

Learning from the Present to Understand the Past:

Forensic and Archaeological Approaches to Sites of the Holocaust

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Introduction

Over the last fifteen years, innovative and systematic methodologies have been developed by forensic archaeologists searching for and recovering buried remains.¹ In the investigation of mass graves of recent conflict, forensic archaeology has played a central role.² Elsewhere, the value of using forensic archaeological methods in long-term no-body murder investigations and cold case reviews has been recognised.³ However, forensic archaeology is only a recognised discipline in a handful of countries throughout the world, and the methods and techniques employed by experts in this area have not been widely applied to the investigation of Holocaust killing sites.⁴ This is in spite of the fact that Holocaust killing sites should also be considered to be crime scenes. Although a significant amount of time has passed since the crimes were perpetrated, evidence will remain within the landscapes where they occurred. These landscapes and associated evidence are incredibly diverse. At macro-level, the geography and topography of Europe was permanently modified by the creation of camps, ghettos, infrastructure and slave-labour sites, and the burial and disposal of victims in individual and mass graves. At micro-level, subtle traces survive in the landscape in the form of earthworks, vegetation change, topographic indicators and other trace evidence. Many sites have been forgotten or become dilapidated since the end of the Second World War and this evidence has been overlooked. This is particularly true of isolated mass graves and killing sites, but it is also the reality in the case of some of the camps where larger-scale massacres and ill-treatment occurred.

This paper will outline the potential for novel forensic archaeological approaches to be used to locate and search these sites in order to identify evidence of the Nazis' crimes. It will be shown how a combination of forensic and archaeological methods has been successfully applied at a number of Holocaust sites across Europe in order to locate mass graves and other evidence of atrocity. The variety of state-of-the-art techniques and innovative methods now available will be presented and suggestions for future work will be made. In particular, proposals for a central database of Holocaust mass grave sites will be presented. Ethical working practices will also be discussed, given the need to carry out detailed scientific enquiry whilst respecting the sensitive nature of the evidence being sought.

Ethical Issues And Approaches To Holocaust Archaeology

¹ John Hunter, Barrie Simpson and Caroline Sturdy Colls. *Forensic Approaches to Buried Remains*. London: John Wiley & Sons 2013.

² For examples see Margaret Cox, Ambika Flavel, Ian Hanson, Joanna Laver, Roland Wessling (Eds). *The Scientific Investigation of Mass Graves: Towards Protocols and Standard Operating Procedures*. Cambridge: Cambridge University Press 2007; Soren Blau and Douglas Ubelaker. *Handbook of Forensic Anthropology and Archaeology*. Walnut Creek: Left Coast Press Inc 2011.

³ Hunter et al, *Forensic Approaches to Buried Remains*, ch. 5.

⁴ For an overview of previous examinations of Holocaust sites by archaeologists see Caroline Sturdy Colls, *Holocaust Archaeologies: Approaches and Future Directions*. New York: Springer 2014.

First and foremost the Holocaust should be viewed as an overwhelming act of evil – as a crime against humanity. Despite its significance, and the impact that these crimes had, (and continue to have) across the world, there have been only a limited number of attempts in recent years by forensic investigators and archaeologists to utilise their skills to increase understanding of this period of history⁵. This seems difficult to comprehend given the scale and seriousness of the events. Additionally, despite the fact that well-established protocols have emerged in the last twenty years concerning the search for and recovery of victims of genocide, these methodologies have also not been intensively used to investigate the atrocities perpetrated by the Nazi regime. Over the last decade, an increasing number of Holocaust sites have been examined by archaeologists and others, but the focus of the methodologies used has remained on invasive methods such as excavation or coring. In some cases, these methods have been deemed inappropriate or unethical, particularly in instances where human remains have been unearthed. This is especially true of sites where Jewish victims are thought to have been buried due to the fact that Halachic Law forbids the disturbance of human remains under most circumstances.⁶ These previous investigations have firmly implanted the idea that archaeology represents a destructive process that focuses only upon excavation. In many cases, those new to “Holocaust archaeology” have failed to consider the sensitivities surrounding the analysis of physical evidence pertaining to this period.

