

Aerial Prospection at Low Altitude in Brittany and Pays de la Loire Region, Results and Synthesis of 1989–1999 Researchs

Since 1989, a vast geographic sector centred on the eastern part of the Armorique area which lies both in Brittany and the Pays de la Loire region, is subject to systematic aerial prospections at low altitude. The conditions of detection, although fairly varied, do not constitute real obstacles to the discovery of vestiges. Due to the real regrouping of lands that began in the 1960's, the traditional bocage of western France has gradually been replaced by semi-open landscapes which are turning out to be the favorite haunt of aerial archeology.

Among the thousands of discovered sites, an overwhelming majority belongs to the category of enclosures bordered by sets of embankments and ditches, that have now been levelled and filled in. As a matter of fact, the vestiges kept above the ground are few and belong most of the time to the medieval period. Concerning the Gallo-Roman monuments built on foundations that were lined with stones, there are hardly any. The chronological range is wide because all the major periods from Neolithic to the Middle Ages are represented. The nature of the sites covers the whole range of

human manifestations pertaining to the conquest and the development of "local territories". The habitats, necropolises, roads and the patterns of fields are engineered to the extent of making up a rural fabric which is truly coherent, especially during the Iron Age and Antiquity. This has been particularly brought to light in the bassins of river Seiche and Oudon, which are respectively situated in the eastern fringe of the departement of Ile-et-Vilaine and in the south-west of departement of Mayenne. The third international conference on archeological prospection will give us the opportunity of presenting a serie of discoveries that, without being original, remain nonetheless fundamental for the knowledge of the stages of the ancient settlement in the western extremity of the European continent. In the recent years, the computerized data-processing has been applied to the rectifying of oblique aerial photographs and to the making up of cumulative cartography.

Finally the aerial campaigns are succeeded by ground verifications, excavations and boring which bring fundamental chronological data.

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Geophysical Preparation of an Archaeological Excavation in the Highlands (Mardorf, Hessen)

From 1993 up to 1998 archaeologists excavated a settlement near Mardorf. The investigated settlement Mardorf 23 is situated in the eastern part of the "Amöneburger Becken", an about 120 km² extended basin in the middle part of Hessen in Germany. Because of the soil conditions (loess developed on clay) this region belongs to the uppermost fertile parts of Hessen. Mardorf 23 seems to be one of the oldest German settlements in that region. Excavations showed that this settlement had its origin in the Iron Age- and Emperor Age (about 50 B.C. up to 300 A.D.)

In addition to the archaeological studies, also geological and geophysical prospections were done. To optimise the excavations, geomagnetic prospections were carried out. In 1995 B.Zickgraf and M.Posselt started these investigations. They covered an area of about 16,000 sqm. Because of the good results, in 1997 and 1998 we continued these measurements. Up to now an area of about 60,000 sqm was mapped with geomagnetic methods. We worked with a Fluxgate-gradiometer FM-18 from GEOSCAN research (Bradford, UