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A PRELIMINARY INVENTORY OF NATIONAL PARK SERVICE PALEONTOLOGICAL RESOURCES IN CULTURAL RESOURCE CONTEXTS, PART 1: GENERAL OVERVIEW

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Abstract—At least 180 National Park Service areas preserve paleontological resources. While most of these fossils are found *in situ*, some are "exposed" in cultural resource contexts. This paper serves as the first in a series that, together, will form a preliminary inventory of National Park Service fossils found in cultural resource contexts. These contexts include archeological resources, ethnographic stories and legends, prehistoric and historic structures and other documented historical occurrences. Fossils are found as tools, jewelry or other spiritual items in National Park Service archeological sites. Ethnographic stories and legends told by American Indians and "mountain men" of the American West also incorporate fossils found within areas now administered by the National Park Service. Many building stones found in prehistoric and historic structures of the National Park Service display fossils including body fossils, trace fossils and petrified wood. In addition, various archives, journals, memoirs and photographs include numerous other historical accounts of fossils in areas of the National Park Service. This paper introduces the concept for an inventory of such occurrences, highlights a few examples and aims to encourage park staff and researchers to view paleontological resources with regards to the cultural resource contexts where they may occur.

INTRODUCTION

Inventory efforts throughout the National Park Service (NPS) currently identify at least 180 NPS areas known to preserve paleontological resources. Increased awareness of paleontological resources has broadened awareness of the contexts in which those resources are found. Most NPS fossils are found *in situ* in the exposed bedrock of a park. However, fossils found in some parks are not found *in situ*, but "exposed" in a variety of cultural resource contexts. Fossils, or references to them, are found in archeological sites, ethnographic stories and legends, prehistoric and historic structures and other documented historic occurrences.

This paper, as a general overview, is the first in a series that will form a preliminary inventory of such paleontological resources found in cultural resource contexts throughout the NPS. This effort is very much a work in progress. With this paper we aim to summarize the various cultural resource contexts that include fossils, highlight a small cross section of known examples and promote interest and awareness of such occurrences. Future papers will delve deeper into the subject and present additional examples. We encourage paleontologists, archeologists, historians and other park personnel to see how the stories told in their park's paleontology, archeology and history intertwine. As awareness of paleontological resources grows throughout the NPS, and other land management agencies, so too will an appreciation for those fossils found in cultural resource contexts.

CULTURAL RESOURCE CATEGORIES

As outlined in the 2001 NPS Management Policies, cultural resources in the National Park Service are broadly categorized as: archeological resources, cultural landscapes, ethnographic resources, historic and prehistoric structures and museum collections. Fossils are found in all of these cultural resource categories, however, not all are applicable to the current discussion. For instance, cultural landscapes include primarily large-scale physical attributes, biotic systems and viewsheds. As such, they are not typically relevant to discussions on paleontological resources. Also, while many parks have paleontological specimens in their museum collections, a separate discussion on them is generally beyond the scope of this inventory. In addition to archeological resources, ethnographic resources and prehistoric and historic structures, we will also consider other historically significant occurrences of fossils within NPS areas. Such occurrences are found in historical archives or other documents such as journals, memoirs or photographs.

ARCHEOLOGICAL RESOURCES

As defined by the NPS Archeology Program, archeological resources are any physical evidences of past human activity at least 100 years old. This includes artifacts such as tools, pottery, jewelry or spiritual objects. Human interest in paleontological resources is not a recent phenomenon. Many American Indians utilized fossils as tools or incorporated them into spiritual objects or jewelry. Examples date back a few hundred to thousands of years. Several NPS areas preserve such resources, including those below.

