A GROUND-PENETRATING RADAR IMAGING OF SCHOENBRUNN VILLAGE ARCHAEOLOGICAL SITE, TUSCARAWAS COUNTY, OHIO

A thesis submitted to Kent State University in partial fulfillment of the requirements for the Degree of Master of Arts

by

Kristen Elizabeth Slattery

December 2011
# TABLE OF CONTENTS

LIST OF FIGURES .............................................................................................................. iv

LIST OF TABLES .............................................................................................................. viii

ACKNOWLEDGEMENTS ................................................................................................. ix

Chapter

I. Overview ......................................................................................................................... 1
   Introduction .................................................................................................................. 1
   Summary of Chapters .............................................................................................. 4

II. Historical Background of Schoenbrunn Village ......................................................... 7
   The Moravians ......................................................................................................... 7
   The Delaware ......................................................................................................... 12
   Schoenbrunn Village ............................................................................................. 17

III. Previous Archaeological Investigations ........................................................................ 25

IV. Methods ......................................................................................................................... 32
   Research Questions ................................................................................................. 32
   Ground-Penetrating Radar ...................................................................................... 33
   GPR Research at Schoenbrunn ............................................................................... 35
   GIS and Historical Research ................................................................................... 38

V. Results of GPR Surveys ............................................................................................... 40
   Typical GPR Signatures ......................................................................................... 41
   Grids ......................................................................................................................... 45
   Summary of Anomalies ......................................................................................... 111

VI. Discussion ..................................................................................................................... 122
   Location of Schoenbrunn Village ........................................................................... 122
   Layout of Schoenbrunn Village and Sizes of Cabins ............................................. 124
   Overall Conclusions ............................................................................................... 128

VII. Conclusions .................................................................................................................... 130
   Recommendations ................................................................................................. 131

BIBLIOGRAPHY ................................................................................................................ 133

APPENDIX ......................................................................................................................... 137
LIST OF FIGURES

Figure 1. Location of Schoenbrunn Village ................................................................. 2
Figure 2. Schoenbrunn Village Today ....................................................................... 3
Figure 3. Reconstructed Cabins at Schoenbrunn ....................................................... 5
Figure 4. Map of Schoenbrunn ................................................................................. 20
Figure 5. Close-up of Map of Schoenbrunn .............................................................. 21
Figure 6. Legend from Map of Schoenbrunn ............................................................ 22
Figure 7. Reconstructed Schoolhouse ...................................................................... 25
Figure 8. Sketch Map of Some of Baby’s Trenches .................................................. 27
Figure 9. GPR Grid Locations and Grid Sizes ......................................................... 36
Figure 10. Amplitude Slice Map and Reflection Profile Showing a Pipe ................. 42
Figure 11. Amplitude Slice Map and Reflection Profile Showing a Modern Path ...... 43
Figure 12. Amplitude Slice Map and Reflection Profile Showing a Flat Surface ...... 43
Figure 13. GPR Grid Locations and Grid Sizes ....................................................... 44
Figure 14. Location of Grid A .................................................................................. 45
Figure 15. Grid A Amplitude Slice Maps ................................................................. 48
Figure 16. Grid A Reflection Profiles ....................................................................... 49
Figure 17. Location of Grid B .................................................................................. 50
Figure 18. Grid B Amplitude Slice Maps ................................................................. 53
Figure 19. Grid B Reflection Profiles ...................................................................... 54
Figure 20. Location of Grid C .................................................................................. 55
Figure 21. Grid C Amplitude Slice Maps ................................................................. 58
Figure 44. Overlap of Sketch Map of Baby’s Trenches onto Map of GPR Grid Locations .......................................................................................................................... 87
Figure 45. Location of Grid K .................................................................................... 88
Figure 46. Grid K Amplitude Slice Maps .................................................................... 91
Figure 47. Grid K Reflection Profile ........................................................................... 92
Figure 48. Location of Grid L .................................................................................... 93
Figure 49. Grid L Amplitude Slice Maps .................................................................... 95
Figure 50. Grid L Reflection Profile ........................................................................... 96
Figure 51. Location of Grid M .................................................................................... 97
Figure 52. Grid M Amplitude Slice Maps .................................................................. 100
Figure 53. Grid M Reflection Profile ........................................................................ 100
Figure 54. Location of Grid N ................................................................................... 101
Figure 55. Grid N Amplitude Slice Maps .................................................................. 103
Figure 56. Grid N Reflection Profiles ........................................................................ 104
Figure 57. Location of Grid O ................................................................................... 105
Figure 58. Grid O Amplitude Slice Maps .................................................................. 109
Figure 59. Grid O Amplitude Slice Maps 2 .................................................................. 110
Figure 60. Grid O Reflection Profiles ........................................................................ 111
Figure 61. Locations of Pipe Anomalies .................................................................... 115
Figure 62. Locations of Path Anomalies .................................................................... 116
Figure 63. Locations of Old Road Anomalies ............................................................ 117
Figure 64. Locations of Reconstructed Cabin Anomaly ............................................ 118
Figure 65. Locations of Trench Anomalies ............................................................... 119
Figure 66. Locations of Potential Living Surfaces ..................................................... 120
Figure 67. Locations of Unknown Anomalies ........................................................... 121
Figure 68. GPR Data Overlaid onto Aerial View of Schoenbrunn ......................... 125
Figure 69. Potential Living Surfaces Overlaid onto Map from Ohio Historical Society ............................................................... 126
LIST OF TABLES

Table 1. Summary of Anomalies Identified in Grid A ................................................. 46
Table 2. Summary of Anomalies Identified in Grid B ................................................. 50
Table 3. Summary of Anomalies Identified in Grid C ................................................. 56
Table 4. Summary of Anomalies Identified in Grid D ................................................. 60
Table 5. Summary of Anomalies Identified in Grid E ................................................. 64
Table 6. Summary of Anomalies Identified in Grid F ................................................. 69
Table 7. Summary of Anomalies Identified in Grid G ................................................. 73
Table 8. Summary of Anomalies Identified in Grid I ................................................. 79
Table 9. Summary of Anomalies Identified in Grid J ................................................. 83
Table 10. Summary of Anomalies Identified in Grid K ............................................... 89
Table 11. Summary of Anomalies Identified in Grid L .............................................. 93
Table 12. Summary of Anomalies Identified in Grid M .............................................. 97
Table 13. Summary of Anomalies Identified in Grid N ............................................. 102
Table 14. Summary of Anomalies Identified in Grid O ............................................. 106
Table 15. Summary of GPR Anomalies Identified in All Grids ................................. 112
Table 16. Areas of GPR Anomalies Interpreted as Cabins or Potential Schoenbrunn
Buildings ............................................................................................................. 127
Table 17. Areas of Reconstructed Buildings ............................................................. 127
ACKNOWLEDGEMENTS

I would first like to acknowledge my advisor, Dr. T. Kam Manahan, for his diligent guidance and support.

The other members of my committee were also indispensable. Dr. Mark Seeman was helpful in the literature review of Schoenbrunn. Everything I know about GPR I learned from Dr. Mandy Munro-Stasiuk. Mandy taught me how to use the machine itself, and also coached me through the interpretive software. She was very accommodating with my many questions regarding the interpretation of the GPR anomalies.

The staff at Schoenbrunn showed a great amount of patience with me throughout this project, especially the site director Laura Milarcik, who was very knowledgeable about the historical happenings at the site.

Phil Parenti, Stuart Nealis, Aaron Comstock, Rebecca Sponseller, Hailey Kinsley, Julia Furlong, Heather Hillenbrand, and the other members of Dr. Manahan’s Fall 2010 Field Methods class assisted in collecting the GPR data. Without them, the process would have been impossible.

I would also like to thank Eszti Pigniczky for babysitting and Caroline Tannert of the Anthropology Department for her patience with my endless questions. Last but not least I would like to acknowledge my husband, Tamas Csajka, for both helping in data collection and supporting my education in general.
CHAPTER I

OVERVIEW

This thesis is the product of a recent study of Schoenbrunn Village, Ohio utilizing Ground-Penetrating Radar (GPR). The results of other archaeological investigations in the 1920s and 1950 were never published, and the artifacts acquired have no provenance. In an effort to expand what is presently known about the settlement, parts of the site around the reconstructed cabins were covered with GPR and the anomalies found were analyzed and classified by category.

The GPR data collected proves that the present reconstruction of Schoenbrunn is unquestionably in the right location. The cemetery is confirmed and several GPR anomalies located in line with and near the reconstructed cabins are interpreted as possible living spaces. Also, Anonymous’ (1952) assertions that the Indian houses were smaller than the reconstructed cabins and were not uniformly located on the street line in the middle of each lot are confirmed. Archaeological excavation is recommended in order to verify the nature of the anomalies and to further understand the historical significance of this site.

Introduction

Schoenbrunn Village is located south of New Philadelphia, in Tuscarawas County, Ohio, just south of the New Philadelphia Airport (Figure 1). It was settled in
Figure 1. Location of Schoenbrunn Village

1772 by a group of Delaware Indians who had converted to Moravian Christianity and who were led by European Moravians. It was abandoned five years later due to troubles associated with the Revolutionary War. Schoenbrunn has been investigated archaeologically a few times in the last century, including major excavations in the 1920s and in 1950. The results of these investigations have never been formally published.

Presently owned by the Ohio Historical Society, a reconstructed Schoenbrunn Village memorializes the original mission as well as the location of Ohio’s first (European-style) church and school. Today there are seventeen reconstructed log
buildings, including a church and schoolhouse, and a visitor center containing a small museum (Figure 2). Recently affidavits have surfaced by old-time residents of the area in the 1920s who gave their statements as to the location of the village (see Appendix). These statements support the archaeological and GPR evidence and confirm that the reconstruction of Schoenbrunn is indeed located on top of the original settlement.

Figure 2. Schoenbrunn Village Today
Summary of Chapters

The second chapter of this thesis lays out background information about the Moravian Christians and the Delaware. In the first section about the Moravians, I describe the origins of the Moravian faith in Europe and their arrival and missionary work in North America. The second section on the Delaware describes their organization as a people and the changes to their lifestyle resulting from European colonization of North America. The final section in this chapter addresses the founding of and life at Schoenbrunn Village.

The third chapter considers previous archaeological work carried out at Schoenbrunn, including major excavations in the 1920s and 1950, and a later study performed on the faunal remains found in the earlier excavations. Results of the 1920s and 1950 excavations were never published. I also refer to the reconstruction efforts of the late 1920s (Figure 3).

Chapter four addresses the methodology employed. I first lay out three research questions that guide this study. In the second part I discuss how GPR works, and in the third section I look at why ground-penetrating radar is appropriate for an investigation of Schoenbrunn, and the specific procedure applied at Schoenbrunn. The final section describes other methods utilized in this investigation, including Geographic Information Systems (GIS), and a comparison of Schoenbrunn to a Huron village occupied a century earlier.
In the fifth chapter I describe the results of the GPR surveys. First I examine three typical GPR signatures that occur frequently, those of the pipe, path, and flat surface. The second section looks in detail at the 15 grids, ranging from 10 x 10 m to 30 x 30 m, that were surveyed using GPR. Amplitude slice maps are shown with anomalies numbered for each grid, and reflection profiles are included for most grids. A total of 68 major anomalies were located in the 15 grids. I describe each one as well as classify them into one of eight categories: pipes, paths, old roads, reconstructed cabins, trenches,
possible living surfaces, graves/grave stones, and unknown. The last part of this chapter is a summary of anomalies in which I map out the locations of the anomaly categories separately in order to better understand their spatial patterning.

Chapter six contains a discussion of the GPR results. I first verify that the location of the reconstructed village is the location of the original village using the GPR data, the affidavits, and previous investigations. I next examine how the village layout and cabin size of the reconstruction compares to the original village based on GPR data. This includes comparing the GPR data with Anonymous’ conclusions following the 1950 excavation.

In the final chapter I present my conclusions. GPR revealed 68 major underground anomalies at the site which support the proposition that the reconstruction is located in the same place as the 1770s village. In addition, Anonymous’ (1952) claims that the original houses were smaller than the reconstructed cabins, and the houses were not uniformly placed on the lots are supported. Further work is recommended, including excavation to confirm these conclusions.
CHAPTER II

HISTORICAL BACKGROUND OF SCHOENBRUNN VILLAGE

Schoenbrunn Village existed in a complex historical environment when the United States was forming itself, and identity in terms of politics, economics, and religion was being established both for the nation and its inhabitants. In order to better understand the milieu that produced Schoenbrunn Village, this chapter contains background information pertaining to the Moravian Christians, the Delaware Indians, and settlement at Schoenbrunn itself as it existed from 1772-77.

The Moravians

The religious group known as the Moravians originated from the Unitas Fratrem (Unity of the Brethren), which was established by followers of Jan Hus in the fifteenth century. The Brethren seceded from the Church of Rome in 1467 and based their doctrine and practice solely on the Bible. They flourished for the next century until the Thirty Years’ War, and in 1620 they were exiled or forced underground. Many of the Brethren took refuge on the estate of a sympathetic Austrian, Count Zinzendorf, where they established the community of Herrnhut (Gollin 1967:4-5).

The Moravians did not have a systematic theology; conduct was more important than doctrine. Elements of conduct considered essentially Christian were frugality, diligence, punctuality, and, very significantly, work (Gollin 1967:17). Overall, the
Moravian faith was “Christocentric and adhered to a belief in salvation based upon joyful and loving apprehension of Christ” (Gollin 1967:15).

The social nature of the Moravian faith was very important. Community was very much emphasized in their rituals as well as in their everyday lives. Their rites included prayer meetings, litanies/liturgies, hymn singing, and sharing in the Lord’s Supper. They also participated in a “love feast,” or *agape* celebration, on occasions such as a new crop or the clearing of a new field. This involved a liturgy in which they enjoyed a meal of coffee and rolls/bread (Gollin 1967:20). Religion also impacted social stratification. The Moravians utilized a choir system in which people were divided into groups (choirs) according to age, sex, and marital status. The purpose of these groups was to allow members of a choir to help satisfy the spiritual needs of their peers (Gollin 1967:67-68).

One way the Moravians tried to incorporate the will of God in their everyday lives was through the use of the lot. This method was used both “to accept and allocate persons into various positions in the status structure of the community and to determine issues of communal policy” (Gollin 1967:51). For the Moravians this was essentially an act of faith, and they believed that through the lot God’s will was made clear (Gollin 1967:50). While the use of this system was a way to involve God in decision making, often divine will was slightly influenced. For example, the wording of the questions was could be carefully formulated so that the “wrong” answer did not threaten the community leaders, who happened to be doing the asking. Also, sometimes the ballots were altered so that instead of the usual three ballots (one affirmative, one negative, one blank), there could be more than one blank, or an affirmative might be put in with only blanks and no
negative (Gollin 1967:55-56). Thus, God’s will for a community might be manipulated by the community leaders.

The history of the Moravians in North America began in the early 18th century when a group of missionaries came to the United States to preach the gospel to Native Americans. They first arrived in Georgia, but had to leave shortly after due to the hostilities between the British and Spanish in the area ( Heckewelder 1820:17-18). Also, the land they had purchased was a swamp and their community was soon full of disease (Gollin 1967:5).

The Moravians then moved to Connecticut, from which they were thrown out having been accused of being French spies. Not long after that unpleasantness, “Parliament recognized the Moravian church as an ancient Episcopal church” (Beaver 1988:432), and subsequently the Moravians moved to Pennsylvania and built the settlements of Nazareth (1740) and Bethlehem (1743). Bethlehem became the mission headquarters and its industries helped support the mission settlements. Several missions were established in the mid-1700s, but unfortunately most of them were abandoned due to conflicts such as the French and Indian War and Pontiac Uprising (Olmstead 1991:6). Their biggest hurdle was the antagonistic attitudes of both the white settlers and the non-Christian Indians, neither of whom understood or cared anything about the Indian converts, and the Moravians realized that they had to conduct their missionary efforts away from white civilization (Olmstead 1991:6). Native Indian leaders disapproved of the missionary work because they saw it as a threat to their culture (Olmstead 1991:7).
The major missionary figure in the 18th century American-Moravian community was David Zeisberger. He was born in Moravia, and had followed his parents to the United States at the age of 17. Because he spent most of his life working as a missionary, he only married at age sixty. Zeisberger became a member of the Six Nations (adopted by a chief of the Onandagas), and understood, in addition to the language, many aspects of Native American culture. As Hutton puts it, “He was an Iroquois to the Iroquois, a Delaware to the Delawares. He understood the hidden science of belts and strings of wampum; he could unriddle their mysterious messages and make speeches in their bombastic style; and he spoke in their speech and thought in their thoughts, and lived a life in their wigwams” (Hutton 2006:321). He was so respected by the Indians that the Delaware and the Six Nations made it illegal to interrupt David Zeisberger in his missionary work (Hutton 2006:321). The Native Americans so trusted him that they were wary of treaties signed in his absence because he was able to verify the translators (Heckewelder 95-96). Olmstead describes Zeisberger as introverted, sensitive, reticent, and pacifistic (Olmstead, 1997:13).

The ambiguousness of Zeisberger’s cultural identity was not unique in colonial America. Donald H. Gaff writes of three different men who successfully navigated between the two cultures: “Their case illustrates that ethnic identity and affiliation were remarkably fluid on the frontier, because, while they are generally regarded as belonging to a particular ethnic or racial group, in reality they were intimately familiar with both Indian and Euro-American cultures and readily switched between them” (Gaff 2006:143-
Zeisberger was probably one of many who were able to go between the two cultures, lying somewhere on a continuum between the two cultural identities.

Also not exclusively at either end of the Native American-white cultural identity spectrum were the Moravian Indians. The adult converts, despite having been brought up in a Native American culture adopted many parts of European culture promoted by the missionaries as part and parcel of the Moravian faith. They dressed like Europeans, farmed like Europeans, and were taught to read and write in German, English, and Delaware. (Credit must be given to the Moravians for translating the Bible into the Delaware language.) Interestingly, while Zeisberger was able to go between the two cultures and was welcomed as a member of the Delaware, the Christian Indians did not have the same privilege. They were not welcomed as equals into European-American society and the missionaries felt that their work with the Native Americans would be more fruitful away from the white settlers.

Thus, this issue of identity is complex. Zeisberger may have been “a Delaware to the Delaware,” but he was definitely not a Delaware to himself. He never fully adopted the Delaware mindset because he always had a Christianizing motive in the background. As for the identity of the Christian Indians, there are more questions than answers. Did they consider themselves fully Christian, and if so, what exactly did that mean to them? Did they think that Christianity went hand in hand with a European way of life? What compelled them to alter their cultural identities by trusting the word of white missionaries over their own original cultural truths?
The approach to cultural identity by Zeisberger and the Moravian missionaries can be associated with classical cultural evolution. They were definitely ethnocentric, especially regarding religion. The Moravian mindset included an element of, “Let’s help these poor Indians find the True God and become more civilized along the way.” Historically Morgan had not yet written *Ancient Society* and invented his “Savagery-Barbarism-Civilization” typology, but the Moravian missionaries probably would have agreed that the Moravian faith and European way of life were above the beliefs and lifestyles of the Native Americans (Morgan 1988).

The Delaware

The Moravians Indians at Schoenbrunn were for the most part Delaware, or Lenape. The Lenape belong to the larger Algonquian linguistic family and call themselves the Lenni Lenape, which means, “original people,” or, “men of our kind” (Weslager 1972:31). At the time of European contact, there was an estimated 10,000-20,000 Lenapes living along a stretch of Atlantic coast from New York Bay to Delaware Bay and in the Delaware River Valley (Grumet 1989:13). They were separated into small, politically independent communities on the various waterways in the river valley (Weslager 1972:32). By 1700 there were probably fewer than 3,000 Lenape, due in large part to the at least fourteen epidemics that they had suffered (Grumet 1989:32-34).

