Ploughzone (also plowzone/plow zone in North American usage) refers to the portion of a site disturbed by post-occupation ploughing or other agricultural activity (such as cattle grazing). In the past, and in some rare cases also in the present, archaeologists often treated the agriculture-related surface sediments of a site as "disturbed," thereby either discarding or not analyzing in any meaningful way those surface contexts. Over the last 30 to 40 years, however, a broad literature on the importance of ploughzone archaeology has emerged, conclusively demonstrating the research value of these upper, disturbed stratigraphic levels.

This chapter examines the use of archaeological studies of the ploughzone in historical archaeology, focusing on examples from the United States and Australia. However, this should not obscure the fact that studies of the ploughzone in landscape archaeology have a rich tradition and background in studies of other periods and regions (particularly the United Kingdom where specialized studies of ploughzone archaeology have a relatively long and distinguished history, especially with respect to the Neolithic and subsequent periods [e.g., Schofield 1991; Steinberg 1996]). Although the specific examples used in this chapter are most directly relevant to archaeology of the more recent past, many of the issues explored here are applicable to ploughzone archaeology more broadly.

Ploughzone Methodology

The precise nature and depth of a ploughzone will vary according to the type of agricultural activity in question, but the central challenge of ploughzone archaeology remains broadly consistent: that agricultural activity significantly disturbs the soil in which it takes place, destroying subsurface archaeological features and changing the location of artifacts. This is equally true whether the agricultural activity in question is current or the ploughzone is itself an archaeological stratigraphic layer related to past activity. Accordingly, most research papers in ploughzone archaeology have focused on the manner in and the extent to which artifacts within the ploughzone can be said to inform on original site definition, both temporally and spatially (e.g., see papers in Schofield 1991).

Perhaps the most important question in ploughzone archaeology is the extent to which ploughing and other agricultural activity disrupts artifact distributions within the ploughed soil (see, for example, Steinberg 1996). It has been recognized for some time that although ploughing results in a destruction of vertical stratigraphy and the mixing of materials from originally separate stratigraphic contexts, horizontal relationships usually remain broadly intact (O’Brien and Lewarch 1981). Thus, if a
17th-century layer was located underneath an 18th-century layer, the stratigraphic relationship between those layers will be, for the most part, destroyed by subsequent ploughing; but if a 17th-century refuse pit was located next to a separate 18th-century refuse pit, then ploughing will not usually destroy the spatial relationship of adjacent deposits. Similarly, although ploughing can and does move individual artifacts a considerable distance, the majority of artifacts will stay reasonably close to their original horizontal point of deposition, allowing identification and mapping of artifact concentrations. Riordan (1988: 3) stresses that such identification and mapping are best undertaken for larger-scale artifact scatters such as middens and architectural scatters rather than small-scale features such as postholes. These basic principles remain broadly true across archaeological periods.

The question of how to sample and map the ploughzone has been the subject of considerable discussion (e.g., Custer 1992; Riordan 1988). In addition to surveys across ploughed areas and their surrounding areas, a variety of subsurface sampling strategies have been used, with common practice consisting of the excavation of a series of test units at regular intervals across the site complementing whatever excavation takes place at the site’s core (though it is certainly not unknown for ploughzone excavations to consist solely of test units where there is no core structure). The soils are then sieved through a screen in order to recover the artifacts. The size of and interval between test units vary, but most American historical archaeologists use units measuring between 1 x 1 m and 1.5 x 1.5 m (though this being the United States, these are usually expressed as between 3 x 3 ft and 5 x 5 ft). The spacing of units across the site is also crucial, with most archaeologists favoring the systematic spacing of units across a site, because this is more likely to recover information about different archaeological distributions at a site. King (2004) recommends spacing the units no more than 4.5 m (15 ft) apart, from center point to center point. After the artifacts have been catalogued, common practice is to enter the data into a computer program that can use the sampling data to map distributions across the entire site.

### The Development of Ploughzone Studies in Historical Archaeology

The history of ploughzone studies in historical archaeology dates back at least to the early 1960s. In 1962, MacCord excavated the ploughzone. Archaeology dates back at least to the early 1960s. The history of ploughzone studies in historical archaeology is not as advanced, and as of this writing very few ploughzone sites have been the subject of archaeological study specifically acknowledging the ploughed component. This, however, has more to do with the nature of Australian historical sites than does any failure on the part of Australian archaeologists; the comparative brevity of European settlement in Australia means that abandoned historical sites that have since been subjected to agricultural activity are at present relatively uncommon. Furthermore, arable land forms a much smaller component of the Australian landscape than is the case in the United States, where a comparatively larger area of the landscape was ploughed during the 19th and 20th centuries.

