

Cowboys, Scientists, and Fossils

The Field Site and Local Collaboration in the American West

*By Jeremy Vetter**

ABSTRACT

Even as the division between professional scientists and laypeople became sharper by the end of the nineteenth century, the collaboration of local people remained important in scientific fieldwork, especially in sciences such as vertebrate paleontology that required long-term extractive access to research sites. In the North American West, the competition between museums and universities for the best fossil quarry sites involved negotiations with locals. The conflict over differing conceptions of the field site is vividly demonstrated through an examination of one site on the High Plains of western Nebraska in the early twentieth century. This case offers a rare opportunity to see not only how professionals regarded such sites but also how the resident ranching family, the Cooks, attempted to exercise leverage over the scientific fieldwork that took place there. While the Carnegie Museum of Pittsburgh became mired in protracted conflict with the Cooks over discovery claims and the ongoing control of the site, the University of Nebraska and the American Museum of New York developed more harmonious relations with the site's resident ranching family.

FAR FROM THE LABORATORIES, UNIVERSITIES, AND MUSEUMS of the cities and towns, another scientific research scene comes into view. Vast, open, grassy plains stretch to the horizon in every direction. This mostly treeless landscape is broken only by scattered clumps of trees around springs and small streams. Rolling hills and bluffs rise up around these riverbeds, some of them bearing rocky outcroppings that reveal the sedimentary depositions of past ages. Signs of human habitation are few, and the grazing cattle do not disturb the peaceful quiet. A cowboy on horseback rides into the scene. His name is James Cook: he once accompanied cattle drives northward from Texas but now

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intends to settle on a large ranch on the High Plains of western Nebraska. A young woman named Kate, whom he is courting, rides with him. They stop briefly at the base of one of the hills, wondering at the bones protruding from the surface. Under the clear blue sky in this remote and semiarid land, they are falling in love. This romantic western scene is also the beginning of a colorful and instructive episode in the history of science.¹

The cowboy-turned-rancher James Cook was one of many local collaborators who helped produce scientific knowledge in the American West. He eagerly encouraged visiting scientists to transform the amazing bone deposits around the ranch—where he and Kate would make a living and raise a family—into a fossil field site. His family's participation in the practice of scientific fieldwork at their ranch, which is unusually well documented by the collection of papers of the Cook family saved there, involved instructive tensions with scientific researchers, who imposed their own conceptions of the field site as a place to be discovered, controlled, and managed. Struggles over the division of labor and the distribution of rewards were manifest in the best-known economic activities of the American West, such as ranching, which took place around most of the fossil exposures, and mining, which shared many practical similarities with fossil digging. This essay examines similar conflicts at paleontological field sites in the American West in the late nineteenth and early twentieth centuries.

The main purpose of this essay is thus to examine the field site as a contested space for the production of knowledge. Scientists and local collaborators, such as the Cooks, did not necessarily agree about what credit and recognition each should receive for their respective contributions, especially regarding discovery claims. In addition, visiting researchers asserted their own norms regarding ownership and use rights, which might be at odds with local interpretations. Furthermore, scientists from distant universities and museums typically concentrated the epistemic value added in knowledge production, through the conversion of natural objects into scientific publications and visual displays, at their own institutions. Local collaborators, to the extent that they chose to participate in the world of science, might contest the terrain of scientific practice by exercising their leverage over resources and knowledge.

Local collaborators were important to all the sciences that involved work in the field, from archaeology to zoology. Some common types of collaboration in the field in the late nineteenth and early twentieth centuries included observer networks, specimen exchange and identification, specimen sale, and—for those scientists who ventured into the field themselves—assistance with local knowledge of collecting and observation sites. In the case of ecology, for example, local fishermen were crucial to the pioneering work of the Illinois ecologist Stephen Forbes on floodplain lakes in the late nineteenth century. Fishermen contributed not only their labor but also their practical expertise, their local knowledge, and even their political concerns. Yet the incorporation of the concerns and knowledge of these fishermen within ecology “simultaneously devalued” that local knowledge.² In short, the conditions of participation in science were contested at the turn of the

¹ The basic details of the story are related in James H. Cook, *Fifty Years on the Old Frontier as Cowboy, Hunter, Guide, Scout, and Ranchman* (New Haven, Conn.: Yale Univ. Press, 1923), pp. 233–234.

² Daniel W. Schneider, “Local Knowledge, Environmental Politics, and the Founding of Ecology in the United States: Stephen Forbes and ‘The Lake as Microcosm’ (1887),” *Isis*, 2000, 91:681–705. Such dynamics of incorporation and devaluation of local knowledge in the field were by no means limited to Europe and North America, for they characterized the field relationships in the non-Western world just as much or even more. For a relevant comparison case see Elizabeth Green Musselman, “Plant Knowledge at the Cape: A Study in African and European Collaboration,” *International Journal of African Historical Studies*, 2003, 36:367–392.

century, as previous writers on the growing divide between professional and amateur science have shown.³

We still know remarkably little about local collaborators in the production of knowledge. Unlike scientists at universities, federal agencies, or museums, few have left any paper trail for the historian to follow. But the roles and perspectives of local collaborators must be taken into account if we are to understand how science was transformed into a more rigidly structured professional activity in the late nineteenth and early twentieth centuries. Laboratory technicians are one important group of nonelite scientific workers. Historians and sociologists have shown how their contributions to scientific knowledge production have been rendered invisible by the social conventions of the lab's controlled setting. In the field, however, scientific work was complicated by the heterogeneous social roles inhabited and the varied activities performed there.⁴ More to the point, scientists were almost always on someone else's turf when conducting fieldwork. Local collaborators thus had significant leverage.⁵ The necessity of trusting such collaborators could sometimes lead to serious conflict over the credibility of their claims.⁶ Researchers might hope to lessen their reliance on collaborators by going into the field themselves, but they could never eliminate it completely.

This essay explores some key issues related to the field site that are posed by collaboration between scientists and local people in the early twentieth-century American West—namely, defining and apportioning credit for discovery in the field, establishing the norms that would govern how researchers would relate to one another at the field site, and determining the locus where epistemic value would be added by transforming the fossils collected into scientific materials. After reviewing the strategies pursued by museum paleontologists to gain control over land containing rich scientific materials, I offer a

³ See, e.g., Mark V. Barrow, *A Passion for Birds: American Ornithology after Audubon* (Princeton, N.J.: Princeton Univ. Press, 1998); Elizabeth B. Keeney, *The Botanizers: Amateur Scientists in Nineteenth-Century America* (Chapel Hill: Univ. North Carolina Press, 1992); and Marc Rothenberg, "Organization and Control: Professionals and Amateurs in American Astronomy, 1899–1918," *Social Studies of Science*, 1981, 11:305–325.

⁴ On the contributions of laboratory technicians see Steven Shapin, "The Invisible Technician," *American Scientist*, 1989, 77:554–563; and Stephen R. Barley and Beth A. Bechky, "In the Backrooms of Science," *Work and Occupations*, 1994, 21:85–126. On work in the field see Henrika Kuklick and Robert E. Kohler, eds., *Science in the Field, Osiris*, 2nd Ser., 11, especially the editors' introduction. On what might well be called the "invisible technicians" of the field, including a study considering the role of scientists' wives in managing camp life on eclipse expeditions and another attending to the contributions of native assistants in African anthropology, see Alex Soojung-Kim Pang, "Gender, Culture, and Astrophysical Fieldwork: Elizabeth Campbell and the Lick Observatory–Crocker Eclipse Expeditions," *ibid.*, pp. 15–43; and Lyn Schumaker, *Africanizing Anthropology: Fieldwork, Networks, and the Making of Cultural Knowledge in Central Africa* (Durham, N.C.: Duke Univ. Press, 2001).

⁵ For an insightful study of the reach and diversity of local collectors in the nineteenth-century United States see Daniel Goldstein, "'Yours for Science': The Smithsonian Institution's Correspondents and the Shape of Scientific Community in Nineteenth-Century America," *Isis*, 1994, 85:573–599. Before doing science became more closely associated with professional career structures, traditional class distinctions were even more important—for example, in the crucial division between gentlemen and artisans in early nineteenth-century Britain. On the delicacy of cross-class cooperation in British natural history see Anne Secord, "Corresponding Interests: Artisans and Gentlemen in Nineteenth-Century Natural History," *British Journal for the History of Science*, 1994, 27:383–408. On the role of fieldwork in geology among gentlemanly specialists see Martin J. S. Rudwick, *The Great Devonian Controversy: The Shaping of Scientific Knowledge among Gentlemanly Specialists* (Chicago: Univ. Chicago Press, 1985). See also Roy Porter, "Gentlemen and Geology: The Emergence of a Scientific Career, 1660–1920," *Historical Journal*, 1978, 21:809–836.

⁶ For an example see Stuart McCook, "'It May Be Truth, But It Is Not Evidence': Paul Du Chaillu and the Legitimation of Evidence in the Field Sciences," *Osiris*, 1996, 11:177–197. A more general treatment of the problem of credibility in science, focusing on "downstream" contests in the public sphere over where to draw the boundaries between science and other parts of culture, can be found in Thomas F. Gieryn, *Cultural Boundaries of Science: Credibility on the Line* (Chicago: Univ. Chicago Press, 1999).

revealing narrative case study that shows how one settler ranching family succeeded in exerting partial control over an especially significant field site. Yet while these local collaborators modestly shaped the terrain on which metropolitan museums struggled for preeminence in one prominent field discipline, they by no means altered the larger structural relations of science, nor could they achieve all their aims. By discussing both adversarial and cooperative interactions between eastern museums and western collaborators, I aim to give a vivid, concrete form to these tensions between lay and professional authority.

LAND CONTROL: SECURING FOSSIL QUARRIES IN THE WEST

Fieldwork in vertebrate paleontology in the American West experienced two great bursts of activity before World War I. The first, in the 1870s and 1880s, was dominated by the great “fossil war” between E. D. Cope of Philadelphia and O. C. Marsh of New Haven, both of whom deployed rival teams of collaborators in the field.⁷ The second, beginning in the late 1890s and extending into the early twentieth century, was driven by the great urban museums of North America and Europe.⁸ These museums were determined to have impressive fossil skeletons, especially dinosaurs and large mammals, to display in their public exhibition halls. Stimulated by the patronage of wealthy capitalists such as Andrew Carnegie, Marshall Field, and J. P. Morgan, eastern museums expanded their buildings and collections, often in competition with one another. The largest museums included the Field Museum in Chicago, the Carnegie Museum in Pittsburgh, the American Museum in New York, the Academy of Natural Sciences in Philadelphia, and the Smithsonian Institution (U.S. National Museum) in Washington. By the time of the great merger movement in American business at the end of the nineteenth century, wealthy capitalists were spending some of the vast sums they had amassed to collect and display fossils, as well as other scientific objects. This generosity could underwrite the general operations of a museum, or it could be quite specific. Carnegie, for example, gave special funds that were designated for vertebrate fossil collecting for his Pittsburgh museum.⁹

Under the sheltering wing of this vast expansion in patronage for public display, paleontologists were able to undertake and publish considerable original research in their discipline. Through the memoirs, transactions, and proceedings of their own institutions,

⁷ The many works on Cope, Marsh, and their protracted fossil feud include Jane Pierce Davidson, *The Bone Sharp: The Life of Edward Drinker Cope* (Philadelphia: Academy of Natural Sciences, 1997); Mark Jaffe, *The Gilded Dinosaur: The Fossil War between E. D. Cope and O. C. Marsh and the Rise of American Science* (New York: Crown, 2000); John H. Ostrom and John S. McIntosh, *Marsh's Dinosaurs: The Collections from Como Bluff*, 2nd ed. (New Haven, Conn.: Yale Univ. Press, 1999); Robert Plate, *The Dinosaur Hunters: Othniel C. Marsh and Edward D. Cope* (New York: McKay, 1964); Elizabeth Noble Shor, *The Fossil Feud between E. D. Cope and O. C. Marsh* (Hicksville, N.Y.: Exposition, 1974); and David Rains Wallace, *The Bonehunters' Revenge: Dinosaurs, Greed, and the Greatest Scientific Fraud of the Gilded Age* (Boston: Houghton Mifflin, 1999). For a wider perspective on U.S. vertebrate paleontology in the second half of the nineteenth century see Uri Lanham, *The Bone Hunters* (New York: Columbia Univ. Press, 1973).

