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THE INFLUENCE OF EPIDEMICS ON THE INDIAN POPULATIONS AND CULTURES OF TEXAS

by
John C. Ewers

ABSTRACT

Historic records indicate that Indian tribes residing in Texas prior to 1820 suffered no fewer than 30 epidemics during the period of white contact prior to 1890. The cumulative effect of successive epidemics was a major factor in the extinction of some of these tribes, and in continued population decreases among the others. Most probably these epidemics also caused significant cultural changes among the Indians who survived them in such varied aspects of life as warfare, political and social organization, and religious beliefs and practices.

That Europeans introduced epidemic diseases into the Americas which drastically reduced the numbers of Indians during the historic period is a fact well known to both historians and anthropologists. But the long range effects of successive epidemics on the populations of particular tribes have not been sufficiently studied, and the effects of these epidemics on the beliefs and customs of the Indians who survived them have been little considered by scholars.

Texas provides a fertile field for studying the influences of epidemics on neighboring tribes of different cultures over an extended period. Nowhere else in the American West did tribes of so many cultures live in such close proximity in the historic period. In Texas alone, buffalo-hunting nomads of the plains met not only horticultural tribes of the plains and woodlands, but also hunter-gatherers of the southwestern deserts and fishermen of the Gulf Coast.

Furthermore, there is a rich and lengthy record of Indian-White contacts in Texas dating back to Cabeza de Vaca's first meeting with Indians on the Gulf Coast in 1528. Most Indian tribes were removed from Texas during the 1850s, but we can follow them to their new homes in present Oklahoma and New Mexico, and continue to study epidemics among them and the possible effects of epidemics on their

numbers and life-ways to the end of the frontier period in 1890.

Texas was also a region of extensive tribal movements during the historic period. There were movements into this region from both north and east before 1820, and out of it before 1860. For purposes of this study let us consider as Indians of Texas those tribes who resided wholly or partially within the area of the present State prior to 1820 — with the exception of those portions of woodland tribes who entered East Texas from the east before 1820 (all of whom, save the Alabama-Coushatta, moved on to present Oklahoma or Mexico before 1860), and the Tigua of the El Paso area, who were Puebloan in culture.

The tribes with whom we shall be concerned, and their relative locations prior to 1820, are shown on the map (Fig. 1).

Any attempt to determine the effects of epidemics on the populations of these tribes must face the difficult problem of estimating their populations at a relatively early date. This is a fascinating numbers game in which a high degree of certainty is impossible because of the general lack of precise contemporary population figures. No actual census of the Indian tribes of the Indian Territory (Oklahoma) was undertaken until 1875, at which time a count of all the men, women, and children of each tribe was needed as a basis for establishing ration rolls. Before that time tribal populations were estimated. James Mooney has reminded us that the first Kiowa census of 1875 yielded a figure almost 50% *less* than an *estimate* of that tribe's population made only two years earlier (Mooney 1898:235).

Before 1875, estimates usually were calculated by formulae — by counting or estimating the number of warriors; or the number of lodges; or

