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The Post-Civil War Battlefield Pattern: An Example from the Custer Battlefield

ABSTRACT

Battlefield Pattern analyses define the spatial and temporal aspects of a battle. The pattern is made up of individual and unit behaviors. Battlefield Pattern analyses test hypotheses regarding the progress of a battle. Gross patterns are defined as the spatial aspect of behavior. Dynamic patterns are defined as analytical techniques that can identify participant movement. Recent historical archaeological investigations at Custer Battlefield National Monument illustrate this process. Battlefield Pattern analyses provide an initial step in defining the archaeological aspect of warfare within broader anthropological contexts.

Introduction

> Little can usefully be said about battlefield sites. If one side had time to dig in, we may be left with the remains of fortifications . . . ; if not, the site will have little to distinguish it, except perhaps some graves and a scatter of hardware that can best be salvaged by using a metal detector. There can be no meaningful stratigraphy (as far as the battle is concerned), and the salvage of relics becomes the be all and end all (Noël Hume 1969:188).

Today, Noël Hume's (1969:188) pessimism is unwarranted. Certainly detection of fortifications, as he advises, and other battle related features can be important. And though not considered by Noël Hume, even in the absence of fortifications, artifact distributions—such as clines or densities—often reveal insight into the battle.

Traditional battlefield interpretations, often limited to historical data augmented occasionally by knowledge based upon haphazard relic collecting, provide largely static or synchronic perceptions of battlefield behavior. Dissatisfied with these limitations, it is argued that it is necessary to inquire about battle events not only in space but in time as well. Behavioral interactions which produced battle events assume prominence in implementing Battlefield Pattern analyses.

The Battlefield Pattern incorporates history and archaeology. Historical research directs the archaeological strategy, provides testable hypotheses, and, in the end, affixes historical identity to the actors and events. Archaeology, by providing an empirical data set, the artifactual residues of war, sets the actors in motion. Thus, Battlefield Pattern analyses provide the key by which behavioral events represented in space can be ordered in time.

The Battlefield Pattern is outlined here, providing a framework within which battlefield behavioral dynamics can be investigated. Recent investigations at Custer Battlefield National Monument in south-central Montana are used to illustrate the utility of Battlefield Pattern analyses. The Custer Battlefield application is essentially a particularistic, single-site, approach. Its utility for the study of contemporaneous sites world wide, American Civil War, Zulu War, or earlier sites needs to be assessed. In fact the post-Civil War Battlefield Pattern is a model that requires testing on a number of different fronts.

By way of explanation the archaeological work discussed here took place on lands administered by the National Park Service (NPS), Custer Battlefield National Monument. The monument commemorates the Battle of the Little Bighorn which took place 25–27 June 1876. The NPS controls two separate areas of land within the field of battle, the Custer battlefield where George Custer and about 210 men were killed on 25 June and the Reno–Benteen defense site where approximately 350 members of the Seventh Cavalry were besieged by Sioux and Cheyenne warriors for two and one-half days before relief arrived.

The Battlefield Pattern

Archaeologists have long recognized patterning in human behavior and, in fact, analytical power derives from this recognition. South's (1977) and Lewis's (1984) classic studies were among the first in historical archaeology to define behavioral pat-

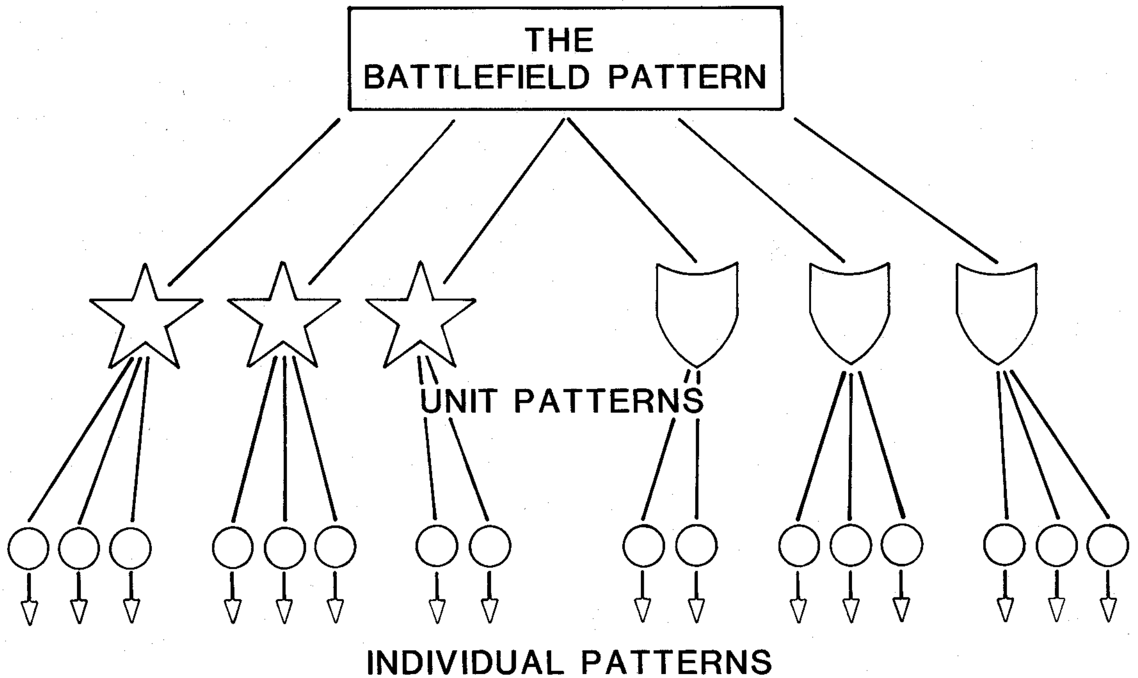

FIGURE 1. The Battlefield Pattern schematic.

