

However, we may discover among the objects excavated from the site with poorly preserved objects, a specimen analogous to a form that is common in the other site in which the material culture is better preserved. The finding of such analogous specimen will, if local manufacture can be proved, allow us to add the type to our list of material culture traits. This in essence is a general statement of the principle of analogous types.

The principle of analogous types has, therefore, a wide application in studies of material culture and is a useful conception in distinguishing the relationship of pre-historic Indian tribes called branches and in the reconstruction of history in general. If we failed to apply it, we would be guilty of omitting important evidence.

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EARLY TOBACCO UTILIZATION AND CULTIVATION IN THE AMERICAN SOUTHWEST

In 1942, White¹ published the summary opinion that "Tobacco was not used among the Pueblos prior to the advent of the white man." This statement may be valid, but needs clarification. The writer² has had considerable contact and experience with many Indian groups in the Southwest in connection with studies of primitive agriculture, and, in the course of these investigations, has gathered much data on the utilization and cultivation of *Nicotiana* by Indians in this area. Since the question of the antiquity of tobacco utilization has been brought forward by White, it seems advisable to present additional data on the subject with reference to the Southwest in general.

That various Indian groups in the Southwest, including the Pueblos, smoked wild species of *Nicotiana*, at least ceremonially, in aboriginal times has been quite universally accepted, based upon two lines of evidence: (1) the finding of numerous pipes in various archaeological sites in the Southwest; (2) ethnographic studies embracing the statements of old Indian informants to the effect that wild tobacco (*Nicotiana*) was smoked by their people in prehistoric times.

As to the first line of evidence, it should be pointed out that the finding of pipes in archaeological sites does not constitute, in itself, acceptable evidence that *Nicotiana* was smoked in such pipes. Southwestern Indian peoples are known to have smoked a variety of wild plants other than tobacco in historic times, and this might apply equally well for pre-conquest times. For instance, the author's field studies reveal that, for a number of decades, at least, various Pueblo groups have smoked manzanita leaves (*Arctostaphylos pungens*) ceremonially, both alone and in combination with tobacco. Neither the vast number of archaeological finds from Basket Maker-Pueblo sites nor the extensive documentary material bearing on the Pueblo area has yielded a single report of any objective evidence pertaining to the prehistoric utilization of *Nicotiana* in the Anasazi area; nor, for that matter, do they reveal direct evidence of the aboriginal smoking of any wild plant. Dottels, or charred smoking materials, have been found in

¹ Leslie A. White, *Further Data on the Cultivation of Tobacco among the Pueblo Indians* (Science, Vol. 96, 1942), pp. 59-60.

² All the field data presented in this paper have been gathered jointly by the author and Dr. W. H. Bell.

Basket Maker pipes, but chemical analyses of these dottels by Dixon and Stetson³ failed to reveal any trace of nicotine; however, these investigators point out the reasonable possibility that, if the smoking material were tobacco, the nicotine might have leached out over the centuries. Further support that the Pueblo Indians did not use tobacco in prehistoric times is given by Bandelier,⁴ a careful student of the documentary sources bearing on Pueblo culture, who wrote that "Tobacco was not known to the Pueblos until Spanish rule became established, but it was in constant use among the tribes of southern Sonora." Although the context of this statement seems to indicate that the author was writing of cultivated tobacco, the absence of ancient utilization of any kind of tobacco among the Pueblos is clearly indicated in another statement by Bandelier.⁵

The second traditional line of evidence for the wide acceptance of the aboriginal smoking of wild species of tobacco in the Pueblo area, as well as in the Southwest in general, consists of the statements of old Indian informants. Southwestern ethnographic studies contain numerous references indicative of the early utilization of tobacco by various Indian peoples. Such evidence is indirect and circumstantial and must be viewed with considerable reserve. The author's own field studies among a number of Southwestern tribes convince him that, within the scope of his investigations, the statements of old informants are, in themselves, not trustworthy when they embrace information purporting to extend back beyond the actual memory and experience of the informant concerned, or, at best, knowledge gained from his parents, grandparents or their contemporaries. When an informant states that his people *always* has used tobacco, his opinion must be accepted only within the limitations indicated. For example, several old Mohave informants assured the author that their people cultivated wheat long before the advent of the Spaniards, and a very reliable old Yuma informant was positive that his group had the horse in pre-conquest times.