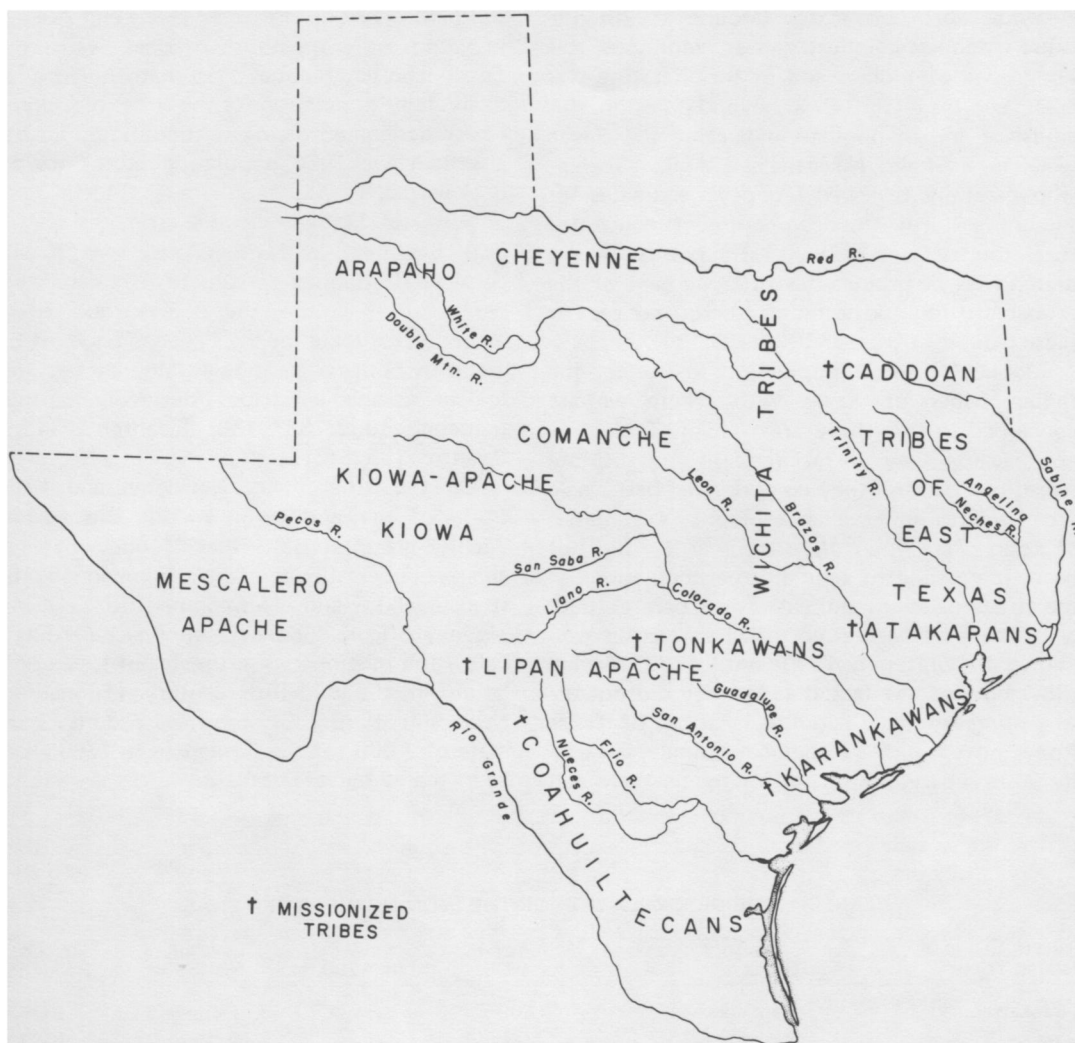


Figure 1. Indian tribes of Texas considered in this paper.

the number of families in a tribe; and then multiplying by certain arbitrary factors to arrive at a total tribal population. Not only were the numbers of warriors, lodges, or families usually set down in round numbers, but different estimators employed different factors in their multiplication. Obviously, the man who multiplied the number of warriors by five obtained a tribal total 25% greater than the one who used four for his factor.

Mooney estimated that the Kiowa averaged "6 or 7 souls to a tipi," but he recognized that this ratio "varied greatly with different tribes" (Mooney 1898:236). It also must have varied in

the same tribes at different periods, say, before and after a serious and fatal epidemic. On the other hand, Newcomb and Field recently estimated only 10 to 11 occupants in a two-family grass lodge among the horticultural Wichita (Bell, Jelks and Newcomb 1967:340). Whether one estimates 5 or 7 individuals to a family can make a difference of nearly 40% in one's total population for a tribe.

In view of the difficulties in evaluating early estimates of Indian populations, it is not surprising that most anthropologists have relied upon the figures cited in James Mooney's posthumously published study, *The Aboriginal Population of*

America North of Mexico (Mooney 1928). Because Mooney's industry was enormous, his knowledge of Indians and of the literature was great, and his integrity was beyond question, this study of Indian population became the classic work in its field. Nevertheless, A. L. Kroeber, who carefully reviewed Mooney's estimates for the entire North American continent, concluded that "the best of Mooney's estimates can hardly pretend to be nearer than 10 per cent of the probable truth, and some may be 50 per cent or more from it" (Kroeber 1939:133-134).

Mooney's earliest population figures for the Indian tribes of Texas with whom we are concerned in this study are cited in Table 1 — not because they are accurate in any absolute sense, but because they comprise the best single set of figures now available. Mooney's estimates, of course, are *not truly aboriginal*. He did not deem it possible to estimate the populations of the tribes of south and east Texas before 1690, or of the tribes farther north (who were not even known to whites in 1690) until 1780. Making allowance for the fact that Mooney did not try to distinguish the Coahuiltecan tribes of Texas from those south of the Rio Grande, and he made no separate estimates for the northern and

southern divisions of the Cheyenne and Arapaho, of whom only the southern ones lived on the Texas frontier, Mooney's estimates yield a relatively early population for the tribes of Texas (as I have designated them) of about 42,000, a little less than the 1960 population of the town of Brownsville, Texas.

Some of Mooney's tribal estimates now appear too high, and others too low. Kroeber considered Mooney's estimate of Coahuiltecan population far too high; Swanton reduced Mooney's estimate for the Caddoan tribes of East Texas by 500, and he thought Mooney's estimate for the Karankawan tribes "decidedly too high" (Kroeber 1939:133, 158; Swanton 1942:25; Swanton 1952:321).