terns in cultural terms. Behavioral patterns are expressed through individual behaviors constrained by the norms, values, sanctions, and statuses governing the group within which the individual operates. Among standing armies, military behavior is rigidly defined and hierarchically ordered (Dyer 1983). Thus, in warfare, tactical operations, both offensive and defensive, are designed to precipitate individual behaviors carried out within and on behalf of the military unit to which the individual belongs. War tactics which represent prescribed patterned behavior govern the movement, deployment, and establishment of troops. The residues of tactics in warfare—artifacts, features and their contextual relationships—should also be patterned and reflect details of battlefield behavior.

The structure of the Battlefield Pattern is portrayed schematically in Figure 1. The analytical foundation is laid by recognizing individual behavioral patterns. Normally, this recognition is dependent upon identification of individual positions and movements about the battlefield. As noted, however, individual patterns must be viewed in the aggregate as products of unit operations, though aberrant individual behaviors may often be identified. Therefore, individual patterns, though themselves discrete, should generally reflect unit behavioral patterns in time and space. Military units include, for example, the battalion, company, or platoon. By integrating individual patterns, unit patterns emerge. The composite of unit patterns representing opposing forces defines the Battlefield Pattern which exposes and accounts for the events, or progress, of a battle.

Resolution of the Battlefield Pattern requires investigation at two inclusive analytical levels. Gross pattern and dynamic pattern analyses. Gross patterning, a synchronic approach, represents a composite of battle events exclusive of, or poorly understood in time. Battle events are perceived statically at fixed locations on the battlefield using artifact distributions. Behavior is interpreted from

the nature of the artifact record. Spatial and behavioral information are correlated with the historic record.

Dynamic pattern analyses sort in time the composite of battle events observed in gross patterning. Such sorting, or chronological ordering of events represented in space, provides the basis for hypotheses concerning event behaviors. Dynamic patterning, in this case, is rendered intelligible primarily through firearms identification, the comparative analysis of unique artifact "signatures" representative of individual behaviors.

Gross Patterning

Discerning gross patterns requires the archaeological identification of combatant positions and the correlation of these phenomena with the historical record which, of course, is an integrated process; one task does not follow the other. But once accomplished, an historically meaningful, though static, perception of battle events emerges.

Archaeological density information, such as artifact clustering, clinal distributions, or presence/absence criteria, provide the data necessary for locating battle events in space. Clustering of features—such as rifle pits—or military hardware, for example, suggests combatant positions. Behaviors at these positions are read from frequencies, variations, and proportions within and between artifact classes.

An individual combat episode might be identified by a discrete concentration of spent cartridge cases or human remains. Patterning in individual episodes, such as artifactual evidence for lines at skirmish intervals, may typify a unit pattern. However, in gross patterning, it is usually difficult to distinguish individual positions in unit patterns without the aid of dynamic pattern analysis, as demonstrated later.

Gross patterns typically cannot be assigned historically meaningful identities on the basis of archaeological data alone. Historical sources provide the means by which gross patterning can be differentiated. Certain combatant positions may be ascribed to one combatant group; others, to the opposing force by using historical accounts. Accounts such as eyewitness testimonies, maps, and official reports may also allow identification of archaeological data as residues of known units, such as regiments or companies, comprising an army. A detailed knowledge of organizational, tactical, ordnance, and equipage variation is necessary, particularly where opposing forces differ only subtly.

Gross pattern development is dependent upon the fit between history and archaeology or the resolution of discrepancies between the two. Dynamic pattern analyses help resolve the fit and, by adding the temporal element to gross patterns, provide a mechanism for testing historical theories regarding a battle's progress.

Dynamic Patterning

The key to translating gross patterns into dynamic patterns is based in this case on modern firearm identification analysis of ammunition components. Firearm identification analysis allows resolution of individual positions and movements, or trajectories, across a battlefield. Individual patterns are integrated to form unit patterns; together these patterns develop the flow or progress of a battle, allowing hypothesis testing and formulation of alternative explanations.

Firearm Identification

Firearm identification analysis (Scott et al. 1989; Hatcher et al. 1977) is routinely conducted in police laboratories; the procedures used here are similar to those used in criminal investigations. The procedures involve comparative analysis of distinguishing attributes imparted to ammunition components during the process of firearm discharge and reloading.

Ammunition components include the cartridge case and its projectile, the bullet. Distinguishing attributes include firing-pin, extractor, and land-and-groove marks (Figure 2). Firing-pin marks are left on the base of a cartridge case when the weap-

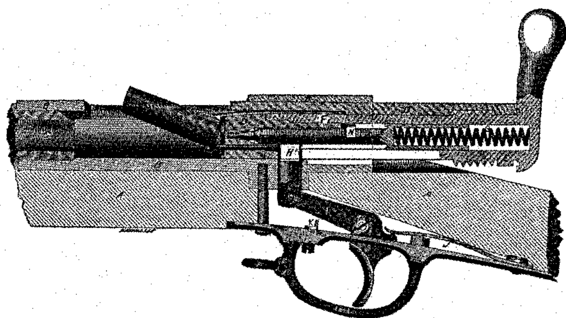

FIGURE 2. A cut-away drawing of the operating action of a rifle in the act of extracting and ejecting a cartridge. The firing pin (N) marks the case when fired. The extractor (F) and the ejector (H) mark the case as it is removed from the chamber (after Rules for the Management of the Ward–Burton Rifle Musket Model 1871, Springfield Armory 1872).

on's firing-pin mechanism is activated. Extractor marks are left on the cartridge case rim when, using the firearm's extractor mechanism, the spent cartridge is extracted from the chamber. Land-and-groove marks are imprinted in mirror image on bullets by barrel rifling. Each of these firearm ''signatures'' bears information that is important in laying the foundation of the Battlefield Pattern.

Firearm signature information will be most useful at battlefield sites that postdate the widespread adoption of self-contained metallic cartridges (ca. 1865). Prior to the popularization of self-contained metallic cartridges and compatible weapons, percussion firearms were commonplace and individual percussion-cap signatures did exist, but this potential is not addressed here. Land-and-groove signatures from muzzle-loading rifles also offer avenues for analysis. The soft lead bullets used in 19th-century muzzle- and breech-loading rifles imprint the land-and-groove marks extremely well; however, the lead tends to oxidize in archaeological contexts, thus potentially obscuring an individual firearm's land-and-groove details even though retaining class characteristic marks. The copper cartridges—and a few of brass—at Custer Battlefield National Monument were well preserved and were suitable for analysis at both the class and individual characteristic level.

Ammunition component signatures provide specific information on the nature of firearms used in a battle, even in the absence of actual firearms. Signatures provide the ability to (1) identify firearm types—class characteristics, (2) distinguish between individual weapons within a type—individual characteristics, both necessary analytical steps before (3) firearm signature data can be translated into behavioral dynamics.

Firearm type analysis facilitates identification of opposing forces and specially equipped units on the battlefield. The procedure is straightforward. Firing-pin and extractor mechanisms, as well as barrel rifling, differ among most weapon types: firearm types have distinctive class characteristics. Signature differences are important because only occasionally can firearm type be established on the basis of ammunition characteristics alone, e.g., caliber. For example, many ammunition calibers can be fired in a variety of weapons. The .44-caliber Henry cartridge, a popular 19th-century ammunition, could be fired not only in the Henry repeating rifle (for which it was designed) but also in the Model 1866 Winchester rifle, the .44-caliber rimfire Colt pistol, and the .44-caliber rimfire Remington revolver, among many others. Of course, firearm types can be established by recovering weapons or weapon parts, but these are rare occurrences on an historic battlefield. Ammunition components are very common; thus, signatures assume the central role in type analysis.

To discriminate between individual weapons within types, signature variations are investigated. Minute variations, individual characteristics unique to each firearm's mechanisms and visible only to the aided eye, produce unique signatures on ammunition components. Variation is caused by specification tolerances and wear in tooling machinery used to manufacture firearm mechanisms. Assembled firearm mechanisms amplify these variations. Comparative analysis of signature variations allows sorting of ammunition components representative of individual weapons. When all unique signatures are compared and sorted, the number of individual weapons within each type can be determined. Figure 3 illustrates identical, overlapping firing-pin signatures imprinted on two

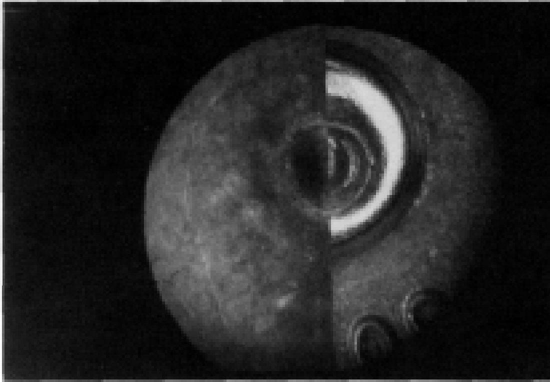

FIGURE 3. Identical, overlapped firing pin signatures on two .45-caliber centerfire cartridges. The signatures indicate both cases were fired in the same gun. (Comparison photomicrograph; courtesy of Midwest Archeological Center, National Park Service.)

.45-caliber centerfire cartridges. The signatures indicate the cartridges were fired from the same weapon. Identical extractor-mechanism signatures (not shown) provide confirmation.

In sum, the range of firearm types used in a battle can be established using signature types; unique signatures facilitate determination of the number of individual firearms by type. The latter capability is important in determining individual patterns, particularly using cartridge-case signatures, for unlike bullets, spent casings tend to fall, when ejected, close to the weapon, thus indicating a weapon's position on the battlefield.

Individual Patterns

Individual firearm signature comparisons coupled with precise artifact locational data can be used to trace the positions and movements of individual weapons across the field of battle. A tight cluster of cases from the same weapon probably indicates a single firing position. Casings with identical signatures from several discrete locations indicate that the weapon in which they were fired moved about the battlefield. Observed locations and movements of weapons may be correlated with individual combatants, with caution, however, for certain variables may intervene.

There are numerous site-specific variables that can affect correlations between weapons and individuals. One obvious variable is the potential for disturbed artifact provenances caused by severe soil disturbances. The bias of captured weapons is another. Indeed, this phenomenon was encountered at Custer battlefield, confirming historical accounts of government firearms in the hands of Indians and necessitating careful elimination of the biased signatures from analysis (Scott and Fox 1987; Scott et al. 1989). Spent cases may not necessarily signal firing positions since spent cases can be carried in the chamber for some time before extraction. While subsequent relic collecting within an area may be random, it could partially or wholly deplete signature records of one or more firearms.

The integration of individual-pattern trajectories provides the basis by which unit patterns can be constructed. This also involves tracing positions and movements, but at the unit-pattern level. In effect, sequential deployments of combat units—or others, such as support units—are traced in this way.

Unit Patterns

Dynamic patterning provides a check, either through confirmation, modification or refinement, on battlefield events observed in gross patterning. This is particularly true when applied to spatial parameters. That is, discrete occurrences of identical signatures may elucidate individual patterns within the unit patterns discerned in gross patterning. Moreover, a spatially discrete occurrence of a set of signatures dissimilar in composition to other sets elsewhere in space reflects the unique composition of individuals who compose a discrete military unit.

It is likely that completely discrete firearm signature sets will seldom be encountered, particularly if individuals moved during a fight from area to area or if several units occupied the same position. But barring complete tactical disintegration, discrete units ought to be evident on this basis. On the other hand, disorganized military units re-

vealed by the lack of discrete signature sets is a revelation in itself, suggesting a breakdown in military structure. Such information is essential in assessing a battle's progress.

Tactics prescribe combat behavior. All cultures have combat tactics, some more rigidly defined than others. In the absence of unit tactical disorganization, signature patterning may reflect prescribed deployments. A skirmish line, for example, might be evident on the basis of discrete sets of individual signatures spaced at regular intervals. In practice, however, patterning should only approximate tactical prescription because of the difficulty in maintaining precise order during combat.

Firearm identification complements gross patterning and this complementary function is, in fact, a logical product of dynamic patterning. Having identified discrete units as composites of individual patterns, their trajectories about the battlefield can be traced much in the same manner as individuals. In doing so, the Battlefield Pattern takes form.

The Battlefield Pattern

It is argued here that individual and unit patterns can be traced about the battlefield. These trajectories add the temporal aspect to individual and unit behaviors observed in gross patterning, thereby defining the progress of behavioral events comprising a battle. Such definition supports or refutes hypotheses regarding the nature of a battle or elicits alternative explanations. This process, defining the spatial–temporal elements of battlefield behavior and proposing explanations, therefore completes the Battlefield Pattern analysis.

Battlefield Pattern analysis is an innovative approach to battlefield studies. Contrary to Noël Hume (1969:188), there can be horizontal sequencing at battlefields. Nonetheless, the task of ordering the sequences may or may not be difficult because sequencing, or the order of deployments, is not necessarily inherent in signature data. Were deployments, for example, from north to south or reversed?

Sequencing is initially dependent upon determining the locations of the beginning and end points of a fight. Obviously historical accounts and theories of a battle are key elements in determining sequencing. But these may be absent, vague, or contradictory. It may be necessary to return to the archaeological record, and the nature of these clues may be as varied as the number of battles in history. Some possibilities, however, may be considered.

The composition of artifactual data at discrete locations representing battle events may vary, for example, in density or class frequencies. Variation may signal sequencing, such that the location with a low density or few artifact classes may represent the initial engagement and other locations with increasing artifact densities and class variation, subsequent encounters. These possibilities assume that artifact residues increase as the battle progresses. But the opposite could also be true. For example, attrition in manpower may signal sequencing in the form of progressive reductions in unique firearm signatures at differing locations or depletion of other military paraphernalia. On the other hand, in prolonged battles where forces were resupplied or reinforced, both patterns may emerge.

In sum, Battlefield Pattern analyses generate explanations for battle events ordered in time. The Battle of the Little Bighorn provides an excellent example of this approach for several reasons. The points at which command was engaged are well known. The artifact inventory, including ammunition components, is readily amenable to pattern analyses. Also, despite a vast literature and notwithstanding the fight's outcome, the details of the fight are murky. Finally, the Battle of the Little Bighorn furnishes a test of the Battlefield Pattern as it applies to military organizations virtually at polar opposites, the rigid military structure of the United States cavalry and the unstructured, individually based tactics of the Plains Indian.