During the author’s own research in this area, it became apparent that it was the failure to develop methodologies that addressed these political, social, ethical and religious sensitivities that has resulted in a paucity of investigations aimed at locating the physical evidence from this period.⁷ Although the Holocaust may be distant in time, the after-effects of it continue to be felt and it remains lodged between history and memory. Archaeological excavation in particular can be viewed as physically and metaphorically digging up painful memories of the past and may bring to the fore, in a very visible fashion, particular aspects of the past that perhaps some people would rather forget. Therefore, any work (archaeological or otherwise) that focuses on the physical evidence of this period must acknowledge that Holocaust sites are not only defined as physical landscapes and material remains, but by the often conflicting memories and attitudes that are associated with them. It must be recognised that sites mean different things to different people, and that there may be many reasons why physical remains have remained undisturbed or unexamined for the last seventy years. Any attempts to examine Holocaust sites require a methodology that accounted for these sensitivities.

The Holocaust Landscapes Project

Fortunately, emerging forensic archaeological approaches, digital humanities tools and visual technology offer new possibilities for the investigation, representation and commemoration of Holocaust sites.⁸ These approaches will in turn facilitate preservation of the sites (both physically and by way of record), produce materials to be used in education and genocide prevention, and enhance the information provided to visitors. Archaeology in general is no longer solely about the

⁵ Ibid

⁶ , A. Weiss (2003). A monumental failure at Belzec. <http://www.hir.org/amcha/belzec.html>. Accessed 21 September 2007.

⁷ Caroline Sturdy Colls. Holocaust Archaeology: Archaeological Approaches to Landscapes of Nazi Genocide and Persecution, in: *Journal of Conflict Archaeology* 7 (2012) 2, pp. 70-104.

⁸ For examples see Cristina Corsi/Božidar Slapšak/Frank Vermeulen (Eds). *Good Practice in Archaeological Diagnostics*. New York: Springer 2013; Eugene Ch'ng/Vince Gaffney/Henry Chapman. *Visual Heritage in the Digital Age*. New York: Springer 2014; Sturdy Colls, *Holocaust Archaeologies: Approaches and Future Directions*, chs. 6-9 and 12.

excavation of sites and technological advances mean that, in some cases, excavation need not be carried out at all. These novel approaches to the physical evidence of the Holocaust allow remains to be examined in a thorough scientific fashion whilst accounting for the ethical issues that will arise when working in this field, as outlined above. Additionally, new methods in forensic archaeology offer the possibility to go beyond the simple documentation of burial sites – to explore these crime scenes as evidence of the suffering of the victims and the actions of the perpetrators; to use techniques in offender profiling to locate lost and unmarked sites; to analyse whole landscapes for what they can tell us about systematic murder; to examine graves in terms of how genocide was carried out and attempts made to hide the crimes; to find and recover human remains, where permitted, to identify victims and to provide both an account of their deaths and to tell the stories of their lives.

Based on the acknowledgement by the author of the need to develop ethical, non-invasive approaches to the physical evidence of the Holocaust, the Holocaust Landscapes Project was developed in 2007.⁹ This project began as Masters and doctoral research, and continues as an active research project involving staff and students from Staffordshire University and a number of international partners. This project is interdisciplinary in nature, drawing on techniques and expertise from archaeology, history, geography, forensic science, engineering, computing, memory studies and a variety of other disciplines. Research at specific sites centres on the collection and integration of documentary, cartographic and physical evidence, as will be outlined in more detail below. As well as revealing information about the past, archaeology can also tell us about the present and teach us valuable lessons for the future. Archaeology is about identifying layers that reveal information about events and interactions. Archaeological investigation has a key role to play in examining the physical evidence relating to historic crimes and assessing the competing memories that exist in association with it. Because of the latter, it is entirely possible that physical evidence may have been manipulated - however, archaeologists can assess the level of manipulation, identify the surviving evidence and reveal new information about both the historical event itself and the memories and attitudes pertaining to it.

