Searching for Mass Graves in the Ukraine

by Roland Wessling and Charles Enright
Cranfield Forensic Institute, Cranfield University, Shrivenham, Wiltshire, UK, SN6 8LA
Tel: +44(0)1793 785266, Email: r.wessling@cranfield.ac.uk

TWO archaeologists from the Cranfield Forensic Institute (CFI) have returned from the Ukraine having discovered, what they believe could be evidence of mass graves of genocide victims from the Stalin era and World War II.

Roland Wessling, Research Fellow in Forensic Archaeology and Anthropology at Cranfield University, and the Director of Operations for the Inforce Foundation, and **Charlie Enright**, Forensic Graduate of Cranfield University, had been invited to the Ukraine last year to conduct their historical and ground breaking research that will help the country not only to rediscover their past but also to deal wisely with their future. The two geophysical surveyors have since been back to Kiev and presented their pilot study to a committee of the Ministry of Culture, which since endorsed geophysical surveying as official evidence assisting the authorities to determine the protection status of suspected mass grave sites.

Leading up to, during and following the events of World War II countless victims had suffered persecution and genocide which resulted in unmarked single, multiple and mass graves scattered across the European continent. It is estimated that the mass murder of 11 million people took place under the Nazi regime; six million of these were Jews. The hardship of many of these is well documented but for the 2.5 million that lived in countries in Eastern Europe who fell under the communist rule of the Soviet Union, their plight is only just beginning to be understood.

Since the collapse of the Soviet Union in 1991, the **Union of Council for Soviet Jews** (UCSJ) have been working towards locating and preserving sites that are important to Jewish Heritage, including chapels, cemeteries and mass graves. They have accomplished this by gathering and analysing witness testimonies, searching archives for evidence and studying aerial photographs.

In the Ukraine, much like several other countries, many municipalities have introduced the need for archaeological surveys to be carried out on any site that is to be protected. This has proved difficult for sites containing Jewish burials as Jewish laws restricts the excavation of burials. However, recent advances in archaeological and forensic geophysics may now provide the additional level of proof required to ensure the protection of Jewish and other burials by allowing us to see beneath the surface without the need for excavation.

At the beginning of 2012 **Meylakh Sheykhet**, the UCSJ director to the Ukraine, contacted Roland Wessling, a forensic archaeologist based in the UK. Together the pair agreed a Memorandum of Understanding between their two organisations and to conduct a pilot study in the Ukraine, sampling a number of sites to

assess the feasibility of various geophysical surveying techniques to provide an additional level of proof for the presence or absence of mass graves.

After months of preparation Roland and Charlie were deployed to the Ukraine in April 2012 to administer a number of surveys and carry out what is probably the world's largest, most comprehensive multi-technique geophysical survey of suspected mass graves ever undertaken.

The team took with them three pieces of highly sensitive geophysical equipment; ground penetrating radar (GPR), resistivity and magnetometry. Each technique measures different physical properties of the earth. After much data processing and interpretation it allows archaeologists to see what lies beneath the surface without the need for disturbing the buried remains. For decades geophysics has been used in geology and traditional archaeology to detect sub-surface features and objects in a quick and non-invasive way. Often used as a prerequisite to excavations, the results of which used to plan the location of trenches over archaeological features with a high degree of accuracy. Through this success, these methods were an obvious choice for forensic archaeologists to be used in their work too. Both archaeologists and police forces in the UK, and many other countries, now rely heavily on the expertise of geophysicists for locating clandestine burials as well as other archaeological features.

Figure 1: Charles Enright conducting a GPR survey. The GPR unit consists of an antenna that is pulled along the surface whilst continuously emitting a radar wave into the ground. When the wave comes into contact with a sub-surface interface part of its energy gets reflected to the surface. The time it takes for the wave to return can be used to calculate the depth of the feature/object.

The technique requires no disturbance of the soil and can even be carried out over hard surfaces.

The geophysical prospection of real mass graves has only been carried out sporadically so far, with some sites in Bosnia and others in Poland being investigated. But most of those studies were limited to just one geophysical technique; something the CFI team does not believe is scientifically sound. "Soils, as well as mass graves vary so considerably that the risk that one single technique will produce negative results on sites that do contain mass graves is rather high" said Roland Wessling.

In the Ukraine, the team (supported by a third specialist from Bournemouth University, Paul Cheetham, with a fourth piece of equipment known as an electromagnetic conductivity meter) surveyed a total of sixteen sites spread across the L'viv and Kyiv regions of the Ukraine. "We surveyed in peoples vegetables gardens, sheds, green fields and a major city park in the middle of Kyiv [Babyn Yar]. Each of these sites was surveyed with between two and four techniques, resulting in over 70 individual surveys. These ranged from a few meter traverses with the GPR in someone's back garden, to over 200m traverses at Babyn Yar" explained Roland. "The beauty of geophysics is that it can allow us to survey areas that would normally be inaccessible to traditional

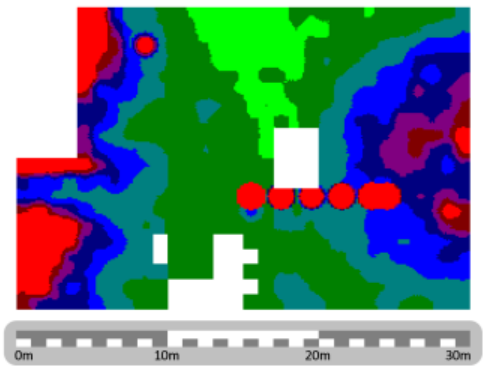

Figure 2: Resistivity plot showing five possible grave anomalies.

archaeological methods, like beneath the foundations of buildings" added Charlie.

"Our surveys took us to the outer edges of the city of L'viv in a meadow next to the train tracks, research by Meylakh Sheykhet and his team suggests that Nazi's killed and buried a number of Jewish civilians here. Our resistivity and GPR surveys detected a number of interesting anomalies, possibly graves" explained Charlie. Figure 2 shows a processed data plot of the area from a bird's eye view collected with the resistivity meter (which measures the flow of an electrical current through the earth to map areas of high and low resistance). The five red circular features towards the centre of the survey area indicate discrete areas of high resistance. To an archaeologist this could be interpreted as a 'pit-like' feature containing a contrasting backfill to its natural surroundings – possibly indicating the presence of graves. One thing for certain is that the possibility for a natural phenomenon to occur in a linear formation, similar in size and shape and spaced equi-distant from one another is highly unlikely.

The GPR traverse below (Figure 3) shows a cross section of the area corresponding to the features in the resistivity data in Figure 2. Between the areas marked with the arrows the continuous horizontal radar reflections are likely to be caused by a sub-surface interface at a depth of 1 – 1.5 meters, quite possibly a grave.

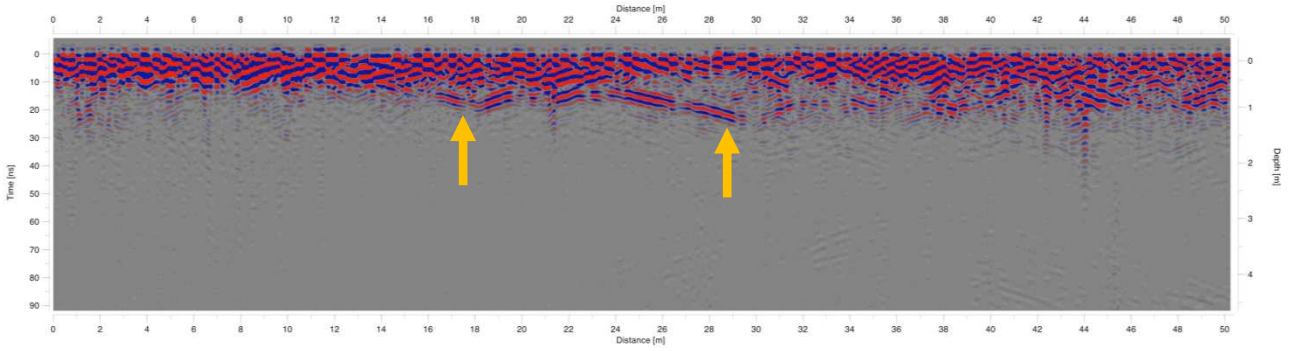

Figure 3: GPR Traverse showing possible sub-surface interface, possibly a grave.

