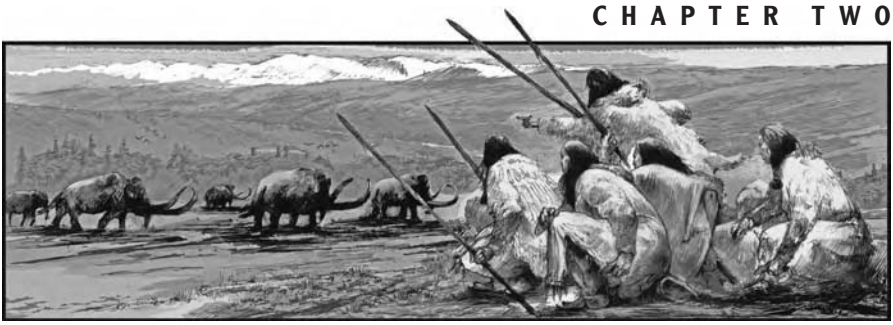
CHAPTER TWO



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That Was Then, This Is Now

Seventy-Five Years of Paleoindian Research in Colorado

The origins of Colorado's Paleoindian studies are virtually synonymous with the foundations of Paleoindian archaeology in the United States. In fact, two of the state's earliest, albeit poorly and incompletely reported, discoveries, the Dent Clovis and Lindenmeier Folsom sites (1924–1931), pre-date discoveries and early investigations of their respective cultures' type-sites: New Mexico's (Blackwater Draw) Clovis and Folsom sites. As we explain later, "Clovis" culture should have, on the basis of historical precedent, been known as the "Dent" culture.

Certainly, when myriad archaeologists and artifact hunters took to the field in Colorado in the early twentieth century, little was known of the chronology, material nature, and paleoenvironmental contexts of the state's colonizing residents. Understanding of early human occupations evolved slowly in the earliest decades of the 1900s but accelerated with important discoveries in the 1960s–1980s,

keeping pace with and contributing to the overall evolution of North American Paleoindian studies. Now, in the early twenty-first century, archaeologists are developing increasingly sophisticated and productive approaches to interpreting Paleoindian adaptations to ancient Colorado's diverse and dynamic ecosystems.

This chapter reviews Colorado's Paleoindian research history as divided into three general developmental phases: (1) early exploratory surveys and excavations through roughly 1960, (2) site-focused research conducted from the 1960s through the 1980s, and (3) increasingly sophisticated, multidisciplinary research programs based almost exclusively in the state's mountainous regions from the end of the 1980s to the present day.

We do not overview every Paleoindian-related undertaking in Colorado history; rather, we highlight the state's best-reported Paleoindian investigations to give a flavor for how they have evolved. This chapter's reference section provides a foundation for anyone wishing to delve deeper into any aspect of Colorado Paleoindian archaeology. Additional sources of background information can be found in E. Steve Cassells's *The Archaeology of Colorado* (1997), the five (1999) *Colorado Prehistory Contexts* (Gilmore et al.; Lipe, Varien, and Wilshusen; Martorano et al.; Reed and Metcalf; Zier and Kalasz), and the Colorado State Historic Preservation Office site database (a 2006 search of which yielded 715 recorded "Paleoindian" sites and isolated finds in the state). George Frison's Afterword to this volume is also most interesting for the personal perspective he brings to both early and contemporary Colorado Paleoindian archaeology.

EARLY EXPLORATORY SURVEYS AND EXCAVATIONS (ca. 1930–1960)

Colorado's earliest ventures into what eventually became known as Paleoindian archaeology occurred during the 1930s and 1940s with a long-term survey program by the University of Denver (DU) and several important site excavations from 1932 through the late 1950s by the Colorado Museum of Natural History (known as of 1948 as the Denver Museum of Natural History and since 2000 as the Denver Museum of Nature and Science), the Smithsonian Institution, and the University of Colorado. During that time, Colorado archaeologists and sites were at the forefront of North American archaeology's attempts to define an interpretive framework for the continent's earliest prehistoric occupants.

E. B. Renaud and the High Plains Archaeology Survey Program

Some of Colorado's most significant early work in Paleoindian studies came from a series of field surveys conducted by E. B. Renaud of DU from 1930 to 1946. Renaud was a French-trained romance language professor who developed an interest in archaeology. After obtaining a doctorate from DU in 1920, Renaud was appointed full professor of anthropology in 1924. He acquired archaeological field skills in France during the 1920s while also participating in field projects in southwestern Colorado.

In 1930 Renaud initiated a long-term archaeology survey program known variously as the "Eastern Survey of Colorado," the "Archaeological Survey of Colorado," and the "High Plains Archaeological Survey." He documented sites in eastern Colorado's foothills and plains, visiting nearly every county therein at least once. Within two years his Colorado research branched out to include higher portions of the Colorado Rockies, including Rocky Mountain National Park, South Park, the San Luis Valley, and the upper Rio Grande drainage. His methodology entailed making contact with local landowners and artifact collectors, examining their collections, and then tracking down the originating sites. Renaud's students completed graduate theses based on their findings during the survey program, and some made important contributions to Paleoindian studies at the national level.

John Cotter (1935), for example, produced an early summary of Folsom and late Paleoindian projectile points documented by project surveys from 1930 to 1934—roughly the time frame of his excavations at the Clovis type-site, Blackwater Draw, New Mexico. In her thesis, Mary Elizabeth (Betty) Yelm (1935; Yelm and Beals 1934) examined private point collections from Colorado's northern foothills to the Continental Divide. She documented about a dozen "Yuma-type" points and Paleoindian sites, including three very high-altitude localities revisited in 1998–2002 by the University of Northern Colorado (Benedict 2001; Brunswig 2001b, 2001c, 2003a, 2003b, 2004a, Chapter 9, this volume).

When the DU project began, the archaeological community recognized one Paleoindian culture: Folsom. Neither older Clovis nor any late Paleoindian cultures or projectile points had yet been distinguished from Folsom, although some scholars (Cook 1927; Figgins 1927) suggested that lanceolate projectiles with parallel flaking patterns were associated with very ancient human occupations. In the early 1930s, while working with amateur archaeologists Perry and Harold Anderson (e.g., Anderson 1988; LaBelle 2002), Renaud and others adopted the term "Yuma" to describe non-Folsom lanceolate projectile points collected in the vicinity of Yuma, a town in northeastern Colorado. Renaud was by now keenly aware of the significant antiquity of both Folsom and Yuma spear points, and he highlighted their distinctiveness in reports and articles (Renaud 1931, 1932b, 1934, 1935b, 1935c, 1937, 1941, 1960a, 1960b).

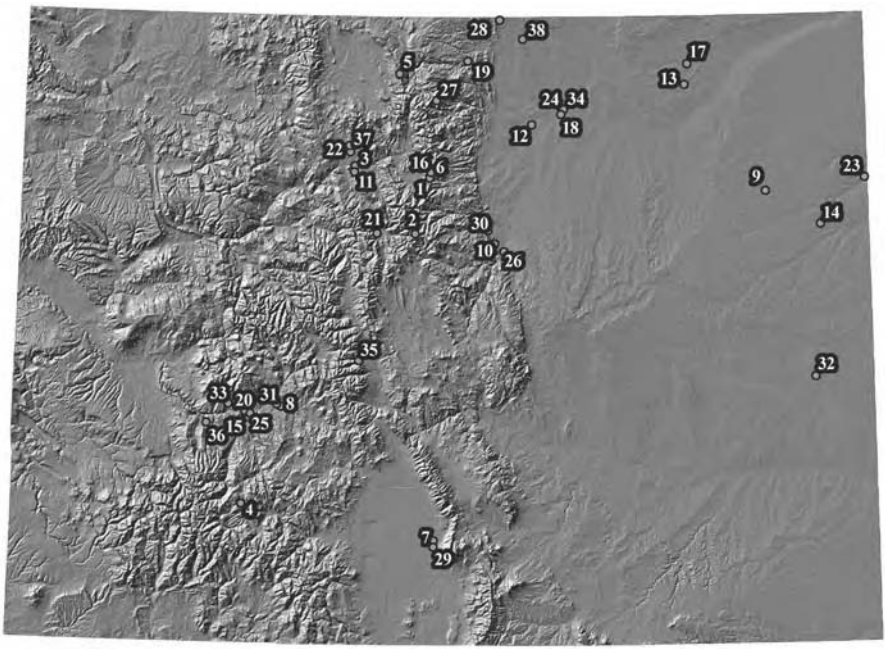
With the subsequent discovery at the Lindemeier site of Yuma (later determined to be Cody Complex) occupations *overlying* Folsom camp deposits, the chronological relationship between Folsom and Yuma was definitively established (Roberts 1935, 1937b; Wilmsen and Roberts 1978). Moreover, Renaud, his students, and others (see *Southwestern Lore* editorial 1941) noted the significant stylistic variability of projectile point types then lumped within the Yuma classification. One student, H. Marie Wormington (1949, 1957), was instrumental in developing a generalized system of Yuma "subtypes" in the 1940s and 1950s. Her work presaged the development of more formal late Paleoindian typologies in the 1960s, when radiocarbon dating increased chronological control and the site database was more robust.

In 1935, Renaud (1935a:21) reported 190 Folsom and 662 Yuma points representing "a phase of the American Paleolithic culture" from private artifact collections in Colorado's mountains, eastern foothills, and plains. Many sites identified on the basis of points in those collections and on file in project catalogs in DU's anthropology museum were later entered into the state's site database. In the end, Renaud, his students, and a few others observed and recorded dozens of sites with Paleoindian points or components from eastern Colorado's foothills-plains (Cotter 1935; Gebhard 1949; Renaud 1932a, 1932b, 1933, 1934, 1935a, 1937) and high mountains (Cotter 1935; Potts 1934; Renaud 1933, 1934, 1935a, 1937, 1942; Yelm 1935). In so doing, they established a comprehensive foundation for future Paleoindian research in the state. For more detail on Renaud's contributions to Colorado Paleoindian archaeology, we refer readers to George Frison's Afterword (this volume).