The Holocaust Landscapes Project has involved visits to many sites across Europe although to date three sites have been the focus of intensive fieldwork. For all of these sites, before any investigation took place, research was undertaken regarding the political, social, religious and ethical issues that have unquestionably shaped their current appearance. These specific sites were selected as they demonstrate the diversity of the Holocaust:

Treblinka Extermination and Labour Camps, Poland - The first investigation areas are the extermination and labour camps at Treblinka in Poland, where a six-year project has helped to map the layout of the camps, and locate evidence of structures and mass graves previously thought destroyed. This project has also focused on the areas outside the camp boundaries in order to locate unmarked mass graves and execution sites located in the surrounding woodland.¹⁰

⁹ Centre of Archaeology. Holocaust Landscapes Project. 2014. Available at: <http://blogs.staffs.ac.uk/archaeology/projects/holocaust-landscapes>. Accessed 23 April 2014; Caroline Sturdy Colls. The Archaeology of the Holocaust. *British Archaeology* 130 (2013), pp.50-53.

¹⁰ Caroline Sturdy Colls. Holocaust Archaeology: Archaeological Approaches to Landscapes of Nazi Genocide and Persecution. Unpublished PhD Thesis: University of Birmingham 2012; Caroline Sturdy Colls. Finding Treblinka: Archaeological Evaluation. Unpublished Fieldwork Report. Centre of Archaeology, Staffordshire University 2014.

Staro Sajmište, Serbia - The second investigation area is Staro Sajmište - a former camp for Jews and political prisoners in Belgrade, Serbia where the victims were murdered in the gas vans. Here, the common narrative of the site is dominated by recent political events. As a site which is now dominated by residential areas, workshops and commercial buildings, and even a Roma camp, this site can be described as a Living Death Camp; a place which has had multiple lives after it ceased to be used as a camp.¹¹

Alderney, Channel Islands - The third area of study is the complex of SS and labour camps, associated fortifications and mass grave sites on the island of Alderney in the Channel Islands.¹² Here workers were murdered at various locations across the island - sometimes systematically, sometimes in an ad hoc fashion, and sometimes as a result of the work they were tasked with. Here, rather than seeing the fortifications they were constructing solely as military installations, these structures are seen as the products of slave labour and killing sites in themselves - their location can also often provide clues as to where mass grave sites may be located.¹³

In addition, a number of ongoing and planned *location-based* projects are underway:

- Desk-based searches and fieldwork at sites of suspected mass graves throughout Eastern Europe, most often at the request of relatives;
- Research into the use of Jewish cemeteries as execution sites, specifically in Poland;
- Geophysical surveys of Polish killing sites and “community archaeology” (in collaboration with the Office of the Chief Rabbi of Poland)

Alongside this, ongoing and planned *themed* research is being undertaken in a number of key areas in order to develop a sub-discipline of Holocaust archaeology, thus accounting for the sensitivities and challenges surrounding the investigation of sites from this period. Key areas include:

- Ethical issues surrounding the investigation of massacre sites
- Community archaeology at massacre sites
- Development of remote sensing and hybrid surveying technologies

It is hoped that, as more work of this nature is undertaken, that a large-scale survey of killing sites will take place in order to create an international database of sites of the Holocaust. This point will be returned to at the end of this paper.

Forensic Archaeological Methods

Forensic archaeology is the application of archaeological techniques in either a legal or humanitarian context, thus its remit includes the investigation of recent and historic crimes for the purpose of pursuing prosecutions and with the aim of locating, documenting and often recovering human remains and physical evidence to provide information for the victims, their families and for the public record.¹⁴ Forensic archaeology is not limited only to excavation but instead includes a wide variety of techniques spanning the search for, recovery of and analysis of physical evidence. The author of this paper is a professional forensic archaeologist who consults for numerous police

¹¹ Forensic Architecture. *Forensic: The Architecture of Public Truth*. Berlin: Sternberg Press 2014.

¹² Caroline Sturdy Colls and Kevin Colls. *Reconstructing a painful past: A non-invasive approach to reconstructing Lager Norderney in Alderney, the Channel Islands*, in: Eugene. Ch'ng/Vince. Gaffney/Henry Chapman (Ed.) *Visual Heritage in the Digital Age*. New York: Springer 2014.

¹³ Sturdy Colls, *Holocaust Archaeologies: Approaches and Future Directions*, ch.10.

¹⁴ Hunter et al, *Forensic Approaches to Buried Remains*.

forces in the UK on search strategies for missing persons, and the location and excavation of buried remains. The methods employed in these scenarios represent the same methods that can be used in Holocaust-related projects, where camps, ghettos and killing sites can all be treated as crime scenes and may be equally diverse in terms of scale, the environment and the levels of complexity.

Documentary Evidence

Just as in forensic cases, the documentary evidence relating to the Holocaust forms a body of evidence and witness testimony that can assist in the search for graves, execution sites and internment sites. Returning to original primary sources, as well as utilising secondary research, allows this evidence to be assessed by archaeologists with a knowledge of offender profiling, construction processes, demolition practices and landscape development. Thus new questions can be asked of this material and, often, new sources uncovered. Often witness plans, spy reports or information provided by witnesses not deemed important by prosecutors or historians have direct relevance to archaeological investigations and can be a key part of devising search strategies. Various mapping and visualisation tools used by archaeologists also offer the possibility to layer multiple data types in order to compare sources and overcome some of the issues caused by multiple conflicting testimonies.¹⁵

In order to understand the multiple layers of a site's history, researchers also need examine and assimilate a variety of other evidence types before commencing in-field survey: map regressions and satellite imagery analysis (to facilitate the analysis of landscape change, modification, demolition or erection of structures); the location and analysis of aerial imagery (which is georeferenced in GIS to modern mapping data to allow direct comparisons between modern landscape features and potential remains relating to the Holocaust to be made).¹⁶ When assessing maps, plans, aerial photographs, documentary evidence and the landscape itself, taking a forensic archaeological approach allows us to do so in light of the perceived motivations of the offender. The more information that is known about the crime, the more likely it is that a burial site can be identified - the landscape can be profiled and suitable burial locations identified in light of the number of victims killed, whether the burial site is thought to be the place where the victims were also killed, the resources and time that the perpetrator had at their disposal, whether or not they were concerned about getting caught and whether the grave site is a primary or secondary site.¹⁷ All of these questions can be asked in the context of searching for Holocaust mass graves, or indeed any graves of genocide victims, even where the "perpetrator" is in fact an entire regime.

Field Reconnaissance and Walkover Survey

This work forms part of an initial systematic assessment and recording of the site and the surrounding landscape. What has been evident at the three case study sites examined as part of the Holocaust Landscape Project is that much of the evidence at these locations actually exists in plain sight. On many occasions, the evidence has been visible on the surface e.g. as earthworks, structural remains, objects; at Treblinka, for example, where over 200 artefacts were recovered from the surface in under half an hour through a systematic line search of the woodland in the

¹⁵ For examples see Sturdy Colls, *Holocaust Archaeologies: Approaches and Future Directions*, ch.5.

¹⁶ *Ibid*

¹⁷ For examples in a forensic context see Alistair Ruffell/Jacqueline McKinley. *Geoforensics*. London: John Wiley & Sons 2008; D. Kim Rossmo. *Geographic Profiling*. Boca Raton: CRC Press 2000.

camp area.¹⁸ All of these findings can be recorded using highly accurate digital field survey methods and these find-spots can be compared to aerial images and maps. As well as providing physical evidence, this process also reveals much about attitudes towards the site in question and may highlight issues such as looting or the effect of the weather.