⁸ For a brief account of the prominent Jurassic component of that second wave see John S. McIntosh, “The Second Jurassic Dinosaur Rush,” *Earth Sciences History*, 1990, 9:22–27; for a comprehensive account, based on a thorough investigation of field correspondence and other archival sources, see Paul D. Brinkman, “The Second American Jurassic Dinosaur Rush, 1895–1905” (Ph.D. diss., Univ. Minnesota, 2005). For one interesting episode see Brinkman, “Henry Fairfield Osborn and Jurassic Dinosaur Reconnaissance in the San Juan Basin, along the Colorado–Utah Border, 1893–1900,” *Earth Sci. Hist.*, 2005, 24:159–174.

⁹ Similarly, the wealthy financier J. P. Morgan gave \$16,000 per year in special funds for fossil collecting to the American Museum in New York, directed a few years later by his nephew, Henry Fairfield Osborn. See Jean Strouse, *Morgan: American Financier* (New York: Random House, 1999), p. 560.

as well as other scientific journals, the work of paleontologists proliferated. These publications built the careers of the generation of American paleontologists after Marsh and Cope, especially those who were able to obtain leading positions in vertebrate paleontology departments in museums. The burgeoning growth in field research opportunities for museum paleontologists also created new opportunities for staff assistants to participate in, and sometimes even lead, expeditions to the vast field of the interior American West. As Ronald Rainger points out, however, subordinate paleontologists often experienced barriers to their upward mobility owing to the hierarchical structure of paleontology at the few well-funded institutions.¹⁰

Power could be still more unevenly distributed where local collaborators were concerned. Local knowledge, discoveries, and labor often received only token recognition, if any. Some local collaborators, especially those who worked for wages, may have cared little about the credit they did not receive in the scientific community. But others coveted a share of the recognition for the knowledge and assistance they provided, as well as partial control over the use of their finds. In vertebrate paleontology collaboration took a variety of forms, including granting land-use rights, prospecting, hospitality, and labor. First, fossil-hunting activities were obviously extractive and tied to specific parcels of land; when that land was in private hands, the permission of its owners was a necessary aspect of collaboration. Second, collaborators used their local knowledge to help paleontologists engaged in prospecting locate promising fossil sites. Third, local ranchers and other landowners provided hospitality while fieldwork was going on, assistance that was both practical (e.g., areas to camp or graze horses) and social (e.g., invitations to dinner or to meet other locals). Finally, local workers were paid wages to assist in research work, especially to perform the physical labor of digging out fossils.

The most formal kind of leverage that local collaborators had was their private ownership of lands that paleontologists wished to prospect for fossils. As more land originally in the public domain fell into private hands—especially with the provision for larger claims made possible by the Kinkaid Act of 1904 (640-acre homesteads in western Nebraska only), the Enlarged Homestead Act of 1909 (320 acres), and the Stock-Raising Homestead Act of 1916 (640 acres)—scientists had to tread more carefully.¹¹ How did fossil expeditions get permission to use private land? And how did they gain access to local knowledge about where fossils might be found? In some cases, ranchers were content to grant scientists free use of their land and liberally provided advice about where to look. In other cases, the process of negotiation was more complicated.

Even into the early twentieth century, however, much of the land in the arid, eroded areas of the West—where fossil exposures were most easily found—was still in the public domain. These grassy plains, rocky buttes, and sagebrush deserts, used as seasonal hunting grounds by generations of American Indians such as the Sioux and Cheyenne, were generally only sparsely occupied by open-range cattle ranchers after the Indians were dispossessed and concentrated on reservations. Ranchers who grazed their animals on vast expanses of this land usually lacked formal title to most of it, there being no provision in the land laws for transferring public land to such extensive ranching operations. In many

¹⁰ Ronald Rainger, "Collectors and Entrepreneurs: Hatcher, Wortman, and the Structure of American Vertebrate Paleontology circa 1900," *Earth Sci. Hist.*, 1990, 9:14–21.

¹¹ The landmark Homestead Act of 1862 had provided for claims of 160 acres. For a thoughtful summary, along with an insightful discussion of how ranchers influenced and reacted to these changes in land policy, see Karen R. Merrill, *Public Lands and Political Meaning: Ranchers, the Government, and the Property between Them* (Berkeley: Univ. California Press, 2002), pp. 40–66.

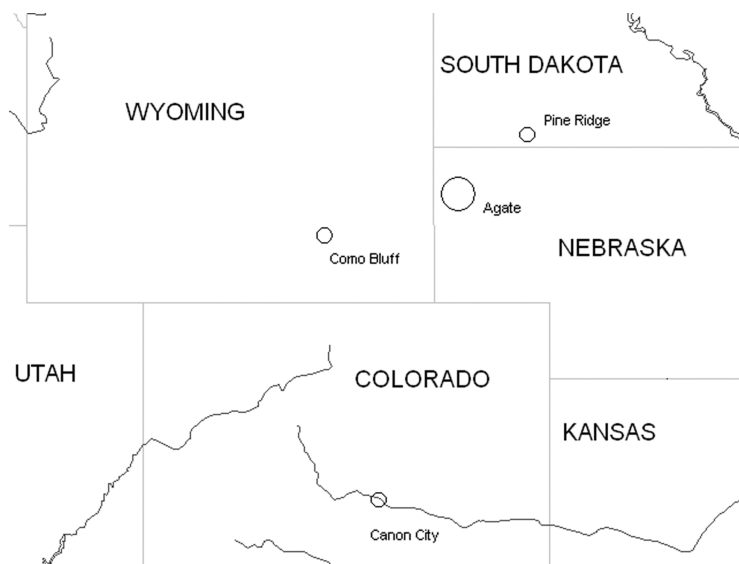


Figure 1. Map of the central interior western region of the United States, showing fossil field sites mentioned in the text. Map drawn by the author.

cases fossil hunters could simply prospect where they pleased, although fierce struggles to secure the best fossil beds continued among rival collectors. And they did also have to watch out for homesteaders, especially after the land policy changes of 1904, 1909, and 1916. If, during the course of their excavations, scientists suspected that new settlers might soon file claims on the land they were using, they had to take action. On the other hand, they could also attempt to use the same land laws elsewhere for their own purposes.

Consider, for example, the varied land-use experiences of the Carnegie Museum of Natural History in Pittsburgh under the direction of William J. Holland, a versatile researcher with wide interests and a strong personality who pushed the museum into the ranks of elite metropolitan institutions. A young upstart struggling to catch up with longer-established museums such as the American Museum in New York, the Carnegie Museum moved aggressively into the field at the turn of the century (see Figure 1 for a map of the field sites mentioned in this essay). In 1899 the Pittsburgh museum's leaders organized a Department of Vertebrate Paleontology in accordance with the "special wishes" of museum founder Andrew Carnegie.¹² They initially fought with the University of Wyoming for control of a valuable bone bed "grubstaked"—claimed informally on behalf of financial backers through the posting of a sign—by the local fossil hunter William Harlow Reed. After the Carnegie Museum lured Reed to its side with a lucrative job offer, Carnegie paleontologists finally succeeded in gaining control of another valuable site that yielded a fantastic dinosaur skeleton, which would be named *Diplodocus carnegii*. Prospecting north of the famed Como Bluff quarries in southeastern Wyoming,

¹² For a brief biography of Holland, which celebrates him for combining "breadth of interest with increasingly rigorous standards for practice" but also aptly describes him as "strong-willed, colorful, and vocal," see Monique Borque, "Holland, William Jacob," in *American National Biography*, <http://www.anb.org>. On the formation of the new department at the Carnegie see J. L. Wortman, "The New Department of Vertebrate Paleontology of the Carnegie Museum," *Science*, 1900, 11:163–166.

Carnegie field collectors located and established a new quarry in the summer of 1899 at Sheep Creek, in Albany County, which they named Camp Carnegie. Here their control was maintained simply through visible occupancy of the site—basically, scientific squatting—which would ordinarily be respected by other prospecting field parties.¹³

Land control would require more proactive measures at another Carnegie site, near Cañon City, Colorado. Prospecting at an old Marsh quarry that had yielded some good Jurassic material, the Carnegie paleontologist John Bell Hatcher approached the land's owner, M. P. Felch, in the spring of 1900 and concluded a deal in early May. According to their agreement, Felch would allow Hatcher to “strip an area as large as the entire area worked for Marsh in a period of 3 or 4 weeks” and then take out any bones that were found for a fixed rate of \$25 per month. That fall, Hatcher sent his assistant W. H. Utterback to supervise the excavation. Although Felch had hoped Hatcher would come in person, he agreed to help Utterback find a good fossil exposure to work. Utterback began operations in early November, and by March 1901 he had reopened the quarry.¹⁴ However, when Hatcher arrived in early August to check on Utterback's progress, he “found things in rather a bad way. . . . Mr. Felch was trying to play us false.” So the Carnegie Museum terminated its relationship with Felch, and instead Hatcher filed four land claims on nearby parcels—former Cope quarries in the vicinity of Felch's quarries once worked by Marsh—under his name and Holland's, arranging at the same time to transfer a field assistant from Wyoming to help Utterback. By the time of the Carnegie Museum's October 1901 report, things were looking good. “The museum has acquired title to eighty acres of land lying north of this locality, on which Professor Cope at one time labored very successfully,” the report noted, “and from which he recovered a great many specimens.”¹⁵

While some fossil sites could be acquired through land claims, others were reserved by the government as off-limits to private ownership. Sioux Indian reservation lands in southwestern South Dakota, for instance, were in a region of accessible Tertiary deposits that promised great fossil treasures revealing the early evolution of mammals. In May 1904 Hatcher began the process of securing a permit for the upcoming summer season, which would enable Carnegie field assistant O. A. Peterson—a recent Swedish immigrant who was also Hatcher's brother-in-law—to collect fossils on Sioux reservation lands near the Pine Ridge agency. Although the reply from the acting commissioner warned that such permits were usually refused because “it is displeasing to the Indians and sometimes leads to trouble,” especially when scientific prospectors were hunting for prehistoric remains in the Southwest, he agreed that fossil hunting would probably escape the objections of the Sioux. Thus he would issue a permit if Hatcher could “get the consent of the Agent at Pine Ridge, with the assurance that the Indians will not oppose.” For the summer of 1904

¹³ The fascinating story of *Diplodocus carnegii* is told with attention to institutional rivalry and class tensions in Tom Rea, *Bone Wars: The Excavation and Celebrity of Andrew Carnegie's Dinosaur* (Pittsburgh: Univ. Pittsburgh Press, 2001). On the establishment of Camp Carnegie see “Museum Notes,” *Annals of the Carnegie Museum*, 1901, 1:6; for further details on the Carnegie Museum's fieldwork in Wyoming and neighboring states before 1905 see Brinkman, “Second American Jurassic Dinosaur Rush” (cit. n. 8).

¹⁴ For the initial agreement see J. B. Hatcher to W. J. Holland, 9 May 1900, Hatcher Papers, Section of Vertebrate Paleontology, Carnegie Museum of Natural History, Pittsburgh (hereafter cited as **CMNH**). Felch expressed his willingness to help Utterback in M. P. Felch to Hatcher, 28 Oct. 1900, Hatcher Papers, CMNH. Regarding Utterback's work see Hatcher to Holland, 30 Nov. 1900, Hatcher Papers, CMNH; and “Museum Notes,” *Ann. Carnegie Mus.*, 1901, 1:7.

¹⁵ Hatcher to Holland, 12 Aug. 1901, Hatcher Papers, CMNH (“play us false”); and “Museum Notes,” *Ann. Carnegie Mus.*, 1901, 1:254.