Early Paleoindian Site Excavations

Aside from occasional, limited test excavations, the DU research program involved no major excavations. In fact, in the early decades of Colorado Paleoindian research, substantial professional excavations were conducted at just five sites: the Dent mammoth (Clovis) site and four Folsom localities (Lindenmeier, Powars, Linger, and Zapata) (see Figure 2.1 for site locations). The multicomponent (Clovis–late Paleoindian) Claypool site was subjected to very limited excavations during the 1950s. Because Chapter 3 presents a detailed history of Dent site research, we only briefly overview its early discovery and investigation here. We likewise highlight here only the earliest excavations at Lindenmeier, Linger, and Zapata—all of which were subsequently re-examined in investigations we reference, as appropriate, later in this chapter.

Clovis (Dent). In response to a 1932 report from a student, Saint Regis College geology professor Father Conrad Bilgery excavated the Dent Mammoth Site that autumn (Bilgery 1935). Jesse Figgins, a curator at the Colorado Museum of Natural History, studied the mammoth remains and continued the Dent excavations in 1933. Figgins, who had excavated the Folsom type-site a few years earlier, found at least ten mostly juvenile and infant mammoths coupled with two fluted points. Calling upon his experience at Folsom, Figgins characterized the points as "Folsomoid" but not sufficiently distinct to warrant a new label. A few years later, specimens like the Dent points were recovered *below* Folsom at Blackwater Draw, New Mexico, demonstrating that "Clovis" points (as they were thenceforth known) pre-date Folsom (Meltzer 1993; Sellards and Evans 1960). For decades the Dent site, which through historical accident lost naming rights for the first universally recognized culture in the Americas, remained an enigma—one tackled by contemporary archaeologists and explored in Chapters 3–6 of this volume.



2.1. Map of key Paleoindian sites mentioned in Chapter 2. (1) 5BL3440; (2) Argentine Pass; (3) Barger Gulch; (4) Black Mountain; (5) Carey Lake; (6) Caribou Lake; (7) Cattle Guard; (8) Chance Gulch; (9) Claypool; (10) Crescent Rockshelter; (11) Crying Woman; (12) Drake; (13) Dutton and Selby; (14) Dent; (15) Elk Creek; (16) Fourth of July Valley; (17) Frasca; (18) Frazier; (19) Gordon Creek; (20) Haystack Cave; (21) Hourglass Cave; (22) Jerry Craig; (23) Jones-Miller; (24) Jurgens; (25) Kezar Basin; (26) Lamb Spring; (27) Lawn Lake; (28) Lindenmeier; (29) Linger, Reddin, Zapata Folsom, Zapata Mammoth; (30) LoDaisKa; (31) Mountaineer; (32) Olsen-Chubbuck; (33) Ponderosa/Soap Creek; (34) Powars; (35) Runberg; (36) Soderquist Ranch; (37) Upper Twin Mountain; (38) Wilbur Thomas.

Folsom (Lindenmeier, Powars, Linger, and Zapata). The Lindenmeier site, located in a northern Front Range foothills creek valley, is an extensive, relatively deeply buried campsite with highly visible cultural deposits exposed in an arroyo. Lindenmeier was discovered in 1924—two years before formal excavations began at the Folsom type-site—during an amateur artifact-collecting expedition by Judge Claude C. Coffin, his son A. Lynn, and C. K. Collins (Coffin 1937, 1960; Greenway 1960; Renaud 1932b:27–28). The Coffins spent nearly a decade surface collecting artifacts and conducting small test excavations before learning from E. B. Renaud that many of the specimens in their possession belonged to the newly defined Folsom Complex.

The Coffins eventually contacted scientists at the Smithsonian's Bureau of American Ethnology to report Lindenmeier. Frank H.H. Roberts, a field archaeologist with the Smithsonian, responded, visiting the site in September 1934 with

Roy C. Coffin (a geologist and relative of the site's discoverers). Impressed with the site's potential, Roberts conducted excavations from 1935 through 1940 (Reed 1940; Roberts 1935, 1936a, 1936b, 1937a, 1937b, 1938, 1940a, 1940b, 1941). The first year's investigations involved joint work by the Smithsonian and the Colorado Museum of Natural History, the latter led by former Renaud student John Cotter (1978). Subsequently, Roberts worked alone, although he engaged in interdisciplinary collaborations that produced results revolutionary for the time (Bryan and Ray 1940). Although not immediately published, Roberts's records eventually yielded valuable information when the final site report was produced several decades after the 1930s excavations, after Roberts's death (Wilmsen and Roberts 1978). Even later, Colorado State University student Erik Gantt (2002) wrote a master's thesis on the artifacts in the Coffins' private collections.

The Powars site, identified in the 1930s by local artifact collector John Powars, was discovered on an abandoned terrace of the South Platte River east of Greeley. After a quick test excavation, Powars contacted Frank H.H. Roberts (1937a, 1940b), then directing excavations at Lindenmeier. Roberts conducted a brief excavation at Powars in 1936, recovering Folsom point fragments and other tools suggestive of a small, short-term hunting camp. The site overlooks what was then the South Platte's main floodplain, an ideal location for spotting and hunting game. Powars was never reinvestigated and was destroyed by construction of a private home.

Two San Luis Valley Folsom sites, Linger and Zapata, stand as the state's earliest Rocky Mountain (albeit parkland-setting) Paleoindian excavations. Both sites were discovered by local resident Gene Sutherland in the 1930s, and both were subjected to limited excavations in the 1940s and 1950s. C. T. Hurst (1941, 1943), professor of anthropology at Western State College in Gunnison, conducted test excavations of Linger in 1940–1941. The site yielded what Hurst (1941:31) described as a "definite association (of Folsom artifacts) with the remains of what may be *Bison taylori*." F. V. Worman, an Alamosa State College professor, tested (but never reported) the Zapata site, an endeavor that yielded an artifact assemblage similar to but smaller than that recovered at Linger (Jodry 1999b; Wormington 1957). Both Linger and Zapata saw expanded excavations by the Smithsonian Institution in the 1970s and 1980s.

Late Paleoindian (Claypool). Claypool, a multicomponent Paleoindian site, was discovered in the mid-1930s by Perry and Harold Anderson in the state's easternmost plains (Dick and Mountain 1960; Wormington 1957). Another area resident, Bert Mountain, subsequently recovered two Clovis points and portions of a mammoth skeleton eroding from a terrace creek bank and in 1953 assisted in a brief University of Colorado (CU) site excavation (Dick and Mountain 1960). The CU tests suggested Claypool's cultural deposits consisted of naturally deflated (and thus mixed) Clovis and Cody Complex camp assemblages. Two decades later a Smithsonian Institution team led by Dennis Stanford conducted additional test

excavations at Claypool and reached similar conclusions about the integrity and interpretation of the deposits (Stanford and Albanese 1975).

SITE-FOCUSED RESEARCH (1960s–1980s)

Compared with preceding decades, Colorado Paleoindian studies became increasingly diverse, more productive, and technically sophisticated in the 1960s, 1970s, and 1980s, with radiocarbon dating providing chronological data of a resolution previously unknown. Here we highlight excavations conducted at sites representative of the Paleoindian era, beginning with pre-Clovis contenders and ending with late Paleoindian localities (Figure 2.1). In addition to producing a wide array of well-collected data, this period of Paleoindian investigations was also important for expanding investigations from the eastern plains and large, open mountain basins to essentially all of the highly varied environmental settings that make up the state of Colorado.

Pre-Clovis

Mirroring intense interest in the subject throughout North America, Colorado archaeologists of the post-1950s began exploring the possibility that their state supported human groups even prior to the arrival of Clovis people. A local rancher discovered the Lamb Spring site near a natural spring in the foothills west of Denver when he excavated a livestock pond and exposed the bones of Pleistocene mammals. Excavations by Smithsonian archaeologist Waldo Wedel (1960–1961) recovered the remains of at least seven mammoths along with camel bone, some with what Wedel interpreted to be cultural flaking. The bones overlaid a silt-clay layer dated to around 13,000 radiocarbon years before present (RCYBP) (Wedel 1965). In 1979–1981, Dennis Stanford and a new team from the Smithsonian returned to Lamb Spring. Their work (Stanford, Wedel, and Scott 1981) revealed remains of five additional mammoths, more potential evidence of cultural bone modification, and a 33 kg river boulder transportable only through human effort. Additional analysis of the site's faunal assemblage proved inconclusive, however, and the site's pre-Clovis status is regarded as unlikely (Fisher 1992; Stanford 1983a).

Two other Colorado localities, Dutton and Selby, located in the northeastern Colorado plains near Wray, have been proposed as possible pre-Clovis sites. Both were encountered when ranchers in the mid-1970s enlarged natural pond hollows for livestock watering, exposing bones of Ice Age megafauna. Smithsonian archaeologists working at the nearby Jones-Miller bison kill site excavated the localities, which yielded the remains of mammoth, horse, camel, and now-extinct bison (some with possible human modification), as well as—at Dutton—a Clovis point in backhoe dirt excavated prior to the professional investigation (Stanford 1979). Although the sediment adhering to the Clovis point resembled buried sediments dated to 11,170 RCYBP, neither Selby nor Dutton is now viewed as definitively pre-Clovis (Stanford 1979).