The Dutch West India Company came to the Lenape homeland in 1614 and had several trading forts there by 1626 (Grumet 1989:30). The relationship between the Lenape and the Europeans was trade-based, with the Lenape providing fur, which meant
nothing socially or economically nothing to them, in exchange for European goods (Kraft 1986:197). Weslager emphasizes that the Dutch were not interested in colonizing Delaware territory in the sense of permanent settlements like the English; they were in the area for commercial reasons only (Weslager 1972:111). Trade with the Europeans impelled the Delaware and the other tribes to hunt more than they ever had. Consequently, the economy of the Delaware changed as a result of the first years of contact with the Dutch. They moved from a subsistence economy based on hunting, fishing, and gardening to an economy “based on hunting-for-barter” (Weslager 1972:116). According to Kraft, “Prior to European contact the Indians were always careful not to overkill or destroy the breeding stock…”, but as the worth and desire of European goods (including liquor) increased over time, they were much less discriminating and hunting and trapping greatly intensified (Kraft 1986:199). By 1644 trade with the Lenape had practically ceased due to the shortage of fur-bearing animals (Kraft 1986:201).

Lenape communities were organized along kinship lines. Clans asserted a common ancestor, and clan membership was matrilineal. Although the Lenape were divided into many smaller groups, linguistically there were two major groups: those who spoke Munsee in the northeast, and those who spoke Unami in the south (Grumet 1989:13, 31). Grumet says the following about Lenape tribal divisions:

It has been widely thought that the Lenapes were divided into only three tribal clans ever since John Heckewelder confused three Lenape tribal names with what are believed to have been their principal matrilineages. Thus, all “Unamis” living along the Delaware River were thought to have belonged to the Turtle clan, all “Wunalachticos” of the seacoast to the Turkey clan, and all “Monsys” of the highlands to the Wolf clan. Today,
most scholars agree that these names are most commonly regarded as only three of a much larger number of now-extinct matrilineages [Grumet 1989:15-16].

This misunderstanding was the product of a misreading of David Zeisberger, who used the German *Hauptstamme*, or “principal branches.” Zeisberger also did not refer to animal totems, and the Lenape freely hunted the turtle, wolf, and turkey without any taboos (Kraft 1986:xv-xvi).

Through diplomacy and compromise the Lenape had tried to maintain their lands, but European settlement and displacement caused the Delaware to begin migrating westward away from the Europeans in small groups (Grumet 1989:47). Many Delaware went to the Susquehanna River valley in Pennsylvania. As they migrated, they faced pressures from other Native American groups (Iroquois, Mahican, and Susquehannock), and eventually moved further west into Ohio and Indiana where they allied themselves with the Miamis, Ottawas, and Shawnees (Kraft 1986:233, Grumet 1989:41).

In addition to European displacement, the Lenape westward migration was influenced by their relationship with the Iroquois. In the early 1700s the Delaware were politically dominated by the Iroquois and paid tribute to them (Weslager 1972:180). The fact that European traders denied guns to the Lenape while providing them to the Mohawk may have had some influence on these affairs (Kraft 1886:159). The Delaware were referred to as “women” by the Iroquois, indicating that they were under Iroquois protection and could not make war or negotiate treaties (Weslager 1972:180). After having migrated to the Susquehanna River Valley in Pennsylvania that was under the control of the Iroquois, many Lenape moved on to settle in Ohio (Weslager 1972:196).
By the mid-eighteenth century the Moravians had begun working with the Delaware who had migrated to Pennsylvania and Ohio (Kraft 1986:12-13). The missionaries were well received by many Lenape during this tumultuous time (Grumet 1989:51). Those Indians who converted to Moravian Christianity were no longer allowed to live their former lives. They had to adopt a Christian name and move to mission villages where they could be supervised by Moravian leaders. Alcohol was forbidden and they were taught the joys of monogamy, obedience, knowledge of useful trades, and resting on Sundays (Weslager 1978:30).

Parallel with Moravian missionary activity in the mid 1700s, the Delaware were examining their identity as a native people. There were many efforts to redefine Delaware society and many prophets “promoted a nativist revival” (McConnell 1992:222). For example, the prophet Neolin in 1762 began to preach that the Delaware should give up everything European in favor of their old way of life. Although many Delaware agreed with his message, it was hard to reconcile it with the fact that their lives had greatly improved with European strategies and materials (McConnell 1992:220-221). In addition, there were attempts to unify the Delaware and create a Delaware nation in the west (McConnell 1992:225). In the 1760s Netawatwes emerged as the leader of the Delawares in the west and improved the tribe’s reputation among its neighbors (McConnell 1992:225-226). Indeed, the desire to reunify the Delaware, as well as the hope that admitting Christians would “add to their store of spiritual power” against the smallpox, is what compelled Netawatwes to invite Zeisberger and the Moravians to bring their missions to the Muskingum valley (McConnell 1992:229).
The relationship between the Moravian Delawares and the non-Christian Delawares was one of distance and wariness on the part of the Christians. The Moravians maintained at least ten miles between mission towns and non-Christian Delaware villages in order to avoid temptations to alcohol and to reverting to native ceremonies (Weslager 1978:31). Also emphasizing the separation from unconverted Delawares, the Moravians forbid the converts from dressing like Native Americans or wearing their hair shaven with a scalp lock. They were also forbidden from shedding blood, going to war, or even buying the plunder of other warriors (Weslager 1978:31). On the other hand, the Christian Indians were not fully trusted or accepted by the Delaware despite the fact that they were in Ohio by their invitation, and they could not be represented in Delaware council deliberation (Grumet 1989:63).

It is difficult to say in the long run how many Delaware continued to live their lives according to Moravian principles. Witthoft (1949) questions the depth of knowledge the missionaries had of the Indians, in spite of their fluency in the Delaware language. He states that, “it is known from early and contemporary sources that the Delaware actually clung to their native religion with the utmost tenacity and that these rituals survived the Moravian missionaries” (Witthoft 1949:14). In the 1780s after the massacre at Gnadenhutten had shown the futility of pacifism, the Moravians lost many of their Indian followers (Grumet 1989:78). Witthoft also writes of a Mrs. Jameson who visited a Moravian mission in 1835 and discovered that only 235 of the 700 residents were baptized. A missionary admitted to Mrs. Jameson “that he considered the
An interesting element of Lenape history is the survival of the Wallam Olum, or Red Record. This documents through mnemonic glyphs the Delaware’s ancient history in an epic song. It begins with stories of creation and a great flood, and goes on to narrate how the Lenape crossed from Asia into the New World and their crossing eastward across North America to their location on the eastern coast (Red Record 1993:4, Weslager 1972:78). The glyphs’ meanings were conveyed orally down the generations to only a few people who were responsible to continue to tell the story to the people (Weslager 1972:78). There are some doubts about the authenticity of the Wallam Olum, but it is not disputed that the Delaware did in fact use picture writing as a method of communication (Weslager 1972:80, 87).

Schoenbrunn Village

The head chief of the Delaware, Netawatwes, was the reason the Moravians were able to come to the Muskingum River valley in Ohio. Netawatwes had visited the mission at Friedenshutten and was impressed with the work of the Moravians. He went to the Muskingum valley with Zeisberger a year earlier and offered Zeisberger an invitation to bring the Indian converts to the area (Olmstead 1991:7). Zeisberger agreed condition that they be allowed to live their Christian lives away from “drunken Indians” and free from the hostilities of non-converted Delaware (Olmstead 1997:186).
The village of Schoenbrunn was established in May of 1772 when David Zeisberger and five Indian families arrived at the site. They chose the name of the village by lot from four names: Bethel, Goshen, Schoenbrunn, and Enon. The name “Schoenbrunn” triumphed, meaning “beautiful spring” in German, and “Welhik Thuppeek” in Delaware (Olmstead 1997:192). At the end of 1772 a total of 92 people were living at Schoenbrunn (Zeisberger 2005:122). They were divided into four classes as at other Moravian missions: communicants, baptized, candidates for baptism, and those given permission to live in the village providing they adhered to the rules (Olmstead 1997:205). Other European Moravians besides Zeisberger included Johann and Anna Margaretha Jungmann, his assistants, and John Heckewelder, who served as schoolteacher (Olmstead 1991:7-8). The presence of these specific people at Schoenbrunn was decided directly by Zeisberger, not by lot as would have been custom (Olmstead 1997:192).

The physical layout of the village of Schoenbrunn was started soon after the first group arrived with Zeisberger. They laid out one street running east-west and assigned lots on that street (Olmstead 1997:190). They lived in temporary huts until the following year when permanent structures were built with square-hewn logs, which were easier to caulk and provided better protection against the elements (Olmstead 1997:205-206). As the population increased, another street was added extending north from the center of the first street where the chapel was located (Figures 4-6). Heckewelder calls the first street “of a proper width” (Heckewelder 1820:157). Later a chapel was built of squared logs, that was 36 by 40 feet, had a cupola, a bell, and a shingled roof (Heckewelder 128-129).
The meeting house could seat about 300 people, and it had four glass windows (Olmstead 1997:205-206). According to Heckewelder, “The towns being regularly laid out, the streets wide and kept clean, and the cattle kept out by means of fences, gave the whole a neat appearance, and excited the astonishment of visitors” (Heckewelder 1820:128-129). John Ettwein describes the village during his visit in August 1772 as having 40 lots, each three rods wide and six rods deep (49’6” x 99’) (Olmstead 1997:194). Ettwein’s maps played an important role in Schoenbrunn’s reconstruction in the 1920s-30s (Olmstead 1997:194).

Life at Schoenbrunn was peaceful for the first four years. Men worked as traders and trappers while women watched over cornfields, orchards, and chicken, pigs, and cattle. Formal rules of conduct governed their lives along with an orderly routine of religious services, work, and school (Goehring and Snyder 2003:29). They learned to read and write in Delaware, German, or English, with the Bible having been translated into Delaware (Grumet 1989:64). Both men and women attended school, which held as many as 100 students at its peak (Goehring and Snyder 2003:29). By the end of 1775 (the last year of census data), there were 263 inhabitants at Schoenbrunn (Olmstead 1991:8).

Schoenbrunn was abandoned in April of 1777 due to troubles associated with the Revolutionary War. The village was located in the middle of the war zone in the western frontier. Non-converted Delaware for the most part sided with the British because of the Americans’ breach of the Treaty of Pittsburgh, in which the colonists agreed that the
Figure 4. Map of Schoenbrunn, date and author unknown. Property of the Ohio Historical Society
Figure 5. Close-up of Map of Schoenbrunn, date and author unknown. Property of the Ohio Historical Society
<table>
<thead>
<tr>
<th>Legend</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>lots for Indian dwellings</td>
</tr>
<tr>
<td>B</td>
<td>8</td>
</tr>
<tr>
<td>C</td>
<td>23</td>
</tr>
<tr>
<td>D</td>
<td>22</td>
</tr>
<tr>
<td>E</td>
<td>15</td>
</tr>
<tr>
<td>F</td>
<td>9</td>
</tr>
<tr>
<td>G</td>
<td>forested area — including cutback from fence lines for sewage</td>
</tr>
<tr>
<td>H</td>
<td>fenced corn field — 30 acres in extent</td>
</tr>
<tr>
<td>I</td>
<td>probable dance landing</td>
</tr>
<tr>
<td>J</td>
<td>lagoon — connected with Tuscarawas River — navigable for</td>
</tr>
<tr>
<td>K</td>
<td>path to spring, river, fields, and dance landing (Ettwein Plan, No. 8)</td>
</tr>
<tr>
<td>L</td>
<td>road 9 to Indian town of Tuscarawas (Ettwein Plan, No. 8)</td>
</tr>
<tr>
<td>M</td>
<td>road to confluence of Tuscarawas &amp; Beaverdam Creek</td>
</tr>
</tbody>
</table>

Original T. Plan 1772: 39 Indian Dwellings
Additions of 1773: 10
1774: 10
1775: 12
1776: 12
Total: 83 Indian Dwellings

Portion of Schoenbrunn Memorial Park

N. Path to Beaverdam Creek (Ettwein Plan, No. 2, note 'B')
O. Fence-in corn fields (over 50 acres).
Ohio River would be their permanent western boundary in return for Delaware neutrality (Kraft 1986:235). The villagers of Schoenbrunn were neutral for religious reasons and thus accommodated all visitors, friend or foe. In their visits, the non-Christian Indians tried to persuade the Moravian Indians to join the British side (Olmstead 1991:17).

In late February, 1777, a letter was sent from Goschachgunk (present-day Coshocton, Ohio, principal Delaware village in the late 1770s) to Schoenbrunn that effectively ended Schoenbrunn’s policy of receiving all visitors. According to Heckewelder, the letter asserted that “the enemies of the Delaware threatened to kill all white people, whoever they may be, who may be found in Indian country and that in case this or that Indian should undertake to take white people under his protection such an Indian would forsake his head” (Olmstead 1991:18). There were also various rumors that the Moravian mission leaders would be kidnapped and killed or held for ransom. Zeisberger visited Schoenbrunn in late March to inform them that he intended to move the residents of Schoenbrunn and Gnadenhutten to Lichtenau (a mission town located near Goschachgunk). Zeisberger apparently did not use the lot in making this decision and his decision was very controversial (Olmstead 1991:241). Some of the Delaware declared that they were “through believing,” and Johann Schmick, the leader at Gnadenhutten, did not obey (Olmstead 1991:19). On April 26, 1777, the mission diarists write that, “After he [Zeisberger] … had seen how rowdy the wild Munsee people were and that they were doing whatever they wanted, he immediately made preparations for the Brothers and Sisters to go to Gnadenhutten in peace. … On the 19th of this month we
close this little Town where we had enjoyed so many blessings…” (Zeisberger 2005:372). Schoenbrunn’s brief existence was thus concluded.

Schoenbrunn’s early success impelled the Moravians to found the nearby missions of Gnadenhutten (1772) and Lichtenau (1776). Gnadenhutten did not last much longer than Schoenbrunn. In 1782 the refusal of the Moravians to take sides caught up with them. Colonel Williamson arrived with American troops, asked for lodging, and, based on the Moravians’ policy of hospitality towards all, accused the residents of having sided with the British (Hutton 2006:326). The congregation was rounded up, allowed to pray and sing together overnight, and on March 8, 1782, 90 men, women, and children were brutally murdered (Beaver 1988:432-433). Two teenage boys escaped to tell the story (Carte Engle 2009:233-234). The massacre at Gnadenhutten was the anti-climax of the American-Moravian missionary movement.
CHAPTER III

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

The first archaeological investigations at Schoenbrunn took place in the 1920s in conjunction with the effort to reconstruct the village. Rev. Joseph E. Weinland, a Moravian minister from Dover, OH, researched the village and was compelled to locate it. The property was bought by the Ohio Historical Society in 1923, and money was allocated to the reconstruction project in 1925 and 1927. Reconstruction took place between 1927 and 1930 (Figure 7). Today the park is about 2.5 acres and contains a visitor center/museum, 17 reconstructed log buildings, and the original cemetery. It offers educational opportunities in the form of a video orientation, a self-guided walking tour, a costumed interpreter, and periodic candlelight tours.

Figure 7. Reconstructed Schoolhouse
William C. Mills excavated in 1923 with the purpose of determining the location of the original village (Goehring and Snyder 2003:24). The hearthstone of the original church was found, and they were able to find the exact location of the village (Olmstead 1991:12-13). Several concentrations of artifacts were identified, as well as structural remains, which were interpreted as foundation of Schoenbrunn buildings (Goehring and Snyder 2003:31). According to Olmstead, “Subsequent excavations located the cemetery, and the fences, lots, and houses shown in the Ettwein map” (Olmstead 1991:12-13). In 1927 the location of the cemetery was confirmed by Mills (Goehring and Snyder 2003:43-44). There are no fieldnotes or published data from the 1920s.

No further archaeological work was done until 1950. In April and May of 1950 field work was conducted at Schoenbrunn by Raymond Baby for the Ohio Archaeological and Historical Society. He utilized trench excavation, and the trenches were off of two base lines that were established, one in the center of the east-west street, and the other extending from the church step in the center of the north-south street, at a 90º angle from the first. Twenty-four trenches were excavated, of which the majority were dug using a trenching machine (Fieldnotes). Several sketches of trenches exist, but they are difficult to accurately map (Figure 8). Materials uncovered in the 1950 excavation include fire-cracked rock, flint chips, animal bones, “Indian pottery,” iron nails and other objects, dish and crockery fragments, projectile points, corn cobs, gun flints, charcoal, wooden and leather objects, and glass pieces. A more detailed listing of the artifacts and ecofacts can be found in Goehring and Snyder (2003).
Baby never published his results, but in 1952 an anonymous author published "The Indian Houses at Schoenbrunn," in which major results of the 1950 excavation are recorded. These results include that the houses for the Native Americans were smaller than those made in the reconstruction, and the reconstructed streets were wider and straighter than the originals. Another important discovery was that the houses were not
placed uniformly in the middle of the lots (the houses were positioned by the individual convert) and that the Native American houses contained central fireplaces (Anonymous 1952:30).

Regarding the location of the original Schoenbrunn Village of the late 1700s, the 1950 fieldnotes say the following:

After the excavating and surveying work had been rained out, Mr. Mahr and Mr. Goslin visited the area where, according to the Schonbrunn Mission Diary (SD 12, Jan. 2, ’76), a ditch of about 495’ in length was dug, for the purpose of leading ‘water from the Muskingum (Tuscarawas ACM) into a little lake near the spring, in order not to have stagnant water but a flowing stream’ beside the settlement. Even today, the ditch can be clearly distinguished: it connects the south end of Schonbrunn lagoon with the north extension of the incipient meander loop, part of which the Schonbrunn lagoon originally formed. [Author Unknown 1950:3].

This helps confirm that the reconstruction is in the same location as the original village.

The next Schoenbrunn-related study did not occur until the 1986, when James L. Murphy conducted a short analysis of tobacco pipe fragments found there. A total of three white tobacco pipe fragments were excavated that probably dated to the original historic occupation. The three fragments are a “TD” with starts bowl fragment, a Gottfried Aust fluted pipe fragment, and a piece of an Aust anthropomorphic rococo pipe (Murphy 1986, 66). The first fragment was found in the 1923 excavation, and because there is no context data for it, it was automatically dated to the 1772-1782 occupation. The next two are “believed to be the products of Gottfried Aust’s pottery at Salem, North Carolina (1771-1788)” (Murphy 1986:67).

Sue Goehring and David Snyder wrote “Schoenbrunn Revisited: Modern Attempts to Interpret a Late Eighteenth Century Experiment” in 2003. In this article they
give a detailed description of the over 1400 prehistoric and historic artifacts and ecofacts associated with Schoenbrunn. The collections are biased in that they contain a disproportionate number of diagnostic artifacts; probably not all artifacts found were retained (Goehring and Snyder 2003:31). They summarized the artifacts in the collections and divided them into the categories of stone, earthenware, daub, human skeletal remains, faunal, floral, leather, metal, pottery (historic), and glass. Activities indicated by the collection include the hunting of deer year-round and the planting of domesticated corn, beans, and squash (Goehring and Snyder 2003:43). Due to the presence of artifacts that definitely date to before or after the 1770s, Goehring and Snyder state that “Schoenbrunn should be interpreted as only one of many occupations at this location, possibly including at least one from the mid-19th century” (Goehring and Snyder 2003:42). This late occupation may be the small tract of land east of the spring with a barn on it that Mills viewed as part of the site (Goehring and Snyder 2003:42). Also, based on the presence of Woodland Period pottery and the likelihood that some of the faunal elements date to earlier prehistoric occupations, they think it possible that there was a prior village occupation there, perhaps during the Late Woodland Period (Goehring and Snyder 2003:40). Included in their article are the results of a faunal analysis conducted by Anne B. Lee. In their conclusions, Goehring and Snyder maintain that there are still many unanswered questions regarding life at Schoenbrunn, and additional, systematic archaeological work is still needed (Goehring and Snyder 2003:44).

Significantly, Goehring and Snyder believe that the original location of Schoenbrunn was found. They say:
The location and pattern of features clearly correspond with and corroborate the historical records for Schoenbrunn, giving a secure basis for interpreting the basic village outline. This outline of the village pattern provides us with such basic information as the possible location of the Schoenbrunn community, and particular locations for several prominent structures which formed the core of the mission village [Goehring and Snyder 2003:43].

