

Bartram's Painted Vulture: A Bird Deserving Recognition

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Introduction

In the account of his *Travels...* to northern Florida in the 1770s, William Bartram (1791) of Philadelphia gave a detailed description of a spectacular vulture species that apparently was a resident of the St. John's River region. This bird, which Bartram christened the Painted Vulture (*Vultur sacra*), but which he also variously referred to in his writings as a White Eagle, White-tailed Vulture, or Cropped Vulture, was evidently notable both for its tail color and for its protruding naked crop. Bartram described how it gathered to feed on serpents and lizards killed by fires, and he reported that it was prized by the local Native Americans for its tail feathers, which were incorporated into their royal standards. Bartram's (1791) description of the Painted Vulture is highly reminiscent of the King Vulture (*Sarcoramphus papa*) of Central and South America in the bird's coloration, but differs from that species in having a white tail with a black tip, rather than a fully black (actually dark brown) tail.

Unfortunately, Bartram collected no permanent specimen of his Painted Vulture, and apparently no one traveling to northern Florida after Bartram's visits ever recorded an encounter with this species again. This failure has led to one of the most enduring controversies in the annals of American natural history; some ornithologists are supportive of Bartram's description while many others have surmised that Bartram's vulture was either totally imaginary or a poorly described individual of the Northern Caracara (*Caracara cheriway*) or some other extant bird species. The American Ornithologists' Union (AOU) does not presently endorse Bartram's description. In this presentation, we review the evidence for and against Bartram's Painted Vulture and conclude that there are no persuasive reasons to reject Bartram's description; rather, there are multiple reasons to believe that his account was an accurate depiction of a species that went extinct shortly after the American Revolution. Our views on this topic represent a condensation, reorganization, and clarification of materials presented in Snyder and Fry (2013).

History of the Controversy

Bartram's original description of the Painted Vulture is quite richly detailed (1791, pp. 150–152):

“There are two species of vultures in these regions I think not mentioned in history: the first we shall describe is a beautiful bird, near the size of a turkey buzzard, but his wings are much shorter, and consequently he falls greatly below that admirable bird in sail. I shall call this bird the painted vulture. The bill is long and strait almost to the point, when it is hooked or bent suddenly down and sharp; the head and neck bare of feathers nearly down to the stomach, when the feathers begin to cover the skin, and soon become long and of a soft texture, forming a ruff or tippet, in which the bird by contracting his neck can hide that as well as his head; the bare skin on the neck appears loose and wrinkled, which is of a deep bright yellow colour, intermixed with coral red, the hinder part of the neck is nearly covered with short, stiff hair; and the skin of this part of the neck is of a dun-purple colour, gradually becoming red as it approaches the yellow of the sides and forepart. The crown of the head is red; there are lobed lapets of a reddish orange colour, which lay on the base of the upper mandible. But what is singular, a large portion of the stomach hangs down on the breast of the bird, in the likeness of a sack or half wallet, and seems to be a duplicature of the craw, which is naked and of a reddish flesh colour, this is partly concealed by the feathers of the breast, unless when it is loaded with food (which is commonly, I believe, roasted reptiles) and then it appears prominent. The plumage of the bird is generally white or cream colour, except the quill-feathers of the wings and two or three rows of the coverts, which are of a beautiful dark brown; the tail which is large and white is tipped with dark brown or black; the legs and feet of a clear white; the eye is encircled with a gold coloured iris, the pupil black.”

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"The Creeks or Muscogulges construct their royal standard of the tail feathers of this bird, which is called by a name signifying the eagle's tail; this they carry with them when they go to battle, but then it is painted with a zone of red within the brown tips; and in peaceable negotiations it is displayed new, clean, and white, this standard is held most sacred by them on all occasions; and is constructed and ornamented with great ingenuity. These birds seldom appear but when the deserts are set on fire (which happens almost every day throughout the year, in some part or other, by the Indians, for the purpose of rousing the game, as also by the lightning:) when they are seen at a distance soaring on the wing, gathering from every quarter and gradually approaching the burnt plains, where they alight upon the ground yet smoking with hot embers; they gather up the roasted serpents, frogs and lizards, filling their sacks with them, at this time a person may shoot them at pleasure, they not being willing to quit the feast, and indeed seem to brave all danger."

In his *Report to Dr. John Fothergill (1773–1774)*, his patron in England (see Bartram & Harper 1943, vol. 2, p. 165), Bartram made an earlier and less complete description of this bird (named alternatively in this account the Cropped Vulture, but evidently the same species) and noted:

"When the vast meadows and savannahs of Florida are set on fire, they [the Painted or Cropped Vultures] gather in flocks to the new burnt ground where they feed on the roasted snakes frogs Lizards Turapins and other reptiles, where I had the opportunity of getting one."

Here it seems clear that Bartram had collected a specimen of the bird, perhaps for the purpose of describing it, something that also seems likely from the amount of detail in description (Bartram, 1791). It is difficult to believe that his writings on the sharpness of the bird's bill, softness of the neck ruff, and existence of short bristly hairs on the neck might have been based only on observations of the bird at a distance.

Other early ornithologists did not contest Bartram's description, but few of them included the spe-

cies in their publications. Alexander Wilson, though he was a protégé of Bartram, never visited Florida and did not include the species in his *American Ornithology* (1808–1814). Bonaparte did not include Painted Vulture in his "*Synopsis...*" (1828), nor in his four volume supplement to Wilson's *American Ornithology* (1825–1833), although in the fourth volume he wrote (1833, p. 18): "In the eastern or even southern United States a Condor has never been seen, though the King Vulture of South America has been occasionally observed." The species was likewise absent from John James Audubon's *The Birds of America* (1827–1838) and *Ornithological Biography* (1831–1839); he visited Florida in the 1830s but did not observe the bird. Both Vieillot (1807, p. 26) and Thomas Nuttall (1832, p. 42) repeated Bartram's description in part and pointed out its general similarity to the King Vulture. Whereas Vieillot presented the bird as a distinct species, Nuttall merely mentioned it in his account of King Vulture. John Cassin (1856) was among those who continued to accept Bartram's description as valid:

"Its occurrence has never been noticed since the time of the accurate and veracious naturalist who first described it, and his careful description above quoted seems to clearly indicate it to be a species entirely unknown. The white tail especially is characteristic and establishes a clear distinction from any other known species."

Thus Bartram's Painted Vulture was still widely regarded as something more than a myth through the mid 19th century.

All this was to change in 1871 when Joel Asaph Allen published the results of his own studies of Florida birds. Allen, like other ornithologists after Bartram, failed to find the vulture, even though he collected intensively along the St. John's River where Bartram had evidently encountered it. Like Bartram's original description, his discussion of the bird was quite richly detailed:

"Although the description of Bartram's '*Vultur sacra*' accords more nearly with the *Sarcoramphus papa* than any other known species, I cannot avoid the conclusion that it is in the main a *purely mythical species*, notwithstanding the high reputation for veracity generally accorded

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to Mr. Bartram. I mainly so regard it for the reason that Florida has of late been too often traversed by naturalists, *and especially all the parts visited by Bartram*, for a bird of so striking an appearance, and so numerous as Bartram represented his *V. sacra* to be, to remain undiscovered if such a species exists there. While it nearly accords with the *S. papa* in size and general color, it is most radically different from this species, in the color of the tail, and in having a 'large portion of the stomach hanging down on the breast, in the likeness of a sack or half-wallet.' In the latter feature it is structurally widely different from any known American bird. It is mentioned as though it was an abundant species on, at least, the upper portion of the St. John's River, inasmuch as he speaks of large flights of them. As to the feathers of its tail being used by Creek Indians for a royal standard, and to which feathers they give a 'name signifying the eagle's tail,' it seems to me more probable that they were really feathers of the white-headed eagle (*Haliaeetus leucocephalus* [Bald Eagle *Haliaeetus leucocephalus* (Linnaeus)], since it is well known that the tail feathers of that bird are very generally used for this and similar purposes by the Indian tribes of this continent, whereas the tail feathers of so foul a bird as the vulture must in all probability be too ill scented to suit even the unfastidious taste of an Indian...