Peterson was assigned to explore the Tertiary deposits of northwestern Nebraska and southwestern South Dakota.¹⁶

Beyond free use of land in the public domain, private acquisition of land, and permitted use of Indian reservation land, the Carnegie Museum pioneered a fourth strategy for paleontology: the permanent placement of a valuable site under government protection as a national monument. Under the Antiquities Act of 1906, dozens of national monuments were declared in the early decades of the twentieth century, most of them archaeological sites in the Southwest. Some geological sites were also protected, including Devil's Tower in Wyoming, which was the first national monument, and later the Rainbow Bridge in southeastern Utah.¹⁷ When the Carnegie paleontologist Earl Douglass began exploring some promising new Eocene deposits in Uinta County in the northeastern corner of Utah in the summer of 1908—opening up a quarry in late 1910—such a designation was unnecessary because the land was still part of Ute and Uncompahgre Indian reservations. But in the mid-1910s some of the lands were “thrown open to occupation and settlement by the whites,” so Douglass sought to protect the Carnegie Museum's interests by filing a mineral claim to eighty acres on the quarry site. When this strategy was rejected by federal authorities on the grounds that bones do not qualify their discoverer for mineral rights, the Secretary of the Interior instead offered to make the quarry site a national monument. The Carnegie Museum was given permission to continue excavating after the “National Dinosaur Monument” was proclaimed on 4 October 1915.¹⁸

While operating in the sparsely settled semiarid or arid plains of Utah, Wyoming, and Nebraska, Carnegie fossil-collecting crews often enjoyed the benefits of ranch hospitality from nearby settlers. Ranches provided campsites near water sources, access to food supplies, grazing lands for stock, and lines of communication with supervising authorities in Pittsburgh. Writing from Adelia, Nebraska, in May 1902, for instance, Peterson noted that his crew was “camped a while this side of Bob Harris ranch 5 miles from here and expect this will be our address for some time.” Collectors from other museums depended just as much on the hospitality of ranchers: E. S. Riggs of the Field Museum, for example, worked for at least two weeks in July 1906 along the Niobrara River in northwestern Nebraska at the Burette ranch.¹⁹ The hospitality granted by these local people did not go unremarked in correspondence; but it was rarely mentioned in official reports, and generally no scientific credit was given.

A significant obstacle to the historical interpretation of the interactions between scien-

¹⁶ Hatcher to Commissioner of Indian Affairs, 9 May 1904 (requesting permit); A. G. Tonner to Hatcher, 14 May 1904 (quotations); and Hatcher to Holland, 21 May 1904 (Peterson's assignment for 1904): Hatcher Papers, CMNH. Despite Hatcher's special effort to gain permission for the Carnegie Museum to work on the Sioux reservation, Peterson never got there. That summer, Hatcher died of a sudden illness, and in a fog of despair over the news of his brother-in-law's death Peterson remained in Nebraska, where he stumbled upon the rich fossil quarry at the Cook ranch, a story recounted in the next section of this essay.

¹⁷ See Hal Rothman, *Preserving Different Pasts: The American National Monuments* (Urbana: Univ. Illinois Press, 1989). On the competition over the discovery and early management of the Rainbow Bridge see Rothman, “Ruins, Reputation, and Regulation: Byron Cummings, William B. Douglass, John Wetherill, and the Summer of 1909,” *Journal of the Southwest*, 1993, 35:318–340. Rothman argues that proponents of a regulatory worldview in the Progressive Era sought government control over sensitive areas, contesting with local amateurs and state scientists.

¹⁸ “Editorial Notes,” *Ann. Carnegie Mus.*, 1910, 6:918; and “Editorial Notes,” *ibid.*, 1916, 10:309. On research work at Dinosaur National Monument see Daniel J. Chure and John S. McIntosh, “Stranger in a Strange Land: A Brief History of the Paleontological Operations at Dinosaur National Monument,” *Earth Sci. Hist.*, 1990, 9:34–40.

¹⁹ O. A. Peterson to Hatcher, 9 May 1902; and E. S. Riggs to Peterson, 21 July 1906: Peterson Papers, CMNH.

tists and their local collaborators is that almost all the available evidence about these episodes comes from the writings of the scientists. Directly accessing the perspective of local people is often difficult or impossible. Only rarely did such collaborators publish any accounts of their lives and experiences, and whatever scattered private papers—such as diaries of frontier settlers—might be available are not sorted or identified as including commentary on scientific collaboration. We will probably never know how most ranchers felt about the scientists who prospected on their land, how much money or recognition they received for their assistance, or how they interpreted the fossils they helped the scientists find.

Fortunately, there does exist at least one remarkable documentary collection, which allows us to examine the history of science from the field itself—or at least from the perspective of the local inhabitants. At the Agate Springs Ranch, an especially rich Miocene fossil site in the remote, nearly treeless northwestern corner of Nebraska—now preserved as Agate Fossil Beds National Monument—the Cook family saved a significant collection of papers related (among other things) to the scientific work conducted around its ranch, including the voluminous correspondence that documents its negotiations with scientists from universities and museums. This evidence, used in combination with museum archives, makes possible a fuller account of relations between paleontologists and local collaborators than is usually possible. While the Cooks may have taken an unusual degree of interest in the fossil digging around their home, their anxieties and responses are suggestive of the larger issues involved in collaboration between paleontologists and local people. As will become clear, the Agate story has some remarkable and idiosyncratic twists, but it also offers one of best opportunities to understand how scientific work in the field was experienced by those who happened to live there.²⁰

THE AGATE STORY: A NEBRASKA RANCHING FAMILY AND THEIR VISITING SCIENTISTS

James H. Cook bought the 04 Ranch—located near the headwaters of the Niobrara River in the northwestern corner of Nebraska and so named because of its proximity to the 104th meridian—from his father-in-law, E. B. Graham, in 1887, renaming it the Agate Springs Ranch.²¹ Even before they moved to the ranch, James and his soon-to-be wife Kate discovered another natural resource that would eventually become central to the ranch's identity: fossils. After the initial discovery, narrated in the opening paragraph of this essay, the fossil beds gradually became central to the identity of the Cooks and their conception of the Agate Springs Ranch. As Graham put it in a letter to James and Kate's son Harold, "the discovery of these great fossil beds will necessarily give that ranche [*sic*] that greatest renown of any ranche in the world."²²

As he settled down to manage the Agate Springs Ranch, James Cook (see Figure 2)

²⁰ For a comprehensive administrative overview of fossil excavations at Agate from a paleontological point of view see Robert M. Hunt, *The Agate Hills: History of Paleontological Excavations, 1904–1925* (Lincoln: Univ. Nebraska State Museum, 1984). For a brief, popular account of more recent interpretations of the fossils discovered at the site see Hunt, "Death at a Nineteen-Million-Year-Old Waterhole: The Bonebed at Agate Fossil Beds National Monument, Western Nebraska," *Museum Notes (University of Nebraska State Museum)*, 1992, no. 83, pp. 1–6. General accounts of the ranch include Dorothy C. Meade, *The Story of Agate Springs Ranch* (Scottsbluff, Neb.: Business Farmer Printing, 1990); and R. Jay Roberts, "The History of Agate Springs," *Nebraska History*, 1966, 47:265–293.

²¹ Sometimes—for instance, on letterhead—the ranch was called the Agate Springs Stock Farm.

²² E. B. Graham to Harold J. Cook, n.d., Cook Collection, Box 3, Harold J. Cook Folder, American Heritage Center, University of Wyoming, Laramie (hereafter cited as AHC).



Figure 2. Young cowboy James H. Cook in the mid-1880s on his “old war horse, Curly,” in Alma, New Mexico. At the time, according to the original caption, Cook was “managing the W. S. ranch and taking part in the campaign against the Apaches.” Photograph courtesy of the Agate Fossil Beds National Monument, Cook Photograph Collection, Box G, AGFO 6094.6.

brought with him several years of experience as a cowboy driving cattle north from Texas and then as a horse-riding guide based in Cheyenne, Wyoming. Fossil collecting was not entirely unfamiliar to him. While working as an outfitter for hunting parties around Wyoming and neighboring states, he had assisted the Yale paleontologist Marsh in getting permission from Sioux Indians in Dakota Territory to collect in the Badlands in 1877.²³ Indeed, serving as a well-respected mediator between white settlers and Indians was another of Cook’s great claims to fame. He would find, however, that mediating between competing paleontological parties could be more difficult.

Rather than seeking to make money out of the fossil beds, James Cook reveled in the status that came with owning such a rich scientific site and facilitating the work of paleontologists there. He eagerly encouraged fossil-collecting scientists to work at Agate, at first adopting an ethic of free and open access that would cut across the institutional rivalries then festering in the West. Like most ranchers and farmers, Cook did not have any preestablished social connections with paleontologists. Scientists came to Agate by happenstance, usually when they were prospecting for fossils in the area and heard about the deposits from other local people. When Cook made contact with visiting scientists, he

²³ Erwin H. Barbour, “James Henry Cook,” *History of Nebraska*, 1913, 3:480. Cook apparently avoided taking a side in the earlier fossil war between Marsh and E. D. Cope; see evidence of his assistance to the latter in E. D. Cope to James H. Cook, 29 Oct. 1884, Cook Collection (Second Set), Box 1, AHC.

actively encouraged them to come to his ranch. The first scientist who visited the site, the University of Nebraska geologist Erwin Barbour, who initially came in the early 1890s, largely missed the main fossil beds, focusing instead on the mysterious *Daemonelix*—“devil’s corkscrew”—formations a few miles to the west.²⁴ Finally, in 1904, Cook succeeded in luring the Carnegie Museum field collector Peterson to Agate. Excited by what he found, Peterson opened the first quarry in the main fossil beds. Two nearby fossil-laden hills became the scene of microterritorial conquest the next year, when Cook invited both Barbour and Peterson back, along with their expedition teams from the University of Nebraska and the Carnegie Museum, leading to the excavation of what would become known as University Hill and Carnegie Hill.

Conflict with the Carnegie Museum, 1904–1908

The 1904 arrival of Peterson at Agate and the subsequent opening of Carnegie Hill were events freighted with conflicting interpretations by Carnegie scientists and the Cooks. In July, when Holland reported the illness and later the tragic death of Hatcher, a grieving Peterson desperately wanted to return to Pittsburgh. But Holland pushed him to remain in the field, concerned above all to have some positive results from the summer’s expedition work to report to Carnegie. Writing from Harrison, Nebraska, a small town and the county seat of Sioux County, where Agate is located, Peterson countered that his main work of the summer was already completed. He did, however, agree to make a quick trip to the Sioux reservation in nearby South Dakota before returning.²⁵ With Hatcher gone, Peterson’s personal grief was compounded by career anxiety—often an unpleasant reality for subordinate field staff working under powerful museum curators—conceding to contacts at the National Museum and the American Museum that he worried about his future at the Carnegie. Holland tried to reassure Peterson. He urged the distraught fossil collector to stay in the field and offered to assist him in publishing his new interpretation of the *Daemonelix* fossils in *Science*. Peterson pressed on into August, lamenting his own illness and exhaustion, before at last returning from the field.²⁶ It was during these last troubled weeks of exploration, in early August, that he made his initial examination of the fossil beds at Agate.

What happened during that first encounter in August 1904 would become the basis of a protracted interpretive dispute between Peterson and the Cooks. Retrospective accounts published by the two parties differ sharply.²⁷ According to Peterson, when James Cook

²⁴ Barbour initially reported these as a new kind of gigantic fossil, speculating that they were neither plants nor mollusks but possibly “some ancient worm”: Erwin H. Barbour, “Notice of New Gigantic Fossils,” *Science*, 1892, 19:99–100. Barbour had worked with Marsh at Yale before coming west to launch an independent career in 1889, starting in Grinnell, Iowa, then moving in 1891 to Lincoln, Nebraska. For this and further biographical information on Barbour see C. Bertrand Schultz, “Memorial to Erwin Hinckley Barbour,” *Proceedings of the Geological Society of America, Annual Report for 1947* (New York: Geological Society of America, 1947), pp. 109–117.

²⁵ Peterson to Holland, 5 July 1904 (wish to return to Pittsburgh); Holland to Peterson, 8 July 1904 (persuasion to remain in the field); and Peterson to Holland, 11 July 1904 (agreement): Peterson Papers, CMNH.

²⁶ For Peterson’s concern about his future see Peterson to Charles Schuchert, 18 July 1904; and Peterson to Henry Fairfield Osborn, 25 July 1904: Peterson Papers, CMNH. For Holland’s reassurances see Holland to Peterson, 1 Aug. 1904; for Peterson’s difficulties see Peterson to Holland, 10 Aug. 1904: Peterson Papers, CMNH.