Thus, there exists at present no objective, positive evidence to support the rather universal and deeply rooted opinion that tobacco was utilized aboriginally in Basket Maker-Pueblo culture horizons in the Southwest. This untenable conclusion seems to be a retrojective inference, arrived at by combining two propositions, each valid in itself, namely, that pipes have frequently been found in Anasazi sites, and that Pueblo peoples have extensively utilized tobacco in historic times. But we must not be misled into believing that by adding these two verities we arrive at a third equally valid conclusion—that tobacco was smoked in pipes prehistorically in the Anasazi area. It should be pointed out, however, that the negative evidence for the Anasazi, or Basket Maker-Pueblo region, in no sense precludes the possibility of aboriginal utilization of tobacco in this area.

Although there exists no objective evidence for the ancient utilization of *Nicotiana* in the Anasazi area, there are some data for the Southwest in general. Thus, Jones⁶

³ Roland B. Dixon and John B. Stetson, Jr., *Analysis of pre-Columbian pipe dottels* (AMERICAN ANTHROPOLOGIST, Vol. 24, 1922), pp. 245-246.

⁴ A. F. Bandelier, *Final Report of Investigations*, etc., Pt. 1 (Papers of the Archaeological Institute of America, Ser. III. Cambridge, 1890), p. 37.

⁵ Adolf F. Bandelier, *The Delight Makers* (New York, 1890), pp. 49-50.

⁶ Volney H. Jones, *Ceremonial Cigarettes* (Southwestern Monuments Monthly Report, Supplement, Oct. 1935), pp. 287-291.

reported the finding of tobacco leaves (probably *N. attenuata*), as well as the inner bark of creosote bush (*Covillea tridentata*), in reed "ceremonial cigarettes" from the Casa Grande ruins in Arizona, submitted to him by Charlie R. Steen; also, Fewkes⁷ discovered a dish of *N. attenuata* in one of the Casa Grande ruins. The former constitutes objective proof of the aboriginal utilization of tobacco in the Gila River region (which lies outside of the Pueblo area), and the latter is highly suggestive of the same.

A second important problem associated with tobacco in the Southwest is the antiquity of its cultivation. In 1941, White⁸ reported finding *Nicotiana rustica* in cultivation by the Santa Ana Indians, a Pueblo group, in New Mexico, and his reasons for regarding this discovery as of special interest were: (1) the paucity of evidence that any species of tobacco has ever been cultivated by the Pueblo Indians of the Southwest; (2) finding this particular species of *Nicotiana* in the region under consideration. In this connection, it also seems advisable to present additional data, particularly for the Southwest in general.

In 1921, Setchell⁹ reported *N. rustica* as having been cultivated by all Indian tribes of North America east of the Mississippi and by most of those immediately to the west of it, also by the Winnebago of Nebraska. Formerly the established limit of such cultivation was at best no farther west than the middle of Texas, thus excluding New Mexico.

Over a period of several years, beginning in 1936, the author has found tobacco in cultivation by eight Pueblo Indian groups in New Mexico—Jemez, Picuris, Cochiti, Santo Domingo, Taos, Santa Ana, Isleta and Acoma. Samples of seed were secured at five of these Pueblos and sent for identification to Dr. T. H. Goodspeed, Professor of Botany, University of California. He reported¹⁰ that trial plantings of each of these samples were made, and all found to be of the same strain of *N. rustica* L. This plant is known to all eight Pueblo groups under the name of *punche*.