On the other hand, Newcomb and Field's study of the population of the tribes of the Wichita group suggests that Mooney may have greatly underestimated their numbers in 1690 (Bell, Jelks, and Newcomb 1967:347-349). Mooney's figure for the Lipan Apache is also far below the missionaries' estimates of Lipan population in the mid-18th century (Tunnell and Newcomb 1969:150). I believe Mooney's estimate of 7,000 for the Comanche in 1780 should be increased by at least 50%.¹

TABLE 1. THE DEPOPULATION OF THE INDIAN TRIBES OF TEXAS

Tribe or Group of Related Tribes	Linguistic Stock	Mooney Est. for 1690	Mooney Est. for 1780	Census for 1890	Per Cent Reduction
Karankawan tribes	Karankawan	2,800		Extinct	100%
Akokisa	Atakapan	500		Extinct	100%
Bidai	Atakapan	500		Extinct	100%
Coahuiltecan tribes	Coahuiltecan	7,500*		Extinct	100%
Tonkawan tribes	Tonkawan	1,600		56	97%
Caddoan tribes of East Texas	Caddoan	8,500		536	94%
Wichita group of tribes	Caddoan	3,200		358	89%
Kichai	Caddoan	500		66	87%
Lipan Apache	Athapascan	500		60**	88%
Mescalero Apache	Athapascan	700		473	32%
Kiowa-Apache	Athapascan		300+	326	+9%
Comanche	Shoshonean	7,000		1,598	77%
Kiowa	Kiowa-Tanoan		2,000	1,140	43%
*Arapaho	Algonquian		3,000	5,630	13%
*Cheyenne	Algonquian		3,500		

* Coahuiltecan tribes in Texas estimated at one-half Mooney's total for these tribes in Mexico and Texas.
** Includes 20 Lipan among Tonkawa and 40 among Mescalero Apache in 1890.
+ Yet Mooney (1898:253) states: "They have probably never numbered much over three hundred and fifty."
* All figures for Cheyenne and Arapaho include both Northern and Southern divisions, although only the Southern ones lived on the frontiers of Texas.

On the whole, Mooney's estimates for the Indian tribes of Texas appear to be conservative. He may have erred more grievously in underestimating some of the more populous tribes than in overestimating some of the smaller ones. A total population for the tribes considered of at least 50,000 might not be excessive.

By 1890 census figures for these same tribes indicate that their total populations had declined to 12,243, or less than 25% of Mooney's "aboriginal" total for these tribes (Table 1, columns 5-6). Before 1890 the Karankawan, Atakapan, and Coahuiltecan tribes had become extinct. The Caddoan and Tonkawan tribes, as well as the Lipan Apache and Comanche, appear to have suffered reductions of more than 75%. Only the Kiowa, Kiowa-Apache, Mescalero Apache, Arapaho, and Cheyenne appear to have been reduced by less than 50%.² It is noteworthy that, with the exception of the Mescalero Apache, all of the last group of tribes had limited contacts with whites prior to 1790, and none of them were missionized during the Spanish Period (Fig. 1).

Epidemics certainly were not the sole cause of this radical reduction of more than 75% in the population of these tribes during the period prior to 1890. Intertribal warfare and wars with Spaniards, Mexicans, Texans, and citizens of the United States also took their toll. Overindulgence in liquor on the part of Indians living near white settlements also contributed to this decrease, as did venereal disease, malnutrition, and starvation. Nevertheless, Mooney's contention that epidemics were *the major cause* of marked population decrease among the tribes of North America prior to 1900 appears to have been true of the Indians of Texas.

Mooney listed but five "great epidemics" in Plains Indian history which decimated some or all of the tribes of Texas: an unidentified disease reported to have killed 3000 Caddoans in East Texas in 1691; widespread smallpox epidemics in 1778, 1801, and during the late 1830's; and a widespread cholera epidemic in 1849 (Mooney 1928:12-13). Yet I found references to no less than *thirty* epidemics which appeared among one or more of the tribes of Texas (as I define them) between 1528 and 1890. There was still another one in 1892 (Table 2). Even this may not be a complete record. The absence of references to any epidemic among these Indians during the 146-year-period 1528-1674 may reflect our paucity of information more accurately than it does their state of health, or freedom from epidemics.

Contemporary writers did not identify the diseases involved in a number of the epidemics of the pre-1800 period. However, Dr. Pat Nixon, a San Antonio physician who reviewed the literature on these early epidemics, suggested the diseases on the basis of the symptoms described (Nixon 1946:8-15). Throughout the entire period, smallpox was the most common cause of epidemics.

There were smallpox epidemics in 1674-5, 1688-9, 1739, about 1746, 1750, 1759, 1763, 1766, 1778, 1801-02, 1816, 1839-40, 1861-2, and 1864. Although the Indians of present Oklahoma were vaccinated against smallpox in 1865, an epidemic of this disease occurred among the Mescalero Apache in New Mexico in 1877. Yet another smallpox epidemic was averted among the Mescalero during the winter of 1882-1883, when timely vaccination enabled these Indians to escape "without a single case of smallpox" (11th U.S. Census Office, Census of 1890:403).

Next to smallpox, measles and cholera appear to have been the most deadly, although epidemics of malaria, whooping cough, and influenza also took their tolls of Indian lives.