"On the whole, it seems evident that Bartram's account of the *Vultur sacra* is a confused mixture either of pure fiction and truth, the former largely in preponderance, or of the characters of several different species. The description would seem to have been mainly drawn from an example of *Sarcoramphus papa* that he may have somewhere met with, but with which he combined certain features of this or other species which he had only observed at a distance and that he thus misjudged their exact character (as in respect to the strange external food-pouch) or else added them solely on popular, fabulous rumors. The flights of these birds, which he observed assembling over recently burned districts, I think must refer to the *Polyborus tharus* [*Caracara cheriway*] which is well known to have this habit, while the tail feath-

ers he speaks of as used by the Indians in their councils were more probably either those of the *Haliaeetus leucocephalus* or *Polyborus tharus* than of any species of vulture, since a white-tailed American vulture, I believe, is a bird thus far unknown. If the '*V. sacra*,' then, is to be regarded as anything else than a myth, it should in all probability be identified with the *S. papa*, as already stated, and as was done by Bonaparte in his *Conspectus*."

Irrespective of the merits of his arguments, as the soon-to-become first president of the AOU and author of "Allen's Rule" (1877), Allen was no less weighty an authority on questions of natural history than was Bartram, and perhaps it is no surprise that his judgments on Bartram's vulture found a receptive audience in other ornithologists. His judgments were soon echoed by the dismissive remarks of Charles Maynard (1881) who, like Allen, suggested that Bartram's description was likely based on a Northern Caracara, a bird that Bartram did not otherwise report seeing during his "*Travels...*," though it was collected by Audubon along the St. John's River in 1831 and still occurs there occasionally today.

Additional dismissive remarks are to be found in Arthur Howell's *Birds of Florida* (1932, p. 8) in which Bartram's *Vultur sacra* is referred to as:

"An apparently mythical species having some of the characters of the King Vulture of South America (*Gypargus papa*)...No such bird has been seen by later observers, and we are forced to the conclusion that Bartram in this case drew on his imagination or repeated some tale related to him by others."

Much more recently, and perhaps most surprisingly, Robertson and Woolfenden (1992, p. 154) in their *Florida Bird Species, an Annotated list* stated:

"Thus, at times the King Vulture has been listed as native to Florida and the United States...It appears at least equally likely that Bartram's account relates to a raptor that is still extant in Florida, such as the Crested Caracara (AOU, 1983)."

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The AOU's negative judgment of 1983 is retained in the most recent version of its checklist (AOU, 1998), although it must be noted that the AOU had included Florida in the range of the King Vulture in the fifth edition of the checklist (AOU, 1957).

Bartram's vulture was not completely without defenders during the period after Allen's (1871) critique, and indeed the thorough and fundamentally positive review of Bartram's description by Harper (1936) was the probable reason for the AOU's bow in Bartram's direction in its 1957 checklist. Harper, however, speculated that Bartram had really observed a typical King Vulture in his Florida description (a view supported by Palmer, 1988) but simply neglected to note tail color when he observed the bird and later misremembered it when he wrote the description up for publication in 1791. Thus, Harper was not a defender of *Vultur sacra* as a distinctive species or subspecies, but as an example of a typical King Vulture imperfectly described. He offered no support for the suggestion that the description might refer to a Northern Caracara or Bald Eagle, and he apparently could not accept that the tail color pattern described by Bartram might be real and might simply represent geographic variation in the King Vultures resident in Florida.

It remained for McAtee (1942), among modern observers, to conclude that Bartram's description of the tail of the bird might be accurate. This was an indication that his Painted Vulture was a distinctive bird that deserved recognition as different from, although closely related to, a typical King Vulture.

Arguments Against Bartram's Bird as a Unique Taxon

The main arguments against Bartram's Painted Vulture being a unique taxon trace overwhelmingly to Allen (1871) and can be summarized as follows: (1) The failure of anyone to encounter Bartram's vulture after 1791 cannot reasonably be attributed to disappearance (extinction) of the bird, since Bartram allegedly described it as abundant. Accordingly, Bartram's bird must either have been imaginary or some other extant species poorly described. (2) The white tail color of Bartram's bird differed strongly from that of a King Vulture, and a Florida population of King Vultures could not reasonably have had such coloration as no cathartid vulture has such tail coloration. So either

Bartram misdescribed the tail color or was describing, at least in part, some other species. (3) White tail color does occur in juvenile Golden Eagles (*Aquila chrysaetos*), subadult Bald Eagles, and Northern Caracaras, all of which occur at least occasionally along the St. John's River. Accordingly, Bartram's (1791) description was likely based on the tail of one or more of these other species, especially considering that the use of vulture feathers in the ceremonial regalia of Native Americans was not reasonable because of their objectionable odor. (4) The protruding naked crop of the Bartram's vulture was not known in any North American bird. Thus Bartram's bird was probably imaginary. (5) Bartram's vulture was sufficiently close to Northern Caracara in appearance that it could plausibly have been a misattributed description of that species — a conclusion consistent with the absence of that species from his account of the expedition (Bartram, 1791). (6) Northern Caracaras are known to gather at fires to feed on dead or incapacitated animals, further suggesting that Bartram's vulture was really a Northern Caracara.

With respect to argument (1), the first extensive ornithological field efforts in the St. John's region subsequent to Bartram's were those of Audubon in the early 1830s (Howell, 1932; Proby, 1974), which leaves more than 50 years for extinction to have occurred, unwitnessed and undescribed. Moreover, the Painted Vulture may well have been a rare species at the time of Bartram. He did not directly comment on its abundance, and although he reported that the species assembled in flocks at fires, he never mentioned "large flights" of these birds, as alleged by Allen (1871). Flocks at fires do not demonstrate overall abundance, because fires can attract individuals from many miles away, greatly concentrating relatively sparse populations. Bartram's remark that the birds "seldom appear" except when drawn in by fires is consistent with sparse populations.

Regardless, even abundant species sometimes experience rapid extinction, as was seen with the Passenger Pigeon (*Ectopistes migratorius*), Great Auk (*Pinguinus impennis*), and Eskimo Curlew (*Numenius borealis*) (Blockstein, 2002; Gill et al., 1998; Montevecchi & Kirk, 1996). Furthermore, it is not certain that the Painted Vulture was completely gone by the 1830s, as Nuttall (1832) reported second-hand accounts of it along the Gulf Coast at that time. Florida was still

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very sparsely settled in the 1830s, but for species highly vulnerable to hunting pressure, even small numbers of humans could have had major impacts (see Bartram, 1791, pp. 149–150). Bartram described the species as easy to kill at fires and its feathers were in demand as ceremonial objects. Like the Passenger Pigeon and the American Bison (*Bison bison*), the Painted Vulture may have been under substantial mortality threats from humans.

Harper (1936) noted another potential cause of the bird's disappearance — the extreme cold weather of 1835 that may also have wiped out the royal palm, *Roystonea regia*, from the St. John's region. However, the failure of Audubon to encounter and report the Painted Vulture in 1831 could mean that the bird was already gone from this region before this date. Still another potential stress suggested to us by Storrs Olson (pers. comm.) is that the Painted Vulture may have suffered from the progressive extermination of native tribes by European colonists in the post-contact era, after which the landscape was burned less frequently, and the Painted Vulture's food supply declined.

Perhaps in Allen's day, when the Ivory-billed Woodpecker (*Campephilus principalis*), Carolina Parakeet (*Conuropsis carolinensis*), Eskimo Curlew, Passenger Pigeon, and Bachman's Warbler (*Vermivora bachmanii*) were not yet gone, skepticism about extinction of the Painted Vulture seemed more reasonable. Nowadays, extinction is viewed as a relatively likely fate for uncommon species. Indeed, the King Vulture in particular has proved to be quite susceptible to local extinction in other parts of its range (e.g., see map of range contraction in Mexico given by Howell and Webb, 1995, p. 176).

With respect to argument (2), King Vultures potentially occupying Florida in past epochs may well have become geographically isolated as a result of climate and sea level changes in the Pleistocene, and the Gulf Coast may have been periodically uninhabitable by this species. Restricted gene flow at these times could have facilitated the evolution of a differentiated population with white tail color in Florida. A similar course of events has apparently transpired in populations of other Florida bird species (see Emslie 1998), and substantial geographic variation in color patterns is widespread in other bird species with disjunct populations.