White is of the opinion that the cultivation of *N. rustica* at Santa Ana pueblo, as found by him in 1934, remains to be explained. Commenting on White's article, Beinhart¹¹ suggests that the cultivation of *N. rustica* at Santa Ana owes its origin to the commercial growing of *N. rustica* for nicotine in the upper Rio Grande valley from 1925 to 1929. There are, however, reasons for believing that the cultivation of several species of tobacco, and of *N. rustica* in particular, extends back well beyond the period of 1925-29: (1) in 1916, Robbins *et al.*¹² reported that the New Mexican Tewa Indians formerly cultivated *N. attenuata*. Their field work was done in 1910-11; (2) John H. Bowman,¹³ Navajo Indian Agent, wrote in 1884 that the Hopi cultivated tobacco "to an insignifi-

⁷ J. Walter Fewkes, *Casa Grande, Arizona*, pp. 142-143 (28th Annual Report, Bureau of American Ethnology, 1912), pp. 25-179.

⁸ Leslie A. White, *Nicotiana rustica Cultivated by Pueblo Indians* (Science, Vol. 94, 1941), pp. 64-65.

⁹ William Albert Setchell, *Aboriginal Tobaccos* (AMERICAN ANTHROPOLOGIST, Vol. 23, 1921), pp. 397-414.

¹⁰ T. H. Goodspeed, *Personal correspondence*, Jan. 17, 1939.

¹¹ E. G. Beinhart, *Nicotiana rustica in New Mexico* (Science, Vol. 94, 1941), pp. 538-539.

¹² Wilfred William Robbins, John Peabody Harrington and Barbara Friere-Marreco, *Ethnobotany of the Tewa Indians* (Bulletin, Bureau of American Ethnology, No. 55, 1916), p. 106.

¹³ Annual Report of the Commissioner of Indian Affairs, for 1884 (Washington, 1884), p. 137.

cant extent." This is in line with Whiting's¹⁴ more recent report of the sporadic growing and semi-cultivation of *N. attenuata* and *N. trigonophylla* by this Pueblo people; (3) in the course of field work carried on by the author among a number of Pueblo Indian groups between 1930 and 1942, careful and repeated inquiry was made into the antiquity of tobacco cultivation. Wherever possible the oldest men of each Pueblo were interviewed. Thus, in 1940, three Acoma informants, then reported as seventy-five, ninety-five and ninety-nine years of age, said that in their boyhood they saw the very same kind of tobacco that these Indians cultivate today, namely *N. rustica* (*punche*), in fields at Acoma and at the village of Acomita. Our informants at both Isleta and Santa Ana Pueblos, whose ages in 1940 were given as seventy-four and eighty-five years, respectively, reported that these Pueblos had cultivated the same kind of *punche* they now grow as far back as they could remember. This would indicate that *N. rustica* was under cultivation at these Pueblos at least eighty to eighty-five years ago; (4) in 1886, Vasey¹⁵ stated that Dr. Edward Palmer had observed the cultivation of *N. rustica* by Indians in New Mexico and Arizona. To the author's knowledge, no such reference appears in Palmer's published papers or unpublished notes. Moreover, a search through the National Herbarium and the Gray Herbarium for specimens of *N. rustica* which Palmer might have collected in the Southwest was unsuccessful. It is possible that Palmer's information was transmitted in correspondence to Vasey or to one of his associates. At least, one cannot wholly ignore Vasey's statement, even though no written statement by Palmer has come to light.

Early documentary sources throw some light on the antiquity of tobacco cultivation in New Mexico. Thus, Don Pedro Bautista Pino¹⁶ wrote in his *Exposición*, published in 1812, that tobacco was then being cultivated in New Mexico; also José Agustín de Escudero,¹⁷ writing in 1849, observed that the town of Santa Fe was markedly backward in agriculture, one of its chief products being "a kind of tobacco which the Indians call *punche*, but which its producers cannot sell because of the government monopoly." Therefore, tobacco was cultivated in New Mexico as early as 1812; and *punche* was in cultivation near Santa Fe by 1849, although there is no certainty that this was *N. rustica*.

As to areas of the Southwest other than the Pueblo region, in 1938 seed of *N. rustica*¹⁸ was found by the author among two Pima families on the Gila River Indian Reservation. Elderly Pima informants maintained that the cultivation of this same tobacco was very old among their people, which we have taken to mean that this species was grown as far back as the memory of these informants goes, or at most to the time of their fathers or grandfathers or their contemporaries whom they had heard speak of its cultivation. This would be in line with Browne's¹⁹ statement (he visited the Gila

¹⁴ Alfred F. Whiting, *Ethnobotany of the Hopi* (Bulletin of the Museum of Northern Arizona, No. 15, 1939), pp. 16, 17, 90.

¹⁵ George Vasey, *Report of the Botanist* (in Report of the Commissioner of Agriculture, 1886), p. 76.

¹⁶ *Three New Mexico Chronicles*, Trans. and ed. by H. Bailey Carroll and J. Villasana Haggard (Quivira Society, Publication XI, Albuquerque, 1942), p. 97.

¹⁷ *Ibid.*, p. 120. ¹⁸ Grown and identified by Dr. T. H. Goodspeed.

¹⁹ J. Ross Browne, *Adventures in the Apache Country*, etc. (New York, 1869), p. 109.

Pima in 1864) that the Pima were then raising tobacco (species not designated); also with that of Vasey,²⁰ made in 1886, that Palmer had observed the cultivation of *N. rustica* by Indians in New Mexico and Arizona. It is worthy of note that the five specimens of Pueblo tobacco mentioned and the two Pima specimens have been identified by Goodspeed and his associates as belonging to that section of *N. rustica* which includes the closely related integrating varieties *humilis* Chrank, *jamaicensis* Comes, *asiatica* Chrank and *texana* (Naud.) Chrank, as opposed to var. *brasila* Chrank on the one hand and var. *scabra* Cav. (Comes) on the other.

As regards the early cultivation of *N. Tabacum* in the Southwest, in 1938 we found seed of this species²¹ on the Papago Indian Reservation, with headquarters at Sells, Arizona. The old Papago who furnished the seed stated that its cultivation among his people was fairly common in his boyhood; other old Papago informants confirmed this statement. Based on the ages of these informants, the cultivation of common tobacco would be carried back approximately seventy-five years among the Papago. The Papago at San Xavier (as well as the Pima at Sacaton) are known to have been growing *N. Tabacum* in 1903.²² Similarly, Lumholtz,²³ writing in 1912, referred to the Papago cultivating tobacco (species not designated).

Emory,²⁴ who visited the Pima in 1846, and Bartlett, there²⁵ in 1852, both mentioned Pima crops, but neither made any reference to the cultivation of tobacco. The earliest encountered reference to tobacco cultivation by the Indians of southern Arizona is that of Browne,²⁶ who observed in 1864 that the Pima were then growing tobacco species not designated). Similarly, Asa Gray²⁷ identified as probably belonging to *N. Tabacum* var. *undulata* the "Yaqui tobacco" found in cultivation in Arizona by Dr. Edward Palmer. The Gray Herbarium has two sheets of Palmer's *N. Tabacum* var. *undulata*, both grown in the Botanic Garden at Harvard University in 1871 from seed furnished by Palmer.²⁸ Thus, Palmer's observation was made as early as 1871, possibly earlier. Rogers McVaugh,²⁹ Associate Botanist, Division of Plant Exploration and Introduction of the Bureau of Plant Industry of the U.S.D.A., who has access to most of Palmer's field notes, also C. A. Weatherby, Senior Curator of the Gray Herbarium at Harvard University, where some of Palmer's original notes and plant specimens are located, have been contacted in an effort to locate, among Palmer's published and unpublished material, any reference to, or trace of, this specimen; as neither of these men was able to find any note bearing on this plant, other than the one mentioned, it is probable here again that Gray's statement was based on personal correspondence with Palmer.