The Custer Battlefield Pattern

In the Custer segment of the Battle of the Little Bighorn, five companies of the Seventh U.S. Cav-

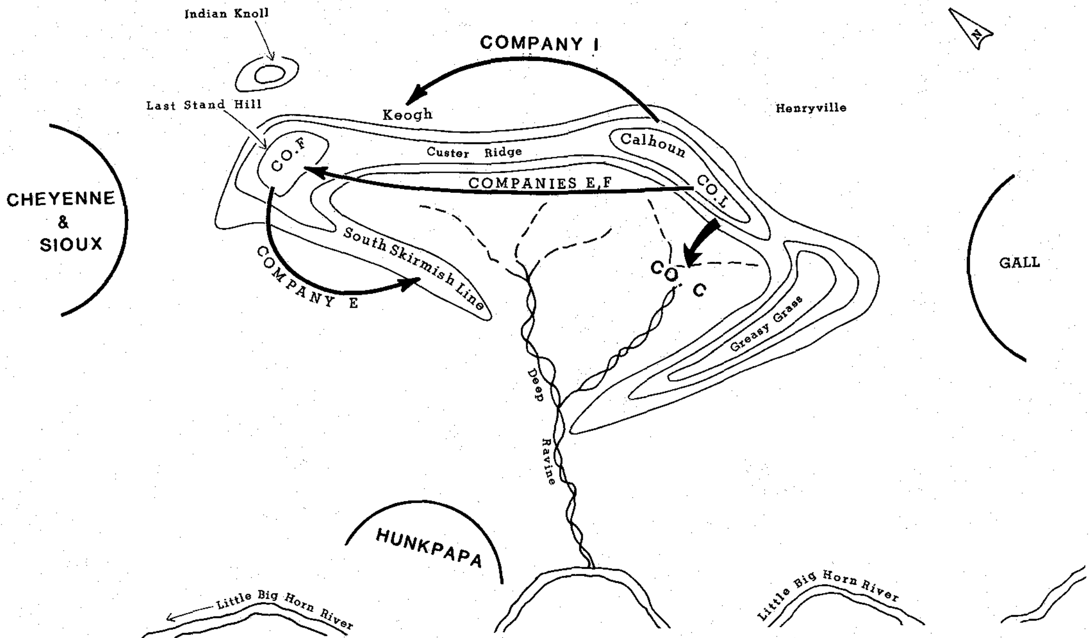

FIGURE 4. Probable movements of the Seventh Cavalry companies into final defensive positions. The initial points of the Indian attack are also depicted. Map is not to scale.

alry regiment led by Lt. Col. (Bvt. Maj. Gen.) George A. Custer were killed to the last man by Sioux and Cheyenne Indians on 25 June 1876. In a separate engagement, the remaining companies of the regiment, commanded by Maj. Marcus Reno, held out until relief arrived on 27 June. The 1984 and 1985 historical archaeological investigations at Custer's battlefield provide the data for this paper. The investigations were within the federal boundaries of Custer Battlefield National Monument, Montana, which demark the final stages of a battle that raged over a larger area. Detailed reporting of the investigations is in Scott and Fox (1987) and Scott et al. (1989).

Faced with investigating a large area (ca. 280 ha), and assuming that most artifacts of war would either be metallic or associated with metal, it was necessary to rely on metal detectors in conjunction with visual inspection and small block excavations. The controlled use of metal detectors in the hands of experienced operators proved highly successful in locating metallic and directly associated non-metallic remains—e.g., human bone, leather artifacts. Over 2,000 battle-related specimens were recovered; nearly all were shallowly buried. A permanent grid system set at 100-meter intervals across the entire battlefield provided the reference for artifact provenance data.

Figure 4 depicts cavalry positions determined from archaeological artifact type, class, and density variation as well as historical evidence. Individual positions are not denoted. Cavalry positions were identified by horse trappings (e.g., bridle and saddle parts, leather, boots, horseshoes), weapon parts (trigger, loading lever), ammunition components, personal accouterments (e.g., jewelry, buttons, coins, suspender clips), military accouterments (canteen, cups, spurs), and human remains. Government cartridge cases plus incoming bullets from Indian weapons indicate troopers fought a defensive action at these positions.

Gross archaeological patterning of trooper positions is consistent with historic accounts (Hammer 1976; King 1980; Nichols 1983). Artifact distribu-

tions at the southern end of the battlefield coincide with Calhoun Hill and Ridge, the northern end, with Last Stand Hill (or Custer Hill). The Keogh position is located between the Last Stand Hill and Calhoun positions. These three positions were distributed along and below a topographic feature now known as Custer Ridge.

A second cavalry element of the archaeological gross patterning is that known historically as the South Skirmish Line. The archaeological record here resembles that from Custer Ridge. Together, the two form a V-shaped defensive position. Interestingly, some historians (Taunton 1986), contrary to Kuhlman (1951) who first proposed the existence of a South Skirmish Line, believe that the area did not sustain significant action. The archaeological work, however, clearly shows considerable combat action—though not necessarily a skirmish order—and human remains in this area.

Areas identified as Indian positions were substantially different in artifact content from cavalry positions. Though artifact densities were often comparable, variety in artifact classes was absent at Indian positions. The Indian-associated artifact classes were primarily cartridge cases as well as incoming bullets from government firearms.

