occupants. In a discussion which remains the best yet published of Mexican land grants in south-central

* Department of Anthropology, Cornell University, Ithaca, New York.

1. Henry F. Dobyns, *Papagos in the Cotton Fields, 1950* (Tucson: Author, 1951).

Arizona, Mattison² attributed the native abandonment to raids by enemy Indians. Speaking of Tucson about 1846, he commented: (following Bancroft):³ "On account of the frequent Apache raids the few remaining ranches in the Santa Cruz valley were abandoned in the last decade of the Mexican regime."⁴ Referring to an earlier period under Spanish imperial rule, Mattison inferred that little is known of ranching then because ranchers lacked land titles. He concluded that such 18th century ranchers also had to retreat south of modern Arizona "on account of the Indian incursions." With regard to the northern Piman Indian settlements encountered by Spanish frontiersmen entering modern Arizona, Mattison wrote: "Indian attacks had caused most of the *rancherías* around the missions and the *visitas*, established by Father Kino and his successors in the 18th century, to be abandoned."⁵

Mattison and a host of writers of all kinds who have attributed the depopulation of northern Sonora and also New Mexico at various periods to long-sustained hostilities with enemy Apache Indian bands were correct in citing Apache raiding as a cause for the contraction of aboriginal Indian settlement. They erred, however, in assuming that warfare was the *only* or even the *principal* cause of territorial abandonment by the natives of New Spain's Sonoran frontier. The present paper seeks to bring together in a coherent analysis available evidence on the process of biological extinction of the aboriginal inhabitants of the middle Santa Cruz River Valley,⁶ in order to demonstrate the fundamental importance of disease agents in that process. The area considered is cen-

2. R. H. Mattison, "Early Spanish and Mexican Settlements in Arizona," *New Mexico Historical Review*, 21:4 (Oct. 1946) pp. 273-327.

3. Hubert Howe Bancroft, *History of Arizona and New Mexico* (San Francisco: History Co., 1889).

4. Mattison, *op cit.*, p. 284.

5. *Ibid.*, p. 285.

6. Much of the data analyzed were collected while the author was Research Associate of the Arizona State Museum investigating Tubac history for the Arizona State Parks Board.

trally located in the region with which Mattison dealt, and was the key to wider land use, so that it constitutes an appropriate geographic sampling.

The last survivors of the native Indian population of the middle Santa Cruz River Valley, the inhabitants of Tumacacori, fled down river to San Xavier del Bac, an amalgamated community of northern Piman Indians which has survived to the present day by continually attracting migrants from other settlements.⁷ Tumacacori provides, then, a suitable starting point for working backward through time so as to examine the evidence.

1. *Tumacacori*. The last settlement of sedentary, irrigation-agriculturalist northern Piman Indians in the middle Santa Cruz River Valley seems to have been abandoned during the latter part of December in 1848, or very soon thereafter. A U.S. military column en route to California found it inhabited toward the end of October of 1848.⁸ Apaches raided both Tubac and Tumacacori in December of that year, killing nine persons at the former settlement of Mexicans and Manso Apaches, and even more individuals at the latter Indian amalgam settlement.⁹ The Tumacacori Indians then abandoned their homes,¹⁰ and fled to Bac, thus strengthening that community at a crucial time. Their absence from Tumacacori thereafter was noted¹¹ by a number of Forty-Niners following the southern route to the California gold fields the following year. A party of southern emigrants reached the abandoned buildings at Tumacacori on May 27, and a New Orleans journalist with the group thought it a ranch whose abandon-

7. Henry F. Dobyns, *Pioneering Christians Among the Perishing Indians of Tucson*. (Lima: Editorial Estudios Andinos, 1962) pp. 24, 27-29.

8. Henry F. Dobyns (Ed.), *Hepah, California! The Journal of Cave Johnson Counts from Monterey, Nuevo Leon, Mexico, to Los Angeles, California, during the years 1848-1849* (Tucson: Arizona Pioneers' Historical Society, 1961) pp. 57, 59, 61, 75 n. 14.

9. *El Sonorense*, February 21, 1849, p. 3, col. 1.

10. *Ibid.*, p. 1, col. 2. The copy of this newspaper in the Bancroft Library, University of California, Berkeley, was Bancroft's (1889:474-475) source for his statement cited by Mattison (1946:284) that Tumacacori was abandoned at this time after an Apache assault.