Petrified Forest National Park, Arizona (PEFO)

In a "textbook" example of a paleontological resource recognized as a cultural resource, archeologists at Petrified Forest National Park uncovered projectile points (arrowheads) fashioned from the park's namesake Triassic petrified wood (primarily *Araucarioxylon arizonicum*) (Fig. 1). Mayor (2005, p. 159) reported that John Wesley Powell visited what

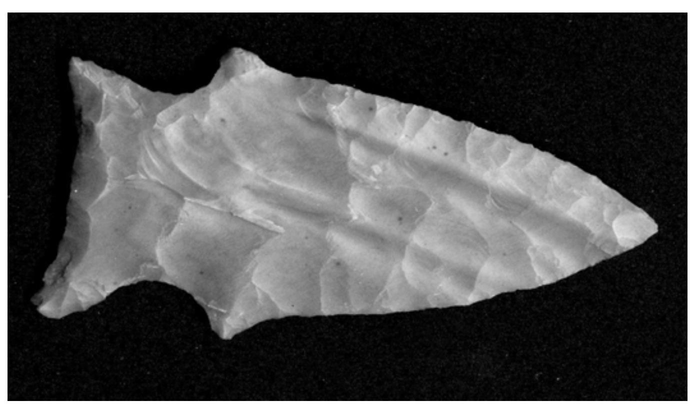

FIGURE 1. Petrified wood shaped into a projectile point, Petrified Forest National Park, Arizona. Size of projectile: 5.75 cm x 3.2 cm. NPS Photo/T. Scott Williams.

is now PEFO in the late 19th century and observed American Indians chipping arrowheads and axes from the petrified wood.

George Washington Birthplace National Monuent, Virginia (GEWA)

Fossil sharks teeth, typical of the Miocene Calvert Formation, have been found within the park in direct association with shell middens dating back to the Late Archaic (5,000-3,200 years before present, ybp), Middle Woodland (2,500-1,100 ybp) and Late Woodland (1,100-400 ybp) periods. The serrated sharks teeth (one tentatively identified as a snaggletooth shark) are up to about one inch in length and are still quite sharp. Their association with the shell middens is thought to suggest their use as "scrapers" for removing meat from the bivalves, although there is not yet definitive evidence of this practice. (R. Morawe, personal commun., 2003, 2005).

Grand Canyon National Park, Arizona (GRCA)

The many rock shelters, alcoves and caves within Grand Canyon National Park contain exceptionally well-preserved archeological resources. Occasionally these archeological resources are associated with much older paleontological resources. For example, some cairns include packrat middens, probably of Late Pleistocene age (Emslie et al., 1987; Santucci et al., 2001). A number of the well-known split-twig figurines found within the park have dung pellets (potentially from the bighorn sheep, *Ovis canadensis*) wrapped inside of them (Emslie et al., 1987, 1995). Apparently, some GRCA caves with abundant paleontological resources seemed to attract prehistoric peoples. In turn, these peoples left offerings of split twig figures and grass bundles (Mayor 2005, p. 163 referencing Paul Martin).

Hopewell Culture National Historical Park, Ohio (HOCU)

Sharks teeth and other fossils discovered in the mortuary offerings of American Indians in Ohio, date back approximately 2000 years (M. Lynott, personal commun., 2005). Museum collections at HOCU include 13 shark teeth that, according to their catalog description, may have originally been part of a necklace (J. Pederson, personal commun., 2005). Further investigation may identify the age of the sharks teeth and their original source, as well as their connection to the Hopewell Indians.

ETHNOGRAPHIC STORIES AND LEGENDS

According to current NPS Management Policies (2001), a park's ethnographic resources are the cultural and natural features of a park that are of traditional significance to traditionally associated peoples. In the context of this paper, we are interested in those stories and legends that mention paleontological resources associated with NPS areas. While paleontologists generally focus on the scientific significance of specimens, ethnographic stories and legends, primarily told by American Indians, offer a unique perspective into the traditional cultural or spiritual significance of fossils. Such cultural or spiritual significance can be above and beyond any associated scientific significance. Adrienne Mayor's (2005) recently published book describes many such stories and legends throughout the country. A number of these legends are tied either directly or indirectly with fossils found in NPS areas, especially in the Great Plains and Southwest. In addition to the stories of the American Indians, the "mountain men" of the American West also told stories of fantastic landscapes and natural features before the subsequent scientific surveys of the West in the late 1800s. Their frequently colorful descriptions occasionally mention fossils, including some found within NPS areas. Ethnographic stories and legends present exceptional interpretive opportunities as they illustrate direct human connections with paleontological resources. Below is a sample of ethnographic stories and legends connected with NPS paleontological resources

Big Bend National Park, Texas (BIBE)

The largest known flying creature was the pterosaur *Quetzalcoatlus northropi*, with an estimated 11 meter wingspan. *Quetzalcoatlus* was originally described from a specimen discovered in BIBE (Lawson, 1975). The pterosaur is named after the Aztec Feathered Serpent god Quetzalcoatl. Similar fossils have been found in the traditional Aztec homeland in northern Mexico and the southwest United States. The bones of this giant pterosaur may have influenced the image of mythic figures such as Quetzalcoatl although there is currently no definitive evidence of such a connection (Mayor, 2005).