The frequency of epidemics within a tribe must be regarded as a very important factor in the progressive decline of Indian population, for it inhibited the recovery and growth of tribal populations. The French biologist, Jean Louis Berlandier, who explored Texas in 1828 and subsequent years, reported that smallpox occurred among the Indian tribes "every sixteen years, making great ravages for a year at a time" (Berlandier 1969:84). He was not precisely accurate in defining the interval between epidemics, but the record is clear that there was a smallpox epidemic among one or more of the tribes of Texas at least once each generation from 1739 to 1877. Losses in these epidemics must have been high among children and teenagers who never lived to reproduce. Older people (including women beyond child-bearing age), who gained immunity by exposure to previous epidemics, presumably survived.

Data on mortality from epidemics are fragmentary, and some of the most precise figures may be exaggerations. Mooney discounted the Kiowa tradition that they had lost half their number in the cholera epidemic of 1849 (Mooney 1898:164). Yet the Cheyenne told of a similar loss, and Comanche mortality must also have been high in the 1849 epidemic (Grinnell

TABLE 2. A CHRONOLOGY OF KNOWN EPIDEMICS
AMONG THE INDIANS OF TEXAS, 1528-1892

Date	Disease	Tribes Infected	Mortality	References
1528	Cholera?	Karankawan tribes	One-half local band, possibly much more widespread	Cabeza de Vaca in Bandelier 1964: 63-4; Nixon 1946:32
1674-5	Smallpox	Coahuiltecan tribes	Widespread north and south of Rio Grande	Bosque in Bolton 1916:298; Castaneda 1936, Vol. I:225; Nixon 1946:53
1688-9	Smallpox	La Salle's Fort, St. Louis	French definitely, Karankawans?	Massanet and De Leon in Bolton 1916:395, 403; Nixon 1946:54
1691	?	Caddoan tribes of East Texas	Estimated 3,000	Father Casanas 1927:294, 303; Mooney 1928:12; Swanton 1942:17
1706	Smallpox	Coahuiltecan tribes in the Rio Grande Missions	Mission Indians almost wiped out	Tunnell and Newcomb 1969:147
1718	?	Caddoan tribes of East Texas	Nearly 100 baptisms in articulo mortis	Father Espinosa in Nixon 1946:46
1739	Smallpox and measles	The five San Antonio Missions	Missions almost depopulated by death and desertion	Castaneda 1936, Vol. III: 71; Nixon 1946:10, 54
ante 1746	Smallpox & measles	Tonkawan & Atakapan tribes	Epidemics prevented any population increase, 1734-1746	Bustillo in Bolton 1914b:334; Nixon 1946:54
1750	Smallpox	San Xavier Missions, Tonkawan and Atakapan tribes	40 at mission	Bolton 1915:223; Nixon 1946:54; Tunnell and Newcomb 1969:151
1751	?	San Antonio Missions	Epidemic "ravaged" the mission Indians	Father Dolores in Bolton 1915:303
1753	Malaria or dysentery?	San Xavier Missions, Tonkawan & Atakapan tribes	"a mortal sickness"	Nixon 1946:44-45
1759	Smallpox	At Nacogdoches (East Texas)	?	Nixon 1946:54
1759	Measles	Caddoan tribes of East Texas	"took its toll of lives"	Nixon 1946:11
1763	?	The San Antonio Missions	"half the population died"	Bolton 1908:304; Nixon 1946:10-11
1763-4	Smallpox	San Lorenzo de la Santa Cruz Mission, Lipan Apache	"devastating scourge"	Castaneda 1936, Vol. IV:179; Nixon 1946:11, 54; Tunnell & Newcomb 1969:171.
1766	Smallpox & or measles	Karankawan tribes	"a devastating scourge"	Castaneda 1936, Vol. IV:200; Nixon 1946:11, 54
1777-1778	Cholera or bubonic plague?	Widespread among East Texas Caddoans, Wichita, Tonkawan, & Atakapan tribes	mortality very high	De Mezieres in Bolton 1914A, Vol II:189, 231-2, 250, 257, 274, 311, 313; Nixon 1946:11
1778	Smallpox	Widespread in Texas and beyond its borders	mortality high	Stearn and Stearn 1945:46, 48; Mooney 1928:12; Nixon 1946:44, 46, 54
1801-1802	Smallpox	Widespread among Texas tribes, especially on Red River	high among the Caddoan tribes	Sibley 1832:721-2; Mooney 1898:168; Mooney 1928:12; Stearn and Stearn 1945:75
1803	Measles	Caddoan tribes of East Texas	Considerable	Sibley 1832:721-2
1816	Smallpox	Caddo, Wichita, Comanche, Kiowa, Kiowa-Apache	Including estimated "4,000 Comanche"	Trimble in Morse 1822:259; Mooney 1898:168; Stearn and Stearn 1945:86
1839-40	Smallpox	Kiowa, Kiowa-Apache Comanche	killed "great number in each tribe"	Mooney 1898:172, 274; Mooney 1928:12; Stearn & Stearn 1945:86
1849	Cholera	Widespread in Southern Plains. Kiowa, Kiowa-Apache, Cheyenne, Comanche	killed "half the Cheyenne"; less than half Kiowa; possibly more Comanche	Mooney 1898:173, 290-291; Mooney 1928:12; Grinnell 1962, Vol. II:164-5; Wallace & Hoebel 1952:298; Fitzpatrick in An. Rept. Com. Ind. Aff. 1850:52