Goehring and Snyder’s paper elicited two responses, neither of which really expand what is known about Schoenbrunn. First, James L. Murphy published “Faunal Remains from the Schoenbrunn Village, Tuscarawas County, Ohio” in 2007. He goes over discrepancies between the analysis done by Anne B. Lee for Goehring and Snyder and his analysis from 1983. Murphy’s explanation for the discrepancy is that perhaps some material was not available to Lee. Due to this difference, Murphy reexamined portions of the collection and recognized some “re-curation” that occurred since he analyzed in 1983. One point Murphy does make that is helpful to any archaeological study of Schoenbrunn is that the temporal provenience of the materials is unknown and this makes it difficult for a serious analysis to be done (Murphy 2007:69). He also disagrees with Goehring and Snyder that a Late Woodland occupation is justified because there are as many Archaic as Woodland artifacts and those categorized as Late Woodland look more like Early Woodland to him (Murphy 2007:70). Second, Anne B. Lee wrote “A Response to James L. Murphy and a Reflection on the Practice of Archaeology in Ohio” in which she defends herself against Murphy’s criticism by asserting that she was only hired to do the faunal analysis and was not a co-author of the report by Goehring and Snyder.
In general, the archaeological work done at Schoenbrunn leaves many unanswered questions. What is known is that there was probably more than one occupation in the area and that the reconstructed village is most likely in the correct location (whether or not the layout of the reconstructed houses perfectly corresponds to the layout of the original Schoenbrunn structures). Also, there is an interesting blend of Native American and European cultures, for example the houses accommodate one family each (European style), but a central chimney (Native American style). The artifacts and ecofacts point to a diet containing corn, squash, beans, deer. Unanswered questions remain about whether or not there were differences between the diets of the converts and missionaries, where the various foods and resources were processed, whether or not there were special activity areas in the village, and whether or not a second cemetery was kept up for non-converted Indians (Goehring and Snyder 2003:44).
CHAPTER IV

METHODS

The major investigative method for this study is Ground-Penetrating Radar. This chapter first describes the research questions that guide this study. I then address how GPR works and its initial use in archaeology. The third section looks at why GPR is appropriate for this study and the specific process employed at Schoenbrunn Village. Finally, I describe other methods utilized in this study including the use of Geographic Information Systems (GIS) and the comparison of Schoenbrunn Village to a Huron Village occupied a century earlier.

Research Questions

The principal aim of this research is to explore Schoenbrunn Village via GPR in order to place Schoenbrunn within a broader context. Excavations conducted in the 1920s and 1950 yielded many artifacts and ecofacts, but unfortunately next to nothing was published about their findings. Recently doubts have arisen that the reconstructed village is actually located above the 1770s village. The primary research question of this thesis is:

- Is the reconstruction of Schoenbrunn in the correct location?
If the key research question is answered in the positive, various related issues then arise which can be examined based on the GPR data. Thus, a further sub-question to be dealt with is:

- Is the reconstructed village true to the original village in terms of layout and the size and spacing of cabins?

The investigation of these questions involves both GPR and historical research. GPR should expose components of the site proving its location and allow for further examination of the spatial patterning of site features. A close examination of previous excavations should provide more information about the true location of Schoenbrunn Village.

Ground-Penetrating Radar

GPR was used to detect underground features at the site. Any GPR device contains two antennae: a transmitter and a receiver. The transmitter sends out radar waves into the ground every 2-10 cm that reflect off of buried features and bounce back to the receiver antenna. The velocity of the waves varies according to the materials through which they are conveyed and the measurement of these velocities combined with the time it takes for the radar waves to bounce back produces a measure of distance, which is depth. Radar antennas are advanced in a straight line along the ground and thus a two-dimensional profile of subsurface stratigraphy is generated. When data from many
subsequent two-dimensional transects in a grid are combined, a three-dimensional representation of subterranean features can be produced, as well as maps of the grid at various depths underground (Conyers and Goodman 1997:12-13).

Radar waves’ velocities change due to the magnetic permeability and the electrical conductivity of the matter underground (Conyers and Goodman 1997:31-32). Magnetic permeability refers to a material’s capacity to become magnetized as it is introduced to an electromagnetic field (Baker et al. 2007:2). Electrical conductivity measures how electrons move through matter that has been introduced to an external electric field (Baker et al. 2007:5). Also important to GPR is relative permittivity (sometimes seen as dielectric constant or dielectric permittivity), because it controls wavelength through signal propagation velocity (Baker et al. 2007:4). “Material that has low relative permittivity will yield high GPR signal propagation velocities and, thus, long wavelengths (allowing only lower resolution)” (Baker et al 2007:5). Because earth materials are usually nonmagnetic, magnetic permeability is less important than electric conductivity and relative permittivity with regard to wave propagation (Baker et al. 2007:8).

Archaeological applications of GPR first began in the 1970s. One early successful study was conducted at Chaco Canyon, New Mexico, the goal of which was to locate buried walls up to one meter in depth (Conyers and Goodman 1997:18-19). GPR is beneficial to archaeology, specifically because it is non-invasive and allows for the complete preservation of the feature or artifact and of its matrix or context.
Collecting GPR data for archaeological purposes is usually done in a grid. The data can be easily processed if the antenna transects collected were parallel and/or perpendicular to each other because most programs that process the images are set for this approach (Conyers 2004:34-35). Grids should be accurately laid out by a surveying technique: corners of the rectangle should be precise, and transects should be parallel or perpendicular to each other (Conyers 2004:35-36). Depending on the machine, a GPS may or may not be present recording the locations of transects (Conyers 2004:36). If not, the corners of the grid must be accurately located.

GPR Research at Schoenbrunn

GPR is suitable for investigating Schoenbrunn Village for two key reasons. First, data were able to collected over a relatively large area up to a depth of 4 m in a short time as compared to excavation, which is very time consuming. Second, and more importantly, the data was collected and the nature of GPR anomalies was determined without breaking ground. This allows future investigations to confirm or deny these findings because the site is completely preserved.

At Schoenbrunn, 15 grids ranging from 10 x 10 m to 30 x 30 m were laid out precisely and investigated with GPR (see Figure 9 for locations and grid sizes). The grids were not chosen systematically, but were situated around the reconstructed cabins. Because of time constraints and the need to use a SmartCart, no grids were placed in the forest surrounding the site.
Each grid was placed deliberately. Grids A, B, C, H, I, K, L and N were placed just off the two major streets in hopes that they might overlap some of the lots of the original village. Grid D was placed behind the reconstructed church and the cabins next to it. Grids E, F, G, and J were placed on the major streets to test the finding in the 1950 investigations that the streets of the original Schoenbrunn village were narrower than those of the reconstruction. Grid M was placed adjacent to the east side of the cemetery in case the boundaries of the cemetery were misjudged and it actually extends out further than the present-day fence. Grid O was positioned on top of the cemetery.
Data was collected over eight days (approximately 64 hours) in the spring and fall of 2010. The equipment used was a pulseEKKO PRO, designed and manufactured by Sensors & Software, Inc. A SmartCart was used to facilitate faster data recovery as the terrain was relatively even. The 15 grids represent roughly 40-45% of the cleared area available for survey with the SmartCart. The antennae were .5 m long, and 200 MHz.

For each grid a square was laid out using the Pythagorean Theorem. For example, if the area called for a 20 m x 20 m grid square, then first one side of the square was measured out precisely. Next the hypotenuse of the square was calculated (28.28 m) and added to the second side of the square (28.28 + 20 = 48.28). The beginning of the tape measure was held at one end of the side already measured out, and the 48.28 m mark of the tape measure was held at the other end of the same first grid side. Then the 20 m mark was pulled out until both the hypotenuse and the second grid side were taught, and that gave the location of the third corner of the grid. The fourth corner was then found by pulling out the 28.28 m mark until it was taught.

Lines of data were collected every .5 meters in both the x and y directions. Tape measures were laid out on the two edges of the x or y direction being surveyed, and a string was positioned between the two equivalent points on the tape measures so that the SmartCart was moved in a straight line. A line of data was collected by pushing the SmartCart along the string, beginning with the transmitter antenna positioned on the first tape measure at the edge of the grid, and ending with the transmitter positioned on the second tape measure at the other end of the grid. After a line of data was collected, the string was moved over 50 cm and the next line was collected, and so on. Most of the
lines of data were collected going in one direction, that is, at the end of a line of data being collected, the collector walked back to the starting side of the first line before beginning the next line. Because of time constraints, however, a few of the x or y directions were done by collecting data in both directions.

I processed and analyzed the GPR data using the software programs GPF Edit and Ekko Mapper 3. First I imported the raw data for each grid into GPF Edit, which was then used to rectify the data: trim the lines that extended outside the grid, verify the lengths of the lines and that the lines were taken .5 meters apart, and see where human error affected the data such as lines being accidentally left out. Ekko Mapper 3 allowed me to view the lines of data all together for a particular grid, giving a flat blueprint for what is underground at every 12.5 cm of depth (amplitude slice map). I then analyzed anomalies by viewing the reflection profiles of the lines that comprise the anomaly. All of the images in Chapter V of amplitude slice maps and reflection profiles are from Ekko Mapper 3.

GIS and Historical Research

Geographic Information Systems (GIS), specifically the program ArcGIS, was used extensively in this analysis. The locations of current structures, the cemetery, and the spring were taken on a GPS and plotted, as well as the locations of the GPR grids. The GPR data contained GPS points and I plotted two of the four corner points in ArcGIS and used the program’s capabilities to draw right angles and set the exact lengths of the sides to attain the other two points. GPR data was overlain onto a map of the current
structures to see the locations of the anomalies compared to the reconstructed cabins.
Also, the reconstructed structures, GPR grids, and some GPR data were overlain onto the
map of Schoenbrunn house lots found at the Ohio Historical Society. They were
georeferenced according to the cemetery and the spring, which are fixed points, in order
to see how the reconstruction and grids compare to this idealized version of the village’s
layout.

Historical research was done on the Moravians and the Delaware in order to
understand their historical circumstances. Primary sources include the diaries of
Zeisberger and Heckewelder. Research was also conducted at the Ohio Historical
Society. The remnants of the field notes from the 1950 excavation were examined.
Unfortunately, the locations of the excavation trenches were not very clearly spelled out
in the notes themselves; however, the maps found in Figures 4, 5, 6, and 8 were located at
the Ohio Historical Center, giving some reference for Baby’s trenches. I also looked
through some of the artifacts from earlier investigations.
CHAPTER V

RESULTS OF GPR SURVEYS

This chapter contains the results of the GPR surveys conducted at Schoenbrunn Village. In all, 15 rectangular grids of varying sizes were laid out between May and November of 2010. GPR results consist of anomalies that are revealed in both the amplitude slice maps (map of the grid at a certain depth) and reflection profiles (horizontal view of an individual data collection line). It is the interpretation of these anomalies that comprise the findings of this study.

The first section in this chapter describes the GPR signatures of three of the most common features found at the site: pipes, paths, and flat surfaces. In the second section, I delve into the individual grids, listing their characteristics as well as describing the anomalies that occur in them. In the 15 grids that were surveyed, 68 major GPR anomalies were discovered. The anomalies shown visually in amplitude slice maps and reflection profiles. The final section is a summary of the anomalies by type. Each type of anomaly is mapped separately in order to better understand their spatial patterning.

As a disclaimer, in this study I examined the most significant anomalies. In the amplitude slice maps there may appear to be some anomalies that I did not cover, but that is because upon viewing the reflection profiles they turned out to be very insignificant or even nothing at all.
Typical GPR Signatures

Once I analyzed the GPR data, three specific signatures appeared consistently in many of the survey grids. In particular I feel confident identifying two of these three signatures as disturbances due to historical or modern intrusions, and one type of signature as potentially historically significant. Those two particular GPR signatures that frequently occurred and may be discounted are the pipe and the modern path, and the third recurrent signature is that of the flat surface.

The signature of a pipe is very well-defined and apparent. In the amplitude slice map for the depth of the pipe, it appears as a long, thin line; however, it is most conspicuous in the reflection profiles for the individual lines of data crossing the pipe. Here, a parabola is seen (from the radar waves bouncing around the pipe) with its vertex at the location and depth of the pipe. Figure 10 shows the appearance of a pipe in an amplitude slice map and a reflection profile. In the reflection profile the vertex of the parabola is at about 1.5 m below the surface, and that indicates that the pipe is at that depth.
The signature of a modern path is also very clear. It is usually visible between the depths of 0 and .5 m. In amplitude slice maps, paths appear as narrow strips with robust signals that have very little variation throughout the path. The reflection profiles of lines that cross the modern paths show them as short (width of the path), bold, flat surfaces. An example of both an amplitude slice map and reflection profile of a modern path is shown in Figure 11.

One of the most important GPR signatures for this study is that of the flat surface (Figure 12). I recognized as flat surfaces those features that appeared in the reflection profiles as strong, almost bold horizontal lines. The image of a flat surface in the amplitude slice maps varied from a strong, consistent signal as shown in the image below, to a signal of wavering strength and color. While the amplitude slice signals varied, the flat surfaces all had very robust reflection profile lines. The flat surfaces were
variously distinguished as locations of cabins, paths, or old excavation trenches depending on their sizes, shapes, and positions.

Figure 11. Amplitude Slice Map and Reflection Profile Showing a Modern Path

Figure 12. Amplitude Slice Map and Reflection Profile Showing a Flat Surface
Figure 13. GPR Grid Locations and Grid Sizes
Grids

Figure 13 shows the locations of the grids in relation to the reconstructed village.

Grid A

Grid A is 35 x 10 m and is located at the far western end of the Schoenbrunn Village property, near the Catholic cemetery (Figures 14-16) (Table 1). Data was collected on May 18, 2010. The grid was laid out with an orientation of 324 degrees along the long (X) axis. Transects were run using the SmartCart from east to west in 50 cm intervals. The Y axis data were then collected running from north to south also in 50 cm intervals. I targeted the area because it falls where the village’s main east-west street

Figure 14. Location of Grid A
should continue if it were to have been expanded to the west. A total of six anomalies were identified, of which three (A4, A5, A6) may be dismissed as modern or historical disturbances.

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area (m²)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Flat</td>
<td>5.33 x 3.48</td>
<td>.5-.75</td>
<td>18.55</td>
<td>Possible living surface</td>
</tr>
<tr>
<td>A2</td>
<td>Linear</td>
<td>28.38 x 1.2</td>
<td>.5-.75</td>
<td>-</td>
<td>Path</td>
</tr>
<tr>
<td>A3</td>
<td>Flat</td>
<td>4.34 x 2.75</td>
<td>.5-.75</td>
<td>11.94</td>
<td>Possible living surface</td>
</tr>
<tr>
<td>A4</td>
<td>Linear</td>
<td>11.15</td>
<td>1.375</td>
<td>-</td>
<td>Pipe</td>
</tr>
<tr>
<td>A5</td>
<td>Linear</td>
<td>9.02</td>
<td>1.375</td>
<td>-</td>
<td>Pipe</td>
</tr>
<tr>
<td>A6</td>
<td>Linear</td>
<td>5.27</td>
<td>1-1.125</td>
<td>-</td>
<td>Pipe</td>
</tr>
</tbody>
</table>

Table 1. Summary of Anomalies Identified in Grid A

Anomaly A1 was identified in the southern part of the grid between the depths of .5 and .75 m below the surface. The feature is roughly oriented to 195 degrees and has a rectangular form. It measures 3.48 meters on the north axis and 5.33 m on the west side, yielding a total area of 18.55 m². It consists of a strongly reflective signal along the northern and eastern edges, giving the rectangular form, with a concentration of material near the center of the anomaly producing a strong reflection loosely ringing a void in the center. The reflection profiles (Figure 16) demonstrate that this feature appears to be completely flat at an approximate depth of .5-.75 meters. The rectangular shape of the edge of the feature lines up perfectly with the other reconstructed along the east-west street. Based upon these findings, it appears likely that this anomaly may be the footprint of an original cabin.
A2 is a linear feature stretching across the central part of Grid A. It is oriented to 290 degrees and at its western end it breaks into two branches, forming a “Y” shape. This feature is about 1.2 m wide and extends 28.38 m. Its depth is between .5 and .75 m. The appearance of this anomaly in the amplitude slice maps leads me to classify this anomaly as an old path.

A3 is an amorphous flat surface encountered east of A2. Its approximate dimensions are 4.34 m on the north side and 2.75 m on the west side, generating a total area of 11.94 m². It is mainly visible between the depths of .5 and .75 m. Unlike A1, it is not located perfectly in line with Schoenbrunn’s reconstructed street line, but it is still along the same general axis farther back from the street had it been continued. The size and depth of A3 are very similar to anomaly A1, making it likely that this also is the location of a cabin from Schoenbrunn.

Anomalies A4, A5, and A6 are pipes in Grid A whose signals are strongest at depths of 1.375 m, 1.375 m, and 1.125 m, respectively. A4 begins on the southeast side of the grid and continues parallel to the grid’s southwest side for 11.15 m. A5 is located northeast of A4 runs almost parallel to it for 9.02 m, but its signal is somewhat weaker and less straight. It ends about 11 m into the grid and its unevenness in the amplitude slice map is likely due to human error. A6 runs north from the middle of the southwest edge of the grid, disappearing around 5 m into the grid.
Figure 15. Grid A Amplitude Slice Maps
Grid B

Grid B is located northwest of the village intersection and is 22 x 22 m (Figures 17-19) (Table 2). Data was collected on May 18, 2010, making it among the first grids to be surveyed. It was laid out with an orientation of 114 degrees along the X axis and 24 degrees along the Y axis. Transects along the X axis were run using the SmartCart in 50 cm intervals from west to east. Y axis data were also collected in 50 cm intervals, running from south to north. This area was targeted because of its location just off the village road next to the last reconstructed cabin. A total of five anomalies were identified
in Grid B, of which one (B2) corresponds to anomaly C1 (which is described in depth later), and two (B4, B5) are unidentified.

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area (m²)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Flat</td>
<td>4.48 x 4.57</td>
<td>.5-.75</td>
<td>20.47</td>
<td>Tree roots</td>
</tr>
<tr>
<td>B2</td>
<td>Flat</td>
<td></td>
<td></td>
<td></td>
<td>See C1</td>
</tr>
<tr>
<td>B3</td>
<td>Linear</td>
<td>14.58</td>
<td>.75-1</td>
<td></td>
<td>Path</td>
</tr>
<tr>
<td>B4</td>
<td>Uneven</td>
<td>2.1 x 3.17</td>
<td>.5-.875</td>
<td>6.66</td>
<td>Unknown</td>
</tr>
<tr>
<td>B5</td>
<td>Uneven</td>
<td>.75-.75</td>
<td>.375-.75</td>
<td>.56</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

Table 2. Summary of Anomalies Identified in Grid B
Anomaly B1 was identified in the southwestern corner of the grid. This feature is somewhat amorphous, measuring 4.48 m along the west side and 4.57 m on the north side, yielding a total approximate area of 20.47 m². The reflection profiles show a solid flat signal with some activity below it that is strongest between .5 and .75 m below the surface. The amplitude slice maps (Figure 18) show that the signal is strongest in the northernmost part of the rectangular feature and that there is somewhat of a void in the western part of the feature. Although this anomaly is somewhat in line with the other reconstructed cabins on the north side of the east-west street, and has a flat signature, the signals below the flat surface and splayed look in the amplitude slice maps lead me to believe that this anomaly is likely the location of an old tree.

B2 is a flat surface that correspond to the flat surface C1. (Grids B and C overlap about 5.3 m in the southern part of Grid B and the northern part of Grid C). This anomaly will be treated in the next section on Grid C.

B3 is a deeper anomaly identified in the southeast corner of the grid. It is linear and is somewhat flat. This feature has an orientation of 75 degrees. It continues for 14.58 m at a depth of between .75 and 1 m. Based on its appearance in the amplitude slice maps, this feature seems to be an old path of some sort.

An uneven feature close to the center of Grid B is B4. It is amorphous with dimensions of is about 2.1 m by 3.17 m, yielding a total area of 6.66 m². The signal is strongest between .5 and .875 m below the surface, but reflection profiles of the lines that cross this feature show disturbances at various depths. The nebulousness of this feature
in both the amplitude slice maps and the reflection profiles make it impossible to interpret. The nature of this feature remains unknown.