²⁷ Published narratives describing the history and significance of Agate, including the diverging interpretations of the site’s discovery, are O. A. Peterson, “The Agate Spring Fossil Quarry,” *Ann. Carnegie Mus.*, 1906, 3:487–494; and J. Cook, “The Agate Springs Fossil Beds,” in *Fifty Years on the Old Frontier* (cit. n. 1), pp. 233–241.

showed him the fossil beds, “very naturally [the ranchman] thought that the bones were those of Indians interred together with their horses.” Moreover, the Carnegie Museum claimed that Peterson himself had discovered the two main fossil buttes near where Cook had showed him a smaller quarry site, later known as Quarry A. It was in the 18 August 1905 issue of *Science* that Peterson first scientifically described a new mammal species found at Agate, naming it after Holland: initially it was called *Dinochoerus hollandi*, but the name was changed to *Dinohyus hollandi* when *Dinochoerus* was found to be already in use. Peterson credited himself with “locating an important fossil quarry,” although he acknowledged James Cook as the property owner and even recognized Harold Cook for guiding him to the location. But even if the elder Cook had known of the bones’ existence “as long ago as the year 1890,” Peterson claimed that Cook thought of them, “when he first found them, as merely proving that the spot had been occupied by the Indians as a burying ground, they having frequented the locality in early days and frequently camped there.”²⁸ Thus, as far as Peterson and Holland were concerned, Peterson had earned full credit for the discovery of the main fossil beds at Agate, although the Cooks might deserve some recognition for directing them to the general area and for their ongoing hospitality at the ranch.

According to Cook’s autobiography, on the other hand, he and his son Harold deserved more credit for finding the fossil hills and recognizing their true significance. “The fossil bones which I discovered in Nebraska,” claimed Cook, “proved to be the clew which led, then, to a veritable house of records.” They had taken Peterson “to the spot,” where he “had dug but a short time when he uncovered a deposit of petrified bones leading back into the hillside.” In his own memoir, Harold indirectly backed up the claim by referring to his father’s earlier experiences with fossil warriors Marsh and Cope. “Before he came to Agate,” Harold asserted, his father already “had a good general understanding of geology and fossils.”²⁹ Thus the Cooks argued that they had always recognized the bone fragments as fossilized and were entitled to proper recognition for their spectacular find.

It is not my aim here to take sides in the priority dispute between the Carnegie Museum and the Cooks over the discovery of the main fossil beds at Agate. In a sense, the dispute cannot be resolved on the basis of extant documentary evidence, for the contending sides disagreed about what constituted a scientific field discovery. Both seem to have agreed that merely seeing bones in the hills was not enough. Discovery in the field meant recognizing them as fossils of scientific significance. Where they disagreed was about whether the Cooks had done so. As soon as James Cook found out that the Carnegie Museum was claiming the discovery of the fossil beds for Peterson in late 1908—a period, as will become clear later in this essay, when issues about discovery were hopelessly entangled with questions of ownership and control—he immediately began pressing his alternative case. The competing claims advanced by the two sides provide an interesting window into emerging scientific class relations, so to speak, between professionals and

²⁸ For Peterson’s retrospective assessment of Cook’s view see Peterson, “Agate Spring Fossil Quarry,” p. 487. The museum’s position is expressed in W. J. Holland and O. A. Peterson, “The Osteology of the Chalicotheroidea with Special Reference to a Mounted Skeleton of *Moropus elatus* Marsh, Now Installed in the Carnegie Museum,” *Memoirs of the Carnegie Museum*, 1914, 3:189–190. For the scientific description and the name correction see Peterson, “Preliminary Note on a Gigantic Mammal from the Loup Fork Beds of Nebraska,” *Science*, 1905, 22:211–212 (the quotations pertaining to Cook’s contribution are on p. 211); and Peterson, “A Correction of the Generic Name (*Dinochoerus*) Given to Certain Fossil Remains from the Loup Fork Miocene of Nebraska,” *ibid.*, p. 719.

²⁹ J. Cook, *Fifty Years on the Old Frontier* (cit. n. 1), pp. 235–236; and Harold J. Cook, *Tales of the 04 Ranch: Recollections of Harold J. Cook, 1887–1909* (Lincoln: Univ. Nebraska Press, 1968), p. 184.

their lay collaborators, since the priority dispute pitted the researchers at a scientific institution against a local rancher.

Holland expressed the Carnegie Museum's point of view to his rival Henry Fairfield Osborn of the American Museum in New York in early November 1908 as follows:

This quarry, as you know, was discovered by Mr. Peterson of our Museum. The bones which Mr. Cook discovered and to which Mr. Peterson was conducted were the bones contained in what we know as Quarry A in our Museum Catalogue, located some three hundred yards away from the hills, and was opened up by Mr. Peterson on the occasion of his first visit to the spot and quickly exhausted. This quarry lies at a somewhat lower level than the bone stream in the buttes which Mr. Peterson discovered. It was only after Mr. Peterson had called Mr. Cook's attention to the existence of the bones in the buttes that he recalled that some years before he had observed fragments of bone in the talus and had thought at the time they were the bones, as he expressed it, of "Indians and horses." These simple facts are worth remembering.³⁰

From this statement, it is clear that Holland did not question giving credit to James Cook for the discovery of Quarry A. The main fossil hills, however, were another matter. There were at least three complicating issues. First, the Carnegie Museum argued that, despite their close proximity to Quarry A, these larger hills constituted a separate discovery claim. Second, Cook claimed to have seen fossil bones in the main hill many times before, but Peterson experienced finding them as an independent discovery. Finally, and perhaps most centrally, the Carnegie Museum believed that Cook had not recognized the scientific significance of the bones in the main fossil hills—hence their counterdiscovery mantra: "Indians and horses."

Harold Cook was apparently the first in the family to hear of the Carnegie Museum's discovery claims. Incensed, he wrote his father in November 1908 to report Holland's claim "that Peterson found the Agate Springs Quarries," adding that "if he does that publicly, I am going to step on him publicly, just to see if he can feel it." Likewise, James Cook's rejection of the Carnegie Museum's claims was immediate and impassioned. As he wrote to Holland just a few weeks later:

I most earnestly request that you do not claim for Mr. Peterson as one of your staff of collectors for the Carnegie Museum, the right of discovery of the fossil quarries here. Remember that I make no claim other than that I was the first to discover the fragments of fossil bones all along the sides of the two hills in question and that my son Harold, & myself, told Mr Peterson of them when he first visited my home *by my invitation*, and *we took him to the place*, and showed him the material that was exposed. My wife and mother & brother, as well as Harold, since he was old enough to ride a horse have taken friends from Fort Robinson and the *East* to those hills to collect specimens of petrified bones. They have done this for over twenty years, as well as myself, so I think I will have no trouble in making good my claim as the discoverer of the bones *on but not in* those hills, for I never did any work there, other than to scratch around with a stick. Naturally every member of my house is highly indignant at Mr Peterson for making the claim he has, & if Mr Peterson insists he is in the right, and I am wrong, action will be taken at once by us to make good our claims.

Cook was offended that Peterson and Holland would deny that he had recognized the bones as fossils, and he invoked his longtime acquaintance with paleontologists such as O. C. Marsh to bolster his claim. "Since 1874 or 5 when I first met Prof Marsh at the Old

³⁰ Holland to Osborn, 9 Nov. 1908, Box 3, Folder 3, American Museum of Natural History, Department of Paleontology, Field Correspondence (hereafter cited as **AMNH-FC**).

Red Agency,” he declared, “I have been interested in fossil bones & since then in every part of the west I have lived, I have kept an eye open for them, and although I claim no scientific knowledge along the line of palontology [*sic*] I think I know of as many exposures of fossil bones over different parts of the west as any ranchman.”³¹

A crucial point that emerges from this debate is the intermediate status of James Cook’s knowledge of paleontology. Even while admitting his relative lack of “scientific knowledge,” the ranchman held firm to his belief that he could recognize fossils, even if he could not identify them precisely. On the one hand, it would seem a bit churlish to insist on an accurate species identification to grant credit for the discovery of a field site, since even educated paleontologists sometimes make mistakes that have to be corrected later. On the other hand, as an untutored layperson James Cook could easily have his nontechnical observational claims dismissed by better-educated scientists. The language that he used to describe the fossils was unquestionably colloquial. In a letter to Osborn in 1907, for example, he referred to the existence of “quite an amount of ‘Old Bones’ about here” and mentioned that Harold had “found during the past two months several undescribed *Beasties*.”³² To the extent that Holland and Peterson inhabited the social world of professional expertise and the Cooks inhabited an alternative world of local lay interpretation, one could say that they had distinct worldviews. Yet because they all sought to receive credit in scientific publications and public presentations, the incompatibility of their field discovery claims posed a problem.

The rhetorical maneuvering between the Carnegie Museum and the Cooks regarding the discovery of the Agate fossil hills is thus in many respects a compelling illustration of the larger tensions between professionals and lay participants in the field sciences of the early twentieth century. Both sides made persuasive claims, when looked at from their own points of view, and it is easy to sympathize by turns with each of them. However, the situation is still more complicated. The American Museum’s paleontologists—eminently scientific but far from disinterested in the whole affair—clearly sided with the Cooks. A note attached to a letter from Holland to Osborn that survives in the American Museum’s archives—in handwriting that resembles that of the American Museum paleontologist William Diller Matthew—includes the following statement:

The claim that Peterson discovered this quarry is directly at variance with the statements of the Cooks and the general understanding of those who have been interested in the quarry. As Mr. Cook showed me the openings that he had made before Peterson came there and as they are *plotted on Peterson’s own map* of Agate Spring quarry the claim is obviously absurd. The fact that Mr. Cook did not recognize the bones as those of fossil rhinoceroses etc does not affect the fact of his discovery.

Not only did the American Museum credit the Cooks with the scientific discovery of the fossil beds; so too did Erwin Barbour at the University of Nebraska. In his report for the 1906 field season, which had focused mostly on the Agate fossil hills, Barbour simply stated: “The discovery of these beds was made some twenty years ago by Mr. James

³¹ H. Cook to J. Cook, 22 Nov. 1908, Box 3, Cook Papers, Agate Fossil Beds National Monument, Nebraska (hereafter cited as **AFBNM**); and J. Cook to Holland, 4 Dec. 1908, Box 3, Cook Papers, AFBNM.

³² J. Cook to Osborn, 9 Aug. 1907, Box 24, Folder 37, American Museum of Natural History, Department of Paleontology, General Correspondence (hereafter cited as **AMNH-GC**).

Cook.” Notably, Barbour also added that “a considerable number of bones” from the site had been collected by University of Nebraska parties as early as 1892.³³

This claim that the openings plotted on Peterson’s map were made by the Cooks themselves before his Carnegie party’s own reported discovery of the two great bone hills was not accepted as fact by the Carnegie Museum. Indeed, Peterson claimed that during the fall and winter of 1904/1905 he repeatedly tried to dissuade the Cooks from further digging in the fossil quarries by themselves. As Holland and Peterson later put it, “Mr. Cook, impelled by curiosity, undertook . . . to make some excavations at one of the spots on the western side of the larger butte, which had been pointed out to him as rich in remains, and was rewarded by finding a number of bones.”³⁴ However, it does seem clear from the handwritten note quoted above that the American Museum regarded James Cook’s claim to an earlier discovery of the bone hills as legitimated by his recognition of the fossiliferous nature of the material in the hills, even if he could not identify the fossils in strictly scientific terms. In other words, professional scientists might willingly invoke the claims of amateurs against their rival professionals, while neatly preserving the hierarchy between lay and expert in authority over the making of scientific claims themselves.

Peterson returned to Agate with two field assistants in the spring of 1905 to ensure that the fossil quarries were excavated under his own supervision for the benefit of the Carnegie Museum. In May, Harold Cook urged Barbour of Nebraska to return to Agate to work in the fossil beds. Barbour was excited about the invitation but asked whether the Cooks had control of the quarries, noting that “it is often of doubtful propriety to work another mans quarry even though it is in the public domain unclaimed.” Appealing to state pride, Barbour complained that “every one has been robbing the state of its very best things and the state itself has scarcely anything.” He offered Harold compensation for summer work at the site, asked him to put out a sign claiming it for the University of Nebraska, and reminded him that the university was the first institution to do collecting work around Agate and thus had some priority rights. When he received reassuring answers about the control of the site—in accordance with James Cook’s policy of encouraging free and open access to multiple parties—Barbour eagerly prepared to send a field team for the summer.³⁵ By the end of the 1905 field season, the Carnegie Museum and the University of Nebraska occupied their respective digging sites on adjacent hills.

As the reputation of the Agate fossil beds grew, other institutions came to open fossil quarries. In 1907 Fred B. Loomis launched a small expedition for Amherst College. Loomis worked with two of his students at a promising site on a smaller hill nearby, which became known as Amherst Point. During their visit to Agate Harold Cook acted as a guide, directing the Amherst party to additional sites of interest within a twenty-five-mile radius of the ranch. James Cook also sought to welcome field parties from the leading metropolitan rivals of the Carnegie Museum, including the Field Museum of Chicago and

³³ Handwritten note attached to Holland to Osborn, 9 Nov. 1908, Box 3, Folder 3, AMNH-FC; and Erwin H. Barbour, “Report of the Geological Expedition of Hon. Charles H. Morrill, Season of 1906,” *Science*, 1907, 25:73–74.