Indian positions are also identifiable on the basis of Indian accounts taken several years after the fight (Graham 1953) and archaeological identifications of previously unknown positions. Figure 4 also shows these positions. The Sioux leader Gall pressed the attack from a southern position, and it is probable that two areas, Greasy Grass Ridge and Henryville Ridge, represent these warriors. Other Sioux undoubtedly followed Crazy Horse's attack from the north and northwest. Indian Knoll, just east of Last Stand Hill, was probably occupied during this attack. Unfortunately, much of the area where Crazy Horse fought has been irreparably damaged by modern Custer Battlefield National Monument facilities. Finally, the Deep Ravine area likely represents Cheyenne/Sioux activity under the general leadership of Lame White Man. The terrain east of Custer Ridge sustained action, too, but most of this region lies beyond the area of NPS administration and the scope of the investigation.

Firearm type analysis of cartridges, casings, bullets, and a few firearm parts provided evidence for the use of at least 45 firearm types at the Battle of the Little Bighorn. Historical records (Nichols 1983) demonstrate that soldiers were armed with single-shot Springfield carbines (.45-caliber) and .45-caliber Colt revolvers. On the other hand, signature types indicate the Indians were equipped with a variety of weapons, including all 45 firearm types and the bow. Indian firearms ranged from obsolete muskets to then-modern repeating rifles—Henry, Model 1866 Winchester—and included captured Springfield carbines and Colt revolvers.

The wide variety in Indian firearms coincides nicely with observations by Sgt. Charles Windolph (DuMont 1974:58), a survivor of the Reno–Benteen defense. Such variety is a statement about the scope of trade networks in which the frontier Indian participated, a well-known fact even at the time. Indeed, after the battle, the *Army and Navy Journal* (1876:805) editor quipped that because Indian agents and traders swore they were not passing arms to Indians, the Indians themselves had to be manufacturing arms. The editor encouraged the Winchester firearm company to sue the Indians for patent infringements.

Details of individual firearm analysis are contained in Scott and Fox (1987) and Scott et al. (1989). It is sufficient here to point out that 371 individual weapons, including 119 repeating firearms (primarily Henry, Model 1866, and Model 1873 Winchester rifles), were identified on the basis of unique signatures. These are minimum figures derived from only the portion of the battlefield that was examined. The individual firearm analysis is, however, sufficient to advance hypotheses regarding the Custer battle progress.

Individual government cartridge-case signatures along Custer Ridge are duplicated at the Calhoun and the Keogh positions, suggesting a temporal relationship between the two positions. Since historically identified bodies belonging to Company C (Capt. Tom Custer commanding) were found at both the Calhoun and Keogh positions, as indi-

cated on a camp map (Taunton 1986:20–21), it is likely that the signature distribution represents movement of Company C. This movement was probably an attack from Calhoun Hill toward the Indians moving from the southwest (Fox 1988). The Calhoun position also was occupied by Company L (Lt. James Calhoun commanding) and is known historically to represent the final position of this company. Thus, the signatures also may indicate, in addition to Company L deployment, Company C movements.

Patterning of unique signatures at Calhoun suggests that at least two skirmish lines were formed (Fox 1988). Indian bullets are coincident with these lines. The tactical deployments, however, likely failed, causing the remaining men from Companies C and L to retreat to the Keogh position. The Keogh area is conspicuous for clear evidence that many soldiers died, but the evidence suggests that they fired their weapons only a limited amount. Fox (1988) argues that tactical instability developed at Calhoun Hill and spread to the Keogh area. In any case, the number of marble markers—which purport to mark locations of bodies on the battlefield—located in the Keogh area are sufficient for two companies and, in fact, Capt. Myles Keogh's body and that of the Company C first sergeant, Sgt. Edwin Bobo, were found near each other, as indicated on a camp map (Taunton 1986:20–21).

Signature data at Last Stand Hill, which represent mainly Company F (Capt. George Yates commanding and Lt. Col. Custer), are not duplicated elsewhere on Custer Ridge. A number of students (Moore 1985) believe that all five companies were originally at the Calhoun position before subsequent deployments. If correct, then Company F must have moved into the Last Stand Hill vicinity during the latter stages of the fight with little or no firing because the signature data are localized. And the haphazard distribution of unique signatures at Last Stand Hill resembles, in contrast to tactical prescription, the popular perception of the last stand.

Current individual signature data from the South Skirmish Line do not allow discrimination between companies. This suggests only one company was deployed or maneuvered in the area and is consistent with the idea that four companies were positioned on Custer Ridge. Numerous eyewitnesses (Hammer 1976) reported seeing bodies from Company E (Lt. Algernon Smith commanding), and a few from other companies, in Deep Ravine. The ravine defines the southern terminus of the South Skirmish Line (Figure 4). Many who saw the bodies (King 1980) suspected Smith's soldiers, faced with impending doom, attempted to flee the line. If so, South Skirmish Line signatures may represent primarily those from Company E.

The men reported killed and buried in the ravine have not been located, but recent geomorphological work by Haynes (1989) has narrowed their location in the ravine to a position within 50 meters of the southern terminus of the South Skirmish Line. Future work in the ravine could locate the bodies and help resolve the dynamics along this line, including questions of spurious body location markers and the companies represented by the Deep Ravine dead.