White tails with dark tips are fairly common among raptors, and there does not appear to be any biological reason to rule out their occurrence in vultures. White or partly white tail color is known in two Old World vultures, the Egyptian Vulture (*Neophron percnopterus*) and the Palmnut Vulture (*Gypohierax angolensis*), so the ecology of scavenging birds evidently does not preclude white tail feathers, a conclusion also supported by the largely white tail of the Northern Caracara, another frequent scavenger.

It is true that specimens of King Vultures we have examined from throughout its present range are quite uniform in their overall dark brown tail coloration, but there are no known specimens from Florida where white tail coloration was reported by Bartram. Nevertheless, it is important to note that many specimens show tiny white marks, invisible at any distance, along the shafts at the bases of the tail feathers, and one specimen from Guyana (USNM 637229) has small white patches to the bases of the vanes of most rectrices. Given the possibility that these variations might have a genetic basis, it seems reasonable to conclude that some populations could evolve much more thoroughly white tail coloration, either through natural selection or genetic drift.

With respect to argument (3), as already discussed, Bartram evidently had access to a whole specimen of his Painted Vulture, and in preparing a description of the species, it seems unlikely that he would describe the tail color of some other species unassociated with the specimen. Much more likely is the possibility that he might later have confused detached decorative tail feathers of subadult Bald Eagles, juvenile Golden Eagles, or adult Northern Caracaras in the regalia of Native Americans with those of his vulture. However, Bartram's one illustration of ceremonial feathers is to be found in his portrait of Mico Chlucco, King of the Muscogulges, which also includes a potential royal standard (see Figure 1). Bartram claimed that such standards were made from the tail feathers of *Vultur sacra*, and as illustrated, the feathers visible in this portrait provide a reasonably close match to those he described. They do not closely resemble any tail feathers of the two eagle species or the Northern Caracara. Thus, at least in this illustration he was apparently not confusing the tail feathers of these other species with the tail feathers of the Painted Vulture.

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Figure 1. William Bartram's original portrait of Mico Chlucco, the Long Warrior or King of the Muscogulges, evidently dates from 1786 and was a response to a request from his publishers to provide a frontispiece for his immortal *Travels...* (1791). The portrait could have been produced either from memory or, perhaps much more likely from some earlier version in his field notes, which have been lost or no longer exist. The fan of feathers attached to a wand on the right side of the portrait is believed to be the "royal standard" described in his *Travels...* (1791) and composed of the tail feathers of his Painted Vulture. The version of this portrait that appeared in 1791 was an engraving by Trenchard that differs in a number of respects, including number and appearance of feathers in the royal standard. Presumably the original version seen here is the most accurate in detailed appearance of the feathers.

History amply confirms that the odor of vulture feathers is not a credible deterrent to their decorative use. Archaeological evidence of the use of vulture feathers and other body parts by human cultures dates to the time of the ancient Egyptians (e.g., Mundy et al, 1992; Snyder & Snyder, 2005, p. 95). Allen's (1871) belief that the decorative use of vulture feathers by Native Americans should be considered implausible

is contradicted by a vast body of evidence, apparently including Bartram's portrait of Mico Chlucco.

With respect to argument (4), the King Vulture, like other New World vultures, is well known to have a distensible naked crop (or craw) that becomes very conspicuous when filled with food, protruding well beyond the breast feathers. This issue was thoroughly discussed by Harper (1936), who noted that in vultures that have not recently fed and in many preserved museum specimens (i.e., lacking food in their crops), the distensible crop can be overlooked. Allen's (1871) ignorance of this often obvious structure suggests major deficiencies in his experience and knowledge. He was clearly mistaken in doubting the reality of this structure.

With respect to argument (5), Bartram's vulture and the Northern Caracara both possess some white color at the base of the tail and a dark terminal band to the tail, but beyond this similarity, these birds differ in almost every respect of coloration (Table 1). That any novice bird student might construct a description resembling Bartram's vulture based on viewing a caracara seems doubtful. That Bartram might have done so seems beyond all credibility, especially since he reported having procured a Painted (Cropped) Vulture and was presumably able to study it closely. Bartram's failure to report Northern Caracaras from the St. John's region is no surprise, as this species may always have been rare in this region. Indeed, Allen also failed to encounter it in the same region nearly a century later. Audubon's account of this species along the St. John's portrayed an extremely wary bird, rather different in behavior than the approachable Painted Vulture described by Bartram (see Proby, 1974, pp. 91–94).

Finally with respect to argument (6), Northern Caracaras have indeed been seen gathering at fires to forage on animals exposed or killed by the fires (Morrison, 1996), but so have many other large raptors and vultures (e.g., Farquhar, 1992; Keddy-Hector, 2000). Swainson's Hawks (*Buteo swainsoni*) and Turkey Vultures (*Cathartes aura*) make similar gatherings (NFRS, pers. obs.). Indeed major concentrations of Turkey Vultures wintering along Lake Okeechobee in Florida are known to gather in recently burned sugar cane fields for food. It would not be surprising if Painted Vultures may have behaved similarly.

Table 1. Major Comparative Characteristics of King Vulture, Bartram’s Painted Vulture, Albin’s Warwovwen, and Northern Caracara

Note: structures noted as black are actually dark brown.

FEATURE	KING VULTURE	PAINTED VULTURE	WARWOVWEN	NORTHERN CARACARA
Tail color	Black	White with black tip	White with black tip	White with black tip and 12 black bars
Leg color	Black, yellow, white	Clear white	Yellowish flesh-color	Yellow
Primaries and secondaries color	Black	Black	Black	Black with large white primary panels
Back color	Buff white	White or cream	Cream	With with black bars (upper), black (lower)
Belly color	White-cream	White or cream	White	White with black bars (upper), black (lower)
Neck ruff	Present: gray, ash-colored	Present: color not described	Present: ash-colored	Absent
Protruding crop	Present, reddish in color	Present, reddish flesh colored	Present, flesh-colored	Not normally visible
Head-neck-throat	Naked	Naked	Naked	Feathered except for naked red lores
Throat-neck color	Yellow-red-purple	Yellow-red-purple	White-yellow-red	White (feathered)
Crown color	Orange-red to flesh-colored	Red	Flesh-colored	Black (feathered)
Upper bill lappets	Present: yellow to reddish	Present: reddish orange	Present: orange	Absent
Iris color	White to yellow	Gold	White	Orange-brown
Eye-ring	Full and red to orange	Not described	Full and red	Absent
Bill color	Yellow to red with dark belt	Yellow	Red or saffron with dark belt	Blue

The burden of proof that Bartram’s vulture description should be rejected would seem to lie with the critics; yet as just discussed, no critic has provided more than weak and speculative arguments against his description, some of which are clearly erroneous. The main objections seem to have centered on a reluctance to believe in the bird’s potential extinction and a reluctance to believe in any geographic variation in King Vulture tail coloration. Both objections could easily be in error, and one is left wondering why such tenuous opposition to his description originated and why it has persisted to the present. Inspection of Bartram’s descriptions and artwork on other species reveals impressive skill in such endeavors. The sloppy

or deliberately dishonest account of the Painted Vulture alleged by critics would have been highly atypical. In sum, the widespread skepticism with which critics have treated Bartram’s Painted Vulture description has not yet been persuasively justified.

Supporting Evidence that Bartram’s Bird Was a Unique Taxon

In contrast to the unpersuasive arguments that have been advanced to discredit Bartram’s Painted Vulture, a variety of materials provide plausible support for his description. The following sections review these lines of evidence, as well as some less convincing supporting

evidence that has been suggested and some potentially strong evidence that has not yet been obtained.

Bartram's Black Vulture Description and Illustration

Often forgotten is the fact that Bartram also described another species of vulture back to back with the Painted Vulture in his *Travels...*, and this description is fully accurate and has never been the subject of controversy, as this bird still exists (see Bartram 1791, p. 152 and Magee 2007, p. 176.) The species involved is now known as the Black Vulture (*Coragyps atratus*), and Bartram's skill in describing and illustrating this closely related species provides reason to believe he was likely also skillful in describing the Painted Vulture, especially considering that he evidently had a specimen of the latter to work from.