11. Although Mattison (*op. cit.*, p 293) thought the "time of abandonment" of Tumacacori "remains a matter for conjecture."

ment he placed in the previous February and attributed to a raid by fifty Apaches.¹² The peaches in the old Tumacacori Mission orchard were ripe by September 1, supplying passing migrants with delicious fruit.¹³

While an Apache attack precipitated the departure of the survivors at Tumacacori, it was merely the final straw in a long series of reverses. Tubac, three miles away and defensive partner of Tumacacori, had been partially depopulated during the fall by the gold rush to California from northwestern Mexico. When the Tubac population fell below what the Mexicans considered a safe size for resisting Apache attacks, they decamped to Tucson. While their migration augmented the size of Tucson, the increase merely restored the combined population to a previous level. It was not, in other words, a genuine increase over prior size. The Tumacacori increment at Bac had the same effect of maintaining viable settlement size by amalgamating previously independent villages. This was the ultimate such amalgamation of middle Santa Cruz River Valley settlements, and the final change in the demography of that region, so far as Indian occupation was concerned.

Tumacacori (Chukum Kavolik "Caliche Bend") had been an Indian mission staffed by Franciscan priests until the expulsion of foreign-born clergy from Mexico in 1827-1828. Its post-mission population may have fallen below the 103 enumerated there in 1796,¹⁴ although the settlement had apparently stabilized at approximately 100 persons toward the end of the 18th century. Whatever their number, the refugees who fled Tumacacori to go to Bac in 1848 constituted the entire surviving native Indian population of the Middle Santa Cruz River Valley and beyond. No other native settlement remained occupied by that time, all having directly or indirectly contributed people to the Tumacacori population.

12. Ralph P. Bieber (Ed.), *Southern Trails to California in 1849* (Glendale: Arthur H. Clark, 1937) p. 209.

13. Mabelle Eppard Martin (Ed.), "From Texas to California in 1849, Diary of C. C. Cox," *Southwestern Historical Quarterly*, 29:2 (Oct.) p. 143.

14. Alfred Whiting, "Census of Tumacacori in 1796," *The Kiva*, 19:1 (Fall) pp. 1-12.

Prior to becoming a mission headquarters early in the 1770's when Franciscan missionaries who entered northern Piman territory in the summer of 1768 moved the former Jesuit mission there from Guebavi,¹⁵ Tumacacori had been a visitation station of Guebavi since as early as 1742.¹⁶ It was reported as inhabited by 150 persons in 1697.¹⁷

2. *Tubac*. The Tumacacori population had already received before the transfer of mission headquarters at least one infusion from another nearby aboriginal northern Piman settlement. The Mexican fort at Tubac was the successor to a royal post founded in Spanish colonial times in 1752 at an Indian village. Indians were recorded at Tubac¹⁸ at least as early as 1726.¹⁹ The Spanish post was founded as a counter measure to the Pima revolt against Spanish rule in November of 1751. The local populace fled during the revolt, and a Spanish officer with the punitive expedition recorded that forty Indians had returned to Tubac in April of 1752 after peace had been restored.²⁰ This was probably only part of the pre-revolt population. More natives likely returned later, but competition with the Spaniards for the Tubac site proved to be too much for the natives, and they moved to Tumacacori within a few years of the founding of the military post. On June 9, 1758, some Tubac Indians were recorded as resettled at Tumacacori,²¹ and they had all moved before 1762.²² What-

15. San Jose de Tumacacori (cited hereafter as "Tumacacori") Libro de Bautismos (cited as "B"), Libro de Casamientos (cited as "C"), and Libro de Entierros (cited as "E"). MS, Archive of the Bishop of Tucson. Copy in Arizona Pioneers' Historical Society.

16. Santos Angeles de Guebavi, Libro de Bautismos (cited hereafter as "Guebavi B") 7. Libro de Casamientos is cited as "Guebavi C," and Libro de Entierros as "Guebavi E." MS, Archive of the Bishop of Tucson. Copy in Arizona Pioneers' Historical Society

17. Harry J. Karns and Associates, *Unknown Arizona and Sonora, 1693-1721. Luz de Tierra Incognita by Captain Juan Mateo Mange* (Tucson: Arizona Silhouettes, 1954) p. 94.

18. Tjuivak "where something rotted"—Carl Lumholtz, *New Trails in Mexico* (New York: Charles Scribner's Sons, 1912) p. 385.

19. Alphonse Louis Pinart (collector), Libro de Bautismos del Partido de San Ygnacio de Caburica, in Coleccion de Pimeria Alta, Bancroft Library, University of California, Berkeley, p. 60 (Cited hereafter as "Pinart A").