TABLE 2 (Cont'd)
A CHRONOLOGY OF KNOWN EPIDEMICS
AMONG THE INDIANS OF TEXAS, 1528-1892

Date	Disease	Tribes Infected	Mortality	References
1861-2	Smallpox	Kiowa, Kiowa-Apache, Comanche, Cheyenne & Arapaho	"terrible ravages especially among the Arapaho"	An. Rept. Com. Ind. Aff. 1862:131; Mooney 1898:176, 311
1864	Smallpox	Wichita and Caddo	"fatal in many cases"	An. Rept. Com. Ind. Aff. 1864:319
<i>Note: Tribes of the present Oklahoma region were vaccinated against smallpox in 1865</i>				
1867	Cholera	Wichita and Caddo	"18 deaths in 5 days among Wichita," "47 Caddo victims"	An. Rept. Comm. Ind. Aff. 1867:322
1877	Smallpox	Mescalero Apache	carried off "a considerable number"	An. Rept. Com. Ind. Aff. 1877:157
1877	Measles & fever	Kiowa, Kiowa-Apache, Cheyenne, Arapaho	Killed 136 Cheyenne & 83 Arapaho children; Kiowa losses heavy but not enumerated	An. Rept. Com. Ind. Aff. 1877:85; Mooney 1898:218, 341-342
1882	Whooping cough & malarial fever	Kiowa, Kiowa-Apache, Comanche, Wichita	"malarial fever fatal in number of cases"	An. Rept. Com. Ind. Aff. 1883:70; Mooney 1898:219
1889-1890	Influenza	Cheyenne & Arapaho	"fatal in large number of cases"	An. Rept. Com. Ind. Aff. 1890:177; 182: Rept. of Indians Taxed & Not Taxed 1894:543
1892	Measles, influenza & whooping cough	Kiowa, Kiowa-Apache, Comanche, Wichita, and Caddo	"deaths chiefly among infants and children; Kiowa loss nearly 15% of pop.; Cheyenne & Arapaho "mortality very light"	An. Rept. Com. Ind. Aff. 1892:374, 377, 386, 388; Mooney 1898:223, 235, 362-3

1962, Vol. II:164; Annual Rept. Comm. Ind. Aff. 1849:51-52). Comanche mortality in the 1816 smallpox epidemic was estimated at 4000 (Morse 1822:260).

There appears to be no record of any tribe in Texas having suffered as severe a population loss from a single epidemic as did the Mandan of the Upper Missouri River during the smallpox epidemic of 1837, which reduced that tribe from about 1600 to less than 140 — a loss of more than 90% (Hayden 1862:433-434). Nor were epidemics the sole cause of the extinction of any of the Texas tribes who became extinct before 1860. Warfare, liquor, malnutrition, and perhaps the absorption of the last remnants into other Indian or Mexican populations, also played parts in the disappearance of those tribes.

How small a tribe could survive and maintain its political and social identity under the conditions of competition with other Indians and whites which prevailed in Texas prior to 1860? There may have been a few cases among the Caddoan tribes of East Texas of remnants of less

than 150 persons who managed to maintain their tribal identity for a short time before they combined with one or more related tribes to insure their biological survival — just as the Mandan combined with the Hidatsa and Arikara on the Upper Missouri River following their disastrous losses in the smallpox epidemic of 1837.

The influence epidemics may have had upon the beliefs and customs of those who survived should be of particular interest to the ethnologist.

To what extent could Indians distinguish between the most common epidemic diseases? Nixon was of the opinion that even the Spaniards, who observed and reported epidemics among the Indians of Texas prior to 1800, tended to confuse smallpox and measles (Nixon 1946:53). Keepers of the 19th century Kiowa pictorial calendars designated epidemics of smallpox and measles by the same graphic symbol — the figure of a standing man, clothed only in a breechclout, his head, body, arms, and legs

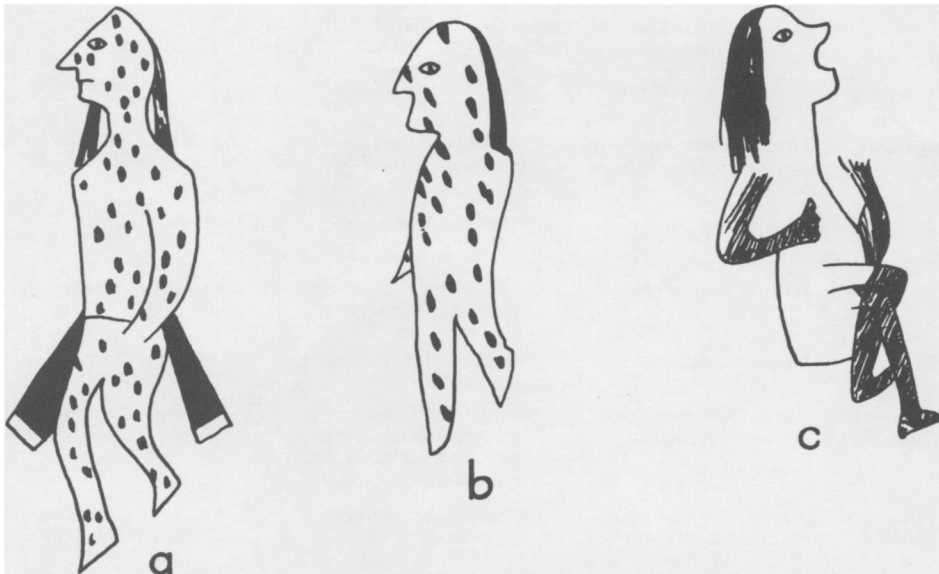


Figure 2. Pictographic representations of epidemics among the Kiowa Indians. *a*, smallpox (winter 1839-40); *b*, measles (summer 1877); and *c*, cholera (summer 1849). After Mooney (1898).

covered with small dots (Fig. 2*a-b*). However, the Kiowa verbally distinguished “hole sickness” (smallpox) from “pimple sickness” (measles). They called the cholera “cramp sickness,” and identified the years of cholera epidemics on their calendars by the figure of a man with his legs drawn up in pain (Fig. 2*c*) (Mooney 1898:274, 289, 342, 391-433).

Indian beliefs regarding the causes of epidemics varied. Interestingly enough, the fragmentary records of two of the earliest epidemics indicate that the afflicted Indians initially, and probably correctly, blamed the whites for these plagues. Cabeza de Vaca wrote that the Karankawa *at first* blamed his Spanish party for communicating the epidemic of 1528 to them, “believing we had killed them and holding it to be certain, they agreed among themselves to kill those of us who survived.” But one Indian saved the Spaniards’ lives by pointing out that if the white men had “so much power” they would not have suffered so many of their own men to perish (Bandelier 1964:64).

Caddoan survivors of the disastrous epidemic of 1691 among the Indians of the East Texas missions at first blamed the high mortality upon the priests’ practice of baptizing the stricken Indians during their death throes. But Father Casañas believed that he convinced even the most

hostile Indian medicine men that the priests’ attentions had not caused the Indian deaths (Casañas 1927:294, 303).

Other and later Indians attributed epidemics to the angry forces of nature. Morris Opler’s conservative Chiracahua Apache informants of the 1920’s believed that offenses against the Mountain Spirits caused epidemics, and that earthquakes and eclipses of the sun or moon were warnings of approaching epidemics. Once warned by these signs, the Apache sought to ward off epidemics by performing masked ceremonial dances. One informant told Opler that as recently as 1903, when these Apache lived near Fort Sill, the neighboring Comanche suffered deaths from smallpox. The Apache masked dancers performed for four nights. “And you know,” said the Indian, “we never got the smallpox” (Opler 1941:187, 241, 278).

The common practice among the nomadic tribes of scattering once an epidemic struck one of their camps, as well as their avoidance of the locality of the initial outbreak for a considerable time thereafter, must have helped to minimize losses among them. The desertion of the missions by some of the missionized Indians during the epidemic of the 18th century must have had a similar effect. The loyal neophytes who remained with their priests perished, while many of the

dispersed apostates survived.

Significantly, the greatest population losses during the 18th century and the early years of the 19th century were suffered by the least mobile tribes. These were the mission Indians and the Caddoan farming tribes. The latter, as well as the Wichita and the tribes of East Texas, lived in compact, semi-permanent villages of multi-family lodges, where conditions were as favorable for the rapid communication of diseases as they were in the mission compounds.

The succession of epidemics must have encouraged a trend in religion toward a greater emphasis upon prayers and ceremonies for protection against sickness and death. This is not to say that they ceased to seek supernatural aid to bring them success in hunting, protection from their enemies, and an abundance of crops (among those who farmed). But their most destructive enemies came to be those unseen ones — epidemics which struck down and killed their women and children, and against which their warriors had no defense. Health magic must not only have grown in importance, but it survived into the Reservation Period after the buffalo were gone and the Indian wars had ended.

At the turn of the century George A. Dorsey was told by an aged Caddo that as a boy he was taught to pray each morning when he returned from his bath, and cast a stick into the family fire, "Grandfather, help me to live and become a good man, and help others to live" (Dorsey 1906:226). One must wonder whether Caddo boys uttered this ardent prayer for life itself in the days before the dread epidemics began to materially lower the life expectancy of children?