Albin's Captive Vulture Description and Illustration

Of special importance to the potential validity of the Painted Vulture is a parallel description of a vulture extremely similar to the Painted Vulture by Eleazar Albin of England (see Albin 1734, vol. 2, p. 4, pl. 4), a description evidently unknown to Bartram, (1791, p. 148, "not mentioned in history"). Albin was an immigrant naturalist from Germany, famed for his watercolor paintings of insects and birds, and the vulture he described was a captive of questionable geographic origin that he called the Warwovwen or Indian Vulture, but for which he provided no binomial scientific name. Albin's verbal description of the bird was as follows:

"The Warwovwen or Indian Vulture"

This bird I saw at the *George Tavern at Charing-Cross*, with the *Cassowares*; it was almost as big as an Eagle; the top of its Head and Neck of a Flesh Colour and bare of Feathers; the sides of the Face, Chin, and Back Part of the Head were of a dark brown Colour; the Bill long and hooked at the End, of a Red or Saffron Colour, with a broad stripe of Lead Colour in the Middle round the upper and under Mandible; on the Base of its Bill grew two broad flat scalloped Caruncles of an Orange Colour. The Irides of the Eyes white, circled round with Scarlet; the Ruff was thick set with soft long downy Feathers of an Ash Colour; the Back and covert Feathers of the Wings were of pale buff Colour, the quill Feathers black; the Craw was of a flesh Colour, and bare of Feathers hanging down like a Bag on

the Breast; the Breast, Belly, and Thighs white; the Tail was composed of twelve white Feathers tipt almost half way with black. The Legs and Feet were of a yellowish flesh Colour; the Claws black; its Food was raw Flesh. Those who were his Keepers called him the King of the *Vavows*, or King of the Vultures. He was brought by a *Dutch Ship from Pallampank in the East-Indies*. I believe it to be some-what like that Bird which Mr. *Willoughby* describes by the Name of *Uruba* or the *Brasil Vulture* Pag. 68 of his *Ornithology*."

Albin's (1734) hand-colored painting (see Figure 2) followed the verbal description closely, but appears likely somewhat faded in the example presented here, reproduced from the collections of the U.S. National Museum. Albin's bird could well have been the same species as Bartram's (see Table 1). There are no major



Figure 2. Eleazar Albin's (1734) painting of the Warwovwen or Indian Vulture was a hand-colored rendition of a captive vulture at Charing-Cross, England, that was of uncertain geographic origin, but presumably came from somewhere in the New World. Described details of this bird, including tail color, provide a close match to Bartram's (1791) Painted Vulture description, although the colors in this print, reproduced from a copy in the U.S. National Museum, may not fully or accurately reflect their original appearance.

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discrepancies between the two birds as described and illustrated, although each description considered some features not detailed in the other. Furthermore, the fact that both authors described birds with largely white tails makes it relatively unlikely that either was simply viewing a leucistic King Vulture. Bartram reported seeing multiple individuals of his Painted Vulture, and it seems reasonable to assume that he would have noticed and mentioned if any lacked white tails. His alternative reference to the species as the "White-tailed Vulture" (see Bartram, 1791, p. 289) suggests that white tail color was one of the most obvious and consistent characteristics of the species in the field.

A detailed description and illustration of a captive vulture in the collection of Hans Sloane of England by George Edwards (1743, vol. 1, p. 2, pl. 2) may also have been unknown to Bartram. Edwards' vulture appears to have been a typical King Vulture with a dark brown tail (he called it black) and was the primary model for Linnaeus' (1758) description, although where the bird had been captured was unclear, just as in the case of Albin's (1734) "Warwovwen." Edwards' (1743) description and illustration of the "King of the Vultures" conformed closely to Albin's description, but differed with respect to the tail and crop:

"the Tail is wholly black; tho' Mr. Albin makes it black only at the End; the Legs and Feet are of a dirty, white Colour, the forward Toes are joined in a little way by a Membrane; the Claws are black, not so great nor crooked as in Eagles.

"This Bird I drew at Sir *Hans Sloane's*, where it lived some Years. I have seen three or four of them; but could discover no such *Crow* of bare Skin as *Albin* has figured. The People who made a *Shew* of the Bird in *London*, told me it was brought from the *East Indies*; tho' I believe it rather to come from the *West*. I have seen an old *Dutch* Print of the Bird, very incorrect intitled *Rex Warwouwarum, ex India Occidentali*. Mr. *Perry*. A great Dealer in foreign Birds and Beasts, has assured me these Birds are brought only from *America*. *Albin* supposes it to be like the *Brazilian Vulture*, called *Urubu, Willoughby*, p. 68, tho' it differs widely from that, which is no other than the *Turkey Buzzard*, described in *Catesby's History of Carolina*. Had Mr. *Albin*

been tolerably correct in his Figure of the Bird, I should not have published a second Draught."

Edwards' (1734) assumption that he and Albin (1734) had described and illustrated the same species of bird led to his conclusion that Albin erred in his representation of the tail and *crop* (crop). Nevertheless, Albin's written description of the tail is a good match for that of Bartram (1791), as is the visible *crop* of Albin's bird, suggesting that Albin may have described his bird accurately, and that his bird may not have been the same species as described by Edwards, although closely related.

Further, although it was evidently unknown to Edwards (1743), a naked *crop* is also conspicuous in typical King Vultures when filled with food. It shows up well in photographs taken of wild King Vultures overhead in Brazil, Guyana, and Guatemala (NFRS, unpubl. data). It is also conspicuous in a very handsome painting of a typical black-tailed King Vulture, evidently another captive, that hangs in the *Belvedere* in Vienna and was created in 1723 by Philip Ferdinand de Hamilton. That painting and other early European paintings or drawings of birds resembling the King Vulture (in addition to Albin, 1734 and Edwards, 1743) are listed in the Appendix. Tail color is unclear in most of the illustrations listed, and we do not know which illustration may be the old "very incorrect" Dutch print of the bird described by Edwards. Albin's (1734) name *Warwovwen*, given alternatively as *Rex Warwouwarum ex India Occidentali* by Edwards (1743), is of uncertain origin, but may bear some relationship to *Wouwouwen*, an early Dutch name for East Indian monkeys, or to the *Warou*, a native tribe of the *Guianas* (Rudd Vlek, Amsterdam, in litt.).

A comparison of the most prominent characteristics of Bartram's Painted Vulture, Albin's *Warwovwen*, the King Vulture across its range, and a typical Northern *Caracara* from Florida (Table 1) reveals the close similarity of the Painted Vulture to the *Warwovwen* and King Vulture. Aside from tail color, the verbal descriptions that have been offered of these birds differ only in subtle features of the softparts and bill color, traits that are intraspecifically variable in New World vultures (e.g., Snyder & Schmitt, 2002; for sex, age, and seasonal variations in naked head color of California *Condors*, and for variable leg coloration in King Vul-

tures, see Harper, 1936; Herklots, 1961, Haverschmidt, 1968; Howell & Webb, 1995; and Ridgely & Greenfield, 2001). Some of this variation appears to result simply from short-term fluctuations in mood. One race of the Turkey Vulture in Peru is known to rapidly change its head color from scarlet to white and back again in interactions around carcasses (photograph in Snyder & Snyder, 2006, p. 43). Much of the variation in leg color in cathartid vultures is the result of urohydrolysis; in hot weather they drench their legs with excrement as a cooling mechanism, and this dries into a white coating of uric acid crystals. The legs of King Vulture specimens free of dried excrement generally have a mottled black and yellow scaling.