In the field, mapping vegetation diversity (stunted growth, abundant growth, species colonisation) subtle changes in topography, and changes in hydrology and ground moisture content, may represent the presence of buried remains.¹⁹ These can all be recorded using highly accurate GPS systems and compared to documentary evidence such as aerial photographs and maps. Archaeologically this type of evidence has been shown to exist from ancient sites, despite the extensive ploughing and other disturbance that may have taken place - therefore it will and does survive for killing sites dating to the Holocaust.

Mapping Beneath The Soil

In many cases where individual and mass graves or other buried evidence connected to specific killing sites are sought, a range of geophysical survey methods can also be used to locate and characterise remains below the ground.²⁰ Most widely known is Ground Penetrating Radar (GPR) which uses radar pulses to record subsurface layers and anomalies.²¹ However, a variety of other methods also exist which examine different properties in the soil. Contrary to popular belief, none of these techniques can detect human remains per se but rather the disturbance to the natural soil layers caused by the presence of graves, structures and other features. It is the ability of the operator to interpret these anomalies and once again compare to historical sources which may lead to the successful location of buried remains. These methods are entirely non-invasive and are useful not only in terms of their ability to search large areas where excavation may not be practical, but also in terms of the fact that they allow buried evidence to be examined and graves located, even in circumstances where excavation is not permitted - such as for graves believed to contain the remains of Jewish victims for example.

Excavation

When excavation is permitted, it is of course the best way to confirm the total extent and nature of buried evidence. However, once again, the way in which excavation techniques are used must be based on a thorough consideration of religious beliefs, the wishes of affected communities and the overall aim of the investigation.²² In some cases, excavation will be carried out to confirm the presence of internment sites, mass graves or execution sites to facilitate the marking of a place and the commemoration of the victims.²³ In other cases, excavation may result in the recovery of human remains for the purposes of identification, drawing on DNA and anthropological analysis.²⁴

¹⁸ Sturdy Colls. Finding Treblinka: Archaeological Evaluation.

¹⁹ Michael J. Hochrein. An Autopsy of the Grave: Recognizing, Collecting and Preserving Forensic Geotaphonomic Evidence, in: William Haglund, and Marcella. H Sorg (Eds), Advances in Forensic Taphonomy: Method, Theory and Archaeological Perspectives. Boca Raton: CRC Press 2002, pp.45-70.

²⁰ Sturdy Colls, Holocaust Archaeologies: Approaches and Future Directions, ch. 7.

²¹ Paul Cheetham. Forensic Geophysical Survey, in: John Hunter, and Margaret Cox. Forensic Archaeology: Advances in Theory and Practice. London: Routledge 2005.

²² Sturdy Colls, Holocaust Archaeology: Archaeological Approaches to Landscapes of Nazi Genocide and Persecution; Sturdy Colls, Holocaust Archaeologies: Approaches and Future Directions, chs. 3-4.

²³ For an example see work undertaken at the execution site at Treblinka below.

²⁴ Marija Definis Gojanovic/Davorka Sutlovic. Skeletal remains from World War II mass grave: from discovery to identification. Croatian Medical Journal 48 (2007) 4, pp.520-527.

Advances in DNA analysis means that it is now possible to collect samples from remains where a considerable amount of time has passed since burial, when remains are well preserved and where comparative samples are available for DNA matching.²⁵ Choosing the correct method by which to excavate and recover human remains from graves is vital to ensure that contamination, which may prevent DNA samples from being obtained, does not occur.

Having reviewed the methodology undertaken as part of the Holocaust Landscape Project, and provided some examples, two of the case study sites will now be discussed in more detail to highlight the benefits of different approaches in different environments.

Case Study: Treblinka

Six years of non-invasive research at Treblinka has allowed the extent and nature of the extermination and labour camps to be mapped, and the location of several mass graves at the extermination camp to be determined without disturbing the remains.²⁶ The latter can now be marked and commemorated, whilst remaining undisturbed. The methodology developed at Treblinka was created in accordance with Halachic Law, following consultation with various authorities. In 2013, an airborne LiDAR survey was commissioned in order to examine the entire landscape of Treblinka. In particular, this research focused on the execution site located south of the labour camp that was previously inaccessible using other non-invasive methods. Airborne LiDAR facilitated the production of a 3D digital terrain model which, in simple terms, showed depressions and earthworks in the landscape.²⁷ This technique has the added advantage that it can record through tree canopies and so can provide access to areas that were previously inaccessible due to the density of vegetation. Hundreds of features were recorded which related to the camps and the execution site, as well as to the Soviet Occupation of the area. Most significantly, this data revealed the presence of several apparent graves in the woodland to the south of the labour camp. Walkover survey was undertaken to locate these features on the ground and subtle changes in topography and vegetation were observed in several areas. Three areas were deemed most likely to contain mass graves. Because of the need to confirm the exact nature of these graves, and due to the wealth of information provided by the non-invasive methods, permission was granted to carry out small-scale, confirmatory excavations to determine whether human remains were present. Human remains were observed in all three graves, which contained the bodies of multiple individuals, and the grave measurements were already clear from the LiDAR survey. In all graves the remains were not in anatomical order. Of interest to forensic archaeologists is also the way in which graves provide information about perpetrator behaviour - they can show evidence of preplanning, the motivations of the perpetrator, they reveal time sequences and may themselves contain layers of remains deposited at different times. They can also provide evidence of the perpetrators' attempts to hide their crimes and may, in some

Eva Susa. Forensic Anthropology in Hungary, in: Megan Brickley and Roxanna Ferlini, *Forensic Anthropology: Case Studies from Europe*. Springfield: Charles C Thomas 2007, pp.203-205.

²⁵ For an example see Morton Erik Allentoft. Recovering samples for ancient DNA research—guidelines for the field archaeologist. *Antiquity* 87 (2013) 338.

²⁶ Various publications have been produced about the work undertaken at Treblinka including Sturdy Colls, *Holocaust Archaeology: Landscapes of Nazi Genocide and Persecution*; Sturdy Colls, *Finding Treblinka: An Archaeological Evaluation*; Caroline Sturdy Colls. *Gone but not forgotten: Archaeological approaches to the landscape of the former extermination camp at Treblinka, Poland*. *Holocaust Studies and Materials* 2014. The complete results of the project will be published in Caroline Sturdy Colls. *Finding Treblinka*. Forthcoming.

²⁷ Simon Crutchley/Peter Crow. *The Light Fantastic: Using Airborne LiDAR in Archaeological survey*. Swindon: English Heritage 2010.

circumstances, reveal information to aid in identifying the individual and their cause and manner of death. The remains themselves provided evidence of brutal treatment. For example, some of the remains at Treblinka had cut marks consistent with sharp force trauma, whilst the configuration of all of them showed a complete disregard for human life on behalf of the perpetrators.

At Treblinka, the graves were able to provide some information about the individuals interred within them, even though the excavations were only confirmatory. Shoes which show evidence of multiple hand completed repairs and severe wear tell us something of the life of the owner. Bullets intermingled with the remains reveal the fate of many but also act as evidence concerning how ammunition travelled during the war. Other items, such as these found in the area around the gas chambers, which were also surveyed and partially excavated, reveal both personal stories relating to both pre-war and war time life, and the collective experiences of the many women sent to their deaths.