Even though traditional curing practices proved ineffective in saving lives of victims of epidemic diseases, Indians persisted in employing them. They may unwittingly have alleviated the patients' sufferings by hastening their deaths. David Burnet described the Comanche treatment of smallpox during the epidemic of 1816:

The patients were strictly confined to their lodges, excluded from the air, and almost suffocated with heat. In many instances while under the maddening influence of the disease, exasperated by a severe paroxysm of symptomatic fever, they would rush to the water and plunge beneath it. The remedy was invariably fatal (Burnet 1851:234).

Even as late as 1892 the Agent for the Cheyenne and Arapaho reported that they treat-

ed measles

by subjecting the patient to a severe sweating process, following it with a plunge in the river . . . In cases of measles this treatment usually proves fatal (Annual Rept. Comm. Ind. Aff. 1892:374).

Early accounts of the Karankawan and Caddoan tribes of East Texas refer to the common practice of infanticide. It was also the custom of the Caddo to bury a live, nursing infant with its dead mother, and of the Comanche to kill a warrior's wife at his grave (Bandelier 1964:64; Casañas 1927:302-303; Berlandier 1969:96-97; Neighbors 1852:133). These customs do not appear to have survived among these tribes beyond the middle of the 19th century. Why? Did not the continued decline in tribal populations encourage the abandonment of customs so wasteful of human life?

The population decline also may have brought about significant changes in Indian war practices during the 19th century. Eighteenth century accounts indicate that the eating of prisoners, the hideous torture of captives, and the trade of captives as slaves were common among the Indian tribes of Texas. As the 19th century progressed only the Tonkawa continued to practice cannibalism to any extent, and both the torture and sale of captives became less common. Captives became more valuable as adopted members of a family — to replace children, wives, and husbands who had been lost in epidemics — than as human sacrifices or human trade goods.

In 1853 the experienced mountain man and Indian Agent, Thomas Fitzpatrick, observed that Comanche and Apache raids south into Chihuahua and Durango were made to capture Mexican prisoners as well as to "sharpen their appetite for pillage and rapine," and that these raids "tend to keep up the numbers of the tribe." Fitzpatrick found that Mexican captives were "so intermingled amongst these tribes that it is somewhat difficult to distinguish them." At that time the Comanche refused to make any treaty with the United States that would require them to give up any captives. "They stated briefly that they had become a part of the tribe; and that they were identified with them in all their modes of life; and they were the husbands of their daughters and the mothers of their children" (Ann. Rept. Comm. Ind. Aff. 1853:363).

Mooney estimated that during the 1890s "at least one-fourth of the Kiowa had captive blood"

(Mooney 1898:236).

Even so, the Comanche and Kiowa practice of inducting prisoners into the tribe failed to reverse the continued downward trend in tribal populations during the 19th century. It did, however, result in marked biological changes in the composition of the tribes. In 1931, Marcus Goldstein, a physical anthropologist studying the Comanche, doubted that more than 10% of the members of that tribe at the time were full-bloods (Goldstein 1934:299-300).

Surely the 19th century Comanche and Kiowa were well aware of their dwindling populations, and they became reluctant to have their true numbers known to Whites. The Comanche likewise did not want their numbers counted in 1837 (Smithwick 1900:173). As late as 1890 the Kiowa were "strangely averse to being counted" (U.S. Census Office, 11th Census, 1890:541). In the light of history this aversion to being counted cannot be interpreted as mere superstition: the Comanche and Kiowa were proud peoples who had been much more numerous, and they had no desire to advertise their weakness in numbers.

On the other hand, the declining numbers of tribesmen among the Southern Plains tribes hostile to the United States during the third quarter of the 19th century must have made the Army task of Indian fighting much less difficult than it would have been had they fought these Indians when they were as numerous as they were in 1780, or even before the cholera epidemic of 1849.

Epidemics strongly affected Indian tribal organization — or more properly disorganization and reorganization. Certainly the Karankawan, Atakapan and Coahuiltecan tribes, all of whom were repeated victims of epidemics, suffered the ultimate in social disorganization — extinction. The Lipan Apache lost their political and social autonomy and survived only as minority groups of a few individuals living among friendly Apache tribes in Oklahoma and New Mexico. Remnants of the Tonkawa were preserved from extinction under the protection of the United States Army at Fort Griffin during the waning years of the intertribal wars. The horticultural Caddoans, who numbered nearly thirty tribes before the epidemic of 1691, were reduced to three small tribes, identified as Caddo, Kichai, and Wichita, by the end of the frontier period.

There is need for a thorough study of the processes by which the Caddoans managed to survive, through repeated combinations and reor-

ganizations into fewer and fewer units as their numbers declined. In this process the names of many of the earlier tribes became almost forgotten. But they survived (to a degree) biologically long after they lost their political identity. There are indications of tribal combinations following the deaths of important chiefs and many of their followers during the 18th century epidemics. Why the names of some of these tribes, such as Anadarko, survived, while those of other once equally numerous and prominent tribes disappeared, needs explanation.