Individual Indian firearms trajectories suggest that in the final stages of the fight (Figure 5), once the troopers had established their positions, Gall brought his forces to bear on Calhoun's position. Calhoun's impending demise allowed Gall's forces to split, one group occupying Henryville Ridge to finish Calhoun's men, the other group moving north along the west face of Custer Ridge to enter the South Skirmish Line fray. After the fall of Calhoun's position, the Indians at Henryville Ridge moved east of the ridge and then north to engage Keogh. Concurrently, Lame White Man's group infiltrated the Deep Ravine area and joining Gall's warriors crushed resistance on the South Skirmish Line. As Keogh's position and the South Skirmish Line fell, Gall's and Lame White Man's groups moved to encircle Custer's position, augmenting the Crazy Horse force which had moved from the north and northwest. The final stages of the fight were played out at Last Stand Hill, a position now comprised of Company F soldiers as well as a few stragglers and/or wounded from other companies.

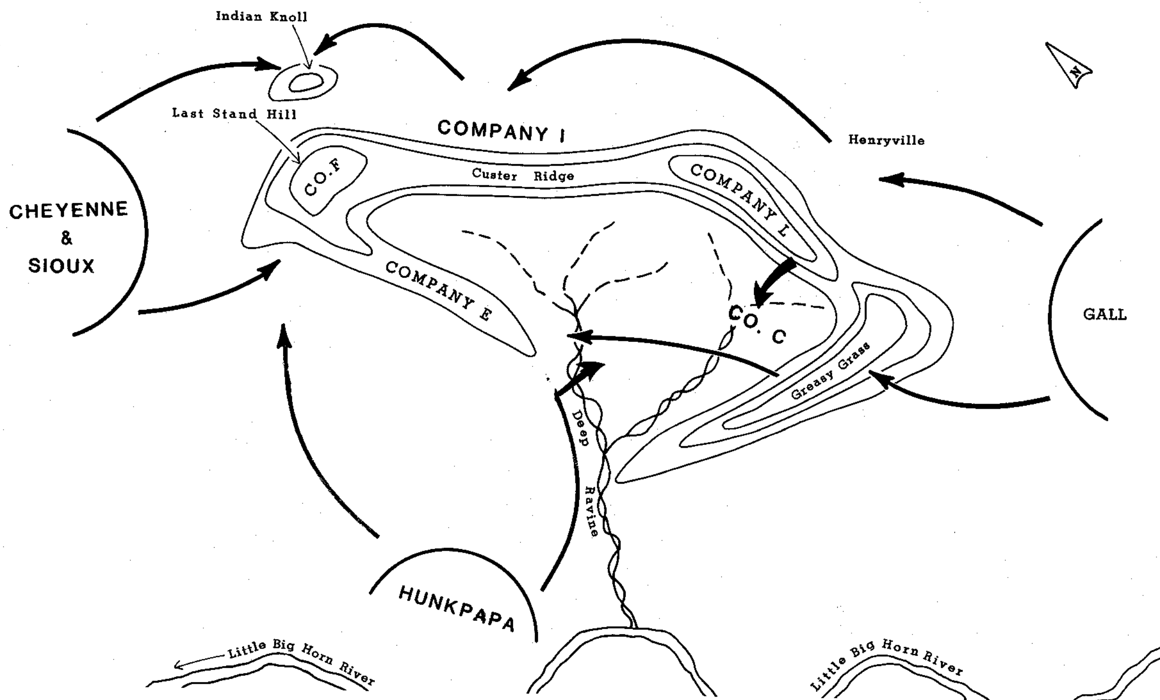

FIGURE 5. The movements and progression of the Indian attacks on the Seventh Cavalry's final defensive positions. Map is not to scale.

Summary

The Custer Battlefield Pattern described above illustrates the transformation of gross patterning into time and space dynamics. In this context, the discussions constitute a plausible behavioral scenario for the observed patterning. The next step might be to ask: What contributed to these behaviors? Several considerations can be briefly entertained.

No doubt manpower superiority—perhaps 10:1 odds—and efficient utilization of the available terrain enabled the Indians sequentially to overwhelm the army units which were deployed in a dispersed pattern, albeit according to the standard practices of the day as described in Upton (1874). Also, as Scott and Fox (1987) and Scott et al. (1989) have shown, superior firepower (projections based upon minimum firearm numbers), at least 119 repeating rifles against about 210 soldiers with single-shot carbines, exacerbated the dilemma. The fact that the Indians had numerous firearms is not an original observation, but these detailed archaeological data transcend vague historic statements and represent confirmation heretofore unavailable. Furthermore, the repeating rifle, though inferior to the carbine in range, stopping power, and accuracy, was probably an advantage in the close fighting at the Custer battle. At the Reno–Benteen defense, however, the carbine—plus a more effective use of the available terrain and a clustering of the men into a tightly defined defensive position—proved effective. Custer's final positioning was comparatively poor.

Another factor may have been tactical deficiencies in 19th-century frontier cavalry operations. Regulation tactics of the time (Upton 1874), for example, called for offensive thrusts from line formation. The battlefield topography would have presented difficult obstacles for several companies

in line, perhaps necessitating the usual route column formation. However, the tactics provided no means for deploying into skirmish order, an effective defensive deployment, from column formation. Interestingly, at Custer battlefield there is little evidence of skirmish order patterning in the archaeological record, though historical records suggest a skirmish line was in place at the Calhoun position. Also, prescribed tactics, formulated on European examples, were designed for use against massed forces. Plains Indians seldom presented a mass force when the situation was not in their favor.

