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Report on a Geophysical Survey at Nipsel Farm Site Autumn 1999INTRODUCTION.

Since 1993, during numerous visits, substantial quantities of pottery shards have been collected from the Lawling Creek foreshore of a field belonging to Nipsels Farm. These finds have now been passed over to MAG where they have been sorted and washed as a prelude to dating analysis. An early sample of this pottery was confirmed as predominantly 1st or 2nd century Roman by the Essex Archaeological Unit. In this location, low clay cliffs, unprotected by a sea wall, separate the foreshore from the modern land surface which is gradually eroding under the influence of sea and weather. As the cliff collapses the pottery shards are deposited on the beach and retained there in a sticky clay matrix. On this evidence there is a high probability that the field covers the site of a settlement of some sort, most likely located on a spur of higher land adjacent to the cliffs.

MAG has an ongoing project to investigate the proposition that the Dengy Peninsular was an Imperial Roman Estate and so has a special interest in a hitherto unknown Roman settlement on the site. To this end, with the assistance of Peter Cott, a geophysical (resistivity) survey was undertaken during the autumn of 1999. It is the purpose of this report to provide a record of the work carried out and to present the results achieved thus far.

LAYOUT.

As a basis for geophysical measurements a rectilinear grid was set out covering the area adjacent to the clay cliff located across the highest part of the field. A hand held compass and ranging poles were used to define a north/south base line adjacent to the cliffs and 5 marker posts set out at 20 metre intervals. The marker posts contained no ferrous material so as not to corrupt geomagnetic measurements in the event they are used. Similarly a 20 metre grid was established in an east/west direction, initially by use of a compass but cross checked and adjusted to give diagonals of 28.28 metres. In this way a matrix 80 x 80 metres was constructed marked out with 25 posts.

In due course it is planned to fix the absolute position of

the grid by means of a hand held GPS receiver.

To identify any 20 metre square in the matrix the rows reading west to east are numbered 1 to 5 and the columns reading north to south lettered A to E. Thus the north/west corner post is 1A and the south/east corner is 5E. The drawing of figure 1 provides this information in plan form.

The first series of measurements taken suggested the presence of features to the north east of our original 80 x 80 matrix and so we extended the survey area by adding posts 3Z, 4Z and 5Z as also illustrated in figure 1.

Having finished survey work for the 1999 season we have had the owners permission to leave the marker posts insitu through the winter to enable work to continue next season. The field is used for hay and should the farmer wish the site cleared our plan is to retain only one row and one column (1A to 1E and 1A to 5E) by driving them into the ground so as to lay flush with the surface and remove all other posts. A metal nail would then be driven into post 1A. The idea is that at some unspecified future date we find the post 1A with a metal detector and from this reference locate the other reference posts by measurement from this reference. This arrangement enables us to retain the option to recreate the grid precisely at an unspecified future date if needed without inconvenience to the owner of the land in the meantime.

THE SURVEY.

On 5TH August 1999 Peter Cott, assisted by MAG members carried out a resistivity survey of 7 20metre blocks on the western side of the matrix as shown in Figure 1. Conditions for the survey were less than ideal due to a the earlier dry weather which had caused severe fissures in the surface. Peter Cott also noted tthe unusually low resistivity values being measured on this site, typically only 4 or 5 ohms, presumably an inherent characteristic of the claylike subsoil. Measurements were made every 1 metre along a north south transects separated by 1 metre thus providing 400 data samples per 20 metre square.

The Resistivity Meter was a commercial type based on a

design originated in Bradford University and fitted with a Data Logger enabling 800 data samples at a time to be down loaded into a Laptop Computer.

Due to a combination of adverse weather conditions and Peter Cott's personal commitments, it was not possible to continue the survey until 20th October, when a further 6 x 20 metre squares were completed. These were located to the east of the matrix, also shown in Figure 1. On this second visit after a period of heavy rain, the surface fissures had all closed up and were now practically invisible. However the average resistance values were still very low and similar to those measured on the first occasion.

With the weather deteriorating late in the season it was not possible to complete the last 5 x 20 metre squares. It is hoped this can be done during the spring of next year.

SURVEY RESULTS.

A composite plot of the two separate sets of resistivity data is shown in Figure 2, white representing low values of resistivity and black the highest values with a limited grey scale in between. The first of the two surveys carried out under dry conditions is reproduced in the 7 squares on the left of the plot and is notable for its granularity which may be attributable to 'soil noise', in this case caused by visibly deep fissures in the dry ground. (When a crack in the ground intercepts the line of current flow, between the probes, near the surface it sees a high impedance path and diverts under or round the fissure, which must decrease the current flow and hence increase the resistance.)