³⁴ Holland and Peterson, “Osteology of the Chalicotheroidea” (cit. n. 28), p. 190. Regarding Peterson’s attempts to dissuade the Cooks from further digging on their own see Peterson to H. Cook, 31 Oct. 1904, 21 Jan. 1905, Box 43, Cook Papers, AFBNM.

³⁵ Barbour to H. Cook, 23 May 1905 (quotation), 3 June 1905, Box 8, Cook Papers, AFBNM. For the announcement of a “supposedly new” species, based on a skull found during the university’s 1905 summer expedition, see Erwin H. Barbour, “Notice of a New Miocene Rhinoceros, *Diceratherium arikarense*,” *Science*, 1906, 24:780–781.

the American Museum of New York. This open approach did not please the Carnegie Museum staff. While Holland recognized that Cook was “impatient to have the entire region exploited,” he noted the Carnegie field team’s pressing obligations elsewhere and appealed to Cook that “in the interests of science it is highly important that the material from this locality, upon which we hope to publish a number of papers which we hope to have illustrated, should be kept together and appear in one publication.” Or, as Holland memorably put it in another letter: “It is a most unfortunate thing to have half of an animal in one museum and the other half in another; to have the skull in the Museum at Lincoln, Nebraska, the backbone in the Carnegie Museum, and the hind legs in New York.”³⁶

Holland’s admonitions seemed to have an impact. In a 1906 letter to a ranching friend who had requested access on behalf of Osborn of the American Museum—who happened to be the recipient’s nephew—Cook expressed his growing uncertainty about the scientific propriety of his open-access policy. In a tone of exasperation, he commented that “these ‘Bone hunters’ like the old time cow men claim to have ‘range rights’ and the first one to work on a quarry claims the earth about that spot for a certain number of miles or leagues I dont know which.” The Carnegie Museum party was displeased with his liberal approach, Cook surmised, for he had “caught ____ for inviting Prof Barbour of the state university of Nebr. to come and get a few bones.” When E. S. Riggs of the Field Museum came “for a couple of weeks and was very desirous of doing a little work,” Cook turned him away owing to Holland’s objection.³⁷

Holland tried to persuade Cook to accept the Carnegie Museum’s power over the field site by stressing the quality of his own field staff over the collectors of rival institutions. “It is true that we at present have only, as you say, ‘a man and a boy’ at work on the deposit, but that man is one of the very best collectors of fossils in America,” he asserted. Of the Carnegie field team’s efforts, Holland claimed to put them “against those of four or five other men of the kind who are generally employed by institutions, which pick up college students who want a vacation and who go into the field more for the purpose of having a good time than for getting down to serious effort.” He judged his field assistant, Mr. Utterback, to be “far superior as a collector to Professor Riggs [of the Field Museum], or to any other man whom I know of at present, who is working in the Western field.” While Cook, as a layman, might not understand the Carnegie Museum’s informal proprietary claim on the fossil hills—based, as Holland saw it, on scientific convention (though it must be said those conventions were continuously evolving and often malleable)—Holland thought that he could perhaps be swayed by an argument that appealed to superior capability and the overall interests of science. “It would grieve my heart,” Holland continued, “to think this project of ours would be knocked to pieces by the activity of other parties who might attempt to come in, and, to use a Western phrase, ‘jump the claim.’” The Cooks tired of Holland’s patronizing letters, with son Harold tacking on a handwritten note to one of them opining that “to write a letter of this kind is the work of a pin headed, egotistical, educated fool.”³⁸

Holland persisted in his attempts to assert the Carnegie Museum’s control over the fossil beds at Agate. In the summer of 1907 he offered to lease the land encompassing

³⁶ Fred B. Loomis, untitled brochure, Oct. 1907, Box 37 (on the work of the Amherst party); Holland to J. Cook, 25 July 1906, Box 33 (“interests of science”); and Holland to J. Cook, 23 Mar. 1908, Box 33 (“most unfortunate thing”); Cook Papers, AFBNM.

³⁷ J. Cook to John M. Adams, 1 Sept. 1906, Box 24, Folder 37, AMNH-GC.

³⁸ Holland to J. Cook, 7 Aug. 1906, 25 July 1906 (with Harold’s note attached), Box 33, Cook Papers, AFBNM.

Carnegie Hill from Cook. Yet that same field season, in line with Cook's eagerness to accelerate fossil collecting at Agate, an American Museum field party proposed "clearing off the whole top of the hill where Mr. Peterson's quarry is located, as the probability of uncovering a large quarry of such previous and enlightening relics of a former world would warrant operations on a large scale." Alarmed, Holland finally decided to visit Agate himself in late August 1907.³⁹ He may well have thought that by meeting with Cook face-to-face—making an effort to oil the social machinery of local collaboration—it might be possible to win his support. Indeed, the tactic did seem to work, at least temporarily. In James Cook's view, Holland "came 'right down to earth' . . . and we all as a family enjoyed his stay with us very much." After his visit, Holland likewise adopted a more conciliatory posture toward Cook, writing him that he looked back "with the greatest pleasure upon the days spent under your roof, and in your company upon the broad mesas and among the sculptured cliffs of the Niobrara Valley." He also expressed the Carnegie Museum's interest in satisfying Cook's desire for more aggressive digging in the fossil hills. "Personal acquaintance with these deposits has convinced me that they possess great importance from the standpoint of the scientific man," he opined, "and that it is a duty for us, having already done what we have done, to prosecute our researches with even greater vigor than has been displayed."⁴⁰

But then another problem came up: Cook worried that he could not protect rival collecting parties' claims. The main fossil hills seemed to lie on land in the public domain, just beyond his own property lines. He mentioned to Osborn, Barbour, and Holland his concern that "the lands about here are rapidly being filed upon" and suggested that a land survey be performed. Resuscitating his old dream of cooperation, Cook urged the three institution leaders to work together in securing title to the land, should it be found to lie outside his own property lines. "In case you should secure title to the hills and saw fit to allow me to use the grass upon them and sometimes take a peep at the work in the quarries I would be content," he declared. Fashioning himself as a friend of science, he worried especially about the risk that the fossil hills or other nearby field sites might fall "into hands that would not be friendly to men of science except at so much per bone." James Cook's last effort at urging cooperation had quite the opposite effect. Seizing his chance, Holland sought to wrest control of the Agate fossil hills from the Cooks. He moved to purchase the land legally, though conceding to Cook that he would allow access to other researchers already invited by the ranchman.⁴¹

Despite Holland's bold maneuvering to gain formal title to the land, the Cooks beat him to it. Early in 1908, Harold returned from his studies at the University of Nebraska and filed a homestead claim designed to include the fossil hills.⁴² As a result, Holland once again had to ask the Cooks for an exclusive lease. They informed him that Harold had claimed the land encompassing the fossil beds under homestead laws in March 1908 to be sure of controlling them—even building a cabin and living in it to meet the law's

³⁹ Holland to J. Cook, 17 July 1907, Box 30 (lease offer); William K. Gregory to J. Cook, 17 Aug. 1907, Box 30 (American Museum proposal); and Holland to J. Cook, 28 Aug. 1907, Box 33 (regarding Holland's visit): Cook Papers, AFBNM.

⁴⁰ J. Cook to Albert Thomson, 4 Nov. 1907, Box 24, Folder 37, AMNH-GC; and Holland to J. Cook, 30 Oct. 1907, Box 33, Cook Papers, AFBNM.

⁴¹ J. Cook to Osborn, 9 Dec. 1907, Box 24, Folder 37, AMNH-GC; and Holland to J. Cook, 20 Dec. 1907, Box 33, Cook Papers, AFBNM.

⁴² Archival evidence suggests that Harold returned to Agate not solely to file his homestead claim but, more importantly, because of his mother's mental breakdown—a delicate issue that relates to the ranch as an isolated place of family life as well as a scientific field site, about which I will say no more in this essay.

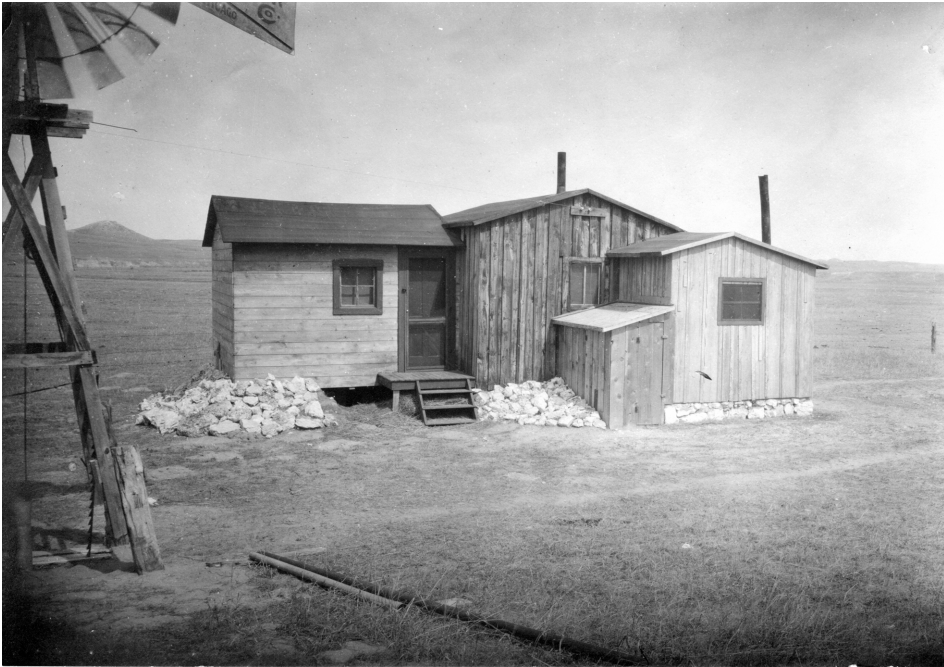


Figure 3. Harold J. Cook's homestead claim cabin in the early 1910s. Photograph courtesy of the Agate Fossil Beds National Monument, Cook Photograph Collection, Box L, AGFO 6013.9.

requirements (see Figure 3). "I now know," declared the father—presuming some paternal power over his family's affairs—"that no [other] homesteader can come along and file a claim there and tell me and everybody else to keep off." Although the formal homestead filing under the Kinkaid Act was not completed at the nearby Alliance, Nebraska, land office until late August 1908, the Cooks immediately started to assert their control over the field site. "As a ranchman," wrote James Cook in his letter to Holland,

I could not do less than extend ranch courtesy to all of the scientific gentlemen that have visited my house, and as the bone fields here are so extensive, and I have had no jurisdiction over a great portion of them, I could only prohibit people from hunting fossils in soil that I actually owned or controlled. . . . As the bone fields are large I have tried to interest you and Dr. Osborne [*sic*] and Dr. Barbour in working them together—but I judge that my efforts along that line have failed. Personally I have no "axe to grind." I have never "made a penny" out of any man that has collected fossils in this country. On the other hand I have spent much time and money trying to assist those that have been engaged in the work here. Being a student of nature in my humble way I have enjoyed the thought that it could be of some service to those who had been blessed with more advantages than myself in this line of study. Now Dr. Holland, I want to say that you will be most welcome to make the quarries you have opened here and if you so desire I will request Dr. Osborne to cease work upon the other side of the hill you are working and I will protect your quarries from others working in them.⁴³

⁴³ Holland to J. Cook, 7 Mar. 1908 (requesting an exclusive lease); and J. Cook to Holland, 11 Mar. 1908 (regarding Harold's claim): Box 33, Cook Papers, AFBNM. For a document relating to the filing of the claim see "No of land filing. 85870. Serial number 0858," 27 Aug. 1908, Box 3, Cook Papers, AFBNM.

This letter indicates both continuity and change in Cook's conception of the workings of science. Rhetorically, he appreciated the importance of disclaiming a financial interest in the fossil beds. Moreover, he acknowledged his subordinate status in the social structure of science, referring to his own "humble way" of being of "some service" to others "more blessed" with knowledge and experience. But he was also beginning to recognize the limits to his assumption of unmitigated cooperation among scientific parties, which failed to reflect the competitive realities of research, especially in a discipline like vertebrate paleontology where there was a finite amount of material to collect in the field.