Investigation of Colorado's only Rocky Mountain site with potential pre-Clovis cultural deposits, Haystack Cave in western Colorado's Upper Gunnison Basin, occurred in the 1970s. First recorded as a jasper quarry in 1935 by Betty and Harold Huscher, Euler and Stiger (1981) conducted test excavations at the site, reporting deposits over 1.5 m deep. Excavators reported that the cave's lower strata yielded chipped stone of possible cultural origin and the remains of late Pleistocene fauna with reported radiocarbon dates of 12,154 ± 1,700 RCYBP and 14,935 ± 610 RCYBP (Emslie 1986; Euler and Stiger 1981; Nash 1987). Subsequent sporadic excavations yielded additional flakes and an expanded collection of Pleistocene fauna (Binford and Nash 1984; Emslie 1986, 1998a, 1998b, 1998c; Nash 1987, in prep). Nash (Emslie 1998c:Part IV-4; Nash in prep) considers Haystack Cave to have yielded positive evidence for a pre-12,000 RCYBP occupation, but most do not view Haystack Cave as a strong pre-Clovis contender.

Clovis

Clovis archaeology since early investigations at the Dent Mammoth Site in 1932–1933 has met with limited success in Colorado, likely a joint function of the low density of Clovis sites and the long period of time they have been subjected to burial and erosion. Nonetheless, Colorado archaeologists explored several Clovis sites in the 1960s–1980s. The Drake site, named for finder Orvil Drake, is a cache of thirteen complete Clovis points from the plains east of Greeley. After tests by the University of Northern Colorado's Bruce Lutz, Dennis Stanford and Margaret (Pegi) Jodry (1988b) excavated the area that yielded the points, locating ivory fragments and a hammerstone. Stanford and Jodry (1988) reported that about half the points were unused while the others were reworked—evidence, they argued, of a utilitarian function.

West of the Great Sand Dunes in the San Luis Valley, the Zapata Mammoth Site was reported in 1943 by Western State College professor C. T. Hurst. A quarter-century later, Dennis Stanford and a Smithsonian Institution team tested the locality (Lyons 1978). According to Jodry (1999b), the tests indicated that the site's original stratigraphy had been disturbed by alternating episodes of wind erosion and reburial, limiting its interpretive potential. However, a local collector reported recovering two Clovis points from a deflated scatter of mammoth bone at the site, and the Smithsonian crew recovered chipped-stone artifacts indicative of Clovis technology. Jodry (1999b) concluded that the Zapata Mammoth Site probably resulted from either a successful Clovis mammoth hunt or Clovis scavenging of an already-dead mammoth.

Over the past two decades, other Clovis finds have been documented in the same general vicinity as the Zapata Mammoth Site, but none has been fully investigated. As summarized in Jodry's (1999b) overview of San Luis Valley Paleoindian archaeology, these localities include the Little Clovis site, an open camp lithic scatter with Clovis and Folsom points (Button 1987); the multicomponent One-Two-Three site with two lithic and ground-stone tool concentrations,

a single hearth feature, a Clovis point, and Archaic and late Prehistoric projectile points; and several isolated Clovis point finds.

Folsom

The San Luis Valley is best known for its Folsom sites, the focus of four decades of Smithsonian Institution field investigations. Processual-era excavations of these sites began in the late 1960s when a University of New Mexico anthropology student from the area, Jerry Dawson, conducted a limited excavation of the Linger Folsom site first visited by C. T. Hurst in the 1940s. Dawson later contacted the Smithsonian's Dennis Stanford and persuaded him to visit the site in 1968 (Dawson and Stanford 1975; Jodry 1999b). Stanford returned and supervised excavations at Linger from 1977 through 1979, recovering evidence for three distinct activity areas: a bison kill area and two bison processing areas (Jodry 1998, 1999a, 1999b).

Additional Smithsonian investigations in the San Luis Valley included a joint 1978 Smithsonian Institution–Colorado Archaeological Society test excavation of the Zapata Folsom site (Jodry 1999b; Lyons 1978), surface collection of the Reddin Folsom site in 1979 and 1983 (Jodry 1999b; Stanford 1983b), and a series of post-1980s research projects that constitute a long-term multidisciplinary research program discussed later in this chapter. The Zapata excavation revealed an area of bison butchery with a Folsom preform (Jodry 1999a, 1999b; Lyons 1978). Studies of surface collections showed that a high proportion of San Luis Valley Folsom artifacts are made of Edwards Plateau chert (Texas), sources for which are hundreds of miles to the southeast (Jodry 1999a, 1999b). Stewart's Cattle Guard, finally—reported by local resident Duane Martin and test excavated in 1981—showed from the start an array and distribution of artifacts indicative of a short-term summer camp (Emery and Stanford 1982). The site would later become synonymous with Pegi Jodry, who conducted meticulous excavations that led to a master's thesis, a dissertation, and other writings (1987, 1992, 1996, 1999a, 1999b).

North of the San Luis Valley but in a similar ecological setting, cultural resource management (CRM) surveys by Colorado State University (CSU) in the 1980s documented a significant Folsom presence in Middle Park. Follow-up work by then-CSU graduate student Brian Naze expanded earlier survey-identified sites by consulting with local landowners and identifying Paleoindian (mainly Folsom) artifacts from their collections. Naze later identified site clusters north and southwest of Kremmling in the lower Middle Park Valley (Naze 1986). In 1994, Naze's research culminated in a master's thesis reporting test excavations at the Crying Woman site in the uplands south of the Colorado River, with evidence for Folsom and Jimmy Allen (late Paleoindian) occupations. Naze's work later served as a springboard for an ongoing, long-term Middle Park Paleoindian research program conducted by the University of Wyoming.

The Lindenmeier site east of Middle Park on the Colorado Plains saw renewed archaeological interest in the 1960s to 1980s. After original excavator Roberts's

death in 1962, University of Arizona graduate student Edwin Wilmsen wrote his doctoral dissertation using Roberts's detailed field records and Smithsonian artifact collections. He concluded that the main Lindenmeier camp sheltered two distinct Folsom social groups (Wilmsen 1967, 1974; Wilmsen and Roberts 1978). In 1959 archaeologists gained chronological control at Lindenmeier when Vance Haynes and George Agogino (1960) dated deposits to 10,780 ± 375 RCYBP, results confirmed thirty years later with additional radiocarbon assays (Haynes 1992). Finally, in a study yielding similar results to those of Smithsonian archaeologists in the San Luis Valley, Jack Hofman, Larry Todd, and Michael Collins (1991) subjected Lindenmeier chipped-stone artifacts to source analysis that indicated some material originated as far away as west Texas.

Late Paleoindian

In addition to important work on early Paleoindian sites, the 1960s to 1980s stand out as the period when Colorado archaeologists began turning their attention to the post-Folsom Paleoindian era, ca. 10,000 to 7,500 RCYBP. Important late Paleoindian sites of this time frame, beginning with Agate Basin and ending with terminal Paleoindian complexes—in both plains and Rocky Mountain settings—were investigated by archaeologists from the Denver Museum of Natural History, the Smithsonian, the University of Colorado, the Center for Mountain Archeology, and others. The 1960s–1980s also saw the beginnings of CRM, a source of archaeological data for Paleoindian studies, including poorly known late Paleoindian site components. To reinforce the dual geographic focus of this era, we divide our discussion by region: plains work first, then research in the Colorado Rockies.

Colorado Plains. In 1965, geologist Frank Frazier located the Agate Basin Paleoindian site that bears his name about 12 km east of Greeley on the Kersey Terrace. He reported finds of bison bone and Agate Basin projectile points to Marie Wormington, who conducted a test excavation at the locality and recovered additional bison bones, debitage, and one in situ Agate Basin point (Malde 1984; Wormington 1984). She completed additional excavations in 1966–1967, concluding Frazier was a secondary bison butchering and processing area (Wormington 1984). Radiocarbon dates on humate extractions from a soil sample overlying the Agate Basin deposits yielded ages of 9,550 ± 130 and 9,650 ± 130 RCYBP (Malde 1984; Wormington 1984). The most recent Frazier research is a CSU master's thesis study of its lithic assemblage (Slessman 2004).

The Jones-Miller Hell Gap site, located east of Frazier on the Colorado Plains near Wray, was discovered in 1972 when local resident Robert Jones Jr. excavated a livestock watering pond. Jones observed bison bones and projectile points, which he reported to Jack Miller, an archaeologist formerly affiliated with CSU. After testing the site and discovering more bison bone, Miller contacted Jim Judge (then of the University of New Mexico), who in turn alerted the Smithsonian's

Dennis Stanford. Stanford (1974) conducted excavations at the site from 1973 to 1975, exposing an extensive bone bed, 3 fire hearths, 91 chipped-stone artifacts, 61 Hell Gap projectile points and fragments, and 136 bone artifacts. Jones-Miller charcoal yielded an age of 10,020 ± 320 RCYBP (Graham 1987), consistent with other Hell Gap site dates. Stanford (1974) concluded that the Jones-Miller bone bed, like Frazier, was a secondary butchering locus.

In 1947, when Paul Forward began farming land just southeast of the town of Firstview, Cheyenne County, Colorado, he noticed scattered bone fragments. Amateur archaeologist Jerry Chubbuck collected a Paleoindian projectile point and scraper from among the bones, reporting his find to fellow avocational archaeologist Sigurd Olsen, who had collected a similar point from the same area, and to Joe Ben Wheat of the University of Colorado. Olsen and Chubbuck first excavated the site, obtaining twenty-four projectile points, stone tools, and bison bones (Chubbuck 1959). In 1958 and 1960, Wheat (1967, 1972, 1978) excavated a "river" of 192 bison from the locality, by then named for Olsen and Chubbuck. In the process, he set new standards for interdisciplinary collaboration, meticulous excavation, attention to taphonomy, and projectile point typology. Wheat dated hoof collagen from the site to 10,150 ± 500 RCYBP. However, Holliday, Johnson, and Stafford (1999) obtained seven bone gelatin ages between 9,290 ± 60 and 9,480 ± 60 RCYBP—more in line than Wheat's date with the Cody Complex elsewhere (Pitblado 2003).