One potentially significant difference is that Bartram failed to describe a dark belt around the bill of the Painted Vulture — a belt that was described for the Warwovwen (Albin, 1734) and is typical for the King Vulture. We believe this difference may not be of any real importance, as Bartram's only description of bill color is found in his *Report to Dr. John Fothergill* (1773–1774), which is so telegraphic in detail that description of a dark belt to the bill may simply have been omitted. Indeed, there is not even a description of tail color in this account. Here we note incidentally that the absence of a tail description in this account led Harper (1936) to speculate that Bartram may have neglected to record tail color in his field notes and later misremembered it — something that is not supported by other evidence to be discussed below. Unfortunately, the whereabouts of Bartram's journal is unknown today, although it seems quite clear that he kept one (see Bartram, 1791, p. 124; Hallock & Hoffman, 2010, p. 323).

The subtle variations described in soft part and bill coloration among the Painted Vulture, Warwovwen, and King Vulture fit within levels of observed and expected intraspecific variability. In most features of feather coloration, the Painted Vulture, Warwovwen, and King Vulture show no obvious major differences. Nevertheless, a striking difference in tail coloration sets the King Vulture apart from both the Painted Vulture and the Warwovwen, and a similarity in tail coloration descriptions could well link the Painted Vulture and Warwovwen as a single species, although as we shall see, the width of the terminal tail band apparently differed in the two birds. The Northern Caracara shares



Figure 3. A painting by Narca Moore-Craig illustrates Painted Vultures assembling at a Florida fire to consume roasted lizards and snakes, as described by Bartram (1791). Details of coloration incorporate all of Bartram's descriptive materials, but for features left undescribed by Bartram, such as color of the neck ruff, presence of a red eye-ring, and presence of a dark belt encircling the base of the bill, the painting incorporates characteristics described in Albin's (1734) Warwovwen and also known to be present in King Vultures, presumably making the painting as close to the actual Painted Vulture as possible. The width of the terminal dark band to the tail reflects the feathers in Bartram's portrait of Mico Chlucco, rather than Albin's portrait of the Warwovwen, on the assumption that the former were indeed tail feathers of his described Painted Vulture.

very few characteristics with the other three birds in Table 1, and although it has some partial similarity in tail color to the Painted Vulture and Warwovwen, this resemblance is marred by the many transverse dark bands across the white portion of its tail.

To visualize the probable appearance of the Painted Vulture, we offer an illustration of individuals gathering at a fire to feed on roasted reptiles, as described by Bartram (see Figure 3). This painting, by Narca Moore-Craig, follows Bartram's (1791) account closely, and has incorporated a few details from Albin's (1734)

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Warwovwen that were lacking in Bartram's account, including a dark belt around the base of the bill.

The close match of Albin's Warwovwen to Bartram's Painted Vulture gives very suggestive corroboration of the validity of Bartram's bird, provided that these two accounts were independent of each other. If both naturalists had been viewing typical King Vultures, it seems almost inconceivable that both would have independently described the dark tail color of this species as white with a dark brown or black tip. Much more believable is that they were both describing the actual tail color of birds that were not typical King Vultures, but belonged to a distinctly different, yet closely related, species or subspecies. Nevertheless, Edwards (1743) accused Albin (1734) of a tail-color mistake, as did Harper (1936), claiming also that Bartram (1791) had made the same error. Neither Edwards nor Harper evidently gave weight to the alternative possibility that more than one taxon might exist. Yet, it seems quite possible that Bartram and Albin were no less accurate in their tail color descriptions than was Edwards.

Both Albin (1734) and Bartram (1791) evidently viewed their birds at very close range, and both reported features that could not have been detected at any substantial distance, making it unlikely that they were mistaken in gross features such as tail color. For example, Albin (1734) reported 12 tail feathers for his Warwovwen (the correct number for a King Vulture, although 12 is also the number found in many large raptors), but it is doubtful he could have made this count without very close observation, if not handling, of the bird. His illustration (see Figure 2) and description of the Warwovwen's tail ("twelve white Feathers tipt almost half way with black") are much too clear and specific for him to have confused white tail coverts with the bases of the feathers — a suggestion offered by Harper (1936) for both Bartram's (1791) and Albin's (1734) tail descriptions.

Nevertheless, it could be argued that Bartram (1791) based his Painted Vulture description on Albin's (1734) Warwovwen and ignored or was unaware of Edwards' (1743) rejection of parts of that description. If so, the similarity of the tail descriptions in Albin's and Bartram's accounts would not have the same powerful implications. However, this hypothesis contradicts Bartram's claim that he was describ-

ing a bird "not mentioned in history" (1791, p. 148) and seems fundamentally undermined by subtle differences between Bartram's and Albin's descriptions, especially by the fact that Bartram described multiple characteristics of his bird (e.g., wingspread, importance to native Americans, diet, and behavior at fires) that were not mentioned by either Albin (1734) or Edwards (1743). That Bartram might have invented his detailed description of diet and flocking behavior, having not actually observed these matters, is difficult to accept. Even if Bartram had known of Albin's description (an awareness that seems unlikely but is impossible to fully exclude), it seems probable that he saw and closely examined a very similar bird.

We agree with Cassin's (1856) and Harper's (1936) assessments of Bartram's integrity and believe that it would have been out of character for Bartram to have known of the description of Albin and then to have presented his description as new. By all accounts, Bartram was an exceedingly generous individual hardly obsessed with self-promotion (e.g., Magee, 2007). Had Bartram been familiar with Albin's (1734) description prior to the publication of *Travels...* (1791), he presumably would have recognized the close similarity of Albin's in his own writings. Further, Bartram would also presumably have been aware that any failure on his part to acknowledge preexisting accounts would surely be discovered and have consequences for his reputation.

Bartram evidently had access to Linnaeus' *Systema Naturae* and could have seen the description of the King Vulture (based on Edwards' 1743 description) in the 10th edition of 1758 and subsequent editions. There is no mention, however, of Albin's name in the surviving correspondence of either William Bartram or his father, and no evidence of a copy of Albin's book in the possession of the Bartrams or in major libraries accessible to the Bartrams (see the 1807 *Catalogue of the Books, Belonging to the Library Company of Philadelphia*, printed by Bartram & Reynolds, Philadelphia; and the 1837 *Catalogue of the Books Belonging to the Loganian Library*, printed by C. Sherman & Co., Philadelphia). Although the Bartrams were known to have copies of some of the volumes published by George Edwards (William contributed to some of the plates in the last volumes), it is unclear whether prior to describing the Painted Vulture, William ever saw

Edwards' first volume of 1743, which contained the King Vulture description (see Harper 1936, p. 387). Thus, available facts and logic suggest that Bartram may well have been unaware of both Albin's (1734) and Edwards' (1743) descriptions. If so, the close similarity of Albin's tail description to that of Bartram provides important independent support to Bartram's description.

Bartram's Illustration of a White-tailed Buzzard

Additional support for the tail color of Bartram's vulture is provided in a letter of Peter Collinson of England addressed to William Bartram, dated July 28, 1767. In this letter, Collinson commented on a series of illustrations that Bartram had sent him, probably in late 1766 or early 1767, which appeared to indicate that Bartram had made a painting or drawing of a "White-tail'd Buzzard" on the trip to Florida that he had taken with his father in 1765–1766 or shortly thereafter, and long preceding his solo Florida explorations of the early 1770s and the publication of his *Travels...* in 1791. Unfortunately, Bartram's side of the correspondence with Collinson is missing, but in a list of comments on the various illustrations, Collinson's letter briefly refers to the illustration in question (which apparently has been lost) as follows (see full letter in Hallock & Hoffman 2010, p. 67):

"The White Tail'd Buzzard I think is figur'd by [Edwards] of thy procureing, a Species unknown before.—"

No other remarks on this illustration precede or follow this comment. Bartram, of course, similarly described his Painted Vulture as having a largely white tail, and from the common reference to vultures as "buzzards" in that era (Bartram often referred to the Turkey Vulture as the Turkey Buzzard) and from Collinson's remarks referring to "Edwards" and "a species unknown before," it seems probable that the "White Tail'd Buzzard" was indeed the same bird as Bartram's Painted Vulture. Here it is important to note that Bartram included no mention of a White-tailed Buzzard or Vulture differentiated from his *Vultur sacra* in the encyclopedic list of avian species he presented in *Travels...* (1791, pp. 289–296).