B5 consists of two small uneven features in the southeast area grid. They measure approximately .75 x .75 m each. In the amplitude slice maps their signals are strong, thick points right beside each other. They are located between .375 and .75 m below the surface. The robust signature of this feature causes it to be worth mentioning, but unfortunately there is not enough information in the GPR data to make a reasonable assessment about its nature. Thus I must interpret this feature as unknown.
Figure 18. Grid B Amplitude Slice Maps
Figure 19. Grid B Reflection Profiles
Grid C

Grid C is 10 x 10 m and is also located northwest of the village intersection, slightly overlapping Grid B (Figures 20-22) (Table 3). Data was collected on May 13, 2010. The area was chosen because of its location in line with other reconstructed cabins. Grid C was set up with an orientation of 113 degrees along the X axis, and 23 degrees along the Y axis. Data was collected using the SmartCart to run transects at 50 cm intervals first from west to east (X axis), and then from south to north (Y axis). This grid contains four anomalies altogether, one of which (C2) may be dismissed as a modern intrusion.

Figure 20. Location of Grid C
### Anomaly Signature Size (m) Depth (m) Area (m²) Interpretation

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area (m²)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1</td>
<td>Flat</td>
<td>6.51 x 7.57</td>
<td>.375-.875</td>
<td>49.28</td>
<td>Reconstructed cabin</td>
</tr>
<tr>
<td>C2</td>
<td>Linear Flat</td>
<td>1.06 x 10</td>
<td>0-.75</td>
<td>-</td>
<td>Modern Path</td>
</tr>
<tr>
<td>C3</td>
<td>Linear</td>
<td>7.04</td>
<td>.75-1</td>
<td>-</td>
<td>Path</td>
</tr>
<tr>
<td>C4</td>
<td>Uneven</td>
<td>2.14 x 1.28</td>
<td>.75-1</td>
<td>2.74</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

**Table 3. Summary of Anomalies Identified in Grid C**

Anomaly C1 is the known site of a reconstructed cabin that burned down. The cabin was approximately 6.51 m on the north side, and 7.57 m on the west side, totaling 49.28 m². The amplitude slice maps show a clearly rectangular footprint visible between .5 and .875 m below the surface, with a strong signal around the perimeter, especially on the east and west sides. The strong signal extends from the east side to the center of the rectangle, leaving a void on the northern, southern, and western areas. On the west side of the cabin there is a rectangular shaped element in the middle: this part of C1 is the chimney of the reconstructed cabin. Interestingly, reflection profiles of lines throughout the cabin area show that it is not flat throughout the cabin, but only around the perimeter of the cabin. This could reflect the nature of the reconstructed cabins in that this cabin may have had a wooden floor instead of a living surface directly on the ground. The lack of a flat surface throughout the cabin area also suggests that this cabin was not built atop the ruins of a previous living space.

C2 runs across the southern portion of the Grid C. It extends one meter into the grid across the entire southern edge and corresponds to a path that is presently visible on the surface. The path is clearly visible to a depth of .75 m.
Anomaly C3 was identified as a linear feature crossing the middle of Grid C. It is oriented to 75 degrees. It extends for 7.04 m located mainly underneath anomaly C1 at a depth of .75 to 1 m. The signal of this feature is a thin line punctuated by very reflective points. It is important to remember here that Grids B and C overlap. Because of this, I believe that C3 corresponds to anomaly B3. Supporting this are the fact that they both appear at the same depths (.75 – 1 m) and orientations (75 degrees). Based on these findings, I would interpret C3 to be the path B3 continuing further into Grid C.

C4 was located in the southwest corner of the grid. It is roughly rectangular shaped with an orientation of 345 degrees. Like C3 it is deeper than the other features in this grid, appearing between .75 and 1 m below the surface. In the amplitude slice maps this feature has a strong “C” shape, with strongly reflective material encircling a void. However, because the reflection profiles do not show any sort of flatness to the signal, it is difficult to decipher, and anomaly C4 remains unidentified.
Figure 21. Grid C Amplitude Slice Maps
Grid D

Grid D is located south of the reconstructed church and is 50 x 8 m (Figures 23-25) (Table 4). Data was collected on May 18, 2010. The area was selected for GPR survey due to its location behind the church and major cabins of Zeisberger and Jungmann. This grid was laid out with an orientation of 125 degrees along the long (X) axis. Transects were run using the SmartCart at 50 cm intervals from west to east (X axis), and the same was done for the Y axis from south to north. Of the six anomalies identified in this unit, two (D2, D3) can be dismissed as modern or historical disturbances, and one (D4) can be rejected as tree roots.

Anomaly D1 was detected in the northwestern part of the grid. This feature’s complete dimensions are unknown because it appears to continue off the grid, but within the grid itself it is oval shaped with dimensions of 1.96 m by 3.6 m, for a total area of 7.06 m². The flat signal of this anomaly is very strong in both the amplitude slice maps
Figure 23. Location of Grid D

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area (m$^2$)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>Flat</td>
<td>1.96 x 3.6</td>
<td>.375-.75</td>
<td>7.06</td>
<td>Unknown, possibly connected to reconstructed cabin</td>
</tr>
<tr>
<td>D2</td>
<td>Linear</td>
<td>33.96</td>
<td>.625-.875</td>
<td>-</td>
<td>Pipe</td>
</tr>
<tr>
<td>D3</td>
<td>Linear</td>
<td>6.4</td>
<td>.625-.875</td>
<td>-</td>
<td>Pipe</td>
</tr>
<tr>
<td>D4</td>
<td>Uneven</td>
<td>4.37 x 4.52</td>
<td>.5-.875</td>
<td>19.75</td>
<td>Tree roots</td>
</tr>
<tr>
<td>D5</td>
<td>Linear</td>
<td>15.37 x 3.83</td>
<td>0-.625</td>
<td>58.87</td>
<td>Old Road</td>
</tr>
<tr>
<td>D6</td>
<td>Flat</td>
<td>2.66 x .68</td>
<td>.25-.75</td>
<td>1.81</td>
<td>Unknown, possibly connected to reconstructed cabins</td>
</tr>
</tbody>
</table>

Table 4. Summary of Anomalies Identified in Grid D

and the reflection profiles, and it does not contain any voids or variations in strength. Its signal is strongest between .375 and .75 m below the surface. Because the signal of the
anomaly was cut off at the gridline and is incomplete, it is impossible to say with any certainty what the anomaly is; however, its location practically abutting the reconstructed cabin of Jungmann makes it likely that this feature is somehow associated with that reconstructed cabin.

D2 and D3 are linear anomalies that are pipes located at a depth of .625-.875 m under the ground. D2 extends northwest-southeast along the grid and is 33.96 m long. D3 is only about 6.4 m long and is positioned in the southern corner of the grid, running into anomaly D4.

Anomaly D4 is in the southeast end of Grid D. It is about 4.37 x 4.52 m in size, generating a total area of 19.75 m². There is no specific orientation to this feature as it is rather amorphous. Its signal is splayed in the amplitude slice maps and it does not have a definitive impression in the reflection profiles. The splayed signature in the amplitude slice maps is a classic tree root profile. Thus, D4 is the signature of an old tree.

D5 is a linear feature identified in the western end of the grid. It is quite wide for a linear feature, with dimensions of 3.83 m by 15.37 m, which yield a total area of 58.87 m². It has an orientation of 325 degrees, and is observable between the depths of 0 and .625 m. This feature corresponds to an old road that cut through the area. It can be clearly seen in Figures 4 and 5.

D6 is a small anomaly located in the middle of the grid’s northeastern edge. It measures 2.66 m by .68 m, with a total area of 1.81 m². This anomaly is amorphous and as such has no real orientation. Its signal is quite strong with no real variations in intensity between .25 and .75 m below the surface. Like feature D1, the location of this
anomaly just next to the reconstructed cabin of Zeisberger makes it likely that it is somehow associated with that reconstruction.

Figure 24. Grid D Amplitude Slice Maps
Grid E

Grid E is located in the center of town, in the middle of the intersection of the two main streets, and is 15 x 20 m (Figures 26-28) (Table 5). It was surveyed with GPR on September 19, 2010. The area was targeted for survey because of its location in heart of town. The grid was laid out with an orientation of 293 degrees along the X axis, which runs along the same axis as the north-south street. In both the X and Y directions the SmartCart was used to collect data in 50 cm intervals. X axis data were collected running north to south, and Y axis data were collected running east to west. A total of five major anomalies were identified, of which one (E4) may be written off as a pipe from modern or historical times.

Anomaly E1 is a visibly rectangular flat surface identified in the eastern part of Grid E. It is oriented almost perfectly with the grid itself, with its northern edge oriented to 293 degrees. The GPR signal is strongest on the east side of the feature in the middle, and is interrupted by disturbances associated with anomaly E4. This feature is larger than the flat anomalies discussed so far, measuring 7.1 m along its northern edge, and 8.1 m
Figure 26. Location of Grid E

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area (m$^2$)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>Flat</td>
<td>7.1 x 8.1</td>
<td>.375-.75</td>
<td>57.51</td>
<td>Possible living surface</td>
</tr>
<tr>
<td>E2</td>
<td>Flat</td>
<td>4.78 x 5.44,</td>
<td>.375-.625</td>
<td>26.00</td>
<td>Possible living surface</td>
</tr>
<tr>
<td>E3</td>
<td>Flat</td>
<td>3.48 x 9.34</td>
<td>.5-.75</td>
<td>32.50</td>
<td>Incomplete, possible living surface</td>
</tr>
<tr>
<td>E4</td>
<td>Linear</td>
<td>19.49</td>
<td>1.375</td>
<td>-</td>
<td>Pipe</td>
</tr>
<tr>
<td>E5</td>
<td>Flat</td>
<td>3.88 x 2.59</td>
<td>.375-.625</td>
<td>10.05</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

Table 5. Summary of Anomalies Identified in Grid E

on its west side, yielding a total area of 57.51 m$^2$. However, the exact dimensions of this feature are unknown as it abuts the east side of Grid E and may extend further off the grid. Its solid flat signal can be seen in the reflection profile in Figure 28. Despite the
fact that it may continue off the grid, its unmistakably rectangular shape, flatness, and location in the center of town convince me that it is the location of a cabin associated with Schoenbrunn.

E2 is a flat surface located west of E1 that is clearly visible between the depths of .375-.625 m. Like anomaly E1, this feature is aligned with Grid E itself with an orientation of 293 degrees along its south side. Its shape is somewhat irregular with northern and southern elements: its southern part is square shaped and measures 4.78 m on its north side and 5.44 m on its west side. The signal of this southern part is concentrated on the northern, southern, and eastern sides, ringing a void in the center. In addition to this square-shaped section, the flatness of this feature continues north on the west side. This northern part of the feature is trapezoidal, measuring 3.88 m on its west side, and 2.59 m on its north side. The total area of the this feature after adding the two parts together is approximately 36.05 m². The location size, square shape and flatness of the southern part of this feature lead me to believe that it is a cabin associated with Schoenbrunn. The irregular northern part of the could represent a porch or other extension of the feature. Also, both E1 and E2 are located along the same general axis of the reconstructed cabins on the north side of the east-west street.

E3 is a flat surface located in the northwest corner of the grid. The signal is strongest at .5-.75 m below the surface. Its dimensions in the grid are about 3.48 m on the eastern edge of the grid and 9.34 m along the northern grid edge, for a total area of 32.50 m², but it very likely extends off the grid both north and east. The reflection profiles show this feature to be steadily flat throughout, while the amplitude slice maps
show varying concentrations of material. Like E1, there is a disturbance in the signal due to the placement of anomaly E4. Not knowing this feature’s exact dimensions makes it difficult to interpret. If it is associated with Schoenbrunn, its large size would make it a building of some importance such as the school, church, or cabin of an important member. Its location in the middle of the square of the reconstruction also points to it being a building of some importance.

E4 is a pipe that runs below anomalies E1 and E3 at a depth of 1.375 m. It runs for 19.49 m in Grid E. The reflection profile (Figure 28) demonstrates the disturbance in E1 likely caused by digging to put the pipe in.
Figure 27. Grid E Amplitude Slice Maps
Grid F

Grid F was positioned just east of Grid E, in the middle of the main village street, and is 18 x 24 m (Figures 29-31) (Table 6). It is oriented to 115 degrees along the long (Y) axis and was surveyed on November 7, 2010. This area was targeted for GPR survey due to its location in the main street and due to the anomalies found in Grid E, to see if perhaps those features represented the true street line. Transects were run from west to east using the SmartCart in 50 cm intervals (Y axis). The X axis data were then collected in 50 cm intervals running both north to south and south to north due to time constraints. Four anomalies were discovered in this grid, and of these, three (F1, F2, F4) may be dismissed as modern or historical disturbances.

Anomalies F1 and F2 are the paths that presently continue along the northern and southern sides of the main east-west street. They run along the northern and southern edges of Grid F and are visible at depths of 0-.5 m. F1 extends into the northern part of the grid about 1.66 m and F2 stretches into the southern part of the grid about 1.61 m. Both are 24 m long—the length of the grid.
Figure 29. Location of Grid F

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area (m²)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>F1</td>
<td>Linear Flat</td>
<td>1.66 x 24</td>
<td>0-.5</td>
<td>-</td>
<td>Modern Path</td>
</tr>
<tr>
<td>F2</td>
<td>Linear Flat</td>
<td>1.61 x 24</td>
<td>0-.5</td>
<td>-</td>
<td>Modern Path</td>
</tr>
<tr>
<td>F3</td>
<td>Uneven</td>
<td>5.68 x 7.14</td>
<td>.25-.5</td>
<td>40.56</td>
<td>Old Road</td>
</tr>
<tr>
<td>F4</td>
<td>Linear</td>
<td>24</td>
<td>1.5</td>
<td>-</td>
<td>Pipe</td>
</tr>
</tbody>
</table>

Table 6. Summary of Anomalies Identified in Grid F

F3 is faintly visible in the southeastern portion of Grid F. It measures approximately 5.68 m by 7.14 m, which produces a total area of 40.56 m², but does not
really have any specific orientation. This feature is located between 0.25 and 0.5 m below the surface. Upon viewing the reflection profile, it is apparent that it is not a flat surface but has a very uneven signal. In the amplitude slice maps this feature has a very hazy signature that is not especially strong in any part of it. The spread out, cloudy signal of this feature leads me to interpret this anomaly as possibly part of an old road.

F4 is a pipe 1.5 m deep that runs the entire length of the grid east-west along the southern edge. Its jagged appearance is due to the fact that the X axis data were collected in both directions and the lines did not line up perfectly.
Figure 30. Grid F Amplitude Slice Maps
Grid G

Grid G is located east of Grid F (Figures 32-34) (Table 7). It is 20 x 25 m and extends across the village’s east-west street and a little further north. Data was collected on October 6, 2010. This grid was laid out with an orientation of 209 degrees along the long (X) axis. Transects along the X axis were run in 50 cm intervals from north to south using the SmartCart. The Y axis data were then collected in 50 cm intervals running from west to east. Like Grid F, I targeted this area for survey because of its location in the middle of the main street and because of the anomalies found in Grid E. Grid G contains a total of four anomalies, of which one (G1) can be written off as a modern disturbance.
Anomaly G1 is the present-day path that progresses along the north side of the main east-west street. It is 1.57 m wide and is the same path that in Grid F is labeled as anomaly F1.
The second anomaly in Grid G was identified on the northwest side of Grid G. G2 is a flat surface whose signal is most intense between the depths of .25 m and .5 m. This feature measures 3.23 m on the east side, and 4.4 m on the south side, yielding a total area of 14.21 m². Its location at the edge of Grid G means that it may extend outside of the survey area. In the amplitude slice maps the north and south sides of the features are well-defined, leaving a foggy area in the middle. Its signal is weak in the reflection profiles: the flat line indicating a flat surface is not nearly as bold as it is for other flat anomalies. Although it is located in the middle of the street, this features lines up with anomalies E1 and E2. Based on these findings, it appears that G2 is possibly the footprint of a Schoenbrunn cabin.

G3 is a roughly rectangular anomaly found along the south side of Grid G. It is oriented with the village’s main east-west street, about 295 degrees. The dimensions of this feature are approximately 14.53 m by 5.94 m, which produce a total area of 86.31 m². Its signal is strongest between .375 and .75 m below the surface. In the amplitude slice maps it has a hazy appearance throughout with a slightly stronger signature in the grid’s southeast corner. It appears somewhat bolder in the reflection profiles, with a surface that is just barely uneven; it is flat with small waves in it. Based on its hazy appearance and large width, I interpret this anomaly as an old road.

G4 was identified in the northeast corner of the grid, just north of the modern path (G1) between .125 m and .75 m below the surface. It is rectangular in shape and measures 7.82 m on its north side and 6.45 m on its east side, which equals a total area of 50.44 m². The orientation of this anomaly is 295 degrees, which is parallel to the east-
west street. Its signature in the amplitude slice maps is very light with a small, linear
void in the center along the same orientation as the feature itself. The reflection profiles
show it to be a flat surface. I interpret this as a possible Schoenbrunn living surface.
Although this feature lines up with the other reconstructed cabins on the north side of the
east-west street, it probably does not represent a reconstructed cabin that no longer exists.
Eighteen structures were originally built in the 1920s, of which 17 still stand today. The
missing structure is the cabin in Grid C that burned down.

Figure 33. Grid G Amplitude Slice Maps
Grid H

At present, fences extend west of the museum a short distance marking the north and south edges of the main east-west street. Grid H is a 12 x 15 m area just north of the northern fence and extends several meters into the cornfield that stretches behind the cabins along the northern edge of the east-west street (Figures 35-36). It was laid out with an orientation of 292 degrees along the Y axis, which is parallel to the east-west street. In both the X and Y directions the SmartCart was used to collect data in 50 cm intervals. X axis data were collected running south to north, and Y axis data were collected running east to west. There was some difficulty in maneuvering the SmartCart over the recently harvested ground of the northern half of the grid in the present-day cornfield. This grid was surveyed on October 6, 2010 and the area was targeted because it is just off the main street and is next to a reconstructed cabin. No anomalies were identified in this grid, although in the northern half of the grid plow marks are visible to a depth of .5 m.
Figure 35. Location of Grid H

Figure 36. Grid H Amplitude Slice Map
Grid I

The 20 x 20 m grid defined as Grid I is located west of the village’s north-south street, between the two reconstructed cabins of Lucia and Conner (Figures 37-39) (Table 8). Data was collected on September 18, 2010. I laid out this grid with an orientation of 22 degrees along the X axis, which is parallel to the north-south street. Transects were run using the SmartCart from south to north in 50 cm intervals. The SmartCart was then used to collect Y axis data running from east to west also in 50 cm intervals. The grid area was targeted because of its location just off the north-south street and between two reconstructed cabins. It contains a total of five anomalies, of which four are unknown.

Figure 37. Location of Grid I
Table 8. Summary of Anomalies Identified in Grid I

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area (m²)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>I1</td>
<td>Flat</td>
<td>8.56 x 4.39</td>
<td>.5-1</td>
<td>37.58</td>
<td>Unknown</td>
</tr>
<tr>
<td>I2</td>
<td>Flat</td>
<td>12.88 x 3.03</td>
<td>.5-1</td>
<td>39.03</td>
<td>Incomplete, possible living surface</td>
</tr>
<tr>
<td>I3</td>
<td>Flat</td>
<td>2.25 x 2.58</td>
<td>.125-.625</td>
<td>5.81</td>
<td>Unknown</td>
</tr>
<tr>
<td>I4</td>
<td>Flat</td>
<td>2.95 x 3.65</td>
<td>.375-.875</td>
<td>10.77</td>
<td>Unknown</td>
</tr>
<tr>
<td>I5</td>
<td>Flat</td>
<td>3.76 x 1.65</td>
<td>.5-.875</td>
<td>6.20</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

Anomaly I1 was identified in the southwest corner of Grid I. It is irregularly shaped, measuring about 8.56 m by 4.39 m, yielding a total area of 37.58 m². The reflection profiles show it to be somewhat of a flat surface, but the amplitude slice maps display a jumble of signals at varying intensities, mostly between the depths of .5 and 1 m. There is not enough information in the GPR data to make a reasonable interpretation of this feature, and therefore it remains unknown.