The second survey, on the eastern side of Figure 1, measured at a time when surface fissures were largely closed up, exhibits substantially less 'soil noise', although still rather granular in appearance, but exhibiting more pattern.

At first sight there is little underlying structure to be seen but a number of linear features aligned approximately N/W and N/E can be discovered. A transparent overlay identifies some of these (with the eye of faith!) and also one particularly

prominent circular feature. They are most easily seen by sliding the overlay across the putative structure at right angles. At least one circular feature is visible in the second square down in the easterly column. Figure 3 shows the same thing but with linear features highlighted.

DISCUSSION.

During 1999 a resistivity survey was carried out over an area of 5200 sq metres and the results plotted out on a matrix of 20 m squares. The site proved to have a significant number of surface fissures caused by drying out of the surface and also the average surface resistance was much lower than usual on sites in East Anglia. It is probably for these reasons the data plots include 'soil noise' which acts to mask any underlying structure. However careful study does seem to disclose linear features aligned roughly NW and NE which may suggest a road or trackway crossing the site and buildings or plots aligned with it. It is suggested these alignments occur rather too frequently to be due to chance alone. Even if it does indicate the presence of a settlement, and it is by no means certain that this is the case, at present it is not possible to be sure of its form or function.

The area we surveyed was adjacent to the cliff edge and so we reasoned that, if the linear feature which seemed to cross the site was a road or trackway, at some point it must intercept the cliff edge where it might be visible in section. Accordingly we marked the line of the putative feature on both sides with ranging poles as shown in Figure 4. We were then able to stand on the foreshore and site along the ranging poles to identify where it exited the cliff. Strange to relate, at the very point where the feature should have been visible in the section, and nowhere else, there is no cliff. Instead a grassy slope exists almost down to beach level. This may be by chance, in which case it is a strange coincidence, or else be related to the feature. It might be all that is left of a ramp leading down to a jetty, or the fact that the feature itself has been selectively eroded by the sea, compared to the undisturbed clay cliff, causing the grassy land surface to slump in this one location. Whatever the

reason, it is odd that on the line of the linear feature and nowhere else in the area, no cliff face is visible.

In addition to the pottery found on the foreshore, Peter Cott also drew my attention to the large amount of septaria that can be found lying on the beach. This is illustrated in Figure 5. I am inclined to think that the line of small rocks at the top of the photograph are the remains of earlier sea defence's because this occurs elsewhere along the beach, but the septaria higher up the beach seems local to the area where we also find the pottery. Whether it comes from our 'site' or not is another matter.

CONCLUDING REMARKS.

Although the 1999 survey of the Nipsels Farm site has not provided conclusive proof of the existence of a Roman settlement, taken together with the pottery finds, that such a feature does exist seems more likely than not. It is clearly desirable that the 5 missing squares be completed and if time permits, for one or two of the north-western squares to be remeasured before cracks appear in the top soil to introduce 'soil noise'. Perhaps more importantly, in view of the anomalously low resistance of the soil on the site, it does seem desirable to undertake a geomagnetic survey and negotiations to this end should be started in the new year. If it is not possible for Peter Cott to borrow a magnetometer through the Colchester Trust, we might seek help from the County in view of the growing weight of evidence that we have discovered a site of considerable potential interest.

As a basis for geophysical measurements a rectangular grid was set out covering the area adjacent to the clay cliff located across the highest part of the field. A hand held compass and ranging poles were used to define a north/south base line adjacent to the cliff and 5 marker posts set out at 20 metre intervals. The marker posts contained no ferrous material so as not to affect geophysical measurements in the event they are used. Similarly a 20 metre grid was established in an east/west direction, initially by use of a compass but cross checked and adjusted to give dimensions of 20.25 metres. In this way a matrix of 25 points was constructed below marked out with 25 posts.

In the future it is planned 5 to fix the absolute position of

Report on a site visit 13th June 2000.

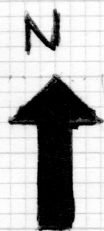
After an unusually wet spring it was not until June 2000 that consideration was given to resuming geophysical survey work on the Nipsels farm site. However before such work could be undertaken the hay crop growing on the site needed to be harvested and this necessitated clearing the grid of posts dividing the survey area into 20 x 20 metre blocks. The method we adopted was to retain the posts in position but, to enable the grass to be cut, we drove the posts into the ground so as to lie flush with the surface. The idea was that after the grass was cut we should be able to find the tops of the marker posts and so recreate the original grid with new markers.

On the 13th June Derek Punchard and I traced those of the original posts that had survived the winter (replacing 4 which had been disturbed or were missing) and driving them all into the ground. On the principle that once we could find one pair of posts at the soil surface we could find the others by direct measurement we inserted a 5" nail into the end grain of posts 1A and 1E (see Figure 1). The idea is that the end markers in the first line of posts will be located by means of a metal detector.

In addition the location of posts 5A and 5E have been marked with a short iron rod flying a white pennant. If practical these should be removed to cut a swath of grass and replace them straight away. From experience we cannot rely on these markers remaining in place but if they do they will provide a useful back-up to the alternative provided on row 1.

As things stand at present we have asked Mrs White to notify us when the grass cutting is due to take place. Ideally we will have someone present but in any case the idea is to re-establish the grid as soon as possible after the grass is cleared.

NIPSELS FARM SITE ZOM MATRIX



ROUGH POSITION
OF CLIFF
EDGE

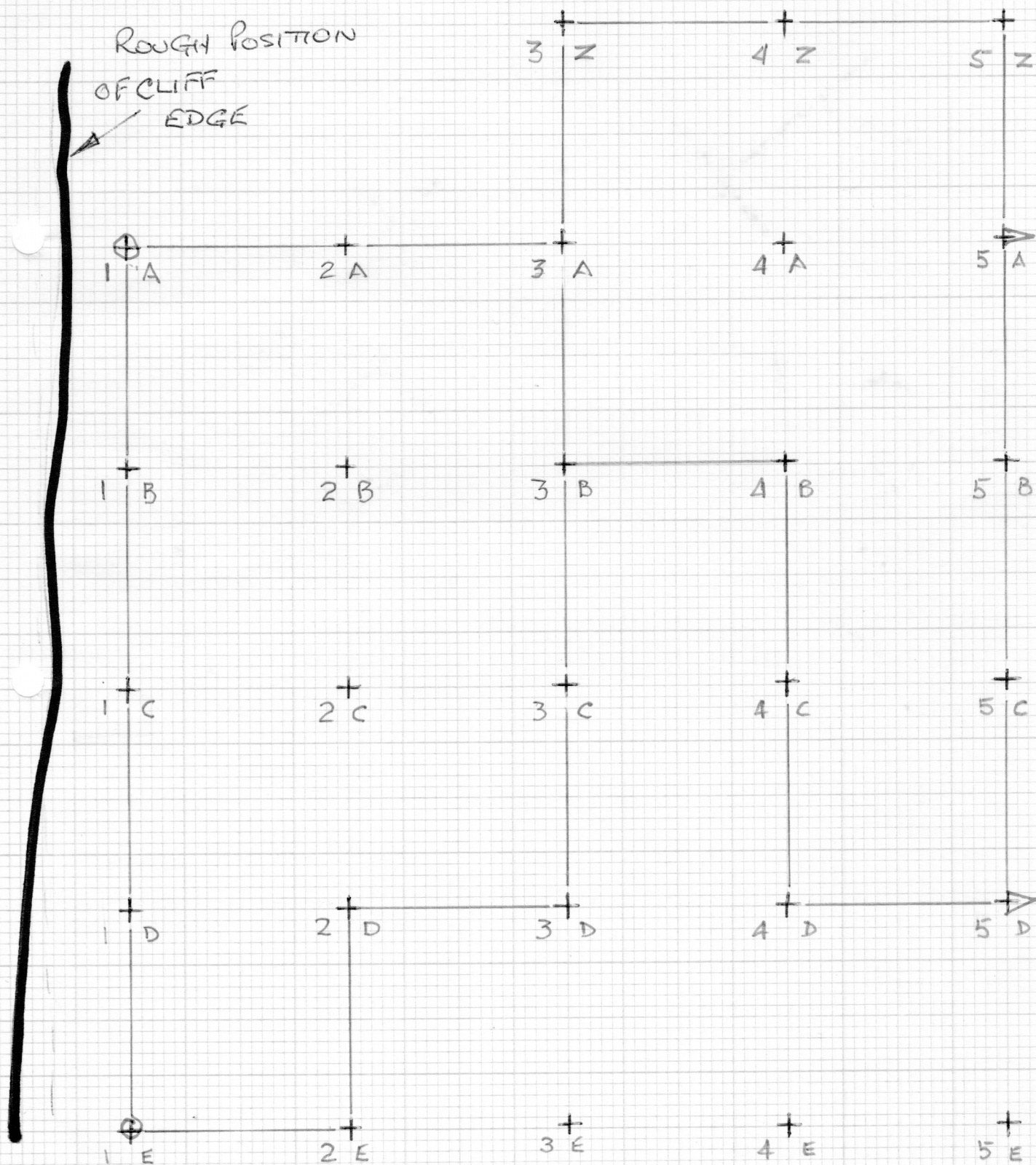


FIGURE 1



*Figure 4....Ranging poles mark the alignment of a linear feature.
Figure 5....Septaria scatter on the foreshore.*