Nevertheless, it is not entirely clear how to interpret Collinson's terse remarks. For us, the most likely

interpretation is that Bartram had remarked to Collinson that his White Tail'd Buzzard illustration might represent a new species, and Collinson was responding that he thought he recognized Bartram's bird as one he had seen illustrated or described before. In particular, he may have seen Albin's (1734) Warwovwen painting but mistakenly remembered it as by Edwards (1743). The phrase "of thy procureing" may also indicate a mistaken belief that the bird illustrated by Albin or Edwards may have been supplied by Bartram himself. However, this phrase may alternatively have referred to Bartram's own illustration of the White-tailed Buzzard from the specimen that he himself had procured, which would seem to mean that it was likely the vulture that he mentioned procureing in his *Report to Dr. John Fothergill* (see Bartram & Harper, 1943, vol. 2, p.165).

Whether Bartram ever responded to or followed up on Collinson's remarks is unknown. Also unknown is whether the illustration was ever returned to Bartram or whether it may still exist. At least one of the illustrations mentioned by Collinson in his letter does still exist.

In any event, the existence of Bartram's illustration of a White Tail'd Buzzard in 1767, assuming it was based on his Painted Vulture, raises uncertainties as to whether he met this bird during his Florida trip of the 1770s (as has been widely assumed), although it reinforces the assumption that the bird occurred along the St. John's River, as his Florida activities of the 1760s were focused on that region. Bartram (1791) did not give a date for his Painted Vulture observations, but seemingly they could have taken place in the 1760s, or both in the 1760s and the 1770s. Since he evidently made a drawing of the species in the 1760s, this seems the most likely timing for his collecting of a specimen and making notes on characteristics of the species. The early existence of this illustration and its apparent disappearance also give a potential explanation for what has always seemed to us an otherwise puzzling failure of Bartram (1791) to accompany his description of the species with an illustration. Bartram's illustration also calls into question the speculation of Harper (1936) that Bartram may have misremembered the tail coloration of his vulture by the time he published his description in 1791.

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Bartram's Illustration of a Potential Royal Standard

Additional support for a basically white color to the tail of the Painted Vulture comes from Bartram's drawing of a feathered standard in his portrait of Mico Chlucco (sometimes spelled Micco Chlucco or Mico Clucco), the Long Warrior, who was King of the Muscogulges or Cricks (Creeks) and whom Bartram had met on two occasions in Florida (see Figure 1). This portrait, evidently created in 1786, but possibly based on an earlier drawing in his now-lost field notes, served as a basis for the engraving by Trenchard that forms the frontispiece of Bartram's *Travels...* (1791) — see Hallock & Hoffman (2010, p. 155). Bartram's illustration depicts a fan of eight feathers attached to a wand that seems likely to be a royal or imperial standard, and may indeed represent the tail feathers of the Painted Vulture, since they match his described color of tail feathers of that species quite closely and since Bartram consistently identified the feathers in this standard as those of the tail of *Vultur sacra* (Bartram, 1791). Further support for this interpretation comes from his notation (apparently to Trenchard) on the back of this portrait suggesting that the proper number of feathers in the standard would be 12 (matching the King Vulture's tail). Trenchard's engraving does increase the number of feathers from eight, but only to 11, possibly an inadvertent error due to miscounting.

As drawn, the feathers in the portrait are apparently white with compact and well-defined dark tips, a good match to Bartram's description. However, they also have a thin and faint dark transverse band just shy of the dark tips that Bartram did not describe. That this band might just represent incompleteness in his verbal description of the Painted Vulture is one possibility, just as his bill description omitted the dark basal belt typical of King Vultures and the Warwovwen. But as considered below, the band may alternatively represent modification of the feathers of a royal standard by the Muscogulges. The color pattern of the feathers seems quite different from the tail feathers of Northern Caracaras, Bald Eagles, or Golden Eagles (e.g., Clark & Wheeler, 1987 and Wheeler, 2003). The only moderate resemblance to be found among these species is in subadult tail feathers of Bald Eagles, which are largely white and sometimes have diffuse dark tips, but here the dark tips are quite irregular in shape and characteristically extend in longitudinal streaks and spots along the feathers — characteristics not visible in

Bartram's illustration. Also consistently missing from Bald Eagle feathers is the faint transverse band just shy of the dark tips. Thus, the feathers in Bartram's illustration are hard to rationalize as referring accurately to any of these other species.

But neither are they identical to the tail feather pattern of Albin's (1734) Warwovwen, especially in the width of the well-defined terminal dark band. How much significance we should attach to this latter difference is unclear, as we have no information on expected intraspecific variability in width of terminal tail bands in either the Painted Vulture or Warwovwen. In other species such features often exhibit some intraspecific variability, especially due to age and sex. Potentially, but not necessarily, such matters could account for the difference.

A caveat that needs to be considered here is that Bartram (1791) reported that the feathers in royal standards were sometimes modified in appearance by the Muscogulges, specifically by a red zone painted inside the dark tips in the context of battles. Whether the faint transverse band within the dark feather tips in Bartram's illustration might have any relationship to this red zone is speculative, especially as the illustration is monochromatic. So even though the illustration provides a reasonably close match to Bartram's (1791) verbal description of the tail coloration of Painted Vultures, we cannot be certain that the pattern illustrated is a representation of a fully natural Painted Vulture tail, and we must also consider intraspecific variability in the extent of the dark tip. Nevertheless, all available evidence points to a largely white tail with a well-defined dark tip in his Painted Vulture, as he claimed, and there is surely no support in his drawing for claims that his vulture had an all dark-brown (black) tail or a tail with multiple transverse bars closely resembling the tail of a Northern Caracara.

The Stone Bowl from Alabama

Still another piece of evidence that has been suggested to support the validity of a bird that resembled the King Vulture in the southeastern states is a limestone bowl recovered in pieces in 1906 from the prehistoric Moundville archeological site in central Alabama. The bowl has a stone handle resembling the head and neck of a King Vulture — or Painted Vulture — as was suggested to its discoverer, Clarence Moore,

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by Witmer Stone (Knight, 1996). We believe that identification of species on such artifacts should be made with considerable caution, but at the same time we know of no contemporary bird species of this region that exhibits both a clearly vulturine or raptorial beak shape together with a projection of the forehead that could be a representation of the fleshy lappets of a King or Painted Vulture (see Figure 4). Nevertheless, it must be acknowledged that the forehead projection on the bowl handle lies somewhat posterior of the position of lappets on a King Vulture's head, and the curvature of the bill might have been exaggerated, to allow an efficient contact of the handle with the bowl and gripping space for fingers on the handle.

Alternatively, the conical shape and position of the forehead projection on the bowl is reminiscent of the fleshy forehead projection (snood) of female and unaroused male Wild Turkeys (*Meleagris gallopavo*) (Steponaitis & Knight, 2004). The Wild Turkey also has a distinctly downcurved bill, though not as hooked as the bill on the bowl. In addition, a worm-like structure descending from the bird's neck inscribed on the bottom of the bowl much resembles the feathered "beard"

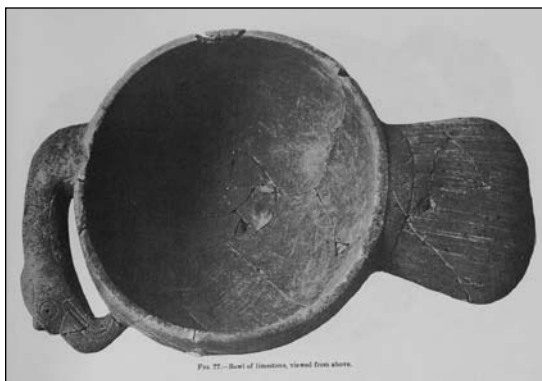


Fig. 77.—Bowl of limestone, viewed from above.