I2 is the dominant feature in Grid I, located in the unit’s northeast corner, along most of the eastern edge. It measures approximately 12.88 m along the east side of the grid (oriented to 205 degrees), and 3.03 m on its south side, generating a total area of 39.03 m², but its total dimensions are unknown as it likely continues off the grid. The shape of this anomaly is not regular: it appears somewhat rectangular in its southern part, but more linear in its northern portion. Also, part of the feature on the western side seems to jut out into the grid. The signal is very intense in the northern part of the feature, leaving no real voids, but is less strong in the southern rectangular part. As evidenced in the reflection profile (Figure 39), the feature is a flat surface. This
anomaly’s signature is strong between the depths of .625 and 1 m. Based upon these findings and the feature’s location adjacent to the north-south street, I believe that the southern rectangular part of the feature is possibly a living surface associated with Schoenbrunn.

Another flat surface in Grid I is anomaly I3. It is roughly oval-shaped and small, measuring only 2.25 m by 2.58 m, producing an approximate total area of 5.81 m². In general its signal is light, but it is slightly more intense on the southern part. Unfortunately, like anomaly I1, the GPR data is not enough to reasonably deduce what the anomaly might represent.

I4 was identified just east of anomaly I1. It is amorphous with no real orientation. Approximate measurements for this feature are 2.95 m by 3.65 m, which yield a total area of 10.77 m². In the amplitude slice maps it appears to be an extension of I1, containing the same jumble of signals of varying strengths. The more intense signals appear to be linear, and the reflection profiles show that it is a flat surface. For this feature there is not enough information in the GPR data to make a reasonable assessment of what the anomaly represents.

The final major anomaly in Grid I is located in the southeast corner. I5 is small, with dimensions of 1.65 m on its north side and 3.76 m on its east side, yielding a total area of 6.20 m². Like I2 it has an orientation of 205 degrees, which is parallel to the village’s reconstructed north-south street. This feature is a flat surface, that has a linear shape with a moderate intensity. Unfortunately, the GPR data is not enough to make a good interpretation of what this anomaly might be.
Figure 38. Grid I Amplitude Slice Maps

Reflection Profile of x-line 02 (at 1 m)

Figure 39. Grid I Reflection Profile
Grid J

Grid J is a 17 x 30 m grid in the main north-south street, beginning in front of the school and extending north (Figures 40-42) (Table 9). Data was collected on November 7, 2010. The grid is oriented to 23 degrees along the long (Y) axis, which is aligned with the north-south street. Transects were run along both the X and Y axes with the SmartCart at 50 cm intervals. The X axis data were collected running west to east, and the Y axis data were collected running south to north. I targeted this area for the same reason as Grids F and G: because of the potential for other features to line up with the anomalies identified in Grid E. The unit has a total of seven anomalies, of which five (J1, J2, J5, J6, J7) may be dismissed as modern or historical disturbances, and one (J4) is likely not a true anomaly.

Figure 40. Location of Grid J
### Table 9. Summary of Anomalies Identified in Grid J

Anomalies J1 and J2 correspond to present day paths on the west and east sides of north-south street, respectively. They are visible from 0 m to .5 m below the surface. Both anomalies extend into the grid .77 m from their respective edges.

J3 was identified in the southwest corner of Grid J with a depth of .25 to .625 m. The reflection profile demonstrates that it is a flat surface (Figure 42). This feature is oriented to 23 degrees (the same as the grid and the north-south street), and has a roughly rectangular shape. It measures 5.51 m along the west side, and 5.35 m on its south edge, and there is an extension of this feature in the north part with dimensions of 3.5 m by 2.24 m. The total area of J3 is 37.32 m². The feature has a concentrated circular feature in the middle of it, about 1 m in diameter, extending to a depth of .625 m. J3 is also in line with anomalies E1 and E3 in the north-south street. Based on these findings, there is a strong likelihood that J3 may be the footprint of an original cabin. I believe that the circular feature represents a central fireplace for this cabin.

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area (m²)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>J1</td>
<td>Linear Flat</td>
<td>0.77 x 30</td>
<td>0-.5</td>
<td></td>
<td>Modern Path</td>
</tr>
<tr>
<td>J2</td>
<td>Linear Flat</td>
<td>0.77 x 30</td>
<td>0-.5</td>
<td></td>
<td>Modern Path</td>
</tr>
<tr>
<td>J3</td>
<td>Flat</td>
<td>5.35 x 5.51 + 3.5 x 2.24</td>
<td>.25-.625</td>
<td>37.32</td>
<td>Possible living surface</td>
</tr>
<tr>
<td>J4</td>
<td>Flat</td>
<td>4.22 x 3.66</td>
<td>0-.5</td>
<td>15.45</td>
<td>Lift around tree, not a true anomaly</td>
</tr>
<tr>
<td>J5</td>
<td>Linear</td>
<td>9.82</td>
<td>.5</td>
<td>-</td>
<td>Pipe</td>
</tr>
<tr>
<td>J6</td>
<td>Linear</td>
<td>30</td>
<td>1.25</td>
<td>-</td>
<td>Pipe</td>
</tr>
<tr>
<td>J7</td>
<td>Linear</td>
<td>2.47 x 0.63</td>
<td>.75</td>
<td>1.56</td>
<td>Excavation Trench</td>
</tr>
</tbody>
</table>
J4 is in the southeast corner of Grid J. Its shape is irregular, about 4 m in length and width, and its signal is somewhat flat. This anomaly corresponds to the location of a tree in the unit around which the SmartCart was lifted, and probably represents that transfer rather than a true anomaly.

Anomalies J5 and J6 are underground pipes. J5 runs north-south in the northern part of the grid for about 9.82 m at a depth of .5 m. J6 is located at a depth of 1.25 m and runs down the center of the grid for the entire length of the grid.

J7 is a linear, flat anomaly .75 m deep extending east-west across Grid J, perpendicular to J5. It appears pipe-like in the amplitude slice map because of its thinness; however, the reflection profiles do not confirm this. They show instead a narrow, flattish profile that measures 2.47 m on its south axis and .63 m on its east side, for a total area of 1.56 m\(^2\). Based on its location, it is probably the beginning part of one of Baby’s 1950 excavation trenches (see Figures 43 and 44 for an overlapping of Baby’s trenches onto a map of the GPR grids). In the amplitude slice map for .375-.5 m of depth it appears that the trench shape of this anomaly may extend out confirming the location of the trench. However, in the reflection profiles only the small part of the trench marked in the amplitude profile maps for .5-.625 m and .625-.75 m of depth is visible.
Figure 41. Grid J Amplitude Slice Maps
Figure 42. Grid J Reflection Profile

Figure 43. Sketch Map of Some of Baby’s Trenches
Property of the Ohio Historical Society
Figure 44. Overlap of Sketch Map of Baby’s Trenches onto Map of GPR Grid Locations
Grid K

Grid K is located northeast of the school, to the east of the north-south village street (Figures 45-47) (Table 10). This was the first of the grids to be surveyed, and data was collected on May 13, 2010. It is 30 x 30 m, and it was laid out with an orientation of 24 degrees along the Y axis, which is parallel to the north-south street. Transects were first run on the X axis using the SmartCart from west to east in 50 cm intervals. The Y data were then collected also in 50 cm intervals running both south to north and north to south because of time constraints. The area was targeted because of its location next the north-south street and because satellite imagery showed what looked like a road to be located in the grid area. The southwest corner of Grid K slightly overlapped with Grid J; they are not shown as overlapping due to slight GPS discrepancies. While the presence of the road was not confirmed with GPR, four other major anomalies were found, of which three (K1, K3, and K4) may be dismissed as modern or historical disturbances.

Figure 45. Location of Grid K
<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area (m²)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>K1</td>
<td>Linear Flat</td>
<td>1.44 x 30</td>
<td>0-.5</td>
<td>-</td>
<td>Modern Path</td>
</tr>
<tr>
<td>K2</td>
<td>Flat</td>
<td>4.74 x 3.88</td>
<td>0-.5</td>
<td>18.39</td>
<td>Tree stump</td>
</tr>
<tr>
<td>K3</td>
<td>Flat</td>
<td>1.13 x 1.19</td>
<td>0-.375</td>
<td>1.34</td>
<td>Signpost</td>
</tr>
<tr>
<td>K4</td>
<td>Linear</td>
<td>21.1</td>
<td>0-.375</td>
<td>-</td>
<td>Trenches</td>
</tr>
</tbody>
</table>

**Table 10. Summary of Anomalies Identified in Grid K**

Anomaly K1 is the present day path that runs northeast from the school to the cemetery. It runs north-south across the entire grid and has a width of 1.44 m. About 10 m from the southern edge of the grid, this path turns west and extends off the grid. The signal for this feature is visible up to .5 m under the surface. It is the same path that appears in on the east side of Grid J (J2).

K2 was identified in the western half of Grid K between the depths of 0 and .5 m. It appears to be amorphous in the amplitude slice maps, but the Y axis data was collected in two directions and every other line had to be manually turned around. When only using the X axis data, anomaly K2 is roughly rectangular shaped. The feature is oriented to 24 degrees on the north axis, which is in alignment with Grid K and the north-south street of the village. It measures 4.74 m on the north side by 3.88 m on the west side, generating a total area of 18.39 m². The anomaly consists of a strong, flat signal throughout with a slight decrease in intensity in the middle of the feature. Based on the signal in the amplitude slice maps, I believe that this anomaly represents an old tree stump.

K3 is a light anomaly located just east of the turn in K1. It is amorphous, measuring about 1.13 m by 1.19 m, covering a total area of 1.34 m². It has been
confirmed by Schoenbrunn staff that this feature is the location of an old signpost that was removed in recent years.

Anomaly K4 is located in the northeast quadrant of the grid. It appears to be an old trench with an orientation of 97 degrees that has two branches which extend 176 degrees and 9 degrees. The total distance of the three parts of the trench is 21.1 m. This feature’s GPR signature is negative rather than positive, indicating that the trench was probably filled in with dirt. It is probably not associated with Baby’s trenches in the 1950 excavation because those trenches were placed at 45 degree angles from the street lines.
Figure 46. Grid K Amplitude Slice Maps
Grid L

Grid L is 15 x 30 m and is situated on the western side of the north-south street, across from the cemetery (Figures 48-50) (Table 11). It was laid out with an orientation of 21 degrees along the long (X) axis, almost parallel to the north-south street. The grid was surveyed on October 10, 2010. Transects were run using the SmartCart from south to north in 50 cm intervals for the X axis. Y axis data was then collected from east to west also in 50 cm intervals. I chose this area for survey because the map found at the Ohio Historical Society (Figures 4 and 5) shows some Schoenbrunn plots across from the cemetery. Two anomalies were identified in this grid, and both can be discounted: L1 as a modern disturbance, and L2 as likely not a true anomaly.
Figure 48. Location of Grid L

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area ($m^2$)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1</td>
<td>Linear Flat</td>
<td>1 x 21.91</td>
<td>0-.375</td>
<td>-</td>
<td>Modern Path</td>
</tr>
<tr>
<td>L2</td>
<td>Flat</td>
<td>3.68 x 2.78</td>
<td>0-.5</td>
<td>10.23</td>
<td>Lift around tree, not a true anomaly</td>
</tr>
</tbody>
</table>

Table 11. Summary of Anomalies Identified in Grid L
L1 is the modern path running along the eastern edge of the grid, which continues along the north-south street of the village. Because Grid L is not perfectly aligned with the north-south street, the path is widest at the southeast corner of the grid and disappears before the northeast corner. It is the same path that appears on the west side of Grid J (J1).

L2 is a flat surface in the northern end of the Grid L that extends to a depth of .5 m. This anomaly corresponds to the location of a tree in the unit around which the SmartCart was lifted, and probably represents that transfer rather than a true anomaly.
Figure 49. Grid L Amplitude Slice Maps
Grid M

Grid M is 30 x 20 m and is located along the west edge of the cemetery (Figures 51-53) (Table 12). Data was collected on September 25, 2010 by Dr. Manahan’s Field Methods class. The grid was laid out with an orientation of 7 degrees along the long (Y) axis, parallel to the cemetery. Transects were first run along the Y axis at 50 cm intervals from east to west. X axis data were then collected running from south to north also in 50 cm intervals. I targeted this area to examine the possibility that the size of the cemetery was misjudged and there are graves outside the modern fence. Five anomalies were identified in Grid M, of which one (M4) may be discounted as a modern or historical disturbance.

Figure 50. Grid L Reflection Profile
**Figure 51. Location of Grid M**

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area (m²)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>M1</td>
<td>Flat</td>
<td>5.27 x 8.61 m</td>
<td>0-.5</td>
<td>22.69</td>
<td>Incomplete, Unknown</td>
</tr>
<tr>
<td>M2</td>
<td>Linear Flat</td>
<td>18.75 x 1.32</td>
<td>.125-.625</td>
<td>-</td>
<td>Path</td>
</tr>
<tr>
<td>M3</td>
<td>Flat</td>
<td>5.39 x 4.30</td>
<td>.125-.5</td>
<td>23.18</td>
<td>Possible living surface</td>
</tr>
<tr>
<td>M4</td>
<td>Linear</td>
<td>28.93</td>
<td>1.5</td>
<td>-</td>
<td>Pipe</td>
</tr>
<tr>
<td>M5</td>
<td>Flat</td>
<td>13.89 x 5.76</td>
<td>0-.75</td>
<td>40.00</td>
<td>Old Road</td>
</tr>
</tbody>
</table>

**Table 12. Summary of Anomalies Identified in Grid M**
M1 was discovered in the southeast corner of Grid M. This feature is definitely a flat surface, as evidenced in the reflection profile (Figure 53), but its dimensions are unknown as it probably extends off the grid. M1 measures 5.27 m and 8.61 m along its longest sides, for a total area of 22.69 m². This feature is triangularly shaped in the corner of the grid, with an orientation of 212 degrees, which is almost parallel to the north-south street. Its signal is visible between 0 and .5 m of depth and it appears to have a clear right angle at its northernmost point. As seen in the amplitude slice maps, the signal is strong throughout the feature, with no areas of lessened intensity. M1 is difficult to interpret both because its dimensions are incomplete and because it practically abuts the cemetery. There is no record of any of Schoenbrunn’s buildings being this close to the cemetery, so it is unlikely that this is a living space associated with Schoenbrunn. It could, perhaps, represent a living surface that predates Schoenbrunn Village, or be associated with the research done on the cemetery in the 1920s. More investigation is needed to determine the true nature of this feature.

M2 is a linear feature running north-south next to A42 that appears to makes a 90 degree turn to continue west. The first part of the path is oriented to 19 degrees, and the part after the turn has an orientation of 289 degrees. It is about 1.32 m wide and is between the depths of .125 and .625 m. The signal is strongest along the outside edges, with almost nothing appearing in the center. In this it differs from the modern trenches appearing in previous grids whose signals were strong across the paths. Also, it appears that this path is comprised of different phases. The fragment of the path along 19 degrees looks to have three different phases extending out from the cemetery, and the second part
seems to have two phases. While there is no path there today, M2 lines up with the paths in earlier grids along the east side of the north-south street, specifically anomalies J2 and K1.

M3 is a flat surface identified on the western edge of Grid M between the depths of .125 and .5 m. It measures 5.39 m on the west side and 4.30 m on the north side, yielding a total area of 23.18 m². This feature has an orientation of 207 degrees, which is roughly aligned with the north-south street. Its shape is roughly rectangular and its signal split down the middle by disturbance associated with the placement of the pipe labeled as M4. The signature is stronger on the west side than on the east side, but the reflection profiles confirm that it is a flat surface. M3 is located about 20 m from the cemetery and more or less lines up with the potential living spaces found in Grids J and E (anomalies E1, E3, and J3). If the map from the Ohio Historical Society is to be believed (Figures 4 and 5), then there were lots located across from the cemetery in Schoenbrunn village. Based upon these findings, I interpret this feature as a possible living space associated with Schoenbrunn.

M4 is pipe at 1.5 m deep extending almost the length of the grid on the western side. It is oriented to the north-south street and appears to run down the center of it.

M5 was identified near the northern edge of the grid between the depths of 0 and .75 m. It is large, measuring 13.89 m by 5.76 m, which produces a total area of 40.0 m². In the amplitude slice maps its signal is light and hazy, with a slight decrease in strength near the center. The reflection profiles confirm that it is a flat area. Its large area and indistinct appearance lead me to interpret this anomaly as an old road.
Figure 52. Grid M Amplitude Slice Maps

Figure 53. Grid M Reflection Profile
Grid N

The 20 x 20 m unit labeled as Grid N is positioned on the east side of the north-south village street, south of the cemetery (Figures 54-56) (Table 13). Data was collected on September 19, 2010. This grid has an orientation of 113 degrees along the Y axis, which is parallel to the north-south street. Transects in both directions were run at 50 cm intervals with the SmartCart. X axis data were collected running west to east, and Y axis data were collected running south to north. The grid area was chosen for survey because of its position just of the north-south street. A total of two major anomalies were identified in Grid N.

Figure 54. Location of Grid N
<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area (m²)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>N1</td>
<td>Flat</td>
<td>6.11 x 6.23</td>
<td>.25-.5</td>
<td>38.07</td>
<td>Possible living surface</td>
</tr>
<tr>
<td>N2</td>
<td>Flat</td>
<td>9.19 x 19.42</td>
<td>.125-.625</td>
<td>178.47</td>
<td>Unknown</td>
</tr>
</tbody>
</table>

Table 13. Summary of Anomalies Identified in Grid N

N1 is located in the northeast part of Grid N, appearing between the depths of .25 and .5 m. It is roughly square shaped, and has an orientation of 205 degrees, or almost parallel to the north-south street. The dimensions of this feature are 6.11 m by 6.23 m, which generate a total area of 38.07 m². Its signature in the amplitude slice maps is not extremely strong; it is constant with a slight decrease in intensity in the center. The reflection profiles confirm this feature’s flatness with a strong, bold line. Based on its size and rectangular shape, I interpret this anomaly as a possible living space associated with Schoenbrunn.

The anomaly N2 comprises almost the entire south side of Grid N. The area measures 9.19 m by 19.42 m, or 178.47 m². In the amplitude slice maps it has signals of varying strengths in disarrangement with no real orientation. It is more of a collection of anomalies than an individual anomaly, but its signals in the amplitude slice maps area run together so much that it is difficult to separate into single anomalies. The depths of the signals range from .125 to .625 and the reflection profiles show flat areas interspersed with uneven signals. The GPR data do not provide enough information to interpret this feature and further investigation is necessary to determine what is occurring under the ground in this area.
Figure 55. Grid N Amplitude Slice Maps
Grid O was laid out on top of the cemetery (Figures 57-60) (Table 14). Because the cemetery is a parallelogram, the square grid is somewhat skewed from the shape of the cemetery. It is 17 x 22 m with an orientation of 189 degrees along the X axis and 99 degrees along the Y axis. Data was collected on November 7, 2010. Transects were run in 50 cm intervals with the Smart Cart in both directions. X axis data were collected running from north to south, and Y axis data running from west to east. It was sometimes difficult to maneuver the SmartCart over and around the grave stones that presently memorialize Schoenbrunn’s inhabitants. I targeted this area both to confirm the 1920s verification of the location of the cemetery and to examine the appearance of the graves’ GPR signals.
Many of the anomalies in this section are graves, so here I would like to briefly describe the GPR signatures of graves and grave stones. Grave stones are located on the ground’s surface and because the SmartCart had to maneuver around and over them, they appear at various depths up to .25 m. Their signatures in the amplitude slice maps look like strong, distinct marks less than .5 m in each direction. Graves are much deeper than the grave stones. In the reflection profiles they look like strong, bold horizontal marks ranging from .5-2 m long. In the amplitude slice maps they appear as marks distinct from their matrices, often less than 1 m$^2$. 