Case Study: Alderney

On Alderney, excavation has never been permitted owing to the sensitivities that still surround this period of history for the modern inhabitants of the islands.²⁸ Here, non-invasive methods have acted as a useful mediatory tool between local residents and the archaeological team, and have allowed access to sites that would otherwise have gone unexamined. As well as the recording of the various internment camps on the island, the research has focused heavily on locating the various mass graves thought to be present across the island as a result of harsh living and working conditions, torture and systematic execution. Here, documentary records dating from the Occupation itself through to modern day were examined in order to determine whether there was any truth to claims of mass burials on the island, something which has been disputed for decades. Through archival research, a number of Imperial War Graves Commission and British Government documents were located that indicated that mass graves did exist. In addition, thousands of aerial photographs of the island were examined as well as intensive searches for death certificates and burial information from the Occupation. Geophysical surveys at various locations across the island were also undertaken at a number of key sites identified through the desk-based research discussed above. As a result, this research has located a number of probable mass graves and has demonstrated that the Nazis attempted to cover up their crimes, harsh treatment, and the unethical approaches towards the slave workers, both the living and the dead, by creating a seemingly orderly cemetery where slave workers were buried. Death certificates that did not match the names of the deceased in the cemetery, coupled with the seemingly haphazard order to the burials themselves, stood alongside aerial images of open pits and geophysical survey data showing large pits in the same locations.²⁹

As well as examining the graves themselves using non-invasive methods, surveys of the fortifications across the island which were built by the slave labourers also revealed further interesting evidence. As mentioned earlier, these sites are seen as the products of slave labour and in many cases as killing sites where the prisoners met their deaths. Evidence etched into the

²⁸ Sturdy Colls and Colls, *Reconstructing a painful past: A non-invasive approach to reconstructing Lager Norderney in Alderney, the Channel Islands*.

²⁹ For information on the research in Alderney see Sturdy Colls, *Holocaust Archaeology: Archaeological Approaches to Landscapes of Nazi Genocide and Persecution*; Sturdy Colls and Colls, *Reconstructing a painful past: A non-invasive approach to reconstructing Lager Norderney in Alderney, the Channel Islands*; Caroline Sturdy Colls and Kevin Colls. *Adolf Island*. Forthcoming.

concrete of these fortifications and in prison cells included names of the people sent to the island, religious markings and artwork - thus revealing what can be termed as an archaeology of resistance - evidence that prisoners tried to literally leave their mark to show that they had been at each of these places.³⁰

A Record For The Future

A variety of 3D visualisation tools also exist to record the environment and the physical evidence found within it.³¹ These techniques can be used when excavation is undertaken or where only non-invasive methods are used. Some of these methods, such as close contact laser scanning, are particularly useful for recording human remains which have to be reburied rapidly but where there is still the desire to determine the ancestry, sex, age, and evidence of trauma/pathologies of the individuals.³² Where graves and killing sites are located, one of the key processes that follow will hopefully be the marking and commemoration of the site in question. However, it is also important that a long lasting record be created to ensure that knowledge of the site is never again forgotten, to facilitate further analysis of the events to which the evidence relates and to provide opportunities for education and research. Because the information collected as part of archaeological surveys is so diverse in nature, one of the key challenges is how to present it all to a wide variety of audiences.

However, a number of techniques taken from archaeology and the digital humanities now offer the potential to create such a record and new emerging 3D visualisation tools provide increased opportunities for the creation of complex databases, digital heritage tools and educational materials in a virtual environment. These range from the very simple - such as maps showing the positions and nature of sites connected to the slave labourers on Alderney - through to complex 3D models which allow us to explore how the Nazis used the topography of the landscape to facilitate control over their victims, to dispose of bodies quickly and with little effort (e.g. through the use of concealed areas, ravines, quarries and the like), and to adapt their killing practices over time.