20. Joseph Diaz del Carpio, Padron General de los Pueblos Cituados al Norte de esta Pimeria Alta. . . . Archivo General de Indias, Audiencia de Guadalajara 419, f. 93v-94 (Copy in Bancroft Library).

21. Guebavi B, 114.

22. Juan Nentvig, *Rudo Ensayo* (Tucson: Arizona Silhouettes, 1951) p. 141.

ever the size of the Tubac migration may have been, it was apparently little more than enough to maintain the size of the Tumacacori settlement.

3. *Guebavi*. Still, the reinforced Tumacacori population was evidently larger than the number of survivors at Guebavi (Ku Vaxia, "big spring"), since the Franciscans were motivated to relocate the mission headquarters. The native population at Guebavi had fallen to fifty by December 19, 1766,²³ despite numerous and repeated infusions of population from other northern Piman villages in the middle valley, and an earlier population of ninety to over 200 individuals estimated in 1699 and 1700 respectively.²⁴ Eighty persons were reported there in 1697.²⁵

The impact of disease mortality upon local northern Piman Indian populations may be indicated by a brief analysis of the depopulation of Guebavi during one quarter-century period. The process of depopulation of this mission can be reconstructed during a twenty-four year period from the beginning of 1743 to the end of 1766. Records of baptisms and burials at Guebavi Mission are available from 1766 back to 1742 with a break in 1752-53 following the northern Piman revolt in November of 1751.²⁶

In none of these twenty-four years did baptisms exceed burials. The disparity between seven recorded baptisms and 213 burials was 206. Adding this figure to the reported population of fifty at the end of 1766 yields a total of 256 persons alive at Guebavi at the beginning of 1743. In other words, if this reconstruction is correct, one northern Piman Indian survived in 1767 where five had lived only a quarter-century earlier in 1743. The rate of depopulation averaged approximately seven per cent annually. The actual rate fluctuated from zero to 19.9 per cent in 1751, with other peaks of 18.5

23. Nicolas de Lafora, *Relacion del Viaje que Hizo a Los Presidios Internos Situados en la Frontera de la America Septentrional Perteneciente al Rey de España* (Mexico: Editorial Pedro Robredo, 1939) p. 126.

24. Herbert E. Bolton, *Kino's Historical Memoir of Pimeria Alta* (Berkeley & Los Angeles: University of California Press, 1948) Vol. I, p. 204, 233.

25. Karns, *op. cit.*, p 94 .

26. Guebavi, B & E.

per cent in 1749, 15.3 per cent in 1766, and 12.2 per cent in 1762.

This computation is subject, of course, to several sources of bias, but does provide at least an approximation of reality. Baptismal figures may not truly represent the native birth-rate because of reluctance of Indian parents to have infants baptized. This seems unlikely, however, since northern Pimans had prior to this time typically sought baptism for their children, even carrying them a considerable distance to obtain it.²⁷ Burial records may be an underenumeration of actual deaths, but for the purposes to which the records have been put in estimating rate of depopulation, underenumeration of deaths would tend to balance any underenumeration of births. Lack of records of either type for two years of the twenty-four indicates an even greater actual disparity between the 1743 and the 1766 populations than was recorded, so the approximation offered here seems conservative. Determination of residence at Guebavi mission may be the most serious source of bias.

This possible source of error exists because Guebavi was absorbing population increments from other settlements from time to time which helped to maintain its size while its death rate far exceeded its birth rate. This process of amalgamation proceeded simultaneously at all the Spanish mission stations on the northern Piman Indian frontier because of Spanish pressure to consolidate settlements, biological depopulation, and to some extent for fear of Apache attacks. Biological decrease *interacted* with fear of enemy Indians and Spanish imperial policy to motivate northern Piman settlement amalgamation.

4. *Ku Shu:tak*. As Juan Bautista de Anza, commander of the Spanish fort at Tubac, returned northward from the City of Mexico with troops, supplies and colonists for an overland expedition to the California coast in 1775, he camped his pioneering host for the night of October 14-15 at a place

²⁷ Francisco Xavier Alegre, *Historia de la Compañía de Jesús* (Mexico: J. M. Lara, 1841) V. II, p. 265.

called *Las Lagunas* (the lakes) on the middle Santa Cruz River.²⁸ None of the expedition's diarists mentioned an Indian population at these lakes and there indeed probably had been none there since before 1762, for the Jesuit writer Juan Nentvig²⁹ confused this place with Guebavi when he wrote about "Guebavi, in Pima Gusudac or Great Water." Before Nentvig, Juan Mateo Manje, while descending the Santa Cruz in 1699 came to "the settlement of Guebavi or Gusutaqui, which gets its title from another river which runs from east to west and joins it at this place."³⁰ The missionaries who advanced the Christian frontier north down the Santa Cruz in 1732 also used both native place names, calling their new mission The Holy Angels Gabriel and Rafael of "Guebavi, or Cusutaqui."³¹