Agate Fossil Beds National Monument, Nebraska (AGFO)

Agate Fossil Beds National Monument was originally authorized in 1965 to preserve the abundant and diverse fossils found primarily in the Miocene Marsland and Harrison formations (Kiver and Harris, 1999). The Miocene mammalian fossils from the monument include bones of *Menoceras* (rhinoceros), *Moropus* (chalicothere), *Daphoenodon* (beardog), *Dinohyus* (pig-like scavenger) and *Stenomylus* (gazelle-like ungulate) among many other genera (National Park Service, 1980). Paleontologists recognized the significance of the site in the early 1900s and collected hundreds of specimens from localities known as Carnegie and University Hills (National Park Service, 1980). The Lakota Sioux, however, know those localities as A'bekiya Wama'kaskan s'e ("Animal Bones Brutally Scattered About") (Mayor, 2005). As reported by Mayor (2005) these bones found at Agate Springs were considered "bad medicine" originating from the malevolent Unktehi monsters. Conversely, the fossils of the beaver *Paleocastor* and its distinctive spiral burrow, *Daemonelix,* were thought to protect people from the "evil" fossils. According to the Lakota legend, the beaver volunteered to sacrifice themselves, becoming stone to offset the "bad medicine" of the Unktehi bones (Mayor, 2005). A traditional buffalo hide wintercount calendar is on display in the park's Visitor Center and includes a number of paleontology-related pictographs. The wintercount was created in 1997 by a Lakota artist working with park staff and is a modern attempt to link the fossil resources and American Indian cultural resource collection of AGFO through a traditional Indian method of recording history (M. Hertig, personal commun., 2006).

Yellowstone National Park, Wyoming, Idaho, Montana (YELL)

Jim Bridger is one of the better known and colorful mountain men. Although his "tall tales", particularly of the area that would become Yellowstone National Park, were embellished over the years, they are generally based in genuine observations. Haines (1974) recounts a mid-late 1800s exchange (originally published in Miles, 1897, p. 137) between General Nelson A. Miles and Jim Bridger. Miles tells Bridger of the "great trees with limbs and bark all turned to stone" he saw when visiting what would become Petrified Forest National Park. Bridger responded "O, that's peetrifaction. Come with me to Yellowstone next summer, and I'll show you peetrifed trees a-growing, with peetrified birds on 'em a-signing peetrified songs". According to Haines (1974), Bridger's story may be a rehashing of a story told by fellow mountain man Moses "Black" Harris in 1823. Nevertheless, the petrified forests of Yellowstone National Park include numerous upright *in situ* trees as well as 27 successive layers of fossil forests as summarized by Santucci (1998). The volcaniclastic sediments of the early-middle Eocene Sepulcher and Lamar River Formations of the Absaroka Volcanic Supergroup (Smedes and Protska, 1972) preserve these exceptional paleontological resources.

PREHISTORIC AND HISTORIC STRUCTURES

Throughout the National Park Service are literally tens of thousands of prehistoric and historic structures including American Indian dwellings and structures, visitor centers, lodges, houses, schools, churches, courthouses, stores, factories and mills, monuments and memorials, tunnels and roads, dams, bridges, military facilities and innumerable outbuildings and other structures. Many of these structures are constructed, faced or ornamented with natural stone either found locally or imported from other parts of the country or world. Paleontological resources are found in some of these limestones, sandstones, or shales, creating unique occurrences of fossils in at least 19 NPS areas. Six examples of fossils in association with NPS structures are described below. Prehistoric and historic structures therefore are the most common cultural resource to display fossils, and likely the most visible to visitors.