Where above-ground traces of killing sites exist, this evidence can be recorded using a range of laser scanning and 360-degree photographic techniques. As part of a survey of Staro Sajmište (Semlin Camp) in Serbia, these techniques were combined with geophysical surveys and archival research to investigate and record the site.³³ Prior to the Second World War, this site represented a complex of buildings and convention centres called the 'Old Fairground' which was subsequently utilised by the Nazi's to house prisoners before their death in gas vans.³⁴ Many of these buildings still exist today, although many have been reused in a variety of ways, and the area is now defined by industrial buildings, offices, artist residences, and a Roma settlement. The data and the images from the scanning and geophysical surveys can be used to assess the ways in which these buildings were used as part of the Nazi extermination process, the interaction between the past and the present (through the alternative functions these buildings have now taken on) and conservation requirements. The scanning also captured the site at a specific moment in time and recorded both

³⁰ Sturdy Colls, *Holocaust Archaeologies: Approaches and Future Directions*, chs. 9 and 10; Caroline Sturdy Colls, Kevin Colls, Rachel Bolton-King and Tim Harris. *Proof of Life: Graffiti Archaeology on the Island of Alderney*. Forthcoming.

³¹ For examples see Ch'ng et al, *Digital Heritage in the Virtual Age*.

³² Sturdy Colls, *Holocaust Archaeologies: Approaches and Future Directions*, ch.7.

³³ Forensic Architecture, *Forensis: The Architecture of Public Truth*.

³⁴ Byford, J. *Semlin Judenlager in Serbian Public Memory*. Available at <http://www.semclin.info> 2013. Accessed 12th August 2013.

acts of daily life and spontaneous memory making; something which was a form of rescue archaeology since many of the residents of these buildings have now been evicted. The 3D models also formed part of an exhibition in Berlin in March 2014 and will be used to produce a range of educational materials. The digital nature of this record is particularly useful since the plans for in situ commemoration of these structures has yet to be decided.

Various digital heritage resources are under development as part of the Holocaust Landscapes Project are under development which integrate field data, laser scans, modern 360-degree photographs, historical information, witness testimony and interviews allows the layering of people's stories within the physical evidence. The use of stories and evidence from before the war up to present day allows the various histories of these sites to be told. Crucially, whatever forms of presentation a project chooses, it is vital to return to the human experience of places and events; the techniques employed, be they archaeological, historical, sociological or otherwise, are simply the medium to derive information about the people affected by these events.

Conclusion: The Future Of Holocaust Archaeology

To conclude, there are now various new technologies and methods which exist that can assist in the location of killing sites and the identification of victims. Many of these methods have been used to great effect as part of the Holocaust Landscapes Project as outlined in this paper. These methods can be drawn from forensic investigation, archaeology, history, geography, memory studies and a whole host of other fields. When examining killing sites, it is important that appropriate methods are chosen from this vast wealth of techniques that meet the scientific, commemorative and practical demands of the project in question. Whatever methods we choose, they must be ethical and they must take into account the beliefs of people connected to the sites being sought. In light of recent developments in forensic archaeology, new technologies now also offer the possibility to record, analyse, interpret and present the killing sites of the Holocaust on a large scale. With the right combination of experts, and a large-scale interdisciplinary commitment to such a venture, the creation of an international three-dimensional database of killing sites and the evidence pertaining to them could become a reality.

To date, there has been much invaluable work aimed at rectifying the lack of knowledge concerning the killing sites of the Holocaust. This work has taken various forms and has been undertaken by scholars and practitioners from a variety of different disciplines. As time progresses, and the Holocaust moves from living memory, the amount of work will undoubtedly need to increase and this seems like the right time to be considering the idea of a central record of killing sites. This could (and should) be more than just a documentary record of sites and could allow multiple evidence types to be assimilated as new sites are located and recorded. If such a resource were to combine both desk-based and in-field research this would serve to present a fuller, more accurate picture of events and would offer new opportunities for commemoration, education and research. The creation of the resource itself could facilitate the identification of even more previously unmarked sites and, where forensic archaeological techniques were also drawn upon, new insights into both forgotten and well-known sites could be provided. Whatever form this record would take, it should be a resource for both professionals and the public alike. Realising such a project would facilitate the identification, commemoration and protection of many more of the killing sites of the Holocaust, thus providing places for relatives to mourn and remember, spaces to share stories and experiences, evidence of the actions of the perpetrators, and opportunities to learn from the past to educate for the future.