Ku Shu:tak could not have been the same settlement as *Ku Vaxia* in aboriginal times. Linguistic analysis shows this: Guebavi or Guevavi in Spanish orthography is northern Piman *Ku Vaxia* in Lumholtz's English orthography, *Ku* being an augmentative³² and *Vaxia* a water source such as a spring, waterhole or well,³³ although often translated into English with the general sense of *water*. Probably Nentvig's and Manje's Piman-speaking informants also rendered *vaxia* into Spanish as *agua*, thus misleading them. Lakes or streams in Piman place names are designated by another term for water, *shu:tak*³⁴ which refers in current everyday northern Piman speech to drinking water. The point of this brief analysis is that there was a prehistoric northern Piman settlement on the shores of what the Spaniards came to call "The Lakes" which survived into early historic times, but was often lumped with nearby *Ku Vaxia*. That two settlements

28. Herbert E. Bolton, *Anza's California Expeditions* (Berkeley: University of California Press, 1930) V. IV, p. 17.

29. Nentvig, *op. cit.*, p. 110.

30. Karns, *op. cit.*, p. 136.

31. George P. Hammond, "Pimeria Alta After Kino's Time," *New Mexico Historical Review*, IV:3 (July) p. 229.

32. Lumholtz, *op. cit.*, p. 379, 381.

33. *Ibid.*, p. 382.

34. "i" designates a "long" or "held" vowel.

actually existed is also shown in the distinction made by a Jesuit missionary more familiar with the area than Nentvig. On May 5 and 6, 1736, Ignacio X. Keller, S. J., baptized some six individuals living at *Ku Shu:tak*. One more Indian from the lakeside settlement was baptized on July 22, 1736.³⁵ Then three more lake shore dwellers were baptized by this local missionary on February 17, 1737,³⁶ five more on January 19, 1738,³⁷ and finally one on February 22 that year.³⁸ After that time the lakeside settlement dropped from recorded history. Probably its inhabitants migrated to nearby Big Spring (Guebavi) sometime in the early 1740's during the mission concentration program, and very likely a lingering tendency for its natives to refer to themselves by this place name rather than *Ku Vaxia* gave rise to the later Spanish misconception that Guebavi was derived from *Ku Shu:tak*.

5. *Sopori*. Another middle Santa Cruz River Valley settlement whose northern Piman inhabitants migrated to Guebavi during the mid-18th century period of conversion to Christianity was Sopori, located on the creek of that name which enters the Santa Cruz from the west. This village was a visitation station from Guebavi Mission prior to the 1751 revolt. The burial of a native from Sopori was recorded in 1744.³⁹ Between that time and August of 1747 part if not all the Sopori Indians migrated to Guebavi. When another native of Sopori was buried at Guebavi on August 17th, he was identified by the officiating priest as "among those aggregated [to the neophytes here] from the Sopori."⁴⁰ That the pre-revolt migration did not entirely depopulate Sopori is suggested in a March 28, 1751, record of the baptism of an infant "from the Sopori"⁴¹ and the fact that a Spanish officer lead-

35. Alphonse Louis Pinart (collector), *Libro de Baptismos de los Pueblos de Santa Maria Suamca. . . desde 1732*, Coleccion de Pimeria Alta, Bancroft Library, University of California, Berkeley (Cited hereafter as "Pinart B") f. 16.

36. Pinart B 20.

37. *Ibid.*, 27.

38. *Ibid.*, 29.

39. Guebavi E 48.

40. *Ibid.*, 51.

41. Guebavi B 93.

ing a scouting party north into hostile territory reconnoitered Sopori after the 1751 Piman revolt, finding dead beasts there and tracks leading to Aribaca.⁴² Sopori seems to have been re-occupied after the revolt, since a mestizo child was born there in 1754.⁴³ By 1757, however, the Guebavi missionary was baptizing children from Sopori "aggregated to Guebavi,"⁴⁴ and the settlement had been abandoned by its aboriginal populace by 1762.⁴⁵

6. *Upiatuban*. Another *rancheria* resettled at Guebavi before 1749 according to a northern Piman chief. In a statement before Spanish military authorities, Captain General Luis Oapicagigua⁴⁶ claimed credit for persuading the natives of Upiatuban to congregate at Guebavi Mission, in extolling his unappreciated services to the missionaries engaged in changing the lifeways of recalcitrant northern Piman countrymen.