Adopting a more deferential tone, Holland replied that Carnegie field parties would return to the site soon. He appealed to scientific norms of field practice, which he interpreted to Cook as follows:

It is a time-honored unwritten law which has always prevailed among institutions until recently and always has prevailed among gentlemen of sportsmen-like instincts, that when one institution or individual gets upon the ground first it is polite to at least ask him whether it is agreeable that the second party should follow. And it is a time-honored rule which has always been observed in scientific work, save and except by two or three individuals of enormously self-assertive disposition, that when one institution had tackled some problem it ought to be left alone until it has announced that it is through and the field is clear.⁴⁴

If Cook was going to insist on playing a more active role in science, Holland thought he should know how the game was played—or, at least, how Holland thought it should be played. Holland's willingness to enter into a discussion of scientific norms, the didactic tone of his remarks notwithstanding, indicates a partial recognition of Cook's desire to be involved in the processes of science itself. If Cook was going to be a collaborator with more of a controlling interest than was usual for a local rancher, then he had to be familiarized with the customs of the scientific community so that he could behave accordingly.

But Cook was still upset with Holland's aggressive, proprietary attitude toward the fossil beds. The ranchman commented: "There are now fifteen fossil collectors besides your party in this vicinity, all very desirous of securing some of the material from this ranch. . . . I have thought of a plan that I will be pleased to submit to you, if I can meet you." If Holland wasn't interested in talking about this plan, then Cook wanted him to "take out whatever material they now have exposed, and cease work." Calling the quarry "one of the world's wonderlands," he insisted that it "must be handeled [*sic*] accordingly from this time on. I cannot let such things as institutional rivalry or personal strife for priority right of description bring about trouble for me in the way of causing me to lose friends that have been brought to me by my discovery of fossils on this ranch."⁴⁵ In other words, he was proud of the high regard accorded him by the many scientists attempting to collect at Agate. Although he eschewed monetary rewards, Cook was determined to secure some of the social rewards, including the esteem of scientific collaborators.

Faced with Cook's determination to manage paleontological work in his little corner of the field, Holland eventually withdrew from Agate. As noted earlier, however, a bitter conflict remained over credit for the discoveries there. A few months after he issued his ultimatum to Holland, when Cook heard of the discovery claims that the Carnegie collectors made in their publications, he complained that "I am placed in the position of

⁴⁴ Holland to J. Cook, 23 Mar. 1908, Box 33, Cook Papers, AFBNM.

⁴⁵ J. Cook to Holland, 25 June 1908, Box 33, Cook Papers, AFBNM.

having to defend my claim as discoverer. I cannot understand how such a claim can be made, when I invited Mr. Peterson to my home, and took him to those bone hills, and showed him the vast amount of material exposed there." Cook further claimed that "nine tenths of all the material ever secured from this country within a radius of five miles, of my home, has been secured by either my son Harold, or myself taking Mr. Peterson direct to the material." Holland, however, defended his collectors' claims, arguing as always that Cook had not perceived the bone beds as fossils but merely as the remains of "Indians and horses."⁴⁶ In struggling over the credit for discovering the fossil quarries, Cook and the Carnegie Museum scientists disputed across a major social fault line in science, with local knowledge of the land pitted against eastern expertise in proper fossil identification. In contesting the Carnegie Museum's claim to most of the credit, Cook's indignation brings the usual structure of power in scientific fieldwork into sharp relief.

Cooperation with the American Museum, 1908–1922

After the departure of the Carnegie field parties, other institutions worked at Agate on the terms set by the Cooks. By the end of the decade, James Cook's son Harold had taken on the role of fossil specialist for the Agate ranch. Leveraging his own experience and homestead claim to the site, Harold became, after a fashion, the indigenous career product of the Agate fossil beds. He studied at the University of Nebraska with Barbour (and married the geologist's daughter Elinor) and then in New York with the staff of the American Museum. Upon his return, Harold became the site manager of the Agate fossil beds (see Figure 4). He invited scientific collectors, such as J. W. Gidley of the Smithsonian in 1909, to visit and conduct on-site research. He exchanged fossil material with geologists in other places, including E. C. Case of the University of Michigan in 1912.⁴⁷ The most active institution working at Agate, and an instructive contrast to the Carnegie Museum, was the American Museum, under director Henry Fairfield Osborn, paleontologist William D. Matthew, and field man Albert Thomson. Osborn and Matthew were influential figures in the history of paleontology whose work in museum development and interpreting the evolution of life on earth ensured their fame well beyond their fieldwork in the American West.⁴⁸ For them, the importance of Agate was not so much the renown of the site in its own right but how its material evidence, along with fossil material gathered from many other places, cast light on important scientific questions such as the evolution of mammals.

The American Museum staff members wisely took their cues for relating to the Cooks from Barbour and the University of Nebraska rather than Holland and Peterson of the Carnegie Museum. Barbour had not only invited Harold Cook to study with him and offered him monetary compensation for his assistance but had also taken care to offer ample credit both for ranch hospitality and, perhaps more important, for the actual

⁴⁶ J. Cook to Holland, 27 Nov. 1908; and Holland to J. Cook, 30 Nov. 1908: Box 33, Cook Papers, AFBNM.

⁴⁷ J. W. Gidley to H. Cook, 19 July 1909, Box 29; and E. C. Case to H. Cook, 15 Mar. 1912, Box 23: Cook Papers, AFBNM.

⁴⁸ For brief biographies of Osborn and Matthew that point out their numerous accomplishments and claims to fame see Ronald Rainger, "Osborn, Henry Fairfield," and Rainger, "Matthew, William Diller," in *American National Biography*, <http://www.anb.org>. Useful longer accounts of the two American Museum paleontologists include Rainger, *An Agenda for Antiquity: Henry Fairfield Osborn and Vertebrate Paleontology at the American Museum of Natural History, 1890–1935* (Tuscaloosa: Univ. Alabama Press, 1991); Brian Regal, *Henry Fairfield Osborn: Race and the Search for the Origins of Man* (Aldershot: Ashgate, 2002); and Edwin H. Colbert, *William Diller Matthew, Paleontologist: The Splendid Drama Observed* (New York: Columbia Univ. Press, 1992).



Figure 4. Harold J. Cook at the field shack on the homestead site—often known as East Agate to distinguish it from the main Agate Springs ranch—near the fossil hills in September 1921. Photograph courtesy of the Agate Fossil Beds National Monument, Cook Photograph Collection, Box G, AGFO 5786.4.

discovery and description of fossil specimens.⁴⁹ In November 1905, for example, Barbour had assured Harold that “we have labeled your specimen *found* and *loaned* by Harold G. [*sic*] Cook.” Barbour had also named a new mammal species for Cook and soon began listing Harold in Nebraska Geological Survey reports and on the survey’s letterhead as “Sioux County Geologist.”⁵⁰ In return, Barbour received generous assistance in response

⁴⁹ In his brief annual report for 1906, Barbour noted that the university’s field party had for two summers “enjoyed all the privileges and hospitalities of this famous ranch,” as well as including Harold Cook in the list of members of the party. See Barbour, “Report of the Geological Expedition of Hon. Charles H. Morrill, Season of 1906” (cit. n. 33). For a brief mention of the previous year’s invitation to collect on the ranch see Barbour, “Report of the Tenth Geological Expedition of Hon. Charles H. Morrill, Season of 1905,” *Science*, 1906, 23:114–115.

⁵⁰ Barbour to H. Cook, 14 Nov. 1905, Box 8, Cook Papers, AFBNM (“Harold G. Cook”). On the new species,

to his plea—prompted by the hope that Nebraska “would eventually secure the splendid material which is going to the eastern colleges”—that Harold “stand by the state university.” Unlike the Carnegie Museum, which always kept Harold at arm’s length, Barbour enabled him to publish articles through the Nebraska Geological Survey.⁵¹

While James Cook, as already noted, was losing faith in his ethic of free and open access to the fossil beds, the paleontologists of the American Museum were starry-eyed with delight over what they had found there in the summer of 1907. Albert Thomson told Osborn that Agate constituted “I dare say the greatest deposit of fossil bones in America, [with] bones enough to supply many museums.” Upon visiting the site, Osborn took careful notes on what the western Nebraska ranchers said. In what he titled a “Memorandum of Conversation with Mr. James H. Cook,” dated 3 October 1907, he recorded that the Cooks would allow the American Museum to dig fossils at Agate and nearby sites “without any recompense of any kind.” Perceptively, he also noted that the quarry was “discovered by James H. Cook many years ago, and the fact communicated first to Mr. Hatcher and subsequently to Mr. Peterson.”⁵² By documenting the Cooks’ point of view in their simmering priority dispute with the field staff of the Carnegie Museum, Osborn laid the groundwork for a harmonious relationship with the Nebraskans.

Although an eastern institution like the American Museum could not appeal to state pride after the fashion of the University of Nebraska, it did manage to cultivate a long-term cooperative relationship with the Cooks. Harold’s budding enthusiasm for field paleontology played a major role, as did his growing skills in fossil identification and site prospecting around the region. In the fall of 1907, after the first field season at Agate for the American Museum, Harold was already writing to Osborn, eagerly reporting his own finds and those of his father. He listed the fossils mostly by their common rather than scientific names—horse, rhinoceros, and camel—but the very fact that he could confidently identify fossil forms at all was significant. Even more important, perhaps, was his extensive prospecting throughout the tristate area where Nebraska, Wyoming, and South Dakota come together. “I think I have been quite successful, so far,” he wrote to Osborn, “and next summer when you come out I hope to be able to show you some things of interest.”⁵³

But how did the American Museum paleontologists propose to take advantage of the situation? It was no easy matter, considering that Holland was still complaining about attempts by other institutions to enter a quarry that he considered the Carnegie Museum’s proprietary domain. Osborn commented to Matthew that the Carnegie director “has been considerably feted abroad, and I found him in Paris much more difficult to deal with than ever before. He claims that we should not have entered the country at all. His entire attitude and conversation on the matter is such that I do not like to put it in writing.” Considering Osborn’s usual patrician circumspection in his writing, such a remark was a

named for Cook, see Erwin H. Barbour, “Notice of a New Fossil Mammal from Sioux County, Nebraska,” *Nebraska Geological Survey*, 1905, 2 (this unpaginated six-page article is bound between pages 292 and 311); and Barbour, “A New Miocene Artiodactyl,” *Science*, 1905, 22:797–798. For an example of the letterhead see Barbour to H. Cook, 2 Nov. 1905, Box 8, Cook Papers, AFBNM.

⁵¹ For pleas on behalf of the state university see Barbour to H. Cook, 17 June 1906, 3 July 1906, Cook Papers, Box 8, AFBNM. Among Harold’s publications see Harold J. Cook, “A New Genus of Rhinoceros from Sioux County, Nebraska,” *Nebraska Geol. Surv.*, 1909, 3:243–249; and H. Cook, “Some New Carnivora from the Lower Miocene Beds of Western Nebraska,” *ibid.*, 1912, 3:259–272.

⁵² Thomson to Osborn, 2 Sept. 1907, Box 3, Folder 3, AMNH-FC; and H. F. Osborn, “Memorandum of Conversation with Mr. James H. Cook,” 3 Oct. 1907, Box 3, Folder 3, AMNH-FC.

⁵³ H. Cook to Osborn, 17 Nov. 1907, Box 24, Folder 37, AMNH-GC.

strong one indeed. Still, in accordance with Holland's objection, Osborn had agreed "not to work in the quarry" and felt "bound to stand by this agreement although, as I told Dr. Holland, I did not think it was fair in him to ask it." For the future, however, he fully concurred with Matthew's idea of cultivating Harold Cook as the American Museum's on-site ally:

The suggestion that we should permanently attach young Cook to our department is one which I welcome and desire to act upon immediately. I am glad to continue to engage Harold in the field during the present season, and I desire to add him to our museum staff during the coming winter. I am ready to make a financial arrangement, that is, to give him a regular salary during the winter months for a certain number of hours of preparation work daily, such as we can agree upon mutually. I think it would be a splendid opportunity for him to work a part of the time and study a part of the time, and to take a full course in mammalian paleontology and qualify himself for the continuation of the work both in the field and in the museum.