Fossil occurrences in these structures may be a result of happenstance (e.g., suitable local material happened to be fossiliferous) or by design (e.g., a particular fossiliferous stone was desired). Fossils in prehistoric and historic structures include body fossils, petrified wood and trace fossils as summarized below. Body fossils represent actual physical morphological elements of the organism such as shells, bones, teeth and leaves or molds/casts of such parts. For example, limestones, which can be almost entirely composed of body fossils or fragments of marine organisms, are commonly used as building stones. Petrified wood is particularly well suited as a "building stone" due to its aesthetic properties and durability and is highlighted here. Trace fossils, such as burrows, tracks/trackways or coprolites, represent evidence of an organism's activity without preserving any part of the actual organism.

BODY FOSSILS

Lincoln Memorial and Capitol Reflecting Pool, Washington, D.C. (NAMA)

Located at opposite ends of the National Mall, both the Lincoln Memorial (interior walls and columns) and Capitol Reflecting Pool (border stones and steps) were constructed with the extraordinarily fossiliferous Mississippian Salem Limestone. This rock is commonly referred to by the trade name Indiana Limestone. Indiana Limestone is an extensively quarried building stone (Patton and Carr, 1982) utilized in numerous buildings across the United States including the Pentagon, the Department of the Interior building and dozens of other federal buildings in Washington, D.C. The Empire State Building in New York City is also constructed with Indiana Limestone. Nearly 190 species have been identified in the Salem Limestone of Indiana including: foraminifera, sponges, coral, bryozoans, brachiopods, bivalves, gastropods, cephalopods, ostracods, crinoids and fish, all indicative of a shallow water environment (Cumings et al., 1906). At the Lincoln Memorial and the Capitol Reflecting Pool, fragmented corals, crinoid columnals, bryozoan fronds and mollusk shells are easily visible. At the Capitol Reflecting Pool, the surrounding limestone matrix weathers away more rapidly than the fossils, creating a unique surface relief where the fossils appear to be coming out of the rock (Fig. 2).

Castillo de San Marcos National Monument, Florida (CASA)

The walls of Castillo de San Marcos, completed in 1695, were constructed of coquina from the Pleistocene Anastasia Formation (Schroeder and Klein, 1954). The coquina was quarried on Anastasia Island, now part of Anastasia State Park. The park actively interprets the coquina quarries (Florida State Parks, 2006). The clam *Donax variabilis* is the primary shell of the CASA coquina. The coquina was relatively soft and easy to quarry, and was found to absorb the impact of cannon balls with minimal damage to the walls of the fortification (Florida State Parks, 2006). Coquina (Spanish for "tiny shell"), is geologically defined as "any detrital limestone composed of weakly to moderately cemented broken and abraded shell fragments" (Bates and Jackson, 1984). Interestingly, this general geologic definition of the word coquina originated from the Donacidae family of clams (which includes *D. variabilis*), which are commonly called coquinas. Therefore, the building stones of CASA are literally the archetypal coquina.

TRACE FOSSILS

Gettysburg National Military Park, Pennsylvania (GETT)

Building stones quarried from the Late Triassic-Early Jurassic Gettysburg Formation at the Trostle Quarry (York Springs, Pa. 24 km northeast of GETT) were utilized in the construction of bridges within GETT during the mid 1930s. Fossils are not common within the Gettysburg Formation; however vertebrate trackways, including those of dinosaurs, are known from the formation as first reported by Wanner (1889). Two well-preserved dinosaur tracks are visible in the parapets of one such bridge within the park. These tracks have been identified as *Atreipus milfordensis* and *Anchisauripus sp.* (Santucci and Hunt, 1995; J. Jones, personal commun., 2006; A. Hunt, personal commun., 2006). In 1937, more than 50 additional track-bearing slabs were recovered from the Trostle Quarry (Cleaves 1937). While many of these tracks were interpreted by the park and distributed to various museums by park administration, it is unclear who (aside from the original stone masons) first noticed the tracks in the park's bridge (W. Peterson, personal commun., 2006).