Like the Frazier site, Jurgens, named for the landowner, was discovered by geologist Frank Frazier, who reported his find to Marie Wormington. In 1967, Frazier, Henry Irwin, William Biggs, and Robert Burton excavated several test pits at Jurgens, uncovering a bone bed and projectile points. In 1967, Joe Ben Wheat visited Jurgens with Wormington and then partnered with her to excavate the site in 1968 and 1970 (Wheat 1979). Wheat's Jurgens research again involved interdisciplinary collaboration, including with pollen analyst Linda Scott (Cummings), who continues working today as Colorado's premier palynologist (see Chapters 6 and 7, this volume). Cody Complex occupation at Jurgens—there has long been debate over *which* manifestation of the Cody Complex the Jurgens projectile points represent—has been dated to 9,070 ± 90 RCYBP, consistent with other Cody site ages.

Around the time Forward observed bison bones near Firstview, rancher Charles Frasca noted large bones eroding out of a bank of Pawnee Creek, twenty miles northwest of Sterling in northeastern Colorado. In 1978, Frasca gave Wayne and his daughter Becky Dreier permission to collect some of the bones for a science project, which led to the discovery of a spear point. The Dreiers contacted the Colorado State archaeologist and the Smithsonian Institution, which excavated the site in 1979–1980. Dennis Stanford led the excavations with a team that included future Paleoindian scholars Pegi Jodry, Larry Todd, Mary Lou Larson, and Marcel Kornfeld. According to Fulgham and Stanford (1982), Frasca was created when hunters killed and butchered at least fifty-six bison at 8,910 ±

90 RCYBP. Fulgham and Stanford (1982) rejected Wheat's term "Kersey" (which Wheat applied to similar-looking projectile points from Jurgens), assigning to the Frasca specimens a generalized "Cody" affiliation.

The Colorado Rocky Mountains. All the post-Folsom Paleoindian sites discussed to this point are located on the plains of eastern Colorado. However, an important theoretical development in the 1960s opened the door for archaeologists to focus on late Paleoindian sites in mountain settings as well. Wilfred Husted (1969, 1995; Husted and Mallory 1968) first proposed that post-Folsom prehistoric occupants of the Rocky Mountains developed adaptations to high-altitude environments that differentiated them from groups on the adjacent plains and other lowland regions. Shortly thereafter, and in many subsequent publications, George Frison (e.g., 1973, 1976, 1988, 1991, 1992, 1997) supported Husted's model with his notion of "foothills-mountain traditions" occupying the Rockies by 10,000 RCYBP. Others (e.g., Black 1991) have since subscribed to this view, a point elaborated and illustrated later in this chapter and volume (e.g., Chapters 9 and 10).

Consistent with and supporting Husted's mountain-focused perspective, the 1960s–1980s saw the beginning of an increasingly substantial body of work focusing on Paleoindian occupation of the Colorado Rocky Mountains. The archaeologist most intimately associated with an emphasis on early human use of the high country is James Benedict of the Center for Mountain Archeology, headquartered in Ward, Colorado. Benedict's meticulous geological and archaeological investigations in the alpine and subalpine region west of Boulder span more than four decades and continue unabated today. Two sites excavated in the early 1970s, Caribou Lake and Fourth of July Valley, represent some of Benedict's earliest work and are therefore discussed here (his more recent work is discussed later).

In 1970–1971, Benedict excavated the Caribou Lake site, located at 3,400 m asl in a cirque valley north of Arapaho Pass, exposing a fire hearth dated to 8,460 ± 140 RCYBP and a projectile point base with a parallel-oblique flaking pattern (1974, 1985). Benedict compared the point to Cody Complex specimens found at Jurgens on the plains to the east. At roughly the same elevation and just 2 km south-southeast of Caribou Lake, Husted reported the Fourth of July Valley site in 1965. Benedict excavated the site in 1971, recovering two types of late Paleoindian projectile points, Jimmy Allen and Pryor Stemmed, and hearth charcoal dated to an anomalously late 6,045 ± 120 B.P. and 5,880 ± 120 B.P. Benedict (1981:92) concluded that the late age of this hunting camp "indicated the persistence of an important late Paleo-Indian complex at the moist western periphery of the plains long after its disappearance from the drier, shortgrass environment." However, new work at Fourth of July Valley in the early 2000s by Benedict (discussed later) has prompted him to alter his interpretation.

Like Benedict, Elizabeth Morris conducted decades of important research in the high Colorado Rockies. In the Rawah Wilderness of northern Colorado, Morris (1990; Morris and Metcalf 1993) repeatedly surface collected the 3,397 m

asl–elevation Carey Lake site, netting late Paleoindian projectile point fragments (Cody Complex and Jimmy Allen) and other artifacts. Although Carey Lake has not been tested for subsurface cultural deposits, the surface assemblage suggests that like Caribou Lake and Fourth of July Valley, the site served as a short-term hunting camp. Morris also conducted research at the 3,597 m asl–elevation Argentine Pass site in Summit County (Marcotte and Mayo 1978). Although she did not excavate Argentine Pass, she monitored construction of a transmission line on-site, identifying as she did subsurface artifacts that included an early Archaic point fragment. Subsequent surface collection yielded two Jimmy Allen projectile point fragments, perhaps indicating buried late Paleoindian deposits.

In 1988, spelunkers discovered one of Colorado's two sets of Paleoindian human remains in Eagle County at 3,400 m asl. Known as Hourglass Cave Man and representing the highest occurrence of early human remains in North America, the find consists of a partial, disarticulated skeleton of a man in his early forties, with no grave goods or signs of deliberate burial (Hildebolt et al. 1994; Kight, Frost, and Wilson 1996; Mosch and Watson 1993, 1997a, 1997b; Stone and Stoneking 1997). The 1.5 m (5'4")–tall man crawled into Hourglass Cave through a restrictive corridor between 8,170 ± 100 and 7,714 ± 84 RCYBP (Mosche and Watson 1997b). His well-preserved DNA suggests a general genetic link with modern Native Americans, and his mitochondrial DNA indicates genetic connections with contemporary indigenous groups of South and Central America (Stone and Stoneking 1997).

In 1984–1985, Elizabeth Morris's student and later collaborator Michael Metcalf served as P.I. for excavations conducted by his CRM firm at the 2,173 m asl Runberg site, south of Hourglass Cave and Argentine Pass in the eastern foothills of the Sawatch Range, Chaffee County. The excavations yielded evidence for at least three late Paleoindian occupations, all probably by hunting bands (Black 1986). The earliest was ascribed an age between 10,000 and 8,800 radiocarbon years on the basis of lanceolate projectile point morphology and a radiocarbon date from an overlying level. In stratigraphic levels above the one that produced the projectile point, the site yielded four late Paleoindian dates ranging from 8,840 ± 100 RCYBP to 7,740 ± 140 RCYBP and representing two distinct occupations (Black 1986).

Even farther south, excavations in the Gunnison Basin during the 1960s to 1980s yielded several sites of late Paleoindian affiliation. Ponderosa/Soap Creek (Dial 1984; Jones 1984a, 1984b) is located on a gentle, sagebrush-covered slope and yielded hearths, a structure, and three late Paleoindian radiocarbon dates between 8,540 ± 140 B.P. and 7,450 ± 330 B.P. The multicomponent Kezar Basin site (Euler and Stiger 1981; Mueller and Stiger 1983), on a sagebrush-covered bench intermittently submerged by Blue Mesa Reservoir, yielded eighty-seven fire features, most early Archaic in age. The two earliest assays, however, are 8,543 ± 100 RCYBP and 7,653 ± 240 RCYBP, from a boiling pit and an unlined hearth, respectively (Jones 1984b). Based on the recovery of bone fragments and chipped-

stone tools and flakes, Mueller and Stiger (1983) suggested Kezar Basin functioned as a bighorn hunting and butchering camp.

The 30-acre Elk Creek site (Mueller and Stiger 1983) is located on a ridgetop at 2,318 m asl. Like Kezar Basin and Ponderosa/Soap Creek, Elk Creek is multicomponent, with dates on hearths ranging from about 9,800 to 4,300 RCYBP (Jones 1984b). Only the earliest date, 9,791 ± 830 B.P., obtained from an unlined fire hearth at this multi-use site, falls within the late Paleoindian period (Mueller and Stiger 1983). A final 1980s-vintage Gunnison Basin late Paleoindian site is Soderquist Ranch, located on a mesa slope in southwest Gunnison County. Discovered during a CRM survey, surface artifact collection and limited test excavations revealed shallowly buried camp deposits. The deepest level produced a Jimmy Allen projectile point and another specimen interpreted to be Hell Gap or Great Basin Stemmed (Liestman and Gilmore 1988; Pitblado 1993; Reed and Metcalf 1999). Although excavators did not encounter late Paleoindian features, charcoal collected at the level of the projectile points was dated to 7,670 ± 70 RCYBP (Liestman and Gilmore 1988; Reed and Metcalf 1999).

Caribou Lake, Fourth of July Valley, Carey Lake, Argentine Pass, and Hourglass Cave are all very high-altitude late Paleoindian sites located in the subalpine-alpine zones at elevations of 3,400 m asl or higher. All but the Hourglass Cave skeleton produced projectile points of the Jimmy Allen type, which have been dated at plains and Rocky Mountain sites to between 9,350 and 7,900 RCYBP (Pitblado 2003). At 2,713 m asl, Runberg is lower than the aforementioned sites, and the Gunnison Basin localities of Ponderosa/Soap Creek, Kezar Basin, Elk Creek, and Soderquist are all located in parkland settings in the 2,200–2,350 m asl–elevation range. The lowest environmental settings of the Rockies are the foothills that transition to the plains as one moves eastward through Colorado. Like the higher regions, the Front Range foothills are home to archaeological sites with late Paleoindian components explored in the 1960s to 1980s.