²⁰ Vasey, *loc. cit.*

²¹ Grown and identified by Dr. T. H. Goodspeed.

²² J. William Lloyd, *Aw-aw-tam Indian Nights* (Westfield, N. J., 1911), p. 58; also observed personally by J. J. Thornber, Professor of Botany, University of Arizona.

²³ Carl Lumholtz, *New Trails in Mexico* (New York, 1912), p. 52.

²⁴ W. H. Emory, *Notes of a Military Reconnaissance*, etc. (Senate Ex. Doc. No. 7, 30th Cong., 1st Sess., Washington, 1848).

²⁵ John Russell Bartlett, *Personal Narrative of Explorations*, etc. 2 Vols. (London, New York, 1854).

²⁶ Browne, *loc. cit.*

²⁷ Asa Gray, *Synoptical Flora of North America*, II, Pt. 1 (New York, 1878), p. 241.

²⁸ C. A. Weatherby, Senior Curator, Gray Herbarium, Harvard University, *Personal correspondence*, Feb. 28, 1940.

²⁹ Rogers McVaugh, *Personal correspondence*, July 13, 1942.

There is one final reference to tobacco cultivation in the Southwest which should be mentioned. As early as 1826, on the west bank of the Colorado River, very close to its confluence with the Gila, Hardy³⁰ found Indians who "showed me tobacco of their own growing."

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THE IMPACT OF WAR ON AN INDIAN COMMUNITY

During the summer of 1942 while engaged in an Ethnological study of the Chippewa (Ojibwa) Indians of Wisconsin, although concerned with more remote subjects, I couldn't help but note certain effects of the current war on this community. The Lac Court Oreilles Reservation consists of some 1700 people scattered over 45,000 acres of land in northwestern Wisconsin. They eke out a scanty living by a combination of the old food-gathering techniques: hunting, fishing, trapping, and the gathering of wild rice, maple sugar, and berries; and wage incomes, most of which were derived from W.P.A. and C.C.C. until July when both were practically eliminated. While some of the old men are wont to laugh at the folly of the white man, the majority of the people take the war very seriously and consider it as "our war." The men have a much more stoic attitude toward it than the women who would occasionally "let loose" with derogatory remarks aimed at certain foreign personalities and usually in English, for there are no swear words in Chippewa; the worst thing you can call a person is *anamush* (dog). Newspapers are a rarity, but quite a few of the people have battery radios, and follow the news reports very assiduously. The war is the number one topic of conversation, and in my contacts with them the first question put to me was usually "How is the war going?" Even some of the older folks who couldn't read or speak a word of English and had never seen a map or even a picture of a tank or battleship would ask me questions about it.

The first and major effect of the war on the Chippewa has been an economic one. The abolition of W.P.A. and C.C.C. cut off the main source of cash incomes, and, although some were sent to schools on W.P.A. funds to be trained for defense jobs and later secured such jobs, it still left quite a group to shift for themselves. While jobs in the cities are relatively easy to secure, some of the men were reluctant to leave their families, which are generally large, and the increased living costs in the cities prevented taking the family along. Others have told me they lacked the capital for transportation and living expenses until the first pay check arrived. With the rise in prices, especially of food, many expressed trepidation as to the coming winter on the Reservation.

The rationing of tires has greatly affected the community. The people who did have cars had what we would put under the general category of "jalopies" with tires already in poor condition, which meant the rapid retirement (no pun intended) of the car. In a community as scattered and isolated as this, where a car is more of a necessity than a luxury, it meant that the person going to work or the store would either have to walk or hire a car, a rather expensive procedure. Thus it is not uncommon for a person to walk anywhere from five to twenty miles to purchase his ordinary staple commodities. One of my interpreters walked five miles to the pulp camp every morning, cut pulp all day, and then walked the five miles home. Fewer people went wild rice gathering this

³⁰ R. W. H. Hardy, *Travels in the Interior of Mexico* (London, 1829), p. 336.