Sometimes the team found things that they were not even looking for. For example in the small town of Goronstaipol (about 30km from Chernobyl) Roland and Charlie were looking for evidence of traditional Jewish burials, although they did not find evidence of the regular burials they expected, they did detect another anomaly in the GPR data that would appear to indicate the presence of a most interesting feature (see Figure 4). Once historical maps were inspected they believe what they had discovered was evidence of the former cemetery wall boundary.

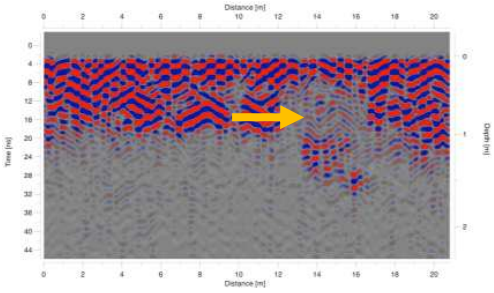

Figure 4: GPR profile showing evidence of buried wall foundations indicated by arrow.

"We also conducted surveys in Babyn Yar Park in the centre of Kyiv – A former mass killing site in the Second World War where over 100,000 Kyivans, many of which were Jews, were said to have been murdered and disposed of here in a ravine. The ravine was backfilled at the end of the War as the Nazis retreated to hide their atrocities. We were hoping to relocate the ravine used to dispose of bodies but the conditions were unfavourable to the equipment we had. We hope to return with more sensitive equipment more suited to this type of work and find the location of the ravine" explained Charlie.

The data already collected by the two archaeologists will prove invaluable in the Ukraine in ensuring the preservation of culturally important sites, with further evidence of burials discovered in the towns of Kamyanka-Buzka, Zabuzhzhya and Zhidachiv.

After arriving home in the UK, Roland and Charlie spent the next five months analysing the data they collected, before returning to the Ukraine in October to present their findings to the country's Ministers for Culture and Heritage. Roland presented the results to the board who would ultimately decide whether the project would be allowed to continue. Roland successfully demonstrated the effectiveness of geophysics to see beneath the soil and what a valuable asset it could be to the Ukraine under such circumstances of preserving mass graves and memories of the mass killings. The entire committee were in agreement that the pilot project had proven itself to be a success and that they had seen enough evidence to convince them that geophysics is the way forward for assisting with the preservation of the legacy of the Jewish community, and other victims of genocide, in the Ukraine.

Figure 5: Roland presenting the results to the Ministers of Culture and Heritage in Kyiv, Ukraine

Thinking ahead Roland and Charlie are beginning to plan a full scale project that will aim to survey as many of the identified sites by the UCSJ as possible. Meylakh Sheykhet has detailed documentation on 183 sites but considers around 1200 sites to contain mass graves from Jewish victims, Ukrainian political prisoners or PoW's. Even this number is likely to represent less than a quarter of all existing sites.

Roland and Charlie both believe that geophysical surveying is undeniably faster, more cost efficient and less intrusive than traditional archaeological methods used in isolation. There is no doubt that geophysics can achieve where archaeology alone would fail and that is at investigating thousands of sites in a reasonable period of time with small teams. Not only this, but geophysics will have less of an impact on the land and its people and it will give the world an example of how to approach a challenge like this, "To evaluate the status of protection of sites that may contain single or mass graves. The Ukraine truly has the opportunity to show the rest of the world that such a challenge can be met in a dignified, respectful and affordable way" explains Roland.