7. *Konkuk*. The northern Piman leader also claimed credit for convincing the people of a settlement he called *Concuc* to congregate at Guebavi at some date prior to 1749.

8. *Calabazas*. Various sites within a small area on the middle Santa Cruz River were occupied by Mexican settlers in the early 19th century, but there had been a prior northern Piman Indian aboriginal occupation. In 1806 the surviving Indians at Tumacacori Mission petitioned Spanish authorities for a grant of lands of the "abandoned pueblo" of Calabazas, to be used for stock range.⁴⁷ Because of the proximity of the place termed "Calabazas" in recent years to the terrace-top

42. Joseph Fontes, *Diario de la marcha q. hizieron los Alfereses Dn Jph de fonttes y Dn Antto Olguin con la tropa de su cargo*. Terrenate, 25 de diciembre de 1751. Archivo General de Indias, Audiencia de Guadalajara 419. Copy in Bancroft Library. f. 49.

43. Juan Maria Oliva, *Pie de Lista de la Tropa que guarneze dho Presidio con expresion de sus clases, nombres, edades, servicios, su procederes: caballos, mulas que cada Yndividio tiene, con distinz.n de los buenos, medianos e inutiles*. No. 2 Real Presidio de Tubac. 13 de Agosto de 1775. Archivo General de Indias, Audiencia de Guadalajara 515. Copy in Bancroft Library.

44. Guebavi B 110.

45. Nentvig, *op. cit.*, p. 141.

46. Luis Oapicagigua, *Declaracion*. San Ygnacio. 24 de marzo de 1752. Archivo General de Indias, Audiencia de Guadalajara 419, f. 189. Copy in Bancroft Library.

47. Mattison, *op. cit.*, p. 292.

early historic site excavated by Dr. Charles C. DiPeso⁴⁸ which he inferred was the northern Piman village called *San Cayetano* by the pioneer missionary explorer Eusebio F. Kino, S. J., it is here assumed that Calabazas and San Cayetano were the same, even though Kino in 1691 associated *San Cayetano* with the Piman place name *Tumagacori*.⁴⁹ Joseph Agustin de Campos in 1726 simply recorded baptizing Indian infants at "San Cayetano."⁵⁰ Whether or not DiPeso's "San Cayetano" was the same as "Calabazas," both clearly were depopulated and abandoned, probably within the 18th century, and the 1806 petition suggests that survivors ended up in the amalgamated Tumacacori population.

9. *Toacuquita*. Before the Indians of Calabazas moved, they received a sizable increment in population from yet another settlement on November 1, 1756. The missionary then at Guebavi recorded⁵¹ baptizing on that day eighty "adults of the Rancheria of Doaquita today aggregated to the Calabazas." If there were eighty adult migrants, there should have been at least as many children (although under disease conditions then prevailing, there may not have been) suggesting an increment of about 160 persons at Calabazas in 1756, and indicating the extent of depopulation that was to occur in the middle Santa Cruz River Valley by the time only Tumacacori remained inhabited.

Missionaries from Guebavi had recorded people living at Toacuquita in 1750,⁵² and in 1741.⁵³ The people of this settlement were probably mountain dwellers prior to their migration to Calabazas, since their village name begins with the Piman word *toak* for mountain.

There were several additional northern Piman Indian settlements in the middle Santa Cruz River Valley during pre-

48. Charles C. DiPeso, *The Upper Pima of San Cayetano del Tumacacori* (Dragoon: Amerind Foundation, 1956).

49. Bolton (1948) *op. cit.*, V. I, p. 119.

50. Pinart A 59.

51. Guebavi B 109.

52. *Ibid.*, 91.

53. *Ibid.*, 6.

historic and into historic times which were abandoned during the middle third of the 18th century as their dwindling populations amalgamated with the people in the places mentioned already. The date when the final inhabitants left these places for the surviving settlements cannot be set for lack of documentation, but their documented existence during the early contact period accentuates the demographic trend of depopulation and settlement consolidation.

10. *Aquituni*. People from this settlement between Sopori and Arivaca were met by missionaries from Guebavi at least as early as 1742, since they performed a marriage of natives from *Vupquituni*,⁵⁴ then. In 1748 the missionaries baptized children from *Aquituni*.⁵⁵ The aboriginal inhabitants abandoned *Aquituni* in the aftermath of the Piman Revolt, and it was not occupied when a Spanish scouting party passed through on December 27, 1751, en route from Sopori to Arivaca.⁵⁶ No record of its being reoccupied after the revolt has been found, so its population presumably was absorbed into the other settlements that did re-form after the pacification.

11. *Xona*. The priest who spent more time converting northern Piman Indians to Catholicism than any other man, Joseph Agustin de Campos, S. J., recorded on one of his trips northward from his San Ignacio Mission that on February 28, 1724, "A little above Guebavi where I was stopped, they brought me from *Xona*" a child to baptize.⁵⁷ Returning on March 11th, Campos baptized half a dozen individuals from this settlement.⁵⁸ Campos appears to have spoken Piman extremely well, and converted it into Spanish orthography better than any other Spaniard, so if he wrote *Xona*, there was a settlement with that name, and this term cannot be correlated with *Concuc* (*kon* or *kawn kuk*, "—standing"). The people of *Xona* appear to have migrated, probably

54. Guebavi C 15.

55. Guebavi B 85.

56. Fontes *op. cit.*, f. 49.

57. Pinart A 45.

58. *Ibid.*, 48.

to Guebavi or to have died out prior to the arrival of resident missionaries in 1732.⁵⁹

12. *Bacarica*. In 1699 the explorer-priest, Kino, counted forty northern Piman Indian houses in a *rancheria* he called San Luys del Bacoancos.⁶⁰ Two years earlier his military escort, Manje, reported ninety persons there.⁶¹ On March 12, 1724, Kino's hardy collaborator Campos baptized fourteen Indians at *Bacarica*⁶² which is here assumed, perhaps on insufficient grounds, to have been the same place. In 1726 Campos again baptized a person from this settlement.⁶³ Then it apparently dropped from written records, its population either extinct or amalgamated to some other.

13. *The San Pedro River Valley*. The pitiful remnant of northern Piman Indians who survived at Tumacacori Mission by the end of the 17th century represented not only the meager remains of a once flourishing Indian population of the middle Santa Cruz River Valley, but also a large number from the San Pedro River Valley to the east. It is impossible to identify which San Pedro River Valley aboriginal settlements contributed to the surviving populace since the Sobai-puri withdrawal from the San Pedro in 1762 caught the Spaniards so by surprise that most details went unrecorded. All that can be said here is that the Sobaipuris did contribute some persons to the middle Santa Cruz River Valley settlements in 1762 since there were approximately 400 refugees roaming among the various Santa Cruz Valley villages besides the 250 who settled at Tucson and some others settled at Santa Maria Soamca.⁶⁴

14. *The Desert Papagos*. As the native riverine Indians perished in epidemics and endemic disease mortality and Apache raids, they were partially replaced in the Spanish

59. Hammond, *op. cit.*, p. 224, 229.

60. Bolton (1948) *op. cit.*, V. I, p. 204.

61. Karns, *op. cit.*, p. 94.

62. Pinart A 48-49.

63. *Ibid.*, 59.

64. Francisco Elias Gonzales, Informe al Señor Gobernador Don Joseph Tienda de Cuerdo, 22 de Marzo de 1762. Archivo General de Indias, Audiencia de Guadalajara 511. Copy in Bancroft Library.

missions by Papago neophytes from the deserts. Underhill⁶⁵ noted that Apache attacks influenced modern Gila River Pima and Papago distribution greatly because "the desert Papagos seeped in" to take the place of their extinct relatives. It should be emphasized that disease mortality was much higher than war casualties. San Ignacio, Magdalena, Bac and Tucson received heavy increments of Papago converts during the 18th century, and the middle Santa Cruz River Valley missions were no exception. Many of the 103 residents of Tumacacori enumerated in 1796 were identified as Papagos.⁶⁶

It is, therefore, necessary to keep in mind that the total depopulation of the middle Santa Cruz Valley wiped out not merely the local northern Piman population, but also additional contingents of unknown size from both the San Pedro River Valley to the east, and the semi-desert Papagueria to the west.

Extent of Depopulation

The native Indian population of the middle Santa Cruz River Valley vanished between roughly 1700 and 1850, the major reduction occurring by 1800. The extent of depopulation has been indicated in the preceding outline of the documented history of settlement amalgamation which contributed to the survival of just one of the enduring northern Piman villages on this river, Bac. At least a dozen settlements existed in the middle valley during the first quarter of the 18th century, but only one remained at the end of that century, even with reinforcements brought from the San Pedro River and the desert to the west beyond the immediate Santa Cruz valley.

This pattern of settlement amalgamation occurred in every part of northern Piman territory for which records are available. Fifteen or more San Pedro River Valley settle-

65. Ruth Murray, *Social Organization of the Papago Indians* (New York: Columbia University Press, 1939) p. 23.

66. Whiting, *op. cit.*

ments existing in 1700 provided the remnant that in 1762 reinforced Tucson, the middle Santa Cruz River Valley, and Santa Maria Suamca (whose population fled to Cocospera, Sonora, in 1768). Tucson and Bac were by 1800 the only lower Santa Cruz River Valley survivors of at least nine settlements there in 1700.⁶⁷ Cocospera was the only survivor of at least six 1700 settlements in the headwaters of the San Miguel River Valley. Four 1700 settlements in the Avra Valley had combined with others by 1800.

The rate of documented amalgamation was lower farther west, but this probably is a function of less documentation for that area, since the process clearly operated there. By 1749 Tubutama Mission contained resettled populations from at least five other settlements. Santa Teresa contained at least one other; Ati two others, Oquitoa one other,⁶⁸ Saric nine others of which three could muster over 1,200 persons in 1700.⁶⁹

There were more aboriginal settlements in Papaguera in 1700, in other words, than there are villages and *rancherías* there today.

Estimation of Numbers. The decrease in settlement numbers just described can be translated at least approximately into population estimates. The northern Piman Indians seem to have considered a community of 200 to 300 persons as desirable under the conditions of life obtaining during the late 17th and early 18th centuries, and about 100 persons as absolute minimum. Underhill⁷⁰ worked out the 1850-60 population of Kuitatk, an amalgamated "defense" village in central Papago territory, at about 300. The forty houses Kino counted at Bacarica in 1699⁷¹ suggest a population of 120 to 200 Indians (using conversion factors of three or five for average family size). Five northern Pimans per house was a ratio observed in 1697 at several settlements where both

67. Dobyns (1962) *op. cit.*, p. 27.

68. Opicagigua, *op. cit.*, f. 188v.

69. Bolton (1948), *op. cit.*, V. I, p. 119, 275.

70. Underhill, *op. cit.*, p. 211.

71. Bolton (1948), *op. cit.*, V. I, p. 204.

houses and population were reported: Santa Catalina de *Kuitatkekam* on the lower Santa Cruz River,⁷² *Gu Oidak*⁷³ and Quiburi on the San Pedro.⁷⁴ The northern San Pedro River village had 5.4 persons per house, but others on that stream had: 4.4 at *Jiaspi*,⁷⁵ 4.0 at *Haiwan Pit*⁷⁶ and 3.5 at Cusac.⁷⁷ San Agustin de *A'ot* on the lower Santa Cruz had 4.2.⁷⁸

The Jesuit missionary in charge of the visitation stations among the Sobaipuris on the San Pedro River noted on April 2, 1743, that all the people at *Vafcomarig* (*Vav*-“rock,”⁷⁹ *Komalik*-“flat”⁸⁰) had joined those at *Baijcat* because of Apache hostilities, as he put it. The combined settlement contained 132 men and 138 women⁸¹ or a total of 270 persons. Since the priest seems to have counted adults only, the total population could have been 500 to 600.

This historically recorded instance of settlement amalgamation on the San Pedro furnishes one index to the northern Piman Indian view of the size below which a village population could not be allowed to fall, on the hostile Apache frontier. In 1735 the same missionary had counted fifty-six men and fifty-six women at *Vav Komalik*,⁸² a total of 112 individuals. The priest's terminology implied he listed only adults so the total population may have been between 225 and 275. There were eight years between 1735 and the 1743 record of the amalgamation at *Baijcat* for the *Vav Komalik* population to fall. If depopulation was proceeding there at a rate comparable to that in Guebavi Mission, a 1735 population of 250 would have dropped to between 160 and 180 by 1743, when amalgamation occurred.

72. Karns, *op. cit.*, p. 91.

73. *Ibid.*, p. 82.

74. *Ibid.*, p. 78.

75. *Ibid.*, p. 80.

76. *Ibid.*, p. 77.

77. *Ibid.*, p. 80.

78. *Ibid.*, p. 92.

79. Lumholtz, *op. cit.*, p. 386; Underhill, *op. cit.*, p. 219.

80. Underhill, *op. cit.*, p. 63.

81. Pinart B 14.

82. *Ibid.*

There is confirmation of this as the critical settlement size in northern Piman eyes in the number of Toacuquita migrants to Guebavi in 1756. That amalgamation brought eighty adults to Guebavi,⁸³ implying a total migration of 200 or more persons (using factors of 2.5 or higher to estimate total population from recorded adults). That the ideal settlement was even larger is indicated by the 250 Sobaipuris settling at Tucson in 1762,⁸⁴ combining with an existing population there. Since the *Toacuquita* amalgamation with the Guebavi Indians represented a presumably Spanish-influenced migration to a mission, the *Vav Komalik* consolidation with the *Baijcat* people, and the general Sobaipuri settlement at Tucson probably represent the most valid available measure of northern Piman Indian ideas of settlement ideal size and practice. In each case, the ideal fairly clearly exceeded 200 individuals by some margin, and practice seems to have been to amalgamate before total population dropped much below 200.