Valley Forge National Historical Park, Pennsylvania (VAFO)

The early Cambrian Chickies Quartzite is the "type formation" for the ubiquitous worm burrow trace fossil *Skolithos* (Wise, 1960; Alpert, 1974). Exposures of the Chickies Quartzite within VAFO are known to display abundant *Skolithos* burrows (Wiswall, 1993). The Chickies Quartzite was used in the façade of the lower visitor center restroom building. Blocks displaying both vertical and horizontal cross sections of *Skolithos* burrows are visible (M. Carfioli, personal commun., 2005).

PETRIFIED WOOD

Petrified Forest National Park, Arizona (PEFO)

The Painted Desert's exceptional abundance and preservation of petrified wood (primarily *Araucarioxylon arizonicum*) from the Late Triassic Chinle Formation led to the creation of Petrified Forest National Monument (now a national park) in 1906. Petrified wood was utilized in the construction of two structures within the park, the Painted Desert Inn and the Agate House Pueblo.

The Painted Desert Inn was originally constructed in 1924 as the Stone Tree House, referring to the extensive amount of local petrified wood used in its construction. Much of this petrified wood is now concealed under a stucco finish. The Civilian Conservation Corps (CCC) applied the stucco during remodeling of the structure to pueblo revival

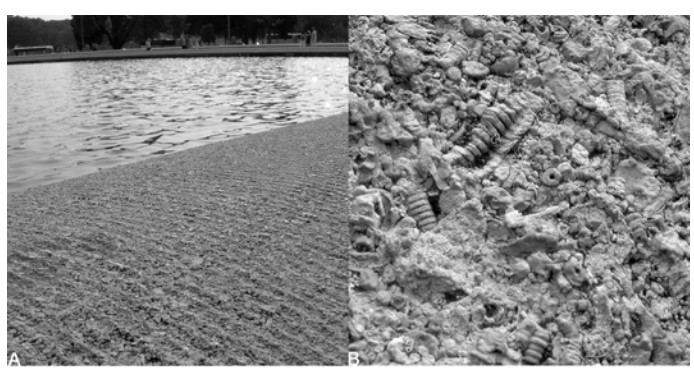

FIGURE 2. Capitol Reflecting Pool, Washington, D.C. **A.** Overview, showing fossiliferous Mississippian Salem Limestone blocks. **B.** Close up, showing fossil detail and crinoid columnals (width of photo approximately 4 cm). NPS Photo.

FIGURE 3. Agate House, constructed of petrified wood (primarily *Araucarioxylon arizonicum*), Petrified Forest National Park, Arizona. NPS Photo.

style, following the 1936 NPS acquisition of the inn (Livingston, 1992).

The Agate House Pueblo is a much older structure dating back to the Pueblo II-III period (approximately 900-1200 AD). Petrified wood was used almost exclusively for the construction of Agate House, and apparently a few other prehistoric pueblos within the park as well (Reed, 1940). The CCC partially reconstructed Agate House to its present appearance in 1934 (Fig. 3).

Washington Monument Commemorative Stones, Washington, D.C. (WAMO)

Petrified wood obtained in the Chalcedony Forest outside of Petrified Forest National Park was incorporated into the Washington Monument as the Arizona Stone in 1924. This striking stone (Fig. 4) consists of nearly 6,000 pounds of an *Araucarioxylon arizonicum* log, cut into three sections (National Park Service, 2003). The state's name is engraved across the logs and painted with gold leaf. Apparently a copy of

FIGURE 4. Petrified wood (*Araucarioxylon arizonicum*) in the Arizona Stone, Washington Monument, Washington, D.C. NPS Photo.

F. H. Knowlton's (1889) publication on the petrified wood of Arizona and a photograph of petrified trees near Holbrook are also incorporated into the state stone (Author unknown 1924). At least a half dozen of WAMO's commemorative stones display fossils (Kenworthy and Santucci 2004), although the Arizona Stone is the most dramatic of the fossiliferous stones. National Park Service (2003) and Jacob (2005) summarize all 193 commemorative stones, from every state, many countries and dozens of organizations, within the monument.

HISTORICAL OCCURRENCES

A rich history of paleontological resource research and collection dating back to the early or middle 1800s and 1900s exists in many NPS areas. Many of the specimens collected during those research efforts represent extraordinarily significant finds. In this section, however, we look beyond those well-documented examples and share just a few of the perhaps more obscure historic occurrences of fossils, or references to them, in NPS areas. There are undoubtedly numerous others, and we certainly welcome any additions or comments. Some specimens mentioned below are themselves historically significant. In other cases, a specimen's significance is derived more from the who, when, where or why they were collected rather than what was collected.