Figure 57. Location of Grid O
<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area (m²)</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>O1</td>
<td>Flat</td>
<td>4.27 x 3.05</td>
<td>0-.375</td>
<td>13.02</td>
<td>Lift around tree, not a true anomaly</td>
</tr>
<tr>
<td>O2</td>
<td>Flat</td>
<td>5.29 x 1.83</td>
<td>.25-.625</td>
<td>9.68</td>
<td>Incomplete, Unknown</td>
</tr>
<tr>
<td>O3</td>
<td>Flat</td>
<td>4.3 x 1.93</td>
<td>.25-.625</td>
<td>8.3</td>
<td>Trench</td>
</tr>
<tr>
<td>O4</td>
<td>Grave stones</td>
<td>-</td>
<td>0-.25</td>
<td>-</td>
<td>Grave stones</td>
</tr>
<tr>
<td>O5</td>
<td>Graves</td>
<td>-</td>
<td>1-1.125</td>
<td>&lt; 1 m²</td>
<td>Graves</td>
</tr>
<tr>
<td>O6</td>
<td>Graves</td>
<td>-</td>
<td>1-1.125</td>
<td>&lt; 1 m²</td>
<td>Graves</td>
</tr>
<tr>
<td>O7</td>
<td>Graves</td>
<td>-</td>
<td>1-1.125</td>
<td>&lt; 1 m²</td>
<td>Graves</td>
</tr>
<tr>
<td>O8</td>
<td>Grave</td>
<td>2.54 x 1.32</td>
<td>1-1.125</td>
<td>3.35</td>
<td>Grave</td>
</tr>
<tr>
<td>O9</td>
<td>Flat</td>
<td>3.89 x 1.91</td>
<td>1.375-1.75</td>
<td>7.43</td>
<td>Trench</td>
</tr>
</tbody>
</table>

Table 14. Summary of Anomalies Identified in Grid O

O1 occurs on the northern end of Grid O and is a flat surface about 4.27 m by 3.05 m. This anomaly corresponds to the location of a tree in the unit around which the SmartCart was lifted, and probably represents that transfer rather than a true anomaly.

O2 is located in the southwest corner of Grid O. It extends 5.29 m on its west side, and 1.83 m on the south side, generating a total area of 9.68 m², but its complete dimensions are unknown because it extends off the grid. This anomaly is visible between the depths of .25 m and .625 m. In the amplitude slice maps this feature has a strong signal throughout, and the reflection profiles show it to be a flat surface. It is unlikely that this feature represents the location of an original Schoenbrunn cabin because it is in the cemetery. It may be somehow connected to feature M1 due to its location nearby. More investigation is needed to see what this anomaly represents.

O3 is in the southeast corner of Grid O appearing between .25 and .625 m below the surface. It is roughly rectangular shaped and measures 4.3 m on its south side and
3.05 m on its west side, yielding a total area of 8.3 m². This feature appears to be somewhat flat in the reflection profiles, and in the amplitude slice maps its signal is choppy and broken up. Based on these findings, I interpret this anomaly to be the location of a trench from the 1927 investigation of the cemetery.

O4 comprises 44 shallow anomalies that correspond to grave stones on the surface. The depths are slightly distorted because the stones are not flush with the ground and the SmartCart had to maneuver over and around them. There are five rows of graves stones.

Features O5, O6, and O7 are rows of small anomalies running north-south. Their depths are approximately 1-1.125 m below the surface, with each row containing 4-6 anomalies. They likely correspond to graves. Each graves is less than 1 m².

O8 is visible between 1-1.25 m below the surface in the northwest corner of the cemetery. It is amorphous and roughly oriented to 111 degrees. This feature measures approximately 2.54 m by 1.32 m, producing a total area of 3.35 m². The reflection profiles show an oval shaped signature that has little variation in intensity throughout the feature. In the reflection profiles there is a central flat surface that is only .36 m wide. Based on its location in the cemetery and in line with other graves, this feature most likely represents a grave.

O9 is in the southern part of the grid between 1.375 and 1.75 m below the surface. It is oriented to 60 degrees and is rectangular shaped. This feature’s dimensions are 3.89 m along the 60 degree axis, and 1.91 m along its other axis, with a total area of 7.43 m². In the amplitude slice maps there are small round pockets of stronger signals that are
aligned along the 60 degree axis. The reflection profile show a strong flat signal at a depth of 1.75 m, with nothing of consequence above or below it. Based on these data, I interpret this anomaly to be the location of a trench from the 1927 investigation of the cemetery. The flat signal at 1.75 m below the surface likely represents the bottom of the trench.
Figure 58. Grid O Amplitude Slice Maps
Figure 59. Grid O Amplitude Slice Maps 2
Figure 60. Grid O Reflection Profiles

Summary of Anomalies

Table 15 presents a summary of all 68 GPR anomalies found in the 15 grids. Based on my interpretation of the anomalies, they can be grouped into eight major categories: pipes, paths, old roads, reconstructed cabins, trenches, possible living surfaces, graves/grave stones, and unknown. In this section I will discuss the spatial patterning of seven of these eight types of anomaly. Because graves and grave stones only occurred in the cemetery in Grid O where they were already known to have existed, they are not addressed here. Not included as major categories of anomalies are tree-related features and the signpost hole.
Table 15. Summary of GPR Anomalies Identified in All Grids

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Signature</th>
<th>Size (m)</th>
<th>Depth (m)</th>
<th>Area (m²)</th>
<th>Location</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Flat</td>
<td>5.33 x 3.48</td>
<td>.5-.75</td>
<td>18.55</td>
<td>81°25'13.715&quot; W; 40°27'57.346&quot; N</td>
<td>Possible living surface</td>
</tr>
<tr>
<td>A2</td>
<td>Linear</td>
<td>28.38 x 1.2</td>
<td>.5-.75</td>
<td>-</td>
<td>81°25'14.158&quot; W; 40°27'57.707&quot; N</td>
<td>Path</td>
</tr>
<tr>
<td>A3</td>
<td>Flat</td>
<td>4.34 x 2.75</td>
<td>.5-.75</td>
<td>11.94</td>
<td>81°25'13.941&quot; W; 40°27'57.757&quot; N</td>
<td>Possible living surface</td>
</tr>
<tr>
<td>A4</td>
<td>Linear</td>
<td>11.15</td>
<td>1.375</td>
<td>-</td>
<td>81°25'13.676&quot; W; 40°27'57.125&quot; N</td>
<td>Pipe</td>
</tr>
<tr>
<td>A5</td>
<td>Linear</td>
<td>9.02</td>
<td>1.375</td>
<td>-</td>
<td>81°25'13.415&quot; W; 40°27'57.176&quot; N</td>
<td>Pipe</td>
</tr>
<tr>
<td>A6</td>
<td>Linear</td>
<td>5.27</td>
<td>1-1.125</td>
<td>-</td>
<td>81°25'14.029&quot; W; 40°27'57.536&quot; N</td>
<td>Pipe</td>
</tr>
<tr>
<td>B1</td>
<td>Flat</td>
<td>4.48 x 4.57</td>
<td>.5-.75</td>
<td>20.47</td>
<td>81°25'12.678&quot; W; 40°27'57.195&quot; N</td>
<td>Tree roots</td>
</tr>
<tr>
<td>B2</td>
<td>Flat</td>
<td>14.58</td>
<td>.75-1</td>
<td>-</td>
<td>81°25'12.269&quot; W; 40°27'56.956&quot; N</td>
<td>Path</td>
</tr>
<tr>
<td>B3</td>
<td>Linear</td>
<td>2.1 x 3.17</td>
<td>.5-.875</td>
<td>6.66</td>
<td>81°25'12.262&quot; W; 40°27'57.535&quot; N</td>
<td>Unknown</td>
</tr>
<tr>
<td>B4</td>
<td>Uneven</td>
<td>75-.75</td>
<td>.375-.75</td>
<td>.56</td>
<td>81°25'11.997&quot; W; 40°27'57.016&quot; N</td>
<td>Unknown</td>
</tr>
<tr>
<td>B5</td>
<td>Flat</td>
<td>6.51 x 7.57</td>
<td>.375-.875</td>
<td>49.28</td>
<td>81°25'12.451&quot; W; 40°27'56.973&quot; N</td>
<td>Reconstructed cabin that burned down</td>
</tr>
<tr>
<td>C1</td>
<td>Linear</td>
<td>1.06 x 10</td>
<td>0-.75</td>
<td>-</td>
<td>81°25'12.521&quot; W; 40°27'56.806&quot; N</td>
<td>Modern Path</td>
</tr>
<tr>
<td>C2</td>
<td>Linear</td>
<td>7.04</td>
<td>.75-1</td>
<td>-</td>
<td>81°25'12.269&quot; W; 40°27'56.956&quot; N</td>
<td>Path</td>
</tr>
<tr>
<td>C3</td>
<td>Uneven</td>
<td>2.14 x 1.28</td>
<td>.75-1</td>
<td>2.74</td>
<td>81°25'12.637&quot; W; 40°27'56.908&quot; N</td>
<td>Unknown</td>
</tr>
<tr>
<td>D1</td>
<td>Flat</td>
<td>1.96 x 3.6</td>
<td>.375-.75</td>
<td>7.06</td>
<td>81°25'11.778&quot; W; 40°27'55.341&quot; N</td>
<td>Unknown, possibly connected to reconstructed cabin</td>
</tr>
<tr>
<td>D2</td>
<td>Linear</td>
<td>3.396</td>
<td>.625-.875</td>
<td>-</td>
<td>81°25'11.569&quot; W; 40°27'55.162&quot; N</td>
<td>Pipe</td>
</tr>
<tr>
<td>D3</td>
<td>Linear</td>
<td>6.4</td>
<td>.625-.875</td>
<td>-</td>
<td>81°25'11.058&quot; W; 40°27'54.743&quot; N</td>
<td>Pipe</td>
</tr>
<tr>
<td>D4</td>
<td>Uneven</td>
<td>4.37 x 4.52</td>
<td>.5-.875</td>
<td>19.75</td>
<td>81°25'10.777&quot; W; 40°27'54.694&quot; N</td>
<td>Tree roots</td>
</tr>
<tr>
<td>D5</td>
<td>Linear</td>
<td>15.37 x 3.83</td>
<td>.6-0.625</td>
<td>58.87</td>
<td>81°25'12.151&quot; W; 40°27'55.347&quot; N</td>
<td>Old Road</td>
</tr>
<tr>
<td>D6</td>
<td>Flat</td>
<td>2.66 x 6.8</td>
<td>.25-.75</td>
<td>1.81</td>
<td>81°25'11.066&quot; W; 40°27'54.95&quot; N</td>
<td>Unknown, possibly connected to reconstructed cabins</td>
</tr>
<tr>
<td>E1</td>
<td>Flat</td>
<td>7.1 x 8.1</td>
<td>.375-.75</td>
<td>57.51</td>
<td>81°25'10.767&quot; W; 40°27'56.014&quot; N</td>
<td>Possible living surface</td>
</tr>
<tr>
<td>E2</td>
<td>Flat</td>
<td>4.78 x 5.44</td>
<td>.375-.625</td>
<td>26.00</td>
<td>81°25'11.144&quot; W; 40°27'56.114&quot; N</td>
<td>Possible living surface</td>
</tr>
<tr>
<td>E3</td>
<td>Flat</td>
<td>3.48 x 9.34</td>
<td>.5-.75</td>
<td>32.50</td>
<td>81°25'10.673&quot; W; 40°27'56.295&quot; N</td>
<td>Incomplete, possible living surface</td>
</tr>
<tr>
<td>E4</td>
<td>Linear</td>
<td>19.49</td>
<td>1.375</td>
<td>-</td>
<td>81°25'10.744&quot; W; 40°27'56.126&quot; N</td>
<td>Pipe</td>
</tr>
<tr>
<td>Code</td>
<td>Type</td>
<td>Measurements</td>
<td>Coordinates</td>
<td>Notes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>----------------</td>
<td>--------------</td>
<td>-------------</td>
<td>------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E5</td>
<td>Flat</td>
<td>3.88 x 2.59</td>
<td>0.375-.625</td>
<td>81°25'11.095&quot; W; 40°27'56.265&quot; N</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>F1</td>
<td>Linear Flat</td>
<td>1.66 x 24</td>
<td>0.5</td>
<td>81°25'9.668&quot; W; 40°27'55.652&quot; N</td>
<td>Modern Path</td>
<td></td>
</tr>
<tr>
<td>F2</td>
<td>Linear Flat</td>
<td>1.61 x 24</td>
<td>0.5</td>
<td>81°25'9.964&quot; W; 40°27'55.143&quot; N</td>
<td>Modern Path</td>
<td></td>
</tr>
<tr>
<td>F3</td>
<td>Uneven</td>
<td>5.68 x 7.14</td>
<td>0.25-5</td>
<td>81°25'9.646&quot; W; 40°27'55.236&quot; N</td>
<td>Old Road</td>
<td></td>
</tr>
<tr>
<td>F4</td>
<td>Linear</td>
<td>24</td>
<td>1.5</td>
<td>81°25'9.976&quot; W; 40°25'55.187&quot; N</td>
<td>Pipe</td>
<td></td>
</tr>
<tr>
<td>G1</td>
<td>Linear Flat</td>
<td>20 x 1.57</td>
<td>0.5</td>
<td>81°25'8.232&quot; W; 40°25'55.113&quot; N</td>
<td>Modern Path</td>
<td></td>
</tr>
<tr>
<td>G2</td>
<td>Flat</td>
<td>3.23 x 4.4</td>
<td>0.25-5</td>
<td>81°25'8.68&quot; W; 40°25'55.091&quot; N</td>
<td>Incomplete, possible living surface</td>
<td></td>
</tr>
<tr>
<td>G3</td>
<td>Uneven</td>
<td>14.53 x 5.94</td>
<td>0.375-.75</td>
<td>81°25'8.369&quot; W; 40°25'54.686&quot; N</td>
<td>Old Road</td>
<td></td>
</tr>
<tr>
<td>G4</td>
<td>Flat</td>
<td>6.45 x 7.82</td>
<td>0.125-.75</td>
<td>81°25'7.911&quot; W; 40°25'55.178&quot; N</td>
<td>Possible living surface</td>
<td></td>
</tr>
<tr>
<td>I1</td>
<td>Flat</td>
<td>8.56 x 4.39</td>
<td>0.5-1</td>
<td>81°25'11.188&quot; W; 40°25'57.46&quot; N</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>I2</td>
<td>Flat</td>
<td>12.88 x 3.03</td>
<td>0.5-1</td>
<td>81°25'10.472&quot; W; 40°25'57.405&quot; N</td>
<td>Incomplete, possible living surface</td>
<td></td>
</tr>
<tr>
<td>I3</td>
<td>Flat</td>
<td>2.25 x 2.58</td>
<td>0.125-.625</td>
<td>81°25'10.796&quot; W; 40°25'57.29&quot; N</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>I4</td>
<td>Flat</td>
<td>2.93 x 3.65</td>
<td>0.375-.875</td>
<td>81°25'10.978&quot; W; 40°25'57.51&quot; N</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>I5</td>
<td>Flat</td>
<td>3.76 x 1.65</td>
<td>0.5-.875</td>
<td>81°25'10.567&quot; W; 40°25'57.16&quot; N</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>J1</td>
<td>Linear Flat</td>
<td>0.77 x 3.0</td>
<td>0.5</td>
<td>81°25'10.51&quot; W; 40°25'56.928&quot; N</td>
<td>Modern Path</td>
<td></td>
</tr>
<tr>
<td>J2</td>
<td>Linear Flat</td>
<td>0.77 x 3.0</td>
<td>0.5</td>
<td>81°25'9.909&quot; W; 40°25'56.682&quot; N</td>
<td>Modern Path</td>
<td></td>
</tr>
<tr>
<td>J3</td>
<td>Flat</td>
<td>5.35 x 5.51+</td>
<td>0.25-.625</td>
<td>81°25'10.577&quot; W; 40°25'56.493&quot; N</td>
<td>Possible living surface</td>
<td></td>
</tr>
<tr>
<td>J4</td>
<td>Flat</td>
<td>4.22 x 3.66</td>
<td>0.5</td>
<td>81°25'10.038&quot; W; 40°25'56.973&quot; N</td>
<td>Lift around tree, not a true anomaly</td>
<td></td>
</tr>
<tr>
<td>J5</td>
<td>Linear</td>
<td>9.82</td>
<td>.5</td>
<td>81°25'10.155&quot; W; 40°25'57.15&quot; N</td>
<td>Pipe</td>
<td></td>
</tr>
<tr>
<td>J6</td>
<td>Linear</td>
<td>30</td>
<td>1.25</td>
<td>81°25'10.237&quot; W; 40°25'56.815&quot; N</td>
<td>Pipe</td>
<td></td>
</tr>
<tr>
<td>J7</td>
<td>Linear</td>
<td>2.47 x 0.63</td>
<td>.75</td>
<td>81°25'10.038&quot; W; 40°25'56.973&quot; N</td>
<td>Excavation Trench</td>
<td></td>
</tr>
<tr>
<td>K1</td>
<td>Linear Flat</td>
<td>1.44 x 3.0</td>
<td>0.5</td>
<td>81°25'9.405&quot; W; 40°25'57.117&quot; N</td>
<td>Modern Path</td>
<td></td>
</tr>
<tr>
<td>K2</td>
<td>Flat</td>
<td>4.74 x 3.88</td>
<td>0.5</td>
<td>81°25'8.572&quot; W; 40°25'56.859&quot; N</td>
<td>Tree stump</td>
<td></td>
</tr>
<tr>
<td>K3</td>
<td>Flat</td>
<td>1.13 x 1.19</td>
<td>0.375</td>
<td>81°25'9.293&quot; W; 40°25'57.048&quot; N</td>
<td>Signpost</td>
<td></td>
</tr>
<tr>
<td>K4</td>
<td>Linear</td>
<td>21.1</td>
<td>0.375</td>
<td>81°25'8.399&quot; W; 40°25'57.234&quot; N</td>
<td>Trenches</td>
<td></td>
</tr>
<tr>
<td>L1</td>
<td>Linear Flat</td>
<td>1 x 21.91</td>
<td>0.375</td>
<td>81°25'8.432&quot; W; 40°25'0.121&quot; N</td>
<td>Modern Path</td>
<td></td>
</tr>
<tr>
<td>L2</td>
<td>Flat</td>
<td>3.68 x 2.78</td>
<td>0.5</td>
<td>81°25'8.432&quot; W; 40°25'0.121&quot; N</td>
<td>Modern Path</td>
<td></td>
</tr>
<tr>
<td>M1</td>
<td>Flat</td>
<td>5.27 x 8.61</td>
<td>0.5</td>
<td>81°25'7.468&quot; W; 40°27'59.908&quot; N</td>
<td>Incomplete, Unknown</td>
<td></td>
</tr>
</tbody>
</table>
Of the 68 anomalies, ten are pipes: A4, A5, A6, D2, D3, E4, F4, J5, J6, and M4.

Figure 61 shows the specific positioning of these pipes in Schoenbrunn Village. Most of the pipes are found within or parallel to the two main village streets. The pipes in Grids E, J, and M line up with each other almost perfectly down the center of the north-south village street (the slight error in alignment can be attributed to the small error margin in the GPS data used to position the grids on the map). The location of this major pipe that runs up the center of the north-south street suggests that it was laid in conjunction with the reconstruction efforts of the 1920s and 1930s.
Figure 61. Locations of Pipe Anomalies

Paths, both modern and historical, comprise 12 of the anomalies. This group consists of anomalies A2, B3, C2, C3, F1, F2, G1, J1, J2, K1, L1, and M2. Of these paths, four (A2, B3, C3, M2) are historic paths, and the remainder are modern paths associated with the present-day reconstruction of Schoenbrunn. Figure 62 shows the locations of all of the path anomalies found. The modern paths flank the sides of the two main streets. As with the pipes, the error in alignment of the paths in Grids J and K can be attributed to the small error margin in the GPS data used to position the grids. The
path in Grid M is in line with the modern paths on the east side of the street, but has phases that are clearly older. The paths in Grids A, B, and C are slightly more random: they are not on the reconstructed streets, but are still located somewhat along the axis of the main street.

Four features have been interpreted as old roads, D5, F3, G3, and M5. Their positions can be seen in Figure 63. Anomalies F3 and G3 line up with each other along the south side of the east-west street. Their positioning in the street indicates one of two
possibilities. First, it could show that the reconstructed Schoenbrunn street is indeed in the right position and these anomalies confirm it. Or, it could indicate that these two features are not roads at all, but represent some ground disturbance associated with the building or upkeep of the reconstructed village, such as bulldozer work. D5 is a road that existed in relatively recent historic times, and it is not associated with the original Schoenbrunn village. Based on its location, feature M3 may possibly be associated with the original Schoenbrunn occupation. The historic map in Figures 4 and 5 suggest that there was indeed a road located just across from the cemetery.