Significant changes in social organization also took place among some of the nomadic tribes of the Southern Plains during the 19th century. Grinnell found evidence that the Cheyenne relaxed their tribal taboo against marriage within one's own band *after* the cholera epidemic of 1849 had decimated some of their camps (Grinnell 1962, Vol. I:92-93). During his field-work among the Comanche in the 1930's Hoebel found that most Comanche marriages "took place within the band" (Wallace and Hoebel 1952:140). Might not a shift from band exogamy to permissive endogamy have taken place among both Comanche and Cheyenne *after* destructive epidemics, when they needed to strengthen weakened bands by any practical means?

Finally, we may consider briefly the effect the succession of epidemics may have had upon Indian attitudes toward death itself. An observer among the tribes of western Oklahoma in 1890 noted that "with characteristic stoicism an Indian accepts sickness as inevitable, evinces no interest in its cause, and expects no relief" (U. S. Census Office, 11th Census, 1890:541). But by 1890 conditions had changed. Acute smallpox had been brought under control through vaccination, and chronic tuberculosis had become the slower-acting killer of reservation-bound Indians. Might not this passive acceptance of sickness and death also have been historically conditioned?

One finds no indication of this passive acceptance of sickness in the dramatic account of the death of a Cheyenne warrior during the cholera epidemic of 1849, as told by George Bird Grinnell:

Little Old Man . . . donned his war-dress, mounted his war horse, and rode through the camp with a lance in his hand, shouting, "If I could see this thing, if I knew where it came from, I would go there and fight it." As he was doing this he was seized with the cramps,

fell from his horse, and died in his wife's arms (Grinnell 1962, Vol. II:164-165).

CONCLUSIONS

The cumulative effect of 30 or more epidemics among the Indians of Texas played a major role in the marked decline in population among these tribes during the historic period prior to 1890. Even though our best available set of early population estimates for these tribes, those of James Mooney, cannot be considered exact, comparison of them with 1890 census figures for the surviving tribes clearly indicates both a general population decline and a differential rate of decline among the different tribes. The sedentary, missionized and horticultural tribes suffered the most severe losses. Some of them became extinct; others sacrificed their tribal independence as their numbers decreased but insured their biological survival by combining with other linguistically and culturally related tribes. This practice was most common among the Caddoan tribes of East Texas. The nomadic tribes of the northern periphery appear to have suffered least, due to a combination of factors such as their relative remoteness from Whites until the early years of the 19th century, their common practice of scattering once they learned of the presence of disease among their people, and their very positive efforts to recruit additional tribal members through raiding for captives — both Indian and non-Indian. Yet even these tribes could not maintain their numbers, and as their total populations decreased the non-Indian blood quantum increased among them.

Obviously, they were aware of their decreasing numbers and revealed that awareness in a reluctance to be counted. Obviously too, they tried to prevent further losses as best they could. Their traditional methods of treating the sick proved futile in the cure of infectious diseases such as smallpox and measles. Frequent and fervid appeals for supernatural protection from illness and death proved little more effective in preventing the occurrence of epidemics. They also appear to have taken positive steps to insure survival by abandoning earlier practices which were wasteful of human life. Instead of killing and eating prisoners, or trading them to other tribes outside the area, they adopted them to take the place of their own dead relatives. Infanticide, the burial of a nursing infant with its

dead mother, and the sacrifice of a wife upon the death of her husband became obsolete. New political groupings emerged through the merging of remnant tribes. Even among the larger tribes who continued to retain their tribal identity, endogamous taboos may have been relaxed in the extensive band reorganizations necessitated by severe losses in the most disastrous epidemics.

Smallpox, the most destructive of the epidemic diseases, was only brought under control through vaccination shortly before the opening of the reservation period, and before 1890 tuberculosis had replaced the earlier epidemics as a slower-acting killer.

I hope this paper may serve to encourage further studies in a too-long-neglected field. Such studies should not stop with efforts to determine the effects of epidemics upon tribal populations: they should encompass efforts to find the influence of epidemics upon the life ways of those Indians who survived those epidemics.

NOTES

1. Mexican estimates of 20,000 to 30,000 for the Comanche in the early decades of the 19th century may reflect the Mexican authorities' fears of those aggressive Indians more accurately than they do the tribal population. Nevertheless, David Burnet, who knew the Comanche well in 1819, reckoned them at 10,000 to 12,000; and José Francisco Ruiz, who lived for eight years among them prior to 1821, estimated their population at 1000 to 1500 families twelve years after they suffered heavy losses in the smallpox epidemic of 1816 (Burnet 1851:230; Ruiz Manuscript 1828:4).

2. The Kiowa-Apache, Mooney believed, "probably never numbered much over three hundred and fifty" (Mooney 1898:253). Their rather unique ability to retain or enhance their population during the 19th century may have been due to additions from remnants of other Apache tribes, predominantly Lipan.

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