Colonial National Historical Park, Virginia (COLO)

While many parks have a record of fossil collection that extends back even as far as the early 1800s, the area surrounding what is now Colonial National Historical Park has been the site of fossil collecting for nearly 320 years! Ward and Blackwelder (1975) tell the fascinating story behind the first described and figured fossil from America (Fig. 5), found in Martin Lister's 1687 Historiae Conchyliorum, Liber III ("History of the Mollusks, Volume 3"). Lister did not name the scallop-like shell in his description. Unfortunately, as he did not actually collect the specimen, he misinterpreted the collecting locality as the Virgin Islands, rather than Virginia. Thomas Say (1824) recognized that the fossil described by Lister came from the Atlantic Coastal Plain rather than the Virgin Islands. No fossil or living pectinids are known from the Virgin Islands according to Ward and Blackwelder (1975). Say (1824) subsequently named the species *Pecten jeffersonius*, (renamed *Chesapecten jeffersonius,* Ward and Blackwelder, 1975). Like Lister though, Say misinterpreted the original collecting locality, identifying the fossil as coming from Miocene deposits in Maryland. Based on many subsequent collections that include *Chesapecten jeffersonius* near Yorktown, Virginia, the Pliocene Yorktown Formation appears to be the likely source of Lister's original

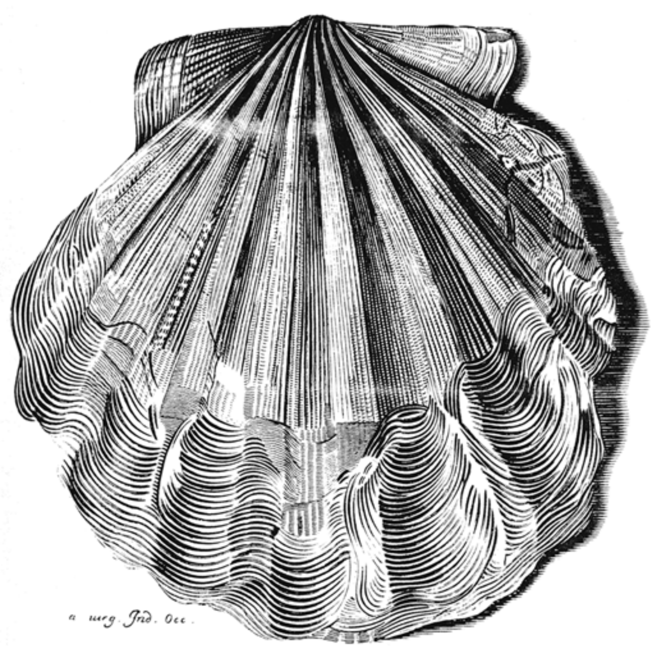

FIGURE 5. Copy of Martin Lister's 1687 figure of *Chesapecten jeffersonius*, the first figured and described fossil from North America, likely collected near Colonial National Historical Park, Virginia. Ward and Blackwelder (1975, pl. 1).

material (Ward and Blackwelder, 1975). The Yorktown Formation is famous for its extraordinary fossil diversity and many fossils have been found within COLO (Ward and Blackwelder, 1980). While the exact collection locality of Lister's specimen is not known, it is likely near, perhaps even within, the current boundaries of COLO (G. Johnson and L. Ward, personal commun., 2003). The Virginia General Assembly, recognizing the historical significance and abundance of the fossil, named *Chesapecten jeffersonius* the official state fossil in 1993 (Kenworthy and Santucci, 2003).

Ulysses S. Grant National Historic Site, Missouri (ULSG)

Julia Dent Grant, wife of Ulysses S. Grant, grew up outside of St. Louis, Missouri on a farm named White Haven, now the site of ULSG. Greg McDonald, senior curator of natural history for the NPS, visited the site in 2005 and noticed a large chunk of fossil coral sitting just outside the house (Fig. 6). Inquiring with park staff, McDonald learned the piece of coral was entwined in the roots of a tree that blew over in a storm (G. McDonald, personal commun., 2005). Interestingly, Pam Sanfilippo, ULSG historian, recalled a passage, below, in Julia Grant's memoirs (published posthumously in 1975) mentioning "petrified honeycomb", very likely a similar piece of fossil coral.