The rigidly defined cavalry tactics of the period were formulated as an offensive complement to infantry operations. The infantry was usually expected to extract cavalry from tight situations; the infantry was effective in this role at the Rosebud fight eight days before the Custer battle. Therefore, there were few provisions for sustained defensive action incorporated in the cavalry tactics. Thus, once Custer's predicament worsened, tactical improvisation would have been necessary but difficult or impossible because of communication limitations of the time. In the end, though, tactical disintegration, the most common cause of defeat in battle, played the most important role (Fox 1988).

The Custer Battlefield Pattern provides a new perspective on the Custer battle using a previously unutilized data base. Revisions will likely be forthcoming if similar investigations are carried out on the field of battle surrounding the Custer Battlefield National Monument. More detailed historical considerations will also be valuable. Nevertheless, the Custer example highlights the value of the innovations in battlefield studies available through application of the Battlefield Pattern.

Conclusions

Tactical considerations provide a model of prescribed behavior, and the Battlefield Pattern defines the actual behavior which occurred on the battlefield. The potential for comparing prescribed and actual behavior, observing the fit between the two, and resolving the differences extends the ability to explain particular battle events. But equally importantly, the Battlefield Pattern is an initial step in studying broader patterns of warfare. Comparative data derived from Battlefield Pattern analyses at other battlefield sites will provide the key by which patterns such as an Indian War Pattern on the western frontier and a Civil War Pattern can be developed.

South (1977:160) may have had this possibility in mind when he proposed a "Revolutionary War Military Battle Pattern" explainable, he thought, "in terms of a battle, supply lines, logistic base, military supply, types of arms, etc." Gould (1983: 134) states that the value to the study of the anthropology of war in the archaeological context is its capability to "identify specific relationships between certain kinds of behavior under the stress of war and the characteristic material by-product of the behavior in their final (archaeological) context of discard." This study constitutes, in the spirit of South's and Gould's proposals, a further step in defining the archaeological aspect of the anthropology of warfare.

ACKNOWLEDGMENTS

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REFERENCES

ARMY AND NAVY JOURNAL
1876 Editorial. *Army and Navy Journal* 22 July:805.

DUMONT, JOHN S.
1974 *Custer Battle Guns.* Old Army Press, Fort Collins.

DYER, GWYNNE
1983 *War.* Crown, New York.

FOX, RICHARD A., JR.
1988 History as Seen through Archeology: The Custer Battle. Unpublished Ph.D. dissertation, Department of Archeology, University of Calgary, Calgary.

GOULD, RICHARD A.
1983 The Archaeology of War: Wrecks of the Spanish Armada of 1588 and the Battle of Britain, 1940. *Shipwreck Anthropology,* edited by Richard A. Gould, pp. 105–143. University of New Mexico, Albuquerque.

GRAHAM, W. A.
1953 *The Custer Myth: A Source Book in Custeriana.* Bonanza Books, New York.

HAMMER, KENNETH
1976 *Custer in 76: Walter Camp's Notes on the Custer Fight.* Brigham Young University Press, Provo.

HATCHER, JULIAN, FRANK J. JURY, AND JAC WELLER
1977 *Firearms Identification, Investigation and Evidence.* Stackpole, Harrisburg.

HAYNES, C. VANCE
1989 Geomorphological Investigations in Deep Ravine. In *Archaeological Perspectives on the Battle of the Little Bighorn,* by Douglas D. Scott, Richard A. Fox, Jr., Melissa A. Connor, and Dick Harmon, pp. 224–242. University of Oklahoma Press, Norman.

KING, W. KENT
1980 *Tombstones for Bluecoats: New Insights into the Custer Mystery.* W. Kent King, Marion Station, California.

KUHLMAN, CHARLES
1951 *Legend into History.* Stackpole, Harrisburg.

LEWIS, KENNETH E.
1984 *The American Frontier: An Archeological Study of Settlement Patterns and Process.* Academic Press, New York.

MOORE, MIKE
1985 Letter to Brian Pohanka, 29 July 1985 (with 10 maps). Ms. on file with authors.

NICHOLS, RON
1983 Reno Court of Inquiry Transcript. Ms. on file, Custer Battlefield National Monument, Crow Agency, Montana.

NOËL HUME, IVOR
1969 *Historical Archaeology.* Alfred Knopf, New York.

SCOTT, DOUGLAS D., AND RICHARD A. FOX, JR.
1987 *Archaeological Insights into the Custer Battle, An Assessment of the 1984 Field Season.* University of Oklahoma Press, Norman.

SCOTT, DOUGLAS D., RICHARD A. FOX, JR., MELISSA A. CONNOR, AND DICK HARMON
1989 *Archaeological Perspectives on the Battle of the Little Bighorn.* University of Oklahoma Press, Norman.

SOUTH, STANLEY
1977 *Method and Theory in Historical Archeology.* Academic Press, New York.

TAUNTON, FRANCIS B.
1986 *Custer's Field: "A Scene of Sickening Ghastly Horror."* The Johnson–Taunton Military Press, London.

UPTON, EMORY
1874 *Cavalry Tactics.* D. Appleton, New York.

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