At the stratified Lamb Spring site, two miles east of the Front Range in Douglas County, a Cody Complex occupation occurred above the potentially pre-Clovis mammoth bone bed (Rancier, Haynes, and Stanford 1982; Stafford et al. 1997; Stanford, Wedel, and Scott 1981; Wedel 1965). Artifacts representing the Cody occupation include two projectile points, a scraper, and a graver, used, Stanford, Wedel, and Scott (1981) argued, during the summer months. Radiocarbon dates obtained on bone collagen from the Cody level—8,870 ± 350 B.P. and 7,870 ± 240 B.P. (Stanford, Wedel, and Scott 1981:24)—reflect a late Cody occupation of the locality.

In 1968–1969, David Breternitz (1971) and a team from CU-Boulder excavated the Wilbur Thomas Shelter, four miles southwest of Carr. This multicomponent rockshelter yielded just one artifact diagnostic of the late Paleoindian period: a Scottsbluff projectile point base. This find, plus one associated artifact thought to be a knife, constitute only a minimal Cody presence at the site and possibly curation of Cody artifacts by later occupants. On the other hand, because the

Scottsbluff point base emerged from the lowest of four stratigraphic levels, it may have been deposited during the late Paleoindian period (Zimmerman 1971). A lack of radiocarbon dates from the level leaves the issue unresolved.

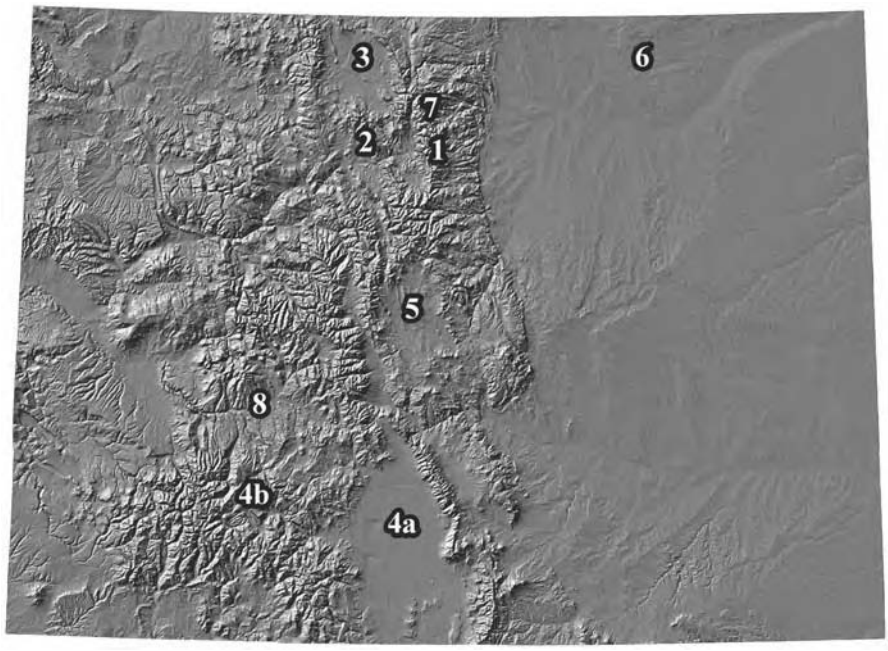
Excavated by the CU-Denver field school, Crescent Rockshelter, southwest of Denver in the Hogback Valley, contained primarily Archaic-era materials in stratigraphic context (Stone 1994; Stone and Mendoza 1994). However (Stone 1994:6), midden deposits in the southern part of the site produced "points indicative of Paleoindian/Archaic transition, including a Jimmy Allen point and a Cody Knife fragment." No accompanying features were found, and no radiocarbon dates were obtained for this level. Nonetheless, as at Wilbur Thomas, the stratigraphic position of Paleoindian artifacts beneath well-dated Archaic materials suggests they could represent late Paleoindian occupation of the rockshelter.

LoDaisKa (Irwin and Irwin 1959) is also located in Colorado's Hogback region. The site is twelve miles north of and at a slightly higher elevation than Crescent Rockshelter, but it shows a similar sequence of Holocene occupations. Excavators recovered one late Paleoindian projectile point from sands and gravels of late Wisconsin outwash. Charcoal, ash, and burned bone occurred in the same level, but in the early days of radiocarbon dating they proved insufficient to date. Irwin and Irwin (1959:146) initially compared the projectile point with the Plainview type on the basis of its lanceolate shape and parallel flaking. However, they wrote elsewhere (1959:31) that the flaking pattern is parallel-oblique, not characteristic of Plainview (e.g., Knudson 1983; Wormington 1957).

A final site located in the Colorado Front Range foothills, Gordon Creek, yielded the second of Colorado's two sets of Paleoindian-aged human remains, these at a lower elevation than those of Hourglass Cave Man. In 1965 the Gordon Creek burial was found eroding from a foothills creek bank northwest of Fort Collins (Anderson 1966; Breternitz, Swedlund, and Anderson 1971; Gillio 1970). Excavations by the University of Colorado recovered the partial skeleton of a young woman believed to be twenty-six to thirty years old and about 1.5 m (4'11") tall. Her body, covered with powdered red hematite, was flexed and interred with her head oriented north. Grave goods included three bifacial knives, an end scraper, a hide abrader, a hammerstone, several utilized flakes, two artiodactyl ribs stained with hematite, and three elk teeth (one perforated). Bone collagen from the remains yielded a radiocarbon date of 9,700 $\pm$ 250 B.P. Mark Muniz (2004) recently dated carbonized sap from the site and provides a best-estimate age for the burial of 9,620 $\pm$ 45 B.P. Muniz (2004) also studied the reduction strategy used to knap the bifaces in the burial, concluding it is consistent with Hell Gap—as is the radiocarbon date.

COLORADO PALEOINDIAN RESEARCH PROGRAMS (LATE 1980s TO THE PRESENT)

In this final section, we identify and discuss the state's major research programs currently investigating Paleoindian occupations of Colorado (Figure 2.2). We also



2.2. Contemporary Colorado Paleoindian research program areas discussed in Chapter 2 and the remaining chapters of this volume. (1) Indian Peaks Wilderness, (2) Middle Park, (3) North Park, (4a) San Luis Valley, (4b) Upper Rio Grande Drainage, (5) South Park, (6) South Platte, (7) Rocky Mountain National Park, (8) Upper Gunnison Basin.

touch on one other recent trend in Colorado Paleoindian research: the systematic study of extant artifact collections, primarily projectile points, as sources of data to address questions at broad interpretive scales.

The San Luis Valley/Upper Rio Grande Paleoindian and Paleoecology Program

The Smithsonian Institution's research in the San Luis Valley is the state's earliest and longest-sustained multidisciplinary research program in Paleoindian archaeology. Although the Smithsonian's investigations in the northeastern Colorado foothills and plains in the 1970s and 1980s reflected a commitment to those areas, they never coalesced into a coordinated research program like that in the San Luis Valley, remaining instead site-focused and opportunistic in sites selected for excavation. The Smithsonian's earliest field investigations in the San Luis Valley were also typically site-specific. However, by the late 1980s, research was taking the form of a sustained, long-term effort designated the "Smithsonian Paleoindian/Paleoecology Program" (Jodry 1999c:12). Of all the investigations contributing to and embodying that evolution, excavations at Stewart's Cattle Guard stand out as most significant.

After testing in 1981 (Emery and Stanford 1982), then-graduate student Pegi Jodry undertook excavations of Cattle Guard for her master's thesis (1987) and proceeded in a vein similar to earlier site-based excavations. However, Jodry's decision to expand her research into a multiyear project—one product of which was her Ph.D. dissertation (Jodry 1999a)—set the stage for ongoing, multidisciplinary studies of Folsom cultural adaptations in the region. Cattle Guard excavations from 1987–1996 resulted in the mapping and analysis of more than 1,400 m^2 of deposits (Jodry 1999a). Jodry (Ahler and Jodry 1997; Jodry 1998, 1999a, 1999b) conducted refitting, stone use-wear, and other analyses, concluding that the site contained three distinct areas (a short-term camp, lithic workshop, and late-summer or early-fall bison kill)—each characterized by a suite of unique activities undertaken by a single Folsom group. Inspired by innovators like Joe Ben Wheat before her, Jodry's (1987, 1999a) reconstructions of spatial organization and economic activities at Cattle Guard set new interpretive standards for hunter-gather archaeology that have, in turn, influenced others (e.g., Surovell and Waguespack, Chapter 8, this volume).

During the later stages of her Cattle Guard excavations, Jodry and Vince Spero (Rio Grande National Forest) initiated excavations at the nation's highest excavated Folsom site, Black Mountain (Jody 1993, 1999b:49–55; Jodry et al. 1996). Located in a subalpine valley west of the San Luis Valley at 3,096 m asl, the Black Mountain site's buried Folsom occupations extend for ca. 120 m along a creek terrace bench and represent what Jodry believes to have been two distinct short-term, open camps used as bases for hunting, waypoints in migrations to or from higher elevations, or both. Stratified organic sediment from Black Mountain's Folsom-associated buried A horizon yielded a date of 10,631 $\pm$ 84 RCYBP.

An essential element of Jodry and the Smithsonian's contemporary Paleoindian research program is paleoenvironmental reconstruction (Jodry 1999c). With palynologist Owen Davis (University of Arizona) and the University of Colorado's Institute of Arctic and Alpine Research, Jodry (1999c) and her colleagues have cored a series of lakes and bogs from subalpine to San Luis Valley bottom ecosystems to explore relationships between climatic oscillations and Paleoindian use of the region. This research complements that which has engaged Colorado paleoecologist Linda Scott Cummings for several decades and which lies at the heart of Cummings's and her colleagues' Chapter 6 and 7 contributions to this volume.