> "*Once, when I was about nine years old, I, with my dusky train, had wandered far up the brook and deeper than usual into the woods when we came upon a beautiful, shadowy, moss-covered nook. My little maids exclaimed: 'Oh! Miss Julia! Have this for your playhouse, and we will mark it out with all the pretty stones we can find.' Hastening to the brook, they gathered all the 'petrified honeycomb' and round boulders they could find, placing these so as to mark the supposed walls of my mansion*." (Grant, 1975, p. 36).

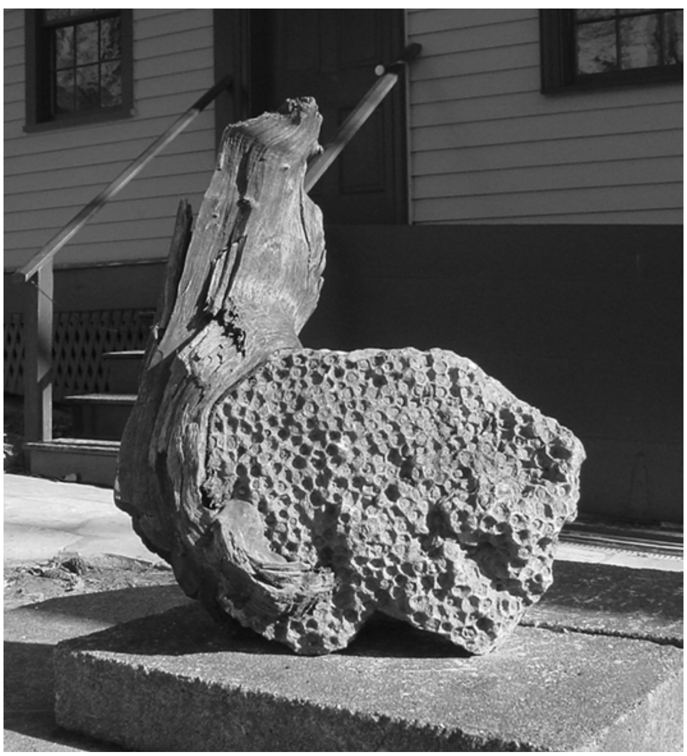

FIGURE 6. Large block of coral from Ulysses S. Grant National Historic Site, Missouri. NPS Photo/Pam Sanfilippo.

Grant is probably referring to Gravois Creek, which flows east of ULSG. Thompson (1928) described exposures along Gravois Creek and measured a section at Grant Road quarry, just outside of ULSG. The abundantly fossiliferous limestone found there was identified as the Mississippian St. Louis Limestone near the contact with the underlying Salem Limestone ("Spergen formation") by Thompson (1928). The tabulate coral *Syringopora* is a common fossil in the St. Louis Limestone (Thompson 1928).

Lewis and Clark National Historic Trail (LECL)

The 5955 km (3700 mile) Lewis and Clark National Historic Trail commemorates the famous three-year voyage of discovery led by Meriwether Lewis and William Clark beginning in 1804. The journey was for the most part the dream of President Thomas Jefferson who was curious about the far western frontier. Jefferson, in fact wrote to French naturalist Bernard Lacépède in 1803, stating his hope that "this voyage of discovery will procure us further information of the Mammoth, & of the Megatherium…and an enormous animal incognitum [*Megalonyx*]" (Jefferson, 1803). Among the numerous discoveries credited to Lewis and Clark, reports of fossils occur in their journals and through other historic accounts. For example, during their travel in western Iowa during 1804, near the confluence of the Missouri River and Soldier Creek, Lewis and Clark discovered in a cave a petrified jawbone of some large, unknown creature (Simpson, 1942). The fossil was later identified and described as an enormous lizard-headed fish named *Saurocephalus lanciformis*. Today the specimen is in the collections of Natural Academy of Sciences in Philadelphia. This discovery has been a mystery to paleontologists including Simpson because this fossil specimen is known only from the Cretaceous Niobrara Chalk of western Nebraska or Kansas. The cave from which the specimen was collected is near Council Bluffs, Iowa, and the area surrounding Soldier's Creek is covered by Pleistocene loess deposits. Mayor (2005) hypothesized that the Cretaceous fish fossil may have been transported from Nebraska or Kansas to the cave by American Indians.