Figure 4. As reproduced from a photograph in Knight (1996), a limestone bowl recovered from the Moundville prehistoric site in central Alabama in 1906 has a handle resembling the head and neck of a King (or Painted) Vulture, as suggested by Witmer Stone. A projection from the bird's forehead could represent the lappets of this species. Although somewhat posterior to the usual position of these structures, this projection might have been more extensive and extended farther forward in the original bowl. Alternatively, and perhaps more likely, the projection could have been a representation of the forehead snood of a Wild Turkey, as suggested by Steponaitis and Knight (2004). Supporting this interpretation is the existence of an incised worm-like structure on the underside of the bowl resembling the feathered beard of a Wild Turkey.

appendage of a male Wild Turkey (but is also often found in females). No spurs are visible on the bird's legs inscribed on the bottom of the bowl (spurs might be expected for a male Wild Turkey, but not for a female turkey or King Vulture). Finally, the rectrices inscribed on the top surface of the handle opposite to the bird's head appear to be far fewer than the 18 found on a turkey's tail and at least approach the 12 appropriate for a King Vulture, although they are hard to count.

Thus 'Wild Turkey' seems to fit the bowl better than 'King Vulture', but neither gives a perfect fit to all of its features. As such, we consider the bowl to provide only very questionable evidence for historic presence of King Vultures in the region. Steponaitis and Knight (2004) considered the bird represented on the bowl to be supernatural because of inscribed features on the neck and legs that "iconographically mark serpents," and suggested that the geographic source of the limestone from which the bowl was made was unknown.

DuPratz's White Eagle

Harper (1936) mentioned another early account that may provide support for the presence of a bird resembling a King Vulture in the southeastern states: a description by DuPratz (1758, vol. 2, p. 109) of a "White Eagle" in Louisiana:

"...being almost entirely white, and having only the extremity of its quills black. As it is rather rare, that is a second reason for making it prized among the natives, who pay a high price for the wing quills as an adornment of the symbol of peace. This is the fan of which I spoke in describing the pipe of peace."

In calling this bird a "White Eagle" we believe that DuPratz (1758) was referring to a large and mostly white raptor or vulture with a bill hooked at the tip, though he made no specific mention of a hooked bill. There is no largely white and hook-billed bird with any black coloration to its wing or tail quills that is known or has been described for the region in question, except the American White Pelican (*Pelicanus erythrorhynchos*). The hook at the tip of the White Pelican's bill, however, is quite inconspicuous, while the rest of the huge pouched bill of this species, quite unlike the bill of any eagle, dominates the appearance of the species, making it questionable that anyone might refer to this

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bird as a White Eagle. Further, the White Pelican continues to be a relatively common and densely social wintering bird in the region (Lowery, 1974), not a rare species as described by DuPratz (1758).

The tail coloration of DuPratz's (1758) bird was not specified clearly. His reference to the "extremity of the quills black" could possibly have applied to the tail feathers in particular, and not to the wing quills as well. Bartram's vulture had black-tipped tail quills and fully black wing quills, and we know of no largely white species with black coloration limited to the tips of both wing and tail quills. If DuPratz (1743) was referring to the same species as Bartram, a possibility at least consistent with Bartram's (1791, p. 454) identical reference to his *Vultur sacra* as a "White Eagle," it is important to note that both authors described exploitation of the species for its feathers (although for different feathers), which may have been a factor in the putative disappearance of the species. Overall we find the evidence provided by DuPratz's (1743) "White Eagle" to be intriguing, but flawed and less than compelling.

The Search for King Vulture Fossils and for Extant Royal Standards

Truly strong evidence for Bartram's Painted Vulture would come with the discovery of *Sarcoramphus* fossils in the southeastern states. So far this has not occurred, although fossil bones of Black Vultures and Turkey Vultures have been found with some frequency (see Emslie, 1998). Even condor (*Gymnogyps*) fossils are known for Pleistocene times in Florida. However, extremely few *Sarcoramphus* fossils have ever been found anywhere in the range of the King Vulture throughout Central and most of South America, possibly because this species has never been abundant anywhere. Accordingly, the absence as yet of such fossils from Florida cannot be taken as strong evidence against former presence of Painted Vultures. Such bones may eventually be found.

So far, we have also failed to locate any extant royal standards of the Muscogulges in museum collections. Should any still exist, their feathers could be directly examined for color patterns and directly tested for King Vulture DNA. Although the Muscogulges were known to sometimes alter the color patterns of ceremonial feathers, such alterations might be detectable by sophisticated chemical analyses. However, while

Bartram identified the Painted Vulture as a source of the royal standards of the Muscogulges, it is worth considering that royal standards, especially for other tribes, might sometimes have involved other species. Indeed, Bartram (1791, pp. 454–455) also mentioned use of tail feathers of the "White Eagle" for royal standards, but here it seems clear in a footnote that this was just another name for his *Vultur sacra*, and was not, for example, an alternative name for the Bald Eagle.

Paintings and descriptions by other sources, however, suggest that at least in certain regions royal standards included the feathers of other bird species. An 18th century painting by William Verelst entitled "James Ogelthorp Presenting the Yamacraw Indians to the Georgia Trustees" in the Winterthur Museum illustrates half-white, half-brown feather standards. These resemble the tail feathers of juvenile Golden Eagles, although they also exhibit a reasonably close resemblance to Albin's (1734) illustration of the tail feathers of the Warwovwen.

Discussion

The hypothesis that the Painted Vulture described by Bartram (1791, pp. 148–150) was a unique species, or subspecies of the King Vulture, that was driven to extinction by the early 19th century, is supported by the following evidence: (1) similarity, save only for tail coloration, of the Painted Vulture to contemporary King Vultures, (2) Albin's (1734) illustration and description of a very similar bird, (3) Collinson's reference to a lost illustration that Bartram made of a "White-tailed Buzzard", (4) extant illustration by Bartram of what appears to be a royal standard comprised of Painted Vulture tail feathers (i.e., white with a dark brown or black tips; Bartram, 1791), (5) Bartram's skillful illustration and accurate description of the Black Vulture. These lines of evidence provide no convincing support for allegations that Bartram's description was of an imaginary or misidentified species. The possibility that the species went extinct because of human activity soon after Bartram observed it seems consistent with his assertions that its foraging strategy made it easy prey for hunters, and that its feathers were valuable in ceremonial contexts. The bird may have already been scarce at the time of Bartram's visits, and many decades passed before detailed ornithological investigations resumed in Florida, so the possibility of early extinction should not be rejected as implausible.

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Surely the simplest and least demeaning explanation for the available historical data on the Painted Vulture is that Albin, Edwards, and Bartram all described their vultures with a high level of accuracy. This is plausible as all three evidently had exemplars that they could view at leisure from very close range (two live captives and one shot bird). There is no reason to suspect insincerity in the writing of these individuals. If all three vulture descriptions were largely accurate, it follows that there were at least two taxa involved that differed in tail color but not significantly in any other visual characteristics.

Why this obvious and reasonable explanation has been so commonly avoided or resisted is puzzling when we know of such color variation in many other closely related species or subspecies and even in different age classes within some species (e.g., Golden Eagles). Of the three species given formal descriptions in the 18th century that closely resemble the King Vulture, we have a probable geographic site of origin for only one — Bartram's Painted Vulture. Florida is not a climatically improbable region to have once hosted a distinctive form of the King Vulture, as the species still occupies some subtropical regions in Brazil and Argentina. Moreover, early disappearance of a Florida population should not be difficult to accept, as King Vulture populations have been notably susceptible to extirpation (e.g., Howell & Webb, 1995, p. 176).

The pervasive opposition to acceptance of the Painted Vulture (see Francis Harper, 1936) can be traced in large measure to the influence of a single individual — J. A. Allen — whose dismissive remarks of 1871 have been repeated in various permutations, but apparently without careful analysis, by ornithologists through the decades. Allen was engaged in an incessant, and sometimes heated, exchange of published views with Elliot Coues over the legitimacy of many of the species mentioned by Bartram, and his treatment of the Painted Vulture was not exceptional to his generally dismissive viewpoint (e.g., Allen 1876; Coues, 1876, 1899).