Figure 63. Locations of Old Road Anomalies
Another category of anomaly is the reconstructed cabin that no longer exists. C1 is the only feature that fits into this category. As seen in Figure 64, C1 is aligned perfectly with the other reconstructed cabins located along the north side of the east-west street.

Figure 64. Locations of Reconstructed Cabin Anomalies
Four anomalies are understood to be trenches, including J7, K4, O3, and O9 (Figure 65). J7 is visible in the middle of the north-south street. This confirms that it is a Baby trench from 1950 because those were placed at a 45 degree angle from the centerline of the reconstructed streets. While there is no map of the work done in the cemetery in 1927, the trenches in Grid O likely correspond to that investigation because it is the only field work known to have been done in the area. The trench in Grid K is interesting because it is not accounted for in the archaeological record. Its angle does not correspond to Baby’s trenches.

![Figure 65. Locations of Trench Anomalies](image-url)
The most interesting category of anomaly for this study is the potential living surface (Figure 66). This group consists of features A1, A3, E1, E2, E3, G2, G4, I2, J3, M3, and N1. In terms of their spatial orientation, these 11 features can be placed into three groups. In the first group are those that are in line with the reconstructed cabins (A1, E3, I2). The second set contains those that are in line with each other, but not aligned with the reconstructed cabins (E1, E2, G2, J3, M3). Interestingly, these features are located along the two main streets of the reconstruction. In the third group are those potential living surfaces located away from the two main streets (A3, N1).

![Figure 66. Locations of Potential Living Surfaces](image)
Unknown anomalies account for thirteen of the 68 (B4, B5, C4, D1, D6, E5, I1, I3, I4, I5, M1, N2, O2). These features are for the most part flat surfaces whose signatures do not look like those of potential living spaces. As seen in Figure 67, these unknown anomalies lie mostly away from the two main streets. Only the unknown features in Grids C and E line up with the main street and its reconstructed cabins.

Figure 67. Locations of Unknown Anomalies
CHAPTER VI

DISCUSSION

Based on the GPR data, the primary research question of “Is the reconstruction of Schoenbrunn in the correct location?” can be answered in the affirmative. The secondary questions of “Is the reconstructed village true to the original village in terms of layout and the size and spacing of cabins?” and “How does Schoenbrunn’s layout compare with another Native American site of the same region and general time period?” are thus relevant.

In this chapter I interpret the GPR anomalies to explain why the present reconstruction is in the correct location. Also, analysis of the data proves Anonymous’ (1952) conclusions that compared to the reconstruction, the Indian houses were generally smaller and had central fireplaces, and the houses not as uniformly placed on the lots. I present some conclusions about Schoenbrunn’s layout and organization based on the GPR data.

Location of Schoenbrunn Village

Three bodies of evidence point to the reconstruction of Schoenbrunn being in the same location as the original village: the GPR data, the affidavits (see appendix) and the excavation results.
Relevant GPR data confirming that this was the location of Schoenbrunn Village are the anomalies interpreted as Schoenbrunn cabins (potential living spaces) and the graves. All of the GPR grids except F, H, and L contain either cabins or graves. It was not possible to GPR over the floors of the present reconstructed cabins, so I cannot say whether or not they are located over the remains of 1770s cabins. Nevertheless, the 11 anomalies interpreted as potential living spaces verify that the reconstructed village is in the same general location as the original Schoenbrunn.

The affidavits confirming the location of Schoenbrunn were given by area residents in the 1920s in conjunction with the investigations done in that decade (see appendix). They do not contain any disagreement about the general location of Schoenbrunn Village; virtually all of them state the position of the village as “being on the high ground north and east of the Spring, and a little east of the present location of the Catholic cemetery” (John Kaderly). The present reconstruction is northeast of the spring and east of the Catholic cemetery. The southeastern part of the Catholic cemetery probably extends onto part of the original village. There is one statement in the affidavits concerning the village’s location that is not consistent with the modern reconstruction. John S. Knisely writes that “the site of that church, (1772) is between fifty and sixty feet east of the southeast part of the cemetery near the historic spring.” The reconstructed church is approximately 435 feet from the southeast corner of the Catholic cemetery, and 455 feet from the spring.

While the remains of the original village are not visible today, in his affidavit, W B Brown remembers when the site was still observable. He says, “I assisted in
tilling with a plow what was then regarded as house cellars or pits, near and north of the present location of the catholic cemetery.” Also, in his affidavit Cyrus Alter remembers “seeing a lot of such material hauled away; in fact, I distinctly remember helping, as a small boy could, in loading stone of house foundations and chimneys to be used for house foundations by pioneer settlers elsewhere.”

The previous excavations also verify the location of the original village. Structural remains were found as well as a hearthstone inferred to be that of the church. The area currently marked as the cemetery was investigated and confirmed in 1927 (Goehring and Snyder 2003:31). Artifacts found at this location are consistent with what would be expected from a late 18th century village of Native Americans and whites: dish and crockery fragments, glass pieces, iron nails, for example.

Layout of Schoenbrunn Village and Sizes of Cabins

In terms of the second research question of “Is the reconstructed village true to the original village in terms of layout and the size and spacing of cabins?”, the GPR anomalies say much about the layout of the village and the size and spacing of the cabins. Overall, the data support three of Anonymous’ (1952) conclusions: 1) the Indian houses were smaller than the reconstructed cabins, 2) the houses were not uniformly placed on the lots, and 3) houses had central fireplaces unlike many of the reconstructed cabins, which have fireplaces at the sides of the cabins.
1) The Indian houses were smaller than the reconstructed cabins. The areas of the anomalies interpreted as potential living spaces and of the reconstructed structures can be found in Tables 16 and 17. (The areas were calculated in ArcGIS based on the flat surfaces in Figure 69 that were traced from the amplitude slice maps.) The average area
of the anomalies considered potential living surfaces is 23.44 square meters. Not including the two incomplete anomalies (E3, I2) the average is 22.11 m². In contrast, the mean area of the reconstructed cabins (not including the church and school) is 39.14 m², which is much larger than the averages of the GPR anomalies. Thus, the GPR data supports Anonymous’ claim that the reconstructed houses are larger than the original cabins.

Figure 69. Potential Living Surfaces Overlaid onto Map from Ohio Historical Society
Table 16. Areas of GPR Anomalies Interpreted as Cabins or Potential Schoenbrunn Buildings

<table>
<thead>
<tr>
<th>Anomaly</th>
<th>Size (in square meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>8.32</td>
</tr>
<tr>
<td>A3</td>
<td>8.11</td>
</tr>
<tr>
<td>E1</td>
<td>32.26</td>
</tr>
<tr>
<td>E2</td>
<td>15.77</td>
</tr>
<tr>
<td>E3</td>
<td>23.57 (Incomplete GPR signature)</td>
</tr>
<tr>
<td>G2</td>
<td>10.98</td>
</tr>
<tr>
<td>G4</td>
<td>40.08</td>
</tr>
<tr>
<td>I2</td>
<td>35.25 (Incomplete GPR signature)</td>
</tr>
<tr>
<td>J3</td>
<td>29.15</td>
</tr>
<tr>
<td>M3</td>
<td>20.16</td>
</tr>
<tr>
<td>N1</td>
<td>34.16</td>
</tr>
</tbody>
</table>

Table 17. Areas of Reconstructed Buildings

<table>
<thead>
<tr>
<th>Cabin Name</th>
<th>Size (in square meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abraham</td>
<td>64.22</td>
</tr>
<tr>
<td>Anton</td>
<td>49.18</td>
</tr>
<tr>
<td>Conner</td>
<td>55.51</td>
</tr>
<tr>
<td>Davis</td>
<td>53.48</td>
</tr>
<tr>
<td>Esther</td>
<td>31.70</td>
</tr>
<tr>
<td>Indian Cabin 1</td>
<td>20.05</td>
</tr>
<tr>
<td>Indian Cabin 2</td>
<td>19.09</td>
</tr>
<tr>
<td>Indian Cabin 3</td>
<td>24.41</td>
</tr>
<tr>
<td>Indian Cabin 4</td>
<td>16.57</td>
</tr>
<tr>
<td>Jungmann</td>
<td>59.27</td>
</tr>
<tr>
<td>Lucia</td>
<td>37.36</td>
</tr>
<tr>
<td>Luke</td>
<td>32.30</td>
</tr>
<tr>
<td>Papunhank</td>
<td>37.71</td>
</tr>
<tr>
<td>Solomon</td>
<td>40.95</td>
</tr>
<tr>
<td>Zeisberger</td>
<td>45.30</td>
</tr>
<tr>
<td>School</td>
<td>87.60</td>
</tr>
<tr>
<td>Church</td>
<td>177.41</td>
</tr>
</tbody>
</table>
2) The houses were not uniformly placed on the lots. The reconstructed houses are generally placed in the middle of the lots along the street line. It is difficult to say whether or not the GPR anomalies interpreted as potential living spaces are on the street line or not because the exact position of original street line is unknown. Anomalies A1, A3, E1, E2, and G2 are located along the same general northwest-southeast axis (somewhat in alignment with the reconstructed village’s east-west street); however, if a straight street line is drawn, they would not fall uniformly in the same place on the household plots. The anomalies located somewhat in alignment with the village’s north-south street, E1, E3, I2, J3, M3, N1, do not all fall on a straight line. E1, E3, J3, and M1 line up almost perfectly, but I2 is located further west of the street, and N1 is more east of the street. The map in Figure 69 shows another east-west street south of the cemetery. If this street did exist, it is possible that the potential living spaces represented in anomalies M3 and N1 were located along that street.

3) Houses had central fireplaces. One anomaly in particular, J3, left a unique footprint in the GPR data. It contains a strong anomaly in the shape of a circle about one meter wide located in the middle of a larger, less strong anomaly. This deeper anomaly may represent a central fireplace.

Overall Conclusions

Schoenbrunn Village appears to have been organized according to approximate east-west and north-south streets arranged in the shape of a “T” as the reconstructed
village shows; however, unlike the reconstruction, the houses were probably located on various parts of the lots.

The sizes of the cabins were typically small and differences in the sizes of cabins may point to some social stratification among the villagers. The sizes of those cabins (not including incomplete anomalies) have a large range from 8.11 to 40.08 m². The four largest complete cabin anomalies are G4, N1, E1, and J3, two of which are located at the center of town where the two streets meet. The smallest of the complete cabin anomalies are A1 and A3, which are further away from the center of town. This pattern is also found among the reconstructed cabins. Those cabins labeled Zeisberger and Jungmann at the center of town (which are supposedly built above the ruins of those leader’s cabins) are 45.30 and 59.27, well above the average size of 39.14 m². In contrast, the so-called Indian cabins, which are furthest from the intersection, are the smallest of the reconstructed cabins, at 16.57, 19.09, 20.05 and 24.41 m².
CHAPTER VII

CONCLUSIONS

Schoenbrunn Village represents a little known part of our country’s history: the breaking off of a group of Christianized Indians and their white leaders in order to form a more godly, utopian community. Unfortunately, they were not able to disconnect themselves entirely from early American society, and, as the massacre at Gnadenhutten illustrates, they were very much subject to the volatility of the times caused by the Revolutionary War.

This study used Ground-Penetrating Radar in an effort to expand what is known about the village. The two key questions that guided my research were: 1) Is the reconstruction of Schoenbrunn in the correct location? 2) Is the reconstructed village true to the original village in terms of layout and the size and spacing of cabins?

Fifteen grids were surveyed via GPR and 68 major anomalies were found. These anomalies are interpreted as pipes (10 anomalies), modern and historical paths (12 anomalies), old roads (4 anomalies), reconstructed cabins that no longer exist (1 anomaly), trenches (4 anomalies), potential living surfaces (11 anomalies), tree-related anomalies (6 anomalies), graves and grave stones (5 anomalies), a old signpost hole (1 anomaly), and unknown anomalies (13 anomalies). These anomalies were analyzed and plotted onto GIS maps to view any overarching spatial patterning.
The first research question regarding the location of Schoenbrunn was answered in the affirmative based on the GPR data, the results of previous excavations, and the affidavits given by old-time residents of the area in the 1920s (included in appendix).

Concerning the question of whether or not the reconstructed village is true to the original village in terms of layout and the size and spacing of cabins, the GPR data confirm Anonymous’ (1952) conclusions that the original houses were smaller than the reconstructed cabins, the houses were not uniformly placed on the lots (in the center, right on the street line), and the houses contained central chimneys.

Recommendations

The GPR data yield much information about what is located underground around the reconstructed cabins. The data also help confirm the results of other excavations (for example, that the cemetery memorial is in the correct location). On the other hand, the data raise a number of questions. GPR data do not read like perfect photographs of underground materials, and further archaeological investigations are needed to confirm what are interpreted as potential living spaces. Also, the unknown anomalies necessitate additional research.

In particular, archaeological excavation should focus on the potential living spaces. I would prioritize them in the following way. First to be examined should be anomalies E₁ (81°25′10.767″ W; 40°27′56.014″ N), E₂ (81°25′11.144″ W; 40°27′56.114″ N), and E₃ (81°25′10.673″ W; 40°27′56.295″ N). These three possible living surfaces are located in the village intersection and had some of the strongest GPR
signatures. They would greatly inform us about the true nature of the village’s layout. The second two anomalies I would explore are J3 (81°25’10.577” W; 40°27’56.493” N), and G4 (81°25’7.911” W; 40°27’55.178” N). These two possible living surfaces are also well situated. J3 is in line with anomalies E1 and E3, and G4 is lined up with the other reconstructed cabins on the north side of the main street, which are supposedly built upon the remains of original Schoenbrunn cabins. Finally, I would look at the remainder of the anomalies interpreted as possible living surfaces: anomalies A1 (81° 25’13.715” W; 40º 27’57.346” N), A3 (81°25’13.941” W; 40º27’57.757” N), G2 (81°25’8.68” W; 40º27’55.091” N), I2 (81°25’10.472” W; 40º27’57.405” N), N1 (81°25’7.055” W; 40º27’59.202” N), M3 (81°25’8.078” W; 40º28’0.168” N).

If time and resources permit, three unknown anomalies that might yield interesting information if excavated are E5 (81°25’11.095” W; 40º27’56.265” N), M1 (81°25’7.468” W; 40º27’59.908” N), and O2 (81°25’7.178” W; 40º28’0.098” N). E5 is very close the other possible living spaces in Grid E and may somehow be connected to E2. M1 and O2 are near and inside the cemetery.

Further investigation of these GPR anomalies would confirm the possible living spaces as Schoenbrunn cabin footprints. It would also further elucidate the anomalies and provide more information on the situation of Schoenbrunn on the American frontier during the Revolution.
BIBLIOGRAPHY

Anonymous
1952 The Indian Houses at Schoenbrunn. Museum Echoes 25:30–32.

Author Unknown
1950 Fieldnotes: Schoenbrunn State Memorial Park. Ohio Historical Society Archives, Columbus, OH.

Baby, Raymond, et al.
1950 Fieldnotes, Ohio Historical Society. UNPUBLISHED.

Baker, Gregory S., Thomas E. Jordan, and Jennifer Pardy

Barr, Daniel P., ed.

Beaver, R. Pierce. “Protestant Churches and the Indians”

Carte Engel, Katherine

Conyers, Lawrence B.
2004 Ground-Penetrating Radar for Archaeology. Walnut Creek, CA: AltaMira Press.

Conyers, Lawrence B., and Dean Goodman
1997 Ground-Penetrating Radar for Archaeologists. Walnut Creek, CA: AltaMira Press.

Gaff, Donald H.
Goehring, Sue, and David Snyder
2003 Schoenbrunn Revisited: Modern Attempts to Interpret a Late Eighteenth

Goehring, Susan

Gollin, Gillian Lindt
1967 Moravians in Two Worlds: A Study of Changing Communities. New York:
Columbia University Press.

Gosden, Chris
2004 Archaeology and Colonialism: Cultural Contact from 5000 B.C. to the Present.

Gray, Elma E.
New York: Russell and Russell.

Grumet, Robert S.

Heckewelder, John
1820 Narrative of the Mission of the United Brethren Among the Delaware and

Hutton, J.E.

Johnston, Richard B., and L.J. Jackson
1980 Settlement Pattern at the Le Caron Site, a 17th Century Huron Village. Journal
of Field Archaeology 7(2):173-199.

Kaufman, Stanley A., and Lawrence W. Hartzell

Kraft, Herbert C.
Historical Society.

Lightfoot, Kent G.
2005 Indians, Missionaries, and Merchants: The Legacy of Colonial Encounters on
McConnell, Michael N.

Morgan, Lewis Henry

Murphy, James L.

Newcomb, William W., Jr.

Olmstead, Earl P.

McCutch en, David, Translator and Annotator.

Silliman, Stephen W.

Skeates, Robin

Turner, Frederick W.

Watkins, Joe
Weslager, C.A.

Weslager, Clinton A.

White, Richard

Witthoft, John

Zeisberger, David
This appendix includes the affidavits of old-time residents of the New Philadelphia area who gave their statements in the 1920s as to the location of the village. I have included a scan and a transcription of each affidavit.
C.L. Crow, Topographer

Schoenbrunn, Ohio, January 1, 1923

John S. Knisely
337 East High Street
New Philadelphia, Ohio.

Dear Sir:

As you have long known, Schoenbrunn, Ohio, founded by David Zeisberger in 1772, with a population of 414, and containing the first church and the first school west of the Alleghany mountains, was burned to the ground in 1777, as a result of troubles growing out of the Revolutionary War, and as you have contributed valuable assistance in reestablishing the long lost site of Schoenbrunn, I take pleasure in sending you, not only a copy of your statement, but also copy of statements made by other reliable old-time residents of Tuscarawas county, Ohio, concerning the true location of the ill-fated town, unwisely destroyed, and destroyed by the very same men that should have defended it in the hour of peril.

It is exceedingly gratifying to find that the old-time settlers of Tuscarawas county are corroborated in the matter of location of the lost townsite by the numerous “finds” discovered on the surface and beneath the surface of the ground, designated by men and women that have lived here for many, many years, and received first-hand information from friends of Zeisberger, corroborated by the map of Schoenbrunn, recently discovered, and corroborated by history, and by the judgment of men experienced in the matter of locations of Indian towns and fortifications.

Sincerely yours,

C.L. Crow

To Whom It May Concern: This is to certify that I am 85 years old, that I know the location of the Schoenbrunn Spring in Tuscarawas County, Ohio, that in about 1854 I was with my father and Geo. Schmitz at the Schoenbrunn spring, Mr. Schmitz, who came here in 1825, showed us the site of the Zeisberger Mission, the same being on the high ground north and east of the Spring, and a little east of the present location of the Catholic cemetery.

I came to Tuscarawas County in 1840.

Witness to signing: ____________________________ (Signed) John Kaderly,

Helen Hynes,
C. L. Crow

(Note: Mr. Kaderly is a retired business man of New Philadelphia, Ohio, and formerly owned land near the Spring. He has a large acquaintance over Tuscarawas county, and has many friends among his large acquaintance.)

New Philadelphia, Ohio, August 13, 1922

To Whom It May Concern:

This is to certify that I am 70 years of age, that I have lived in Tuscarawas County, Ohio, all my life, that I am from Benj. Van Zegh who came here when the Zeisberger Indians were here, I learned that the town of Schoenbrunn of 1772, was located on the high ground north and east of the Schoenbrunn Spring, that I saw evidence of a town site in an early day on the same high ground.

(Signed) ____________________________ Curtis Hill

Witnesses:
John D. Carlisle: (Note Mr. Hill's home is at Goshen, Ohio, a short distance from the Zeisberger cemetery, and a mile from the Schoenbrunn.)
D. M. Snyder
C. L. Crow

From John W. Marseth of Schoenbrunn, Ohio, we have: ____________________________

This is to certify that I am 73 years of age, that I have know the present location of the Schoenbrunn Spring ever since I can remember, that when a small boy, Samuel Finkenfilder, an old time resident of Tuscarawas Co., Ohio, showed me and others the location of the path extending from the Spring up toward the site of the Mission founded by David Zeisberger, two miles southeast of the present location of New Philadelphia, Ohio, the Mission site being on the high ground, now occupied in part by the Catholic cemetery.
New Philadelphia, August 23, 1922

To Whom It May Concern: This is to certify that I am 85 years old, that I know the location of the Schoenbrunn Spring in Tuscarawas county, Ohio, that in about 1854 I was with my father and Geo Schmitz at the Schoenbrunn spring—Mr. Schmitz, who came here in 1825, showed us the site of the Zeisberger Mission, the same being on the high ground north and east of the Spring, and a little east of the present location of the Catholic cemetery. I came to Tuscarawas County in 1845.