Paleoindian Investigations in the Upper Gunnison Basin

North of the Black Mountain Folsom site, the Gunnison Basin has shown in the last decade that it may have been as attractive to Paleoindian people as Colorado's other, better-known mountain parks. Three institutions are actively conducting Paleoindian research in the Gunnison Basin, two focusing on the earlier end of the Paleoindian spectrum (Southern Methodist University [SMU] and Western State College [WSC]) and one on the later end (Utah State University). Southern

Methodist's Gunnison Basin research falls under the auspices of the "Quest" Paleoindian Research Program, headed by David Meltzer; Utah State's "Rocky Mountain Paleoindian Research Program" is directed by Bonnie Pitblado; and WSC has a long history of archaeological fieldwork in the Gunnison Basin (Stiger 2001).

Southern Methodist's and Western State's contributions to Paleoindian archaeology have been made to date primarily at the Mountaineer Folsom site, set on the mesa top of Tenderfoot Mountain at an elevation of 2,620 m asl. Recorded in 1994 by CRM firm Alpine Archaeology, the Mountaineer site was surface-collected in 2000 and excavated beginning in 2001 by a WSC team led by Mark Stiger (Dold 2004; Stiger 2002, 2004, 2006). Stiger (2006) reported finding dozens of Folsom points, preforms, and channel flakes; over 35,000 pieces of debitage; bison and other bone fragments; and a structure. Despite the interpretation—seized upon and widely circulated in the popular press (e.g., Lofholm 2002)—that radiocarbon dates of around 7,000 B.P. from the site represent a "relict" Folsom population, recent radiocarbon dating by expert Thomas Stafford suggests a more conventional radiocarbon age for Mountaineer's Folsom occupation of about 10,400 RCYBP (Stiger 2006).

David Meltzer and an SMU team undertook their own excavations at Mountaineer in 2002. In the most recent report on the work, Ph.D. candidate and field director Brian Andrews (2003) outlined the results of excavation of 77 m^2 just northeast of the WSC excavation area. He noted that Folsom-era activities represented in the SMU excavation area differed from those proposed for the WSC block (Stiger 2002, 2006) and primarily included monitoring game in the valley below and retooling. Andrews (2003) also characterized the Folsom occupation in the Quest block as less intensive than that in the WSC area and as the product of warm-season usage rather than winter occupation, as Stiger (2002, 2006) proposed. Whether Mountaineer was used as a long-term winter camp or as a shorter-term game overlook or both, investigations at the site are expanding Colorado's Folsom horizons. They also provide the basis for an intriguing comparison to a possible structure at the Barger Gulch Folsom site in Middle Park (Surovell and Waguespack, Chapter 8, this volume).

Two kilometers southeast of Tenderfoot Mountain, the Chance Gulch late Paleoindian site was tested and excavated by Bonnie Pitblado in 1999–2002 (McFaul 2004; Pitblado 2001a, 2001b, 2002; Pitblado and Camp 2003; Pitblado, Camp, and Stamm 2001; Stamm, Pitblado, and Camp 2004). The late Paleoindian level of this multicomponent campsite, located adjacent to a spring and quartzite quarries, produced a fire-cracked rock feature with charcoal dated to 7,990 $\pm$ 50 and 8,050 $\pm$ 40 RCYBP (Pitblado and Camp 2003), Angostura projectile points (Pitblado 2002), chipped-stone tools and thousands of debitage fragments (e.g., Ahler 2002), groundstone, animal bones (Walker 2001), and pollen for paleoecological reconstructions (Davis 2002; Varney and Cummings 2004). Pitblado (2003, Chapter 10, this volume) has argued that Angostura points index late Paleoindians who

used the Rocky Mountains year-round, and Chance Gulch is probably no exception. Interpretation of the Chance Gulch assemblage continues, and Pitblado's research program recently expanded to include experiments that show promise for sourcing Gunnison Basin quartzite (Pitblado, Dehler, and Nelson 2006).

Paleoindian Research in the Middle and Northern Colorado Rockies

University of Northern Colorado South Park and South Platte Research Programs. East of the Gunnison Basin, Robert Brunswig and the University of Northern Colorado (UNC) sponsored the South Park Archaeology Project in 2001–2003, surveying 3,000 acres in South Park (Bender 2002, 2003; Brunswig 2002b, 2003b; Della Salla in prep; Friedman and Brunswig 2002; Friedman and Lincoln 2003; Friedman, Lincoln, and Tigner 2001, 2003a, 2003b; Lincoln et al. 2003). The survey documented more than a dozen late Paleoindian sites and isolated finds, primarily Cody and Jimmy Allen; however, private collections also contain Clovis points (Della Salla in prep; Lincoln et al. 2003). South Park sites with Paleoindian components were typically dense, complex palimpsests of artifacts and tool-manufacturing debris, almost always located on river terraces and secondary hill ridge spurs. Brunswig (2002b, 2003b) has suggested that such sites represent many generations of primarily summer hunting base camp and lithic procurement-reduction activities extending from early Paleoindian through historic times.

UNC's second major research program, the South Platte Archaeological Project, began with surveys and site excavations in the Front Range foothills in the mid-1980s. Brunswig and his research team subsequently conducted test excavations and surveys along the South Platte River southwest of Greeley and in three large survey blocks of the Pawnee Grassland northeast of Greeley. While the project's plains-based research documented only a few new sites with Paleoindian components (Brunswig 1999b), it was significant for two reasons. First, it represents the only sustained research into Paleoindian use of the Colorado plains during this time frame (the rest was—and remains—mountain-based). Second, it included reinvestigation of the Dent site, as reported in detail in Chapters 3–6 of this volume (see also Fisher 1995; Fisher and Beld 2003; Hoope 2004; Hoope, Carlson, and Webb 1999).

One of the most recent phases of the South Platte Project was a five-year (1998–2002) archaeological inventory program in Rocky Mountain National Park. This endeavor consisted of the survey of nearly 30,000 acres in the park, including several thousand acres at very high altitudes (tundra and subalpine), which are particularly poorly represented in the archaeological literature. Fieldwork also included excavation of the Lawn Lake site, the Jimmy Allen locality first recorded in the early 1930s by Renaud's student Betty Yelm (1935; Yelm and Beals 1934). The results of the survey, the Lawn Lake excavation, and an associated palynological study of bog cores are reported in Chapter 9 of this volume and other manuscripts (Brunswig 1999a, 1999b, 2000, 2001a, 2001b, 2001c, 2001d, 2002a, 2003a, 2003b, 2004a, 2004b, 2004c; Brunswig and Doerner 2001).

Like other contemporary Colorado Paleoindian research programs, for the past two decades UNC research has involved extensive multidisciplinary collaboration. One example is the study of bog cores in the vicinity of the Lawn Lake site; in fact, six coring localities had been investigated in Rocky Mountain National Park by the end of the five-year project. Other multidisciplinary components of the South Platte Archaeological Project included broad-reaching paleoenvironmental reconstruction (Doerner, Chapter 1, this volume), lithic assemblage and material source analysis, Geographic Information System modeling, and ethnoarchaeological studies (Brunswig 2004a, 2004b, 2004c; Brunswig and Doerner 2001; Brunswig, Elinoff, and Lux 2001; Butler 2004; Doerner 2003a, 2003b; Doerner and Brunswig 2002a, 2002b, in prep; Ellinoff 2002; Lux 2004, 2005; McBeth 2007; Rohe 2003a, 2003b, 2004; Wunderlich 2004; Wunderlich and Brunswig 2004).

Center for Mountain Archeology and Indian Peaks Wilderness Area Research. James Benedict and his Center for Mountain Archeology have made important contributions to Paleoindian archaeology and glacial geology since the 1970s, with ongoing fieldwork in the very high-altitude Indian Peaks Wilderness and Rocky Mountain National Park of northern Colorado. Here, we overview Benedict's recent contributions to Paleoindian studies, most notably game drive sites and systems and new work at the Fourth of July Valley site that prompted him to reevaluate conclusions he drew from his 1971 investigation. We also mention the results of Pitblado's reevaluation of the Caribou Lake site—another site first excavated by Benedict in the 1970s—an undertaking that also yielded new insights about late Paleoindian occupation of the very high Rockies.

In four decades of research, Benedict essentially founded the study of high-altitude game drives in the Indian Peaks and Rocky Mountain National Park areas and in the process demonstrated that at least some of them may have been used by Paleoindians (Benedict 1981, 1985, 2000). The Caribou Lake and Fourth of July Valley sites, for example, have both been interpreted as short-term hunting camps associated with nearby game drives. Benedict (1994, 1997, 1998, 2000) recently conducted fieldwork at 5BL3440, part of the 3,425–3,440 m asl Devil's Thumb game drive and the site of surface finds of late Paleoindian obliquely flaked lanceolate projectile points. Excavations at 5BL3440 yielded microdebitage and radiocarbon dates on naturally occurring charcoal flecks that suggested cultural deposition sometime between 9,560 ± 65 RCYBP and 5,960 ± 85 RCYBP.

5BL3440 presented a second manifestation of obliquely flaked lanceolate points with potentially late radiocarbon dates; the first was the Fourth of July Valley site in 1971. This second occurrence prompted Benedict (2005) to return to Fourth of July Valley to reevaluate the apparent association of late Paleoindian artifacts with radiocarbon dates of 6,045 ± 120 and 5,880 ± 120 RCYBP. New excavations yielded nine microflakes in a geological unit that Benedict (2005) dated to 8,290 ± 50 RCYBP. Benedict also determined that what he believed in 1971

to be a hearth was instead a natural depression that filled with charcoal when trees burned at the site during a wildfire, ca. 5,960 B.P. As a result of these new data, Benedict (2005:797) now notes that "the association of thermally altered microflakes with 8,290-year-old charcoal in a deeply buried stratigraphic context suggests that the site dates from the early Holocene"—not the early Archaic, as he had surmised on the basis of his original work at Fourth of July Valley. The results also instilled new confidence (Benedict 2005) that Paleoindian occupation of 5BL3440 occurred closer to 9,560 ± 65 RCYBP than to 5,960 ± 85 RCYBP.