Regardless of these matters, a close look at Allen's various arguments against the Painted Vulture reveals them all to be facile assertions without firm grounding in either fact or logic — assertions that also presuppose considerable dishonesty or incompetence in Wil-

liam Bartram. Bartram is widely acknowledged to have been one of the most ethical and capable naturalists in our history, and even Allen (1871) paid homage in his introductory remarks to Bartram's reputation for accuracy. Unfortunately, he then proceeded to attempt destruction of that reputation with an argument that today seems quite unconvincing. Surely Allen, from his own studies, was fully aware of geographical variation in birds, so why he resisted the possibility that tail color of King Vultures in Florida might differ from that of King Vultures in other regions is especially difficult to understand. Even more difficult to understand is why some recent ornithologists have repeated Allen's judgments on the validity of Bartram's Painted Vulture without apparently examining for themselves the weakness of his arguments. The persistence of Allen's viewpoint is perhaps one of the best examples we have of the awesome power of tradition and authority in determining conventional wisdom. Prior to Allen's account, Bartram's vulture enjoyed a fair amount of support as a real taxon that was similar, but not identical, to a typical King Vulture, a judgment that still seems the most defensible position today after many rounds of poorly grounded debate.

But surely the most complex and fascinating historical assessment of Bartram's vulture deserving further comment is that of Francis Harper (1936). Harper studied Bartram's writings closely, was generally a strong supporter of Bartram, and was no disciple of Allen, yet he followed Bartram's critics in failing to support the possibility that King Vultures in Florida might differ in tail coloration from those elsewhere. Harper was fully aware of the similarity of Albin's description to Bartram's and the likely independence of these descriptions. But instead of seeing these matters as support for Bartram's tail description, he concluded that both Albin and Bartram were wrong about tail coloration. Evidently he was not troubled by the coincidence that both observers made the very same "errors" in their descriptions, nor by the fact that both should have made very accurate descriptions because they both evidently viewed their birds from very close range. It seems likely that these worrisome features were simply overwhelmed by Harper's reluctance to believe in geographic variation in King Vulture tail coloration. Unfortunately, Harper, like other historic observers, was evidently unaware of the mention of a White-tailed Buzzard in Collinson's letter of 1767, or

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of Bartram's illustration of a probable royal standard made of Painted Vulture tail feathers in his portrait of Mico Chluccho. Had he been cognizant of these matters, his conclusions about the validity of Bartram's description might well have been very similar to those in this paper.

If we accept Bartram's description of *Vultur sacra* as an accurate depiction, the bird could be considered either a distinctive subspecies of the King Vulture or a full species in its own right, presumably in the genus *Sarcoramphus*. The former approach was taken by McAtee ("*Sarcoramphus papa sacra*", 1942) while the latter approach was taken by Cassin (*Sarcoramphus sacer*, 1856). Bartram's own name for the species, *Vultur sacra*, has been disqualified by the International Commission on Zoological Nomenclature (Hemming, 1957) on the grounds that Bartram was not a consistent binomialist. It is not our intent in this paper to delve into the intricacies of nomenclature and provide a proper scientific name for this bird, although we lean toward support of full species status, rather than subspecies status, in view of the magnitude of the tail coloration difference from the King Vulture. Many populations formerly considered subspecies have been promoted to full species status in recent years, largely on genetic grounds rather than on any grounds of potential reproductive incompatibility. For the Painted Vulture's relationship to typical King Vultures, neither genetic information nor information on potential reproductive incompatibility is available, thus such a decision becomes almost completely arbitrary.

Failure to recognize Bartram's Painted Vulture as either a distinct species closely allied to, or a subspecies of, the King Vulture would be to ignore the probable existence of one of the most interesting birds in the historic avifauna of our country, to say nothing of perpetuating a sorry history of unconvincing criticism of both Eleazar Albin and William Bartram. Neither of these gentlemen had an opportunity to defend their descriptions from later criticism, an unsatisfactory situation we hope the present paper together with Harper's (1936) courageous paper help to correct. Bartram's use of the species name *sacra* evidently referred to the special ceremonial esteem with which the Painted Vulture was regarded by Native Americans, and it seems appropriate, at least provisionally, to accept Bartram's account of the bird's cultural importance. Like other

aspects of his description, it seems doubtful that he invented or imagined such things, although he never presented a full account of such matters, detailing the sources of his information, nor produced a physical specimen.

Only fragmentary information exists on the early range of the Painted Vulture, as Bartram was never very specific about where he encountered it, but the placement of its description in his *Travels...* suggests that it at least occurred along the St. John's River of northeastern Florida, and his description of its gathering at fires in the "vast meadows and savannahs of Florida" in his *Report to John Fothergill* likewise suggests northern Florida. His reference to use of its feathers by the Muscogulges also leaves open the possibility that it may have occurred in Georgia and Alabama, and the account of DuPratz (1758), assuming he may have been describing the same species, extends the potential range as far west as Louisiana. It was not mentioned by Lawson (1709) or Catesby (1731–1743) so one suspects that at least by these dates it may not have ranged as far north as the Carolinas and Virginia, which were the bases of their explorations. But if it reached Louisiana, it may well have also occurred in similar habitat of coastal Texas and Mississippi. The species was presumably absent from all these regions by the early 19th century.

Concluding Remarks

Bartram was famed for his accuracy in describing many new species of plants and animals, and his *Travels...* (1791) is today valued both for its natural history studies and for its descriptions of early Native American societies. As a mentor for Alexander Wilson, he can well be considered the Grandfather or Godfather of American Ornithology. His contributions to botany were even more impressive. But to close, it is relevant to mention the warmly positive review of Bartram's herpetological contributions by Kraig Adler (2004) and to quote a passage written in a completely nonvulturine context by the late Archie Carr (1994, p. 58), perhaps Florida's best known and most respected herpetologist.

"Long ago...I decided that looking for fabrication in Bartram's reportage is unrewarding. Once in a while he misinterpreted, but he almost never misobserved."

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For stimulating and guiding our research on Bartram's Painted Vulture, we gratefully acknowledge the central importance of Francis Harper, whose study of 1936 first revealed many of the threads important to analyzing the validity of the taxon. Harper's efforts to study and elucidate the contributions of William Bartram, together with his importance in efforts to preserve the Okefenokee Swamp in Georgia, constitute a unique and impressive legacy. We thank Narca Moore-Craig of Portal, Arizona for the vivid painting of Painted Vultures gathering at a Florida fire, and the Cullman Library of the Smithsonian's Natural History Museum in Washington, D.C. for use of Albin's 1734 plate of his Warwovwen. For reproduction of William Bartram's original drawing of Mico Chlucco, we thank the American Philosophical Society in Philadelphia, and for use of the photograph of the limestone bowl found by Clarence Moore at the Moundville Archeological site in Alabama, we thank the University of Alabama Press. Leslie Overstreet and Daria Wingreen-Mason of the Cullman Library were very helpful in locating relevant historical documents, as was Kathryn Braund of Auburn University in matters dealing with royal standards of the Seminoles, Creeks, and Muscogulges. Rick Wright and Storrs Olson kindly pointed us toward several early paintings of King Vultures we had not previously seen, and Rudd Vlek was the source of data on early Dutch paintings of King Vultures given in the Appendix and of derivation of the name Warwovwen. For helpful comments on our research, we thank Narca Moore-Craig, Gary Graves, Storrs Olson, Peter Warshall, and Steve Emslie. Bio-

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Appendix

Early European paintings of King Vulture-like birds other than those of Albin (1734) and Edwards (1743):

- 1723 oil painting of Philipp Ferdinand de Hamilton of Four Vultures of Different Species, Inventory number 4208, Belvedere, Vienna, Austria. Link to the image: digital.belvedere.at/emuseum/media/view/Objects/3002/1286?t:state:flow=700cc6bd-976a-43ed-a236-080ed2952842
- Nine drawings of a King Vulture in the menagerie of Blaauw Jan in Amsterdam, circa 1700, by Jan Velten. See booklet by Florence Pieters (1998): *Wonderen der Natuur*. ETI/Artis Library University of Amsterdam.
- Two paintings of a King Vulture with other birds by Jan Weenix, circa 1702. One is in the National Gallery of Ireland in Dublin; the other is in the Szepmuveszeti Muzeum, Budapest. Paintings potentially of the same captive bird as in the preceding entry.
- Two 1758 watercolor drawings of a bird in the menagerie of Stadholder in The Hague by Aert Schoumann.

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