Early Contact Period Population. The recorded populations of northern Piman Indian communities around 1700 provides some further indication of their population prior to 18th century decline. In the middle Santa Cruz River Valley under discussion, Tumacacori had 150 people in 1697 and Bacarica had ninety in that year,⁸⁵ but forty houses in 1699, so that count may have under-enumerated, and Guebavi had ninety in 1699.⁸⁶ The average 1697-1699 population of these three settlements was 110 persons or more.

On the lower reaches of this stream, San Clemente and Santa Catalina Cuytoabagum (*Kui Toak ekam*) numbered 1,000 in November of 1699,⁸⁷ San Agustin 800 in 1697,⁸⁸ and Bac 900 in 1697.⁸⁹ The average population of these four set-

83. Guebavi B 109.

84. Elias Gonzales, *op. cit.*

85. Karns, *op. cit.*, p. 94.

86. Bolton (1948) *op. cit.*, V. I, p. 204.

87. Karns, *op. cit.*, p. 138.

88. *Ibid.*, p. 92.

89. Excluding a 1,300 figure in 1699 because other settlements were probably represented in it (*ibid.*, p. 93, 137).

tlements appears to have been 675 persons. There also existed at that time four unnamed settlements between Bac and San Agustin, so the average population of all eight was at least 387 individuals without allowing any additional for the unnamed settlements.

On the lower San Pedro River, six settlements where the population was reported in 1697 had 120, 70, 500, 100, 80 and 380 persons,⁹⁰ for a total of 1,250 and an average of 208. On the upper San Pedro two riverine villages contained 500 and 100 in 1697,⁹¹ and an upland settlement eighty, a total of 680 and an average of 226 for an ecological unit quite comparable to the middle Santa Cruz River Valley area where both riverine and upland settlements evidently contributed to the final few survivors.

These figures, regardless of whatever errors in sampling and reporting they might contain, clearly show—since they were reported by the same observers, whose biases should have at least been consistent—that northern Piman Indian settlement size varied by region along the streams used for irrigation, so it may not be possible to project averages for other regions to estimate the middle Santa Cruz Valley population. These figures also show a consistent pattern of a few large villages or towns of 500 population and over, and numerous smaller *rancherías* ranging in population from about seventy to 120 persons. It is very important to know whether the middle Santa Cruz River Valley population included residents of one town, or only *rancherías*. Tumacacori's 150 may have been the largest single center. The middle Santa Cruz River Valley may have lacked a more urban center. Assuming that to have been the case, one might utilize the average population figure of 110 persons obtained above for the known dozen settlements which existed in the area prior to 1700 to obtain a population estimate of 1,320 persons.

It is difficult to believe, on the other hand, that the mid-

90. *Ibid.*, p. 80, 82-83.

91. *Ibid.*, p. 77-78.

dle Santa Cruz River Valley lacked at least one town in pre-conquest times. The site excavated by DiPeso would seem to have been one such town. The size of the migration from *Toacuquita* to Calabazas in itself indicates that the mountain settlement was larger than Tumacacori. Assuming, then, that at least one town existed in this region, an average settlement size of 200 may be assumed as a conservative figure, being lower than the 208 for the lower or 226 for the upper San Pedro River, and much lower than the 387+ lower Santa Cruz average. If the twelve settlements known to have existed on the middle Santa Cruz River Valley and its hinterland in 1700 averaged 200 population, the total aboriginal populace of the region reached 2,400. This estimate accords with evidence presented above as the northern Piman view of ideal settlement size that brought on migration and amalgamation of communities.

Depopulation Ratio. Since it is known that only the fewer than 100 northern Piman Indian survivors at Tumacacori Mission remained in the middle Santa Cruz River Valley area in 1800, it is possible to estimate the extent of Indian depopulation in this area during the 18th century as 23/24ths of the 1700 population. Since this estimate does not take into account the Sobaipuri and Papago increments which entered the region to die during the 18th century, it must be considered a conservative estimate applying only to this immediate region. In other words, where more than twenty-four natives lived in 1700, only one remained alive in 1800. The depopulation ratio was over twenty-four to one.