In the mid-1990s, Benedict encouraged Bonnie Pitblado to reevaluate the Caribou Lake site he first excavated in the early 1970s. Pitblado's work (1996, 2000; Pitblado and Varney 1997) did not radically alter Benedict's (1974, 1985) conclusions, but it did refine them. Pitblado's team discovered a second hearth with dates of 7,985 ± 75 and 7,940 ± 70 RCYBP—500 years younger than the hearth Benedict documented and indicative of reoccupation. Pitblado (1996, 2000) also recovered several late Paleoindian projectile points not of the Cody type, as Benedict had classified his find, but Jimmy Allen. She later concluded that Benedict's specimen was also more consistent with Jimmy Allen than with Cody. Projectile point typology is significant here because Pitblado (2003) has argued that Jimmy Allen represents seasonal use of the high country by people otherwise adapted to the High Plains. Moreover, this type assignment brings Caribou Lake into line with Fourth of July Valley and Devil's Thumb, both within a few km of Caribou Lake and both sources of Jimmy Allen spear points.

University of Wyoming Middle Park Paleoindian Research. The University of Wyoming's Middle Park Archaeology Project, initiated in 1995, is a long-term archaeological research program that focuses on the Paleoindian period in an intramontane basin north of, but ecologically similar to, the San Luis Valley, Gunnison Basin, and South Park. Over the past decade, Wyoming has conducted archaeological surveys and a series of excavations at camp, lithic quarry, and bison bone bed (kill and processing) sites in the Wolford Mountain and Upper to Lower Twin Mountain areas north of Kremmling and in Barger Gulch west of Kremmling (Hall 1992; Kornfeld 1997, 1998; Kornfeld et al. 1999; Surovell 2003a, 2003b; Surovell et al. 2000, 2001a, 2001b, 2003; also see Frison's Afterword, this volume).

Wyoming's contributions to Paleoindian studies in Colorado have been particularly noteworthy for helping define the role and nature of Goshen-Plainview and Folsom occupations in high basin settings. Wyoming's research program has a rich tradition of multidisciplinary collaboration related to paleoenvironment (Cummings and Moutoux 1998; Kornfeld et al. 1999:658–663; Mayer 2003; Mayer et al. 2005; Miller 1998), site formation processes (Kornfeld et al. 1999:663–666; Surovell 2003a), faunal analysis (Kornfeld et al. 1999:666–669; Logan et al. 1998), lithic tool and source material analysis (Daniele 2003a, 2003b; Kornfeld, Frison, and White 2001; Richings 1998; Surovell, Waguespack, and

Kornfeld 2003; White 1999), and spatial organization (Surovell 2003b; Surovell and Waguespack, Chapter 8, this volume).

Wyoming's most significant Middle Park Paleoindian excavations to date include those at the Upper Twin Mountain, Barger Gulch Locality B, and Jerry Craig sites. Upper Twin Mountain, the first site excavated as part of the long-term research initiative, represents a single-episode Goshen-Plainview kill of fifteen adult bison on a gentle mountain slope. The site yielded butchering tools and flake debitage in association with fragmentary *Bison antiquus* remains (Kornfeld 1998; Kornfeld et al. 1999; Kornfeld and Frison 2000). Bison remains from the site's bone bed produced dates of 10,470 ± 50 and 10,240 ± 70 RCYBP (Kornfeld et al. 1999; Kornfeld and Frison 2000)—younger than northern plains Goshen sites and older than southern plains Plainview sites (Kornfeld and Frison 2000).

University of Wyoming personnel have excavated Barger Gulch Locality B since 1997 (Daniele 2003a, 2003b; Kornfeld 1998; Kornfeld, Frison, and White 2001; Surovell et al. 2000, 2001a, 2001b, 2003, 2005, Chapter 8, this volume). Although the site's surface artifact scatter extends over an estimated 7,000 m^2, its buried Folsom occupation is shallow and thin and represents no more than two medium-term (one- to two-month) cool-season camps ca. 10,770 ± 70 to 10,470 ± 40 RCYBP (Surovell et al. 2003). Detailed spatial analysis (Surovell and Waguespack, Chapter 8, this volume) has revealed several discrete activity areas at the site, including one centered on a hearth, and the possible presence of a structure. Future studies of the potential Barger Gulch structure will be particularly fruitful as a comparative case for the Folsom structure Stiger (2006) hypothesizes to have stood at the Mountaineer site in the Gunnison Basin.

Excavations at the Jerry Craig site north of Kremmling, finally, exposed Colorado's only excavated mountain basin Cody Complex bison kill (Hill and Kornfeld 1999; Kornfeld and Frison 2000; Logan et al. 1998; Richings 1998; Richings-Germain 1999; Surovell et al. 2000). Scattered over an erosion-cut slope of Little Wolford Mountain, the site yielded the remains of five bison, dispatched in late summer to early fall; chipped-stone butchering tools; and Cody Complex projectile points. Some of the Jerry Craig points exhibit the parallel-oblique flaking pattern characteristic of chronologically equivalent—and, in the Colorado Rockies, more prevalent—Jimmy Allen and Angostura types (Pitblado 2003). Brunswig (2004b) has suggested that the presence of parallel-oblique flaked Eden points could represent an initial indigenous mountain-adapted lifestyle by populations utilizing that projectile point type. Organic sediment from the bone bed yielded an age of 9,310 ± 50 RCYBP, an early Cody date (Kornfeld 1998).

Paleoindian Projectile Point Studies: Tapping a Valuable Resource

A final but important development in Colorado Paleoindian research in the past fifteen or so years has been a trend toward increasing and more systematic study of the many early projectile points stored on museum shelves, in private collectors' showcases, and in curation boxes in government repositories. The

recording and analysis of artifacts collected from sites as long as seventy or more years ago are often components of the research programs described earlier. At the same time, such studies are the logical extension of a research strategy initiated long ago by archaeologist E. B. Renaud and his students, who visited dozens of ranchers, farmers, and artifact collectors to record their diagnostic artifacts and determine their sites of origin.

An important stimulus for the reinvigoration of artifact collection studies of Paleoindian points in Colorado came with Robert York's (1991) study of Paleoindian projectile points from southwestern Colorado's San Juan National Forest. Pitblado viewed York's work as inspiration for a larger-scale study of 166 Paleoindian projectile point specimens from a geographically larger portion of southwest Colorado, published as a University of Arizona master's thesis and regional journal articles (Pitblado 1993, 1994, 1998). Since then, systematic documentation of projectile points from private, museum, and government repository collections has become standard procedure for many, if not most, Colorado Paleoindian research programs.

In Middle Park, well before the University of Wyoming established its archaeological research program in the region, private collections illuminated the substantial presence of Folsom material throughout that region (Naze 1986, 1994). In fact, without the input of prolific Middle Park–based private collectors, Wyoming might never have targeted the area for Paleoindian research (see Frison's Afterword, this volume, for more on this observation). At the very least, without their strategic collaborations with knowledgeable local avocational archaeologists and collectors and studies of their collections (e.g., Wiesend and Frison 1998), Wyoming is unlikely to have reaped the many archaeological rewards it can now claim.

Other researchers, too, are looking to studies of Paleoindian projectile points for new insights about their study areas. In 1997, Patty Walker-Buchanan, then working for the Bureau of Land Management, wrote an excellent report on a private collection of Paleoindian projectile point specimens from Grand and Summit counties, focusing on the Blue River Valley that forms an important access corridor between Middle Park and South Park. Her work was important for her own archaeological investigations in the region, but it has also had obvious relevance for the Wyoming scholars focusing on Middle Park and University of Northern Colorado personnel working in South Park, North Park, and Rocky Mountain National Park.

Whereas most studies of Colorado Paleoindian projectile points have been undertaken to overview the Paleoindian record of a region or to obtain clues to the locations of sites (e.g., Brunswig 2001a, 2003a, 2004a), some studies, including recent and forthcoming monographs by the editors of this volume (Brunswig 2001b, 2004a, in prep; Pitblado 1993, 1999a, 2003), use them to explore theoretical issues of Paleoindian land use and mobility. In the mid-1990s, Pitblado documented nearly 600 late Paleoindian projectile points from surface contexts all

over Colorado and Utah, comparing specimens from Southern Rocky Mountain contexts to those from the Colorado Plains, Colorado Plateau, and Great Basin. She concluded (1999, 2003) that a unique mountain projectile point assemblage indexed year-round use of the Rockies by some groups but that other projectile points represented seasonal use of very high altitudes by plains hunters and sporadic visitation of various environments by lowland-adapted people from the east and west. Pitblado's Chapter 10 (this volume) discusses the parallel-obliquely flaked projectile points she found to be characteristic of late Paleoindian occupations of the Colorado Rockies.

CONCLUSIONS

Beginning in the 1920s and continuing through today, Colorado Paleoindian archaeology both paralleled and contributed to the overall development of Paleoindian archaeology in North America. Early excavations at key Paleoindian sites like Lindenmeier and Dent, for example, presaged the primarily plains site-based work of the 1960s–1980s, as well as the sophisticated new work at Dent undertaken in the 1990s and reported in this volume (Chapters 3–6).