(Signed) John Kaderly

Witness to the signing:
Helen Hynes,
C L Crow

(Note: Mr. Kaderly is a retired business man of New Philadelphia, Ohio, and formerly owned land near the Spring. He has a large acquaintance over Tuscarawas county, and has many friends among his large acquaintance.)

New Philadelphia, Ohio, August 13, 1922

To Whom It May Concern:

This is to certify that I am 70 years of age, that I have lived in Tuscarawas county, O, all my life, that from Benj. Van Leghn who came here when the Zeisberger Indians were here, I learned that the town of Schoenbrunn of 1772, was located on the high ground north and east of the Schoenbrunn Spring, that I saw evidence of a townsite in an early day on the same high ground.

(Signed) Curtis Hill

Witnesses:
John D. Carlisle
D M Snyder
C L Crow

(Note: Mr. Hill’s home is at Goshen, Ohio, a short distance from the Zeisberger cemetery, and a trifle over one mile south of Schoenbrunn.)

From John W. Meredeth of Schoenbrunn, O, we have:

This is to certify that I am 73 years of age, that I have known the present location of the Schoenbrunn Spring ever since I can remember, that when a small boy, Samuel Finkenfinder, an old time resident of Tuscarawas Co. Ohio, showed me and others the location of the path extending from the Spring up toward the site of the Mission founded by David Zeisberger, two miles southeast of the present location of New Philadelphia, Ohio,—the Mission site being on the high ground, now occupied in part by the Catholic Cemetery.
New Philadelphia, Ohio, April 26, 1922

TO WHOM IT MAY CONCERN:

This is to certify that my greatgrandfather, John Tachudie (in English, Judy) came to the United States in 1803, and reached Tuscarawas county the same year. He came first to Gnadenhutten and put up a cabin on a piece of land he had contracted for with John Heckewelder. My greatgrandfather personally knew David Zeisberger, heard him preach, and in addition, he, my greatgrandfather, often pointed out to me the site of the Moravian church at Schoenbrunn, the site of that church, (1772) is between fifty and sixty feet east of the southeast part of the cemetery near the historic spring, two miles southeast of New Philadelphia, Ohio.

Respectfully,

John S. Knisely

Witness to Signature:

Mr. John S. Knisely
To Whom It May Concern: New Philadelphia, Ohio, December 30, 1922

This is to certify that I am 81 years of age, that I came here in 1853, that I knew the location of the Schoenbrunn Spring of Ohio, and adjacent lands, that in 1853, I saw on the high ground north and east of the spring and a little east of the south east part of the present location of the Catholic cemetery, the ruins of a large old fashioned fireplace, partially covered with a growth of small trees and blackberries.

I have no interest in the question concerning the location of the townsite of Schoenbrunn, other than to establish the true location.

(Signed) John Geiser

Witness,
Ida Geiser.
New Philadelphia, Ohio, December 30, 1922.

TO WHOM IT MAY CONCERN:

This is to certify that I have personally known the location of the Ohio Schoenbrunn spring and adjacent grounds, since 1866, that from my father, Edward Rosmond, who came here ten or more years prior to 1866 establishing a store and afterward a bank in New Philadelphia, Ohio, I learned that the "Mission town" founded in 1772 by David Zeisberger in what is now Coshocton township, Tuscarawas county, Ohio, was on the high ground north and east of the Schoenbrunn spring, and on land now occupied in part, by the Catholic cemetery; in fact, it was common knowledge that the old "Mission town" was originally located on the high ground, near but north and east of the spring.

Though I was a girl of only thirteen or fourteen years of age when I came here in 1866, yet I distinctly remember seeing a well defined circular depression, or amphitheater on the historic townsite. The dimensions and mystery of this amphitheater attracted my attention, and made a deep and lasting impression on my memory.

The hill, or high ground, on which the amphitheater was located, was certainly higher then, than now; and, the second flat, or lower ground to the south of the amphitheater, was certainly lower, than now. Evidently the change in elevations could be accounted for by rainfall and cultivation of the lands in the half century past.

I have no interest in the question of Schoenbrunn townsite of 1772, other than to aid in determining its true location and rightful place in history.

Witness to signature: [Signature]

(Signed) Rosmond Brown

(Residence, 305 W High Street, New Philadelphia, Ohio)
New Philadelphia, Ohio, December 30, 1922

TO WHOM IT MAY CONCERN:

This is to certify that I have personally known the location of the Ohio Schoenbrunn spring and adjacent grounds, since 1866, that from my father, Edward Rosemond, who came here ten or more years prior to 1866 establishing a store and afterward a bank in New Philadelphia, Ohio. I learned that the “Mission town” founded in 1772 by David Zeisberger in what is now Goshen township, Tuscarawas county, Ohio, was on the high ground north and east of the Schoenbrunn spring, and on land, now occupied in part, by the Catholic cemetery; in fact, it was common knowledge that the old “Mission town” was originally located on the high ground, near, but north and east of the spring.

Though I was a girl of only thirteen or fourteen years of age when I came here in 1866, yet I distinctly remember seeing a well defined circular depression, or amphitheater on the historic townsite. The dimensions and mystery of this amphitheater attracted my attention, and made a deep and lasting impression on my memory.

The hill, or high ground, on which the amphitheater was located, was certainly higher then, than now; and, the second flat, or lower ground to the south of the amphitheater, was certainly lower, then than now. Evidently the change in elevations could be accounted or by rain fall and cultivation of the lands in the half century past.

I have no interest in the question of Schoenbrunn townsite of 1772, other than to aid in determining its true location and rightful place in history.

Sincerely,

Clara Rosemond Brown
(Residence, 305 W High Street,
New Philadelphia, Ohio)

Witness to the signature:
Mr. Edmund Scott
New Philadelphia, Ohio, June 6, 1922

TO WHOM IT MAY CONCERN:

This is to certify that I own property and reside in the school district of Schoenbrunn, Tuscarawas county, Ohio, and within a half mile of the Schoenbrunn Spring, and that when serving as Commissioner of Tuscarawas county (1878-1884) I passed and repassed the Schoenbrunn Spring site hundreds of times from my home to New Philadelphia in the discharge of my official duties, and that from Hon John B Read, who came to Tuscarawas county in 1830, and from other pioneer settlers, I learned that the old towns in Schoenbrunn was on the high ground a short distance to the north and east of the present site of the historic spring discovered by David Zeisberger in 1772.

Hon John B. Read’s home was and is about a half mile to the north of the Schoenbrunn spring on the public highway to New Philadelphia, O, and the towns in question was to the south of his home.

(Signed) H B Keffer,
Commissioner of Tuscarawas County, Ohio, 1878-1884.
New Philadelphia, Ohio, October 21, 1922

TO WHOM IT MAY CONCERN:

This is to certify that I am sixty-two years of age, that I have lived in Tuscarawas county, Ohio, all my life, that I was born and raised about two miles east of the Schoenbrunn Spring, that I know the location of the spring, and that from Hon John B. Read, Cyrus Alters and other well known early settlers of Goshen Township, Tuscarawas county, Ohio, I learned that the site of the "Old Indian Village" better known as Schoenbrunn, established by David Zeisberger in 1772, is on the high ground now occupied in part by the Catholic cemetery, a short distance north and east of the present site of the historic spring. In fact, I have heard Cyrus Alters (who owned adjoining land on the north) say that as a small boy he assisted in removing house foundations on the lands now occupied in part by the Catholic cemetery.

The foregoing information was obtained, not recently, but many years ago.

Sincerely yours,

Witnesses: (Signed) John Frey
Charles L Crow

New Philadelphia, Ohio, October 21, 1922

TO WHOM IT MAY CONCERN:

This is to certify that I am sixty-two years of age, that I have lived in Tuscarawas county, Ohio, all my life, that I was born and raised about two miles east of the Schoenbrunn Spring, that I know the location of the spring, and that from Hon John B. Read, Cyrus Alters and other well known early settlers of Goshen Township, Tuscarawas county, Ohio, I learned that the site of the "Old Indian Village" better known as Schoenbrunn, established by David Zeisberger in 1772, is on the high ground now occupied in part by the Catholic cemetery, a short distance north and east of the present site of the historic spring. In fact, I have heard Cyrus Alters (who owned adjoining land on the north) say that as a small boy he assisted in removing house foundations on the lands now occupied in part by the Catholic cemetery.

The foregoing information was obtained, not recently, but many years ago.

Sincerely yours,

Witnesses: (Signed) John Frey
Charles L Crow
New Philadelphia, Ohio, July 3, 1893.

TO WHOM IT MAY CONCERN:

This is to certify that I am 75 years of age, that I was a United States soldier fighting Indians on the plains of Wyoming in 1868-1869, that I am familiar with the habits of Indian warriors in the matter of locating camps and fortifications, and after examining the respective sites near the Sckenbrunn spring in company with H. B. Kiker, Robert Crowell, and Charles S. Crow, July 6, 1822, I am thoroughly of the opinion that the high ground of, and east of the cemetery, would beyond doubt, have been selected by Indian warriors for a camp or fortification, over that of the site pointed out east of the spring, in front of the farm house paid to belong to C. Morris.

(Signed) T. C. Balliday.
Member of 11 Ohio, Vol. cavalry.

St. Cloud, Minn., and
Frederick, Ohio.

-------------------------

New Philadelphia, Ohio, August 29, 1893.

TO WHOM IT MAY CONCERN:

This is to certify that I was among the Sioux and other warlike Indian tribes of northern Minnesota and Dakota in the Seventies, that I am familiar with the practices of Indian warriors in locating camps and villages, especially when at war with other tribes, or with whites, and that I have examined the site claimed at 25 Sckenbrunn, Ohio, for the original town founded by Zeisberger, on the fortifications of a site previously occupied by Indian warriors prior to 1872, and basing my judgment upon my observation and experience among the Indian tribes of Minnesota and Dakota, it is my opinion that the site selected by the warriors would have occupied the high ground north and east of the Sckenbrunn spring, namely, the high ground of and east of the Catholic cemetery in Graham Township of Tuscarawas county, Ohio.

(Signed) George Anderson.

North Broadway, New Philadelphia, Ohio.
New Philadelphia, Ohio, July 5, 1922

TO WHOM IT MAY CONCERN:

This is to certify that I am 75 years of age, that I was a United States soldier fighting Indians on the plans of Wyoming in 1863-1866, that I am familiar with the habits of Indian warriors in the matter of location of camps and fortifications and after examining the respective sites near the Schoenbrunn in company with M N Keffer, Robert Crownell and Charles L. Crown, July 5 1922, I am thoroughly of the opinion that the high ground of, and east of the cemetery would beyond doubt, have been selected by Indian warriors for a camp or fortification, over that of the site pointed out east of the spring, in front of the farm house and said to belong to C F Harris.

(Signed) T O Holliday,
Member of 11 Ohio, Vol cavalry,
St. Cloud, Fla., and Freeport,
Ohio.

New Philadelphia, Ohio, August 29, 1922

TO WHOM IT MAY CONCERN:

This is to certify that I was among the Sioux and other war like Indian tribes of northern Minnesota and Dakota in the seventies, that I am familiar with the practice of Indian warriors in locating camps and villages, especially when at war with other tribes, or with whitemen, and that I have examined the site claimed at Schoenbrunn, Ohio, for the original town founded by Zeisberger, on the fortifications of a site previously occupied by Indian warriors prior to 1772, and basing my judgment upon my observation and experience among the Indian tribes of Minnesota and Dakota, it is my emphatic opinion that a war like tribe of Indians would have occupied the high ground north and east of the Schoenbrunn spring, namely, the high ground of and east of the Catholic cemetery in Goshen township of Tuscarawas county, Ohio.

(Signed) George Anderson
North Broadway, New Philadelphia, Ohio.
New Philadelphia, Ohio, December 1, 1922

To Whom It May Concern:

This is to certify that I am 62 years of age, that in addition to owning the farm at the present time, I have lived upon what is known as the “Brown farm” at Schoenbrunn, Ohio, for about 58 years, at that my father, Alexander Brown, purchased the farm in question of David Alters, father of Cyrus Alters of New Philadelphia, Ohio, in the early sixties, that the “Brown farm” adjoins the Catholic cemetery on the north, and that from the Rev E F Jacobs, I learned that the Moravian church and school house of 1772 had their respective sites on the flat or high ground north and east of the present site of the Schoenbrunn spring.

About 40 years ago, I assisted in tilling with a plow what was then regarded as house cellars or pits, near and north of the present location of the Catholic cemetery.

(Signed) W B Brown
TO WHOM IT MAY CONCERN:

New Philadelphia, Ohio, December 7, 1912

This is to certify that I am 83 years of age, that I have personally known the Schoenbrunn lands of Tuscarawas Co., Ohio, fully 77 years, having lived on, and for a period of years owned adjoining lands, that a trifle south of the Indian lane and about 30 rods east of the site of the Schoenbrunn spring, at a very early date, was a pile of blackened river-rock, undoubtedly used in the foundation of some building. To the northwest a short distance was a second pile of blackened burned rock, and then additional evidence of a town site was to be seen to the north on higher grounds, in and east of the present location of the Catholic cemetery. Evidence of this townsite consisting of ruins of stone house foundations and chimneys.

I remember seeing a lot of such material hauled away; in fact, I distinctly remember helping, as a small boy could, in loading stone of house foundations and chimneys to be used for house foundations by pioneer settlers elsewhere.

I have no interest in the Schoenbrunn townsite controversy other than to aid in the establishing the correct location of the "Mission town" founded by David Zeisberger at Schoenbrunn in 1772.

Witnesses to signature:

Mrs. Eugenia Alter
Mary Alter
Mrs. Daisy A. McClaskey

Residence, 216 East Ave.,
New Philadelphia, Ohio.

Sincerely yours,

[Signature]
New Philadelphia, Ohio, December 7, 1922

TO WHOM IT MAY CONCERN:

This is to certify that I am 82 years of age, that I have personally known the Schoenbrunn lands of Tuscarawas Co., Ohio, fully 77 years, having lived on, and for a period of years, owned adjoining lands, that a trifle south of the Indian lane and about 40 rods east of the site of the Schoenbrunn spring, at a very early date, was a pile of blackened river-rock, undoubtedly used in the foundation of some building. To the northwest a short distance was a second pile of blackened burned rock, and then additional evidence of a town site was to be seen to the north on higher grounds, in, and east of the present location of the Catholic cemetery. Evidence of this townsite consisting of ruins of stone house foundations and chimneys.

I remember seeing a lot of such material hauled away; in fact, I distinctly remember helping, as a small boy could, in loading stone of house foundations and chimneys to be used for house foundations by pioneer settlers elsewhere.

I have no interest in the Schoenbrunn townsite controversy other than to aid in the establishing the correct location of the “Mission town” founded by David Zeisberger at Schoenbrunn in 1772.

Sincerely yours,

(Signed) Cyrus Alter


Witnesses to signature
Mrs. Cyrus Alter
Mary Alter
Mrs. Daisy A. McCluskey
New Philadelphia, Ohio, June 9, 1922

TO Whom It May Concern:

This is to certify that I am nearly 70 years of age, that I came to Tuscarawas in 1855, that with the exception of my service in the Civil War, I have lived in Tuscarawas county, Ohio continuously since coming here, that I know the location of the Schoenbrunn spring, and from Samuel Knause and other pioneer settlers of the county, the town of Schoenbrunn was located upon the high ground to the north and east of the spring site, on land now occupied in part by the cemetery, and on a line between the spring site and the Schoenbrunn school house building.

(Signed) Gottlieb Affolder

Sherman Street,
New Philadelphia,
Ohio

Schoenbrunn, Ohio, May 24, 1922

Daniel Affolder says: I have lived in Tuscarawas county, Ohio, all my life, that I believe the present site of the spring at Schoenbrunn is the site referred to in the history of the pioneer days of the county, and that the townsite of Schoenbrunn (founded by David Zeisberger in 1772) is on the high ground a short distance northeast of the spring, from information obtained from old-time settlers and others of Tuscarawas county, Ohio.
New Philadelphia, Ohio, June 9, 1922

To Whom It May Concern:

This is to certify that I am nearly 79 years of age, that I came to Tuscarawas in 1855, that with the exception of my service in the Civil War, I have lived in Tuscarawas county, Ohio continuously since coming here, that I know the location of the Schoenbrunn spring, and from Samuel Knauss and other pioneer settlers of the county, the town of Schoenbrunn was located upon the high ground up to the north and east of the spring site, on land now occupied in part by the cemetery, and on a line between the spring site and the Schoenbrunn school house building.

(Signed) Gottlief Affolder
Sherman Street, New Philadelphia, Ohio

Schoenbrunn, Ohio, May 24, 1922

Daniel Affolder says: I have lived in Tuscarawas county, Ohio, all my life, that I believe the present site of the spring at Schoenbrunn is the site referred to in the history of the pioneer days of the county, and that the townsite of Schoenbrunn (founded by David Zeisberger in 1772) is on the high ground a short distance northeast of the Spring,-from information obtained from old-time settlers and others of Tuscarawas county, Ohio.

To Whom It May Concern:

This is to certify that I am nearly seventy nine years of age, that I have known the Schoenbrun Spring and the adjacent lands since I was a small child, about five years of age. I often drank of the water of the "Spring" that I was at the dedicatory exercises when John Judy marked the site of the spring with the inscribed stone, that I remember the old log house that stood upon the bank near the "Spring", that I also remember the stone house foundations, old fashioned fireplaces and chimneys standing on the high ground now occupied in part by the Catholic cemetery. I also remember, that the high ground north and east of the spring, with its evidence of a town site, was known and recognized as a "Mission" town founded by Zeisberger in 1772.

My grandmother Rachael Cribbs, who came to New Philadelphia, Ohio, when there were but nine houses in the town, she often saw and personally knew the Zeisberger Indians, and she and my mother often attended the Moravian church meetings in Tuscarawas county, Ohio. I also remember that my grandparents and parents made maple sugar near and below the "Schoenbrun Spring" in a very early day, and that I accompanied them on such expeditions.

Witnesses to signature: (Signed)

Elizabeth B. Flynn
Rhea K. Flynn
Mary Alter.

Sincerely,

Jennie Kirby
454 East Front St.
New Philadelphia, Ohio

Explanation: Elizabeth Flynn is a daughter of Mrs. Jennie Kirby. Rhea Flynn is a granddaughter of Mrs. Jennie Kirby, and Miss Mary Alter is a daughter of Cyrus Alter, residing at 210 East Ave., New Philadelphia, Ohio.

To Whom It May Concern:

This is to certify that I am nearly seventy nine years of age, that I have know the Schoenbrunn Spring and the adjacent lands since I was a small child, about five years of age. I often drank of the water of the “Spring”, that I was at the dedicatory exercises when John Judy marked the site of the spring with the inscribed stone, that I remember the old log house that stood upon the bank near the “Spring”, that I also remember the stone house foundations, old fashioned fireplaces and chimneys standing on the high ground now occupied in part by the Catholic cemetery. I also remember, that the high ground north and east of the spring, with its evidence of a town site, was known and recognized as a “Mission” town founded by Zeisberger in 1772.

My grandmother Rachael Cribbs, who came to New Philadelphia, Ohio, when there were but nine houses in the town, she often saw and personally knew the Zeisberger Indians, and she and my mother often attended the Moravian church meetings in Tuscarawas county, Ohio. I also remember that my grandparents and parents made maple sugar near and below the “Schoenbrunn Spring” in a very early day, and that I accompanied them on such expeditions

Sincerely,

Jennie Kirby

Witnesses to the signature: 454 East Front St.
Elizabeth B. Flynn New Philadelphia, Ohio
Rhea K. Flynn
Mary Alter

Explanation: Elizabeth Flynn is a daughter of Mrs. Jennie Kirby, Rhea Flynn is a granddaughter of Mrs. Jennie Kirby, and Miss Mary Alter is a daughter of Cyrus Alter, residing at 210 East Ave., New Philadelphia, Ohio.