### Some Historical Archaeology Ploughzone Case Studies

King and Miller’s (1987) classic study of artifact distributions at a 17th-century Native American postcontact site, demonstrating the research potential of ploughzone artifact distributions (MacCord 1969), but this approach was neither immediately nor universally adopted. King (2004) notes, for example, that Ivor Noël Hume (one of the founding fathers of American historical archaeology) publicly questioned the archaeological value of the ploughzone and continued to strip his sites’ topsoil by machine into the 1980s while nonetheless acknowledging that ploughzone artifacts were “in approximately their original locations” (Noël Hume 1982: 9–11).

By the end of the 1980s, however, the potential research value of ploughzone archaeology was broadly acknowledged. Extensive statistical studies of the nature of ploughzone were undertaken by American archaeologists in the 1970s (Ammerman and Feldman 1978; Baker 1978; O’Brien and Lewarch 1981; Redman and Watson 1970; Roper 1976), and historical archaeologists built on this work, culminating in a sequence of papers in the journal *Historical Archaeology* conclusively demonstrating the value of ploughzone artifact distributions to archaeological studies of the more recent past (King 1988; King and Miller 1987; Pogue 1988; Riordan 1988). More recently, the *Journal of Middle Atlantic Archaeology* featured a debate on “Issues in plow zone archaeology” (based on a forum held at the 2006 Atlantic Archaeology Conference), with several papers discussing not only methodological dimensions but also the value and the political and scientific constraints and opportunities of ploughzone archaeology.

Ploughzone studies in Australian historical archaeology are not as advanced, and as of this writing very few ploughzone sites have been the subject of archaeological study specifically acknowledging the ploughed component. This, however, has more to do with the nature of Australian historical sites than does any failure on the part of Australian archaeologists; the comparative brevity of European settlement in Australia means that abandoned historical sites that have since been subjected to agricultural activity are at present relatively uncommon. Furthermore, arable land forms a much smaller component of the Australian landscape than is the case in the United States, where a comparatively larger area of the landscape was ploughed during the 19th and 20th centuries.
Sweringen site in St. Mary’s City, Maryland, offers an excellent introduction into many of the issues relevant to ploughzone archaeology. St. Mary’s City was the capital of the Maryland colony from settlement in 1634 through to 1695, after which the former capital soon became a small agricultural village. Dutch immigrant Garret Van Sweringen had operated a lodging house on his St. Mary’s City property throughout the late 17th century. After Garret’s death in 1698, his son Joseph occupied the site until his own death in 1723. After passing through the hands of the subsequent husband of Joseph’s widow, occupation ended ca. 1745.

The Van Sweringen site had been extensively ploughed in the more than 200 years since the end of occupation. While major subsurface structural features were located beneath the ploughzone and recorded, it was the artifact distributions within the ploughzone that offered additional information about site structure and use through time. By plotting horizontal distributions of dateable artifacts across the site’s ploughzone, King and Miller were able to observe changes in depositional behavior and to identify two separate phases of deposition. These two phases coincided in date with occupation of the site by the two different Van Sweringen family members. Although the artifacts dating to Garret’s occupation were largely located on the original street in front of the site, the artifacts dating to Joseph’s occupation were largely located behind the main house, in the yard space enclosed by the site’s original fence. Plotting the ploughzone artifacts demonstrated that a significant shift in depositional location had occurred at the site in a single generation. In addition, whereas the earlier deposit associated with Garret Van Sweringen appeared to have consisted of a single undifferentiated midden, the later deposits associated with Joseph were characterized by unmistakable differentiation in deposition. In other words, different types of artifacts appear to have been discarded in different areas. King and Miller interpreted these changes in discard behavior as indicating both an increase in local complexity as Maryland’s colonial society matured, and the rise of a Georgian emphasis on greater formality.

In the case of the Van Sweringen site, subsurface architectural remains—including brickwork that survived the post-occupation ploughing. But ploughzone archaeology can also help identify the location of structural features subsequently destroyed by agricultural activity. The Quarter site, Virginia, a late 18th- to early 19th-century slave settlement at the retreat home of the third president of the United States, featured two separate identified ploughing episodes—one predating occupation of the site, and the more relevant mid-19th-century episode that destroyed much of the structural evidence at the slave quarter (Heath 1999: 32–33). Although the lower parts of cellars and some structural posts survived, the locations of doors, fencelines, and paths across the site were all partially identified through the mapping of ploughzone distributions. Ceramic distributions were also used to suggest different periods of occupation and differences in status among the three identified structures at the site (Heath 1999: 38, 41).