Similarly, E. B. Renaud and his many students in the 1930s–1940s—including seminal Colorado archaeologist Marie Wormington—established a tradition of working closely with artifact collectors that resulted in the earliest systematic recording of Colorado Paleoindian sites. But their work did more than that. It set the stage for and inspired investigations by contemporary scholars like Pegi Jodry and Dennis Stanford; George Frison, Marcel Kornfeld, Mary Lou Larson, and other University of Wyoming personnel; and both editors of this book—all of whom have viewed collectors as critical sources of intimate knowledge of archaeological landscapes and Paleoindian artifacts. Both Brunswig's Chapter 9 and Pitblado's Chapter 10 of this volume are contemporary expressions of research trajectories that date back to Renaud's era.

One of Renaud's students, Betty Yelm, stands as the first "foremother" of high-altitude Colorado Paleoindian archaeology. In the mid-1930s she documented several sites at high elevations in the Colorado Front Range. Wilfred Husted in the 1960s, James Benedict starting in the late 1960s and continuing through today, Elizabeth Morris, and both editors of this book have followed in her footsteps in the research we have undertaken in the uppermost reaches of the Rockies. Similarly, C. T. Hurst's World War II–era work in the San Luis Valley instigated a long tradition of work there by the Smithsonian Institution, as well as in all of Colorado's other major mountain parks: the Gunnison Basin, South Park, Middle Park, and North Park.

One important development not foreshadowed in the earliest decades of Colorado Paleoindian archaeology is the vital role CRM archaeology would play in the growth of the discipline. As privately funded archaeology became increasingly prevalent through the 1960s, archaeologists like Elizabeth Morris (through a CRM arm of Colorado State University), Michael Metcalf (founder

of Metcalf Archaeological Consultants), Kevin Black (currently the assistant Colorado state archaeologist), and others conducted important research while also fulfilling CRM mandates. Without their and others' efforts, many of the now 700+ Paleoindian sites in Colorado Historical Society records would never have been documented.

In terms of broad approaches scholars have taken to Colorado Paleoindian archaeology through time, two fundamental shifts differentiate earlier research from more recent iterations. The first shift was from the site-centered approach favored by scholars through the 1980s or so to the regional approach more commonly employed by archaeologists today. Prior to 1990, Paleoindian archaeologists working in Colorado often took an inductive tack in their studies of early sites. They excavated when a potentially early site came along and focused later on drawing broad-scale conclusions about the Paleoindian people who created those sites.

Not surprisingly, this approach helped make the years from about 1960 to 1980 a particularly exciting time in Colorado Paleoindian archaeology. In the Afterword to this volume, George Frison notes that these years were, to him, the "halcyon days" of his career because there were so many new finds and such rich cross-pollination among leading excavators like Dennis Stanford, Marie Wormington, Joe Ben Wheat, and Frison himself. Every site, it seemed, added a dramatic new piece to the puzzle. A detailed chronological picture of Paleoindian prehistory emerged thanks to advances in radiocarbon dating, while studies of lithic technology clarified how projectile points varied and what such variation could mean; and archaeologists began routinely collaborating with other earth scientists.

While necessary for cementing the foundations of Colorado—and broader North American—Paleoindian archaeology, the site-centered orientation of the 1960s–1980s was gradually supplanted by a different approach to the past. Today, most researchers work deductively, creating a theoretical framework for their research teams and choosing geographic areas for survey and sites for excavation on the basis of that framework. For the Smithsonian, for example, Dennis Stanford and Pegi Jodry's central interest is in Folsom use of the San Luis Valley and nearby high-altitude reaches of the Southern Rockies. They carefully craft research strategies to identify and study Folsom sites in their area of interest and to efficiently answer questions they find compelling and believe will contribute to the Folsom database as a whole. Although details of frameworks and research questions vary from researcher to researcher, most currently practicing archaeologists approach their research in broadly similar ways.

A second shift that occurred around the close of the 1980s was the near-complete abandonment of the Colorado Plains in favor of the Rocky Mountains as a geographic area of choice for Colorado Paleoindian scholars (although the 1990s work at Dent reported in this volume is an important exception). Even now, some of us begin conference talks and papers with a statement that the mountains have been marginalized by archaeologists for too long. As should

be abundantly clear after reading this volume's Introduction, Chapter 2, and its entire third section, it is time to put to rest what is rapidly becoming a straw-man position.

It is now downright popular to be a Rocky Mountain Paleoindian archaeologist. In fact, almost every active Colorado Paleoindian archaeologist is based to a greater or lesser degree in the mountains. Current geographic centers of Paleoindian archaeology—the San Luis Valley, the Gunnison Basin, South Park, Middle Park, North Park, Rocky Mountain National Park, and the Indian Peaks area—all represent highly variable environmental zones, from rolling sagebrush-filled parklands to alpine meadows; but none is the equivalent of the High Plains. There are a variety of explanations for the geographic shift in research focus, but two factors appear preeminent: (1) pioneering field research by such researchers as Dennis Stanford and Pegi Jodry in the San Luis Valley and James Benedict in the Indian Peaks region convinced others that Paleoindian sites were at least moderately well represented in Colorado's Southern Rockies, and (2) the synergy of vast federally managed land tracts and federal culture resource protection laws ensured a constant source of funding for archaeological inventory and mitigation projects on public lands.

As we noted earlier in this chapter, some Paleoindian complexes that some of us perhaps still intimately associate with the plains—Folsom comes to mind—appear to have been only as plains-based as the Colorado Paleoindian archaeologists who first studied them. A recent glossy magazine article began with the characterization, in large font, that "The Folsom people were believed to be mobile hunter-gatherers who roamed the Great Plains" (Dold 2004:26). It went on to cite David Meltzer as saying: "The stereotypical view of the Folsom is they were out on the High Plains hunting down bison" (Dold 2004:28). It is important now to ask how that stereotype originated and to evaluate its validity. With recent mountain discoveries, it should be dawning on twenty-first-century professionals that we must reconsider that outdated notion in the face not just of new but even of old evidence (see, for example, Surovell 2003c).

As early as the late 1960s to early 1970s, Wilfred Husted (1969; Husted and Mallory 1968) argued that by 10,000 RCYBP (that is, after the end of Folsom time) the Rocky Mountains were home to people who spent the entire year exploiting their environmentally variable resources. Work conducted since then in Colorado and other Rocky Mountain states and excavations undertaken in the last two decades have reinforced the basic tenets of Husted's model. While it is true that pre-10,000 B.P. Folsom sites occur in relative abundance in the mountains, sites have, with the exception of Black Mountain, been restricted to expansive parkland and foothills-plains ecotone settings, possibly as a result of renewed Younger Dryas glacial cooling during much of Folsom time and the presence of bison in those settings, a Folsom staple.

On the other hand, soon after 10,000 radiocarbon years ago, post-Folsom sites like Caribou Lake, Fourth of July Valley, Devil's Thumb, Carey Lake, Lawn Lake,

Chance Gulch, Runberg, LoDaisKa, Crescent Rockshelter, and others—both in Colorado and in other portions of the Southern through Northern Rockies—have been documented in every ecological zone, from the lowest foothills to the highest alpine settings. Recent synthetic research, such as Pitblado's (2003) study of late Paleoindian projectile points from Colorado and Utah and Brunswig's (e.g., 2001c, 2004a) publications on Colorado Paleoindian adaptations, provide a strong empirical record supporting Husted's view that, by at least 10,000 years ago, some groups had committed themselves to a mountain-oriented lifestyle similar to that documented for pre-horse mountain-adapted Shoshone and Ute peoples.

As Colorado Paleoindian archaeology now stands, just a few years into the new millennium it seems clear that the questions that will guide us in coming decades will have less to do with *whether* Paleoindian people used the Rocky Mountains than with *how* they used them and how that use shifted from early to late Paleoindian times and varied across the state's highly variable mountain landscape—issues at the heart of most of the contributions to this volume. We will undoubtedly continue our multidisciplinary efforts to reveal and understand the impact of the paleoenvironmental parameters that confronted Colorado's earliest residents—summarized thoroughly by James Doerner in Chapter 1 of this volume—perhaps using new methods suggested by Linda Scott Cummings and her colleagues in Chapter 7.

Research of Colorado's rich Paleoindian record has come a long way since E. B. Renaud first documented collectors' "Folsom" and "Yuma" projectile points, the only Paleoindian types known in the early 1930s when he began his wide-ranging studies. At the same time, the threads of Renaud's work, and those of his students and his students' students, are with us today, serving as the foundation for seeking answers to new and compelling questions and applying innovative research methodologies by Colorado Paleoindian archaeologists of the twenty-first century.

Acknowledgments. We gratefully acknowledge the suggestions of two anonymous reviewers. They greatly improved the focus and flow of this chapter.

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Published by the University Press of Colorado
5589 Arapahoe Avenue, Suite 206C
Boulder, Colorado 80303

Printed in the United States of America


The University Press of Colorado is a proud member of
the Association of American University Presses.

The University Press of Colorado is a cooperative publishing enterprise supported, in part, by Adams State College, Colorado State University, Fort Lewis College, Mesa State College, Metropolitan State College of Denver, University of Colorado, University of Northern Colorado, and Western State College of Colorado.


The paper used in this publication meets the minimum requirements of the American National Standard for Information Sciences—Permanence of Paper for Printed Library Materials. ANSI Z39.48-1992

Library of Congress Cataloging-in-Publication Data

Frontiers in Colorado Paleoindian archaeology : from the Dent Site to the Rocky Mountains / edited by Robert H. Brunswig and Bonnie L. Pitblado.
p. cm.
Includes bibliographical references and index.
ISBN 978-0-87081-890-5 (hardcover : alk. paper) 1. Paleo-Indians—Colorado. 2. Paleoanthropology—Colorado. 3. Land settlement patterns, Prehistoric—Colorado. 4. Colorado—Antiquities. I. Brunswig, Robert H. II. Pitblado, Bonnie L., 1968–
E78.C6F76 2007
970.01—dc22

2007030395

Design by Daniel Pratt

16 15 14 13 12 11 10 09 08 07 10 9 8 7 6 5 4 3 2 1