Vicksburg National Military Park, Mississippi (VICK)

John Wesley Powell is certainly one of the most well known figures in North American geology. Before his explorations of the west in the 1870s, he served in the U.S. Army during the Civil War. In 1863, he was stationed at Vicksburg. There are many accounts (e.g. Dellenbaugh, 1902; Moring, 2002) of John Wesley Powell collecting fossils from around the Federal earthworks during the siege of Vicksburg (D. Dockery, personal commun., 2005). According to Moring (2002) John Stewart, an amateur geologist and paleontologist who accompanied Powell on his second Colorado River expedition, first met Powell at Vicksburg as both were looking for fossils. There is no shortage of paleontological resources in the Vicksburg area. Most of the earthworks were probably excavated into the extensive Pleistocene loess deposits that blanket the area. This loess contains an abundant gastropod fauna and has even produced mastodon remains south of Vicksburg (Mellen, 1941; Kolb et al., 1976). Exposures of the Oligocene Vicksburg Group near Mint Spring Bayou within the park have produced an extraordinary diversity of marine invertebrates (e.g. Mellen, 1941; Kolb et al., 1976; Dockery 1982; McNeil and Dockery, 1984). Powell's Vicksburg collection may have been housed in the Illinois State Natural History Society where he served as curator in the late 1860s (Dellenbaugh, 1902). Further investigation may yield additional information regarding the whereabouts and extent of this collection.

Florissant Fossil Beds National Monument, Colorado (FLFO)

The world-renowned paleontological resources of FLFO are extraordinarily diverse and well preserved (see Meyer 2003). Fossils from the late Eocene Florissant Formation include nearly 2,000 known species of fossils, three-quarters of which are insects. Fossil spiders, fish, birds and mammals are also found in the formation in addition to a significant floral assemblage and large pieces of petrified wood. The petrified wood, primarily *Sequioa affinis* (redwood), attracted the attention of a seemingly unlikely paleontological resource "manager", Walt Disney. In 1956, Disney visited the privately owned Pike Petrified Forest; now a part of FLFO (established 1969). He personally purchased a large petrified stump 2.3 m in diameter and weighing some five tons from the owners (Meyer 2003; D. Smith, personal commun., 1999) appar-

FIGURE 7. Petrified wood from what is now Florissant Fossil Beds National Monument, Colorado, on display at Disneyland's Frontierland (Anaheim, California). NPS Photo.

ently as a gift to his wife, Lillian. Disney later displayed the stump in Disneyland's (Anaheim, Calif.) Frontierland area, where it can be seen today (Fig. 7).

INTERPRETATION AND RESOURCE MANAGEMENT

The NPS generally makes a distinction between natural resources (including fossils) and cultural resources. Indeed, paleontologists and archeologists have all spent time explaining the differences in their respective disciplines. However, fossils found in cultural resource contexts, such as those summarized in this paper, reinforce the interconnectivity of humans and their natural surroundings. This interconnectivity of these "cultural resource fossils" creates incredible interpretive opportunities. Awareness of this interconnectivity and, in some cases, sacred values associated with some paleontological resources or localities, should be considered in interpretation and paleontological resource management decisions.

Paleontological resource management policy in the NPS generally focuses on *in situ* occurrences (1998 NPS Omnibus Management Act Section 207, NPS 2001 Management Policies Section 4.8.2.1, and NPS DO 77 (Natural Resource Management)). Therefore, fossils found in cultural resource contexts may be subject to the legislative protection and management/preservation guidance found in the 1979 Archeological Resources Protection Act (ARPA), 1990 Native American Graves Protection and Repatriation Act (NAGPRA), NPS 2001 Management Policies Section 5.3, and NPS Directors Orders (DO) 28 (Cultural Resources Management) and DO 29 (in development, Ethnography Program).

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