As important as the ploughzone was for the interpretation of the Quarter Site, the site was also methodologically important for being only partially ploughed. A third of the site had not been subject to post-occupation ploughing, providing a rare opportunity to compare artifact distributions in ploughed and unploughed sections of the same site. A study of ceramics and glass cross-mends (conjoins) across both components of the site demonstrated that it is possible to compare data across differentially disturbed components of the site and that horizontal distributions in the ploughzone maintain a certain level of coherence. The line between the ploughed and unploughed components of the site also divided two of the structures at the site. The refined earthenwares and bottle glass were almost entirely contained north of the “zone of transition” between the two structures. That this was a meaningful distribution, and not the result of ploughing, was demonstrated by the fact that the coarse earthenware and stoneware mends crossed the zone of transition (Brooks 1996). This enabled Poplar Forest archaeologists to interpret artifact distributions across the site as the result of human behavior rather than primarily caused by post-occupation activity.

Not all studies of ploughzone sites involve actual excavation. The combination of surface collection and modern geophysical remote sensing techniques (see Cheetham, this volume) can make it possible to gain a picture of a site prior to, or even entirely without, excavation work. The Willoughby Bean site, a rare example of an Australian historic site with a ploughzone component—and that is the subject of ongoing research—is located in Gippsland, the southeast corner of the state of Victoria. It was the residence of the first permanent Anglican minister...
structure was destroyed by fire in 1861. The site is believed to have been used as farmland ever since. While the general location of the site was known from historic maps, the specific location in what is now an open grazing paddock was identified through a surface artifact scatter. Surface scatterers are not uncommon on ploughzone sites, and the visibility of surface artifacts is often improved by recent ploughing activity or rain. The surface artifacts at the Bean site were mapped in situ in early 2006. A 100 x 100 m section of the grazing paddock was then subjected to geophysical survey using a fluxgate gradiometer. By superimposing the artifact map with the geophysical survey, the research team was able to confirm that the surface artifact scatter was still archaeologically meaningful, to confirm that archaeological features survived beneath the ploughzone, and to engage in preliminary site interpretation prior to excavation.

As with the Van Sweringen and the Quarter Sites, distinct areas of artifact deposition were identifiable at the Bean site. The bricks were concentrated behind a structure and over a subsurface anomaly, probably indicating a chimney. The ceramics were largely concentrated in an area of subsurface disturbance believed to be a garden of some sort. The bottle glass seems to follow a fenceline dividing the two identified structures. Although excavation of the site (forthcoming) will no doubt help to refine this data, the combination of remote sensing technology and surface collection has proven to be a powerful research tool at Bean’s residence.

Conclusions

Although this discussion has focused on the research potential and use of ploughzone archaeology at three historic sites in the United States and Australia, the basic principles are applicable across periods and geographic regions. Ploughing and other agricultural activities are often an integral part of site formations processes, whether that site is large scale or small scale, single period or multiperiod. Archaeologists, whether historical archaeologists or not, should not dismiss the potential research value of the ploughzone by stripping and discarding surface layers. The artifact distributions within ploughzone layers often turn out to considerably add to an understanding of sites located within that landscape, as demonstrated here by how archaeologists were able to gain new insight into both site occupation and the impact of post-occupation agricultural activities at the Bean sites through their in-depth analysis of the ploughzone component. While remote-sensing techniques, as used at Bean, may transform historical archaeologists’ approach to ploughzone sampling in coming years, the spatial analysis of ploughzone deposits will remain integral to an understanding of those sites where postdepositional agricultural activity has occurred.

Acknowledgments

Thanks are due Bruno David for inviting me (at very short notice!) to contribute to this volume. Special thanks to Julie King and Barbara Heath for their assistance with their own research—particularly Julie for pointing me in the direction of her excellent short summary of Chesapeake ploughzone archaeology. The Willoughby Bean site discussion in this chapter is based on ongoing, still unpublished, research by a team consisting of this author, Susan Lawrence, and Jane Lennon, and funded by an Australian Research Council Discovery Grant. The geophysical survey at the Bean site was undertaken by Hans Dieter Bader of New Zealand-based consultancy firm Geometria.

References