The way Osborn saw it, both Harold and the museum could benefit from a closer relationship. In saying that he had "Harold's interests at heart," of course, he was thinking almost entirely of the young man's paleontological career, not his life on the ranch. "Nothing could possibly be so much to Harold's advantage as a prospect of this kind," wrote Osborn. While he could not promise any long-term position, they could undoubtedly "give him a good professional start." Osborn urged Matthew to speak directly with James Cook about what they could offer Harold. "In New York," Osborn pointed out, "Harold could get a first-class training, and I feel confident that we can make a good paleontologist out of him."⁵⁴

From 1908, in recognition of his growing investigative energy and prospecting skills, American Museum scientists began to offer Harold various incentives. Matthew hired him as a part-time summer field collector for \$60 per month, and Osborn convinced Harold to study with him and other eminent scientists in New York. That Osborn had flattered Harold with the invitation is evident in the younger Cook's memoir, where the eminent museum director is said to refer—in a direct quotation, it must be admitted, that was based solely on Harold's memory—to the young man's "exceptional ability" or "exceptional interest" that justified taking him on at the museum despite his lack of standard education or training. Even privately to Matthew, however, Osborn referred to Harold's "intelligence and enthusiasm," so this was no groundless boast on the younger Cook's part.⁵⁵ Moreover, they were prepared to make special concessions, including provision for joint publication and the preservation of Harold's formal ownership of material discovered by him and excavated by the American Museum. The following two summers the American Museum offered Harold the same monetary compensation, even though they were not sending a field party to Agate. They expected him "to be chiefly prospecting, sizing up good country and localities and getting all available information to guide a party next year."⁵⁶ The

⁵⁴ Osborn to W. D. Matthew, 30 June 1908, 30 June 1908 (second letter), Box 3, Folder 4, AMNH-FC.

⁵⁵ For the offers from the American Museum of Science see Matthew to H. Cook, 14 May 1908, Box 38; and Osborn to H. Cook, 22 July 1908, Box 42: Cook Papers, AFBNM. Harold reported their assessments in H. Cook, *Tales of the 04 Ranch* (cit. n. 29), p. 201. Osborn's actual view is clear in Osborn to Matthew, 30 June 1908 (second letter), Box 3, Folder 4, AMNH-FC.

⁵⁶ The concessions for 1908 are spelled out in W. D. Matthew, "American Museum of Natural History, Memorandum of Agreement with Harold Cook for season of 1908," 23 June 1908, Box 38, Cook Papers, AFBNM. Regarding the next two years see Matthew to H. Cook, 26 May 1909, 12 May 1910, Box 38, Cook Papers, AFBNM.

powerful combination of access to an excellent site and continuing use of Harold's local knowledge was irresistible for the American Museum.

All these efforts to prove their good intentions toward and intellectual respect for the Cooks paid off. At first James Cook had been cautious, telling his son "not to give *anyone* permission to work the bone quarries next summer" without consulting him. On Christmas Day 1908 he wrote to Harold in New York, urging him to "take no chances whatever on loosing [*sic*] your land claim," for which securing title, after all, would require that he actually reside on the land. Taking a leave of absence would only extend the time required to "prove up" on the homestead claim. Once he did prove up, his father commented, Harold "could rest on [his] oars so far as the quarry is concerned." As a ranchman, Cook might understand the language of science only in part, but he could fully appreciate the value of a piece of land as a permanent basis upon which to earn a living. Beginning in the spring of 1909—soon after Harold returned from studying in New York—the Cooks proposed a radical shift in their previous policy of free and open access to the Agate quarries. "We would be pleased to have the American Museum work the quarries to the exclusion of all others," James Cook wrote, "provided you and Harold could come to some agreement that would be mutually agreeable and beneficial." Moreover, he urged the American Museum to open a "small field laboratory and headquarters" at Agate.⁵⁷ Osborn was receptive, and a dialogue began over the terms of access and compensation.

In fact, the American Museum had been considering just such a plan since the previous summer. Observing that "everything revolves around Harold," Matthew deduced that James Cook seemed ready "to find an excuse to withdraw the privilege of working in the Carnegie quarries from Dr Holland, and work them himself for Harold's benefit—more or less in cooperation with one or several of the museums, but so that Harold gets whatever there is coming in the way of value of the quarry material or privileges." Matthew thought that the Cooks' aspirations could deliver "more real benefit to science" but was also "pretty certain that with the right handling we would have the inside track and get out of it all that we could by working the proposition ourselves, and more." Matthew was also keen enough to perceive that the Cooks' wounds from the acrimonious encounter with the Carnegie Museum still stung. Not only was there the bitter discovery dispute, but Harold himself seemed to want more recognition for his field assistance. Matthew surmised that he was "very sore at Peterson's lack of appreciation of the assistance he has had from himself (Harold), and somewhat so at Loomis' not recognizing him more fully." For the American Museum, the Agate deposit offered the chance, as Osborn put it, "to restore our prestige in the western fossil field," while for the Cooks, as Matthew noted, "it means the swinging of Harold's entire future career."⁵⁸

As the negotiations developed over the next few years, Harold insisted on two major conditions: "First, that in any publication which may be made concerning these quarries from the American Museum, the fact that *my father found this deposit* be recognized. . . . Second, that the American Museum will not use any duplicate material secured for exchange purposes, *for a limited time.*" Henceforth Harold would help control the circulation of specimens from Agate, and he would demand that proper credit be given to his father for his discovery. Osborn was happy to comply with these demands in order to

⁵⁷ J. Cook to H. Cook, 30 Oct. 1908, 25 Dec. 1908, Box 3; and J. Cook to Osborn, 11 Mar. 1909, Box 42: Cook Papers, AFBNM.

⁵⁸ Matthew to Osborn, 25 June 1908; Osborn to Matthew, 8 July 1908; and Matthew to Osborn, 8 July 1908: Box 3, Folder 4, AMNH-FC.

gain access to the rich fossil beds. The next day, Matthew drew up a set of “additional conditions” for agreement, which included access to the main quarry and another nearby quarry that Harold had discovered. It also granted Harold the “right of first description of new species or material.”⁵⁹ Harold approved. Over the next several years, Osborn and Matthew continued to assist Harold in publishing scientific papers based on Agate fossils. On the ground, Harold worked out the details of access with Thomson, who led the American Museum parties in the field at Agate. Harold assigned the American Museum “as large a section in the Big Quarry, where Peterson worked, as an ordinary party can work,” and he also helped refer local workers to do the heavy digging who “would do work, and who would *not* require *constant* supervision.”⁶⁰ As a negotiator of the division of labor in field paleontology, Harold could use his ownership and local knowledge effectively to bargain for his own inclusion in the credit and publication arena while at the same time assisting in the control of lower-status labor.

Although Harold exercised considerable leverage in the field, he was unable to get everything he wanted. From early on, he sought with only modest success to concentrate the processing, study, and display of fossil materials from Agate—the “value-adding” steps in accumulating scientific credibility—at the ranch site itself. Matthew had formally proposed a similar idea in writing to Osborn (and informally in person to the Cooks) as far back as 1908. In a letter to Osborn, the New York-based paleontologist argued that Agate’s location was “a very central one for working the Tertiary north, south, east and west,” so that it might be “very advantageous” as a “permanent headquarters.” Anchored to such a site, they could “prospect in the summer, prepare material in the winter, and send on material ready prepared to the Museum.” Matthew’s dream plan, which would long be advocated but only partly realized by Harold Cook, constituted a romantic hybrid vision of museum science and frontier homesteading:

We would build a shack and workshop adjoining and drive a well and put up a small windmill, at some point near the quarry. Thomson and Stein would spend the winter here preparing material. Mrs. Thomson would keep house for them. They could have a small irrigated garden, keep a cow & chickens and be very comfortable. They would send in the prepared material as instructed. Next spring they would prospect or work in the quarry, and in bad weather or other delay would turn to preparation.

Matthew followed up this breathless sketch with a list of eight itemized reasons for supporting the plan, mostly having to do with the economies of labor and material involved but also including the advantage that Thomson would be prospecting in the region in collaboration with Harold Cook. Advantage #7 was the least tangible but perhaps the most crucial: “This arrangement would put us *solid* with the Cooks, as it would give Harold the best possible opportunity for studying fossil mammals, and result in working quarry along the lines Mr. Cook desires.” Osborn’s response was measured but supportive of Matthew’s plan, as long as they could “come to some understanding regarding the work in the quarry,” for this was back in 1908, before the land ownership issue had been settled.⁶¹ In effect, the effort by the American Museum researchers to concentrate fossil

⁵⁹ H. Cook to Osborn, 21 Jan. 1910; Osborn to H. Cook, 14 Feb. 1910; and Matthew to Osborn, 15 Feb. 1910: Box 42, Cook Papers, AFBNM.

⁶⁰ H. Cook to Thomson, 22 Jan. 1911, Box 52, Cook Papers, AFBNM. Regarding Harold’s publications see, e.g., Osborn to H. Cook, 11 Oct. 1911, Box 42, Cook Papers, AFBNM.

⁶¹ Matthew to Osborn, 11 June 1908; and Osborn to Matthew, 30 June 1908: Box 3, Folder 4, AMNH-FC.

processing and fieldwork coordination at Agate constituted a central component of their casting their lot with the Cooks.

Indeed, Harold Cook remained a strong supporter of this plan, long after the initial euphoria of the American Museum staff about the paleontological riches at Agate had died down. At various times during the next decade, Harold continued to urge the American Museum to support the building of a laboratory or museum on the site, thereby placing more of the epistemic value-adding steps in scientific knowledge production at Agate itself. The museum did provide at least \$50 in 1911 for the construction of a small shack near the fossil hills for use by its fieldworkers. This structure and the neighboring homestead cabin were known by various names, including East Agate, the Agate Laboratory, the Red Shack, and “our ‘Alpine-house-on-the Rhine.’” But it was not the larger, more permanent building that Harold envisioned.⁶² Matthew supported the plan for a more substantial building, as a way of “putting the Agate work on a more permanent basis and making it the centre for Miocene collecting and preparation work.” But when financing was not forthcoming Harold continued to press for a “Field Laboratory,” contending that the American Museum would save money through lower labor costs for fossil bone preparation and freight cost savings. Osborn agreed that it was a sensible idea but explained that he could provide financial support only if the funds were derived from the sale of duplicate *Moropus* skeletons (see Figure 5) that had been excavated from the Agate site.⁶³

The fabulous collection of *Moropus* material—which would eventually comprise seventeen mountable skeletons, of which the American Museum would need only four—seemed like a sure source of financing for Harold’s plans for an on-site laboratory and museum at Agate.⁶⁴ Osborn was wary of involving the American Museum in a remote property in Nebraska. He therefore proposed, as Matthew had suggested to him privately several months earlier, that the proceeds from the sale of duplicate *Moropus*, minus the cost of preparing the specimens, be given directly to Harold.⁶⁵ This arrangement was mutually agreeable, and in the spring of 1914, while the specimens were still being prepared, several prospective buyers were already lining up. The director of the Senckenberg Museum in Germany, for example, was willing to pay between \$1,500 and \$2,500 for a *Moropus*. But the whole plan was disrupted when the onset of World War I destroyed the market. “As you know,” Matthew wrote a few months after the armistice, “the war has blocked any sales up to date, and has I fear reduced our market to very small proportions for many years to come.” The best they could do was scramble to arrange various reciprocal exchanges and two-for-one packages to recover the preparation costs plus a small profit that could be given to Harold for his building project. Finally, in April 1919,

⁶² Regarding the provision of funds for the shack see Thomson to H. Cook, 14 Oct. 1911, Box 52, Cook Papers, AFBNM. For the various names see Thomson to J. Cook, 6 Jan. 1912; and Thomson to H. Cook, 30 Jan. 1912: Box 52, Cook Papers, AFBNM. East Agate, the name used most frequently, identified not just the American Museum’s shack but the whole cluster of buildings, including Harold’s adjacent homestead cabin and barns.

⁶³ Matthew to H. Cook, 16 Sept. 1912, Box 38; H. Cook to Matthew, 28 Jan. 1913, Box 38; and Osborn to H. Cook, 10 Feb. 1913, 20 Oct. 1913, Box 42: Cook Papers, AFBNM.

⁶⁴ Matthew to H. Cook, 14 Feb. 1919, Box 38, Cook Papers, AFBNM (regarding the number of completed skeletons and the number the museum would require for its own purposes).

⁶⁵ H. Cook to Matthew, 28 July 1914, Box 38, Cook Papers, AFBNM; Matthew to H. Cook, 4 Aug. 1914, Box 38, Cook Papers, AFBNM; and Matthew to Thomson, 4 Aug. 1913, Box 4, Folder 1, AMNH-FC.

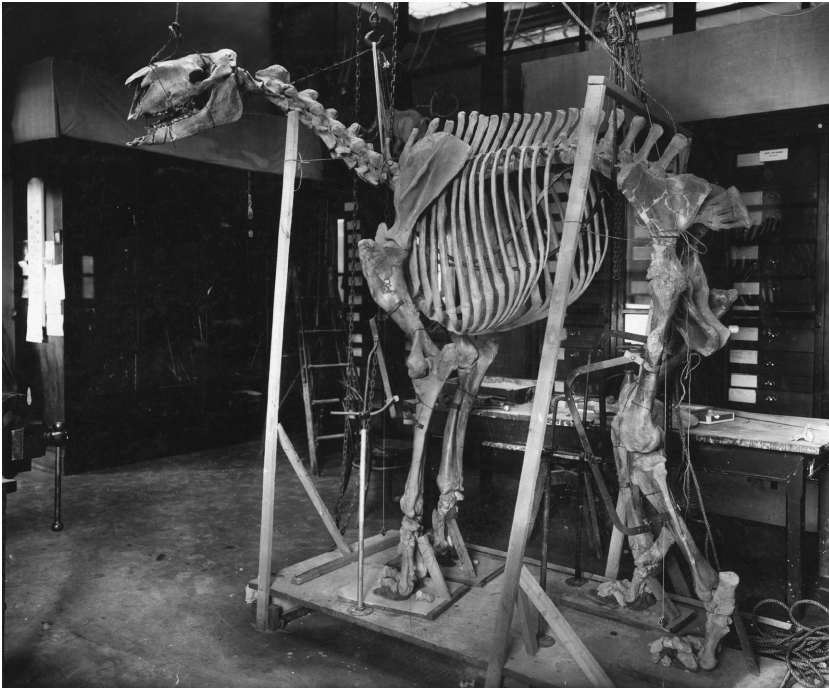


Figure 5. *Moropus* skeleton in its final stages of preparation for display, presumably at the American Museum in New York. Photograph courtesy of the Agate Fossil Beds National Monument, Cook Photograph Collection, Box C, AGFO 3467.1.

Osborn sent Harold a check for \$1,000 from a discounted sale.⁶⁶ Other unsold *Moropus* skeletons were simply donated to mutually agreeable recipients, such as Barbour at the University of Nebraska. These modest returns were far too little to finance Harold's ambitious plans.

One consequence of donating a *Moropus* specimen to the University of Nebraska, however, was to help alleviate tensions between the American Museum and the State of Nebraska. As Harold put it, the donation would help ease the "unfortunate prejudice and even hostility against outside collecting in this state." Occasionally, political discontent surfaced in Nebraska against the expatriation of fossil materials from Agate and other sites within state boundaries. Some of the discontent was probably a by-product of the strategies for seeking state funds used by Nebraska scientists such as Barbour, who often complained of the superior resources of East Coast museums and universities. But whatever its source, any attempt to regulate or restrict the movement of fossil materials out of Nebraska met with predictably fierce opposition from outside institutions such as the American Museum. When such a bill (ultimately unsuccessful) was introduced in Nebraska in 1914, Osborn called it a "great step backward," citing similar legislation in Alberta and Madagascar. "The effect of stopping outside work," Osborn contended, "is always to arrest local work." In Madagascar, he noted, "the result is that work there has

⁶⁶ Osborn to H. Cook, 1 Apr. 1914, Box 42 (on the Senckenberg museum's interest); Matthew to H. Cook, 14 Feb. 1919, Box 38; and Osborn to H. Cook, 3 Apr. 1919, Box 42: Cook Papers, AFBNM.



Figure 6. Harold J. Cook in his office at the Colorado Museum in Denver. Photograph courtesy of the Agate Fossil Beds National Monument, Cook Photograph Collection, Box G, AGFO 3775.5.

ceased entirely.”⁶⁷ With his close connections to the American Museum, Harold also generally opposed such attempts to limit the activities of nonresident researchers.

Harold had even more reason to support the continued movement of fossil materials across state boundaries in the 1920s, when he took a job in the neighboring state of Colorado. Beginning with the 1917 summer field season, he had developed a close relationship with J. D. Figgins of the newly established Colorado Museum of Natural History in Denver. Like the Nebraska and American Museum scientists, Figgins respected the Cooks’ control over the knowledge-making process at Agate, asking Harold’s permission before exchanging extra specimens with other institutions. Furthermore, in return for his assistance and hospitality, as well as his now considerable knowledge of paleontology, Harold was accorded credibility within the Colorado scientific community. Figgins offered him tools and access to the Colorado Museum’s Florissant site near Pike’s Peak in 1919. A year later, Figgins’s fossil collecting team found a site in northeastern Colorado that they called the “second Agate quarry” and invited Harold Cook to look it over.⁶⁸ Harold was subsequently given a position at the Colorado Museum (see Figure 6), normalizing his career aspirations as a scientific researcher, although the move did require him to leave the ranch for an urban institution.

⁶⁷ H. Cook to Osborn, 29 Feb. 1916; and Osborn to H. Cook, 11 May 1914: Box 42, Cook Papers, AFBNM.

⁶⁸ J. D. Figgins to H. Cook, 10 Oct. 1917, 11 Mar. 1919, 19 July 1920, 25 July 1920, 10 Aug. 1920, Box 28, Cook Papers, AFBNM.

CONCLUSION

As American science entered the twentieth century, the days of heroic adventure typified by John Wesley Powell's descent of the Colorado River in 1869 may have seemed long past. After all, the frontier in the West was declared officially closed after the 1890 census. By the turn of the century, only the polar and Alaskan expeditions seemed to represent that style of science.⁶⁹ Yet it has proven instructive to consider how scientists in the West operated in a more settled landscape, in which the local inhabitants might assert their own authority over field sites. Many of these settlers had both significant claims to control over resources and an intimate knowledge of the land acquired through local experience. This story of fossil extraction in the American West contributes to our understanding of the frontier expansion of scientific fieldwork and the concomitant struggle over the social structure and authority of modern science.

The Carnegie Museum's initial attempts to control knowledge production at Agate Fossil Beds and the circulation of specimens and knowledge obtained there incited protest from the Cook family. Here was one field site on the periphery that seemed to talk back—or at least its resident owners did. Later-arriving museums, especially the American Museum, accommodated their strategies to the Cooks' expectation of sharing some control over knowledge making and circulation. They permitted some local accumulation of scientific credibility at Agate itself, even going so far as to support Harold Cook's budding career as a paleontologist. Through his family's leveraging of Agate's natural resources and by wresting some control over the fossil beds from eastern museums—in effect, by playing the two rivals off against each other—Harold ultimately extended his scientific reputation beyond Agate to sites elsewhere.

At the same time, however, the story of the Agate Fossil Beds exposes limits to the power of local collaborators in the field sciences. Despite James Cook's desire to be involved in controlling what happened at the fossil hills near his ranch and his exceptionally strong will to impose his views, he and his son Harold ultimately bumped up against structural constraints they could not change. James Cook's original idea of providing access to all paleontological parties on cooperative terms fell apart within a few years, and he ultimately submitted to the exclusionary, competitive system of the metropolitan museums by making a special arrangement with the American Museum of New York. He could not press his own discovery claims in the scientific literature, and it was only the interests of the powerful American Museum, whose agents articulated them, that kept them under consideration at all for credit in the arena of world science. Furthermore, reflecting on the larger significance of the Agate fossil materials to paleontologists around the world—a context that is largely beyond the scope of this essay—suggests that the period of heightened worldwide interest in Miocene mammal collecting that conferred so much global importance on the Agate Fossil Beds of Nebraska was ultimately a brief window of opportunity. While the local residents at a rich fossil field site may enjoy some leverage during its heyday, the covetous eyes of metropolitan paleontologists seem always

⁶⁹ For overviews of the earlier era of heroic exploration see William Goetzmann, *Exploration and Empire: The Explorer and the Scientist in the Winning of the American West* (New York: Knopf, 1966); Richard A. Van Orman, *The Explorers: Nineteenth Century Expeditions in Africa and the American West* (Albuquerque: Univ. New Mexico Press, 1984); and Edward S. Wallace, *The Great Reconnaissance: Soldiers, Artists, and Scientists on the Frontier, 1848–1861* (Boston: Little, Brown, 1955). For an insightful recent treatment of American polar exploration see Michael F. Robinson, *The Coldest Crucible: Arctic Exploration and American Culture* (Chicago: Univ. Chicago Press, 2006).

to be turning to the next great frontier once (or perhaps even before) the key discoveries and excavations are completed, thereby rendering the local site's advantages all too transitory.

Though the successful leveraging of Agate's resources helped Harold Cook to build his career, even this move confronted structural constraints. The generational shift from father to son certainly demarcated a set of changing approaches, practices, and career trajectories that separated James and Harold Cook. Yet despite Harold's earnest efforts to concentrate the value added through the processing of fossil specimens into knowledge on site at Agate, and despite the unusual assistance of the American Museum in providing him some financial means to do so, he found it frustratingly difficult to build his scientific career at the ranch and eventually opted to accept a more conventional position at the Colorado Museum of Natural History in the regional metropolis of Denver. Moreover, throughout the entire saga of Agate, expert authority over the proper scientific identification and interpretation of the fossil resources of Agate was never really contested. Local collaborators in paleontology, as in other field sciences, were ultimately subject to constraints that limited their power to act within the increasingly professionalized world of modern science. We should be wary, therefore, of overstating the leverage possessed by the Cooks and other local collaborators.

The experiences of the Cooks may not have been typical for ranchers who collaborated with scientists in their fieldwork in the American West. But the tensions they experienced—and the negotiations to resolve them—are suggestive of the wider mixture of social conflict and cooperation that characterized fossil hunting in a former frontier zone that was rapidly being settled. The case of Agate also suggests that the struggles of scientists to gain control of peripheral field sites could involve some concessions to local collaborators. These compromises extended beyond the need to provide monetary compensation and could in some instances involve the division of credit and labor for scientific fieldwork; they might even (modestly) alter the geographical patterns of how scientific objects circulated. Yet the existence of some latitude for actively shaping the field site on both sides of the collaboration need not imply that heterogeneous actors at the local site could negotiate their own terms independent of the strong influence of established translocal structural relations.⁷⁰ Moreover, the case of Agate was quite unusual. Few local collaborators pushed so hard to gain a larger share of the power over knowledge and its circulation from the field. As a challenge to the system of prerogatives of established members of the scientific community over knowledge work, the Agate story reinforces the importance of hierarchy in the structure of science. It was only the combination of rare perseverance and the incredible natural bounty of having exceptionally rich fossil beds located at their ranch that enabled the Cooks to exercise as much leverage as they did.

This case of local collaboration in scientific fieldwork on the Agate Springs Ranch is

⁷⁰ The most frequently cited, canonical article in this agency-centered genre, which my interpretation here critiques, is Susan Leigh Star and James R. Griesemer, "Institutional Ecology, 'Translations,' and Boundary Objects: Amateurs and Professionals in Berkeley's Museum of Vertebrate Zoology, 1907–39," *Soc. Stud. Sci.*, 1989, 19:387–420. Rather than insisting on analyzing the constraints posed by hierarchical structures or power relations, as I do, analyses in this genre emphasize how diverse social groups such as scientific researchers and hired field hands collaborate around shared standards and "boundary objects." For a more comprehensive discussion of the collaboration between Joseph Grinnell and Annie Alexander at the Museum of Vertebrate Zoology, which provides an important comparison case of amateur–professional collaboration on the Pacific coast, see Barbara R. Stein, *On Her Own Terms: Annie Montague Alexander and the Rise of Science in the American West* (Berkeley: Univ. California Press, 2001). Though likewise an amateur collaborator, Alexander was more powerful than the Cooks and was also a major patron of museum research.

just one unusually well-documented example among a much larger body of evidence for the importance of local collaborators throughout the region. Local settlers and American Indians were omnipresent as collaborators throughout the American West in the late nineteenth century in all sciences. Scientists moving into the field encountered more than just a natural landscape; they also met and collaborated with the diverse human inhabitants of the area.⁷¹ And that fieldwork proved to be crucial in many fields in which American scientists received international acclaim by the early twentieth century, such as vertebrate paleontology. We can fully understand the development of American science, then, only if we are willing to examine how field scientists collaborated with local people—including a few indomitable cowboys.

⁷¹ For a more recent example of contestation over fossil bones see Steve Fiffer, *Tyrannosaurus Sue: The Extraordinary Saga of the Largest, Most Fought Over T. Rex Ever Found* (New York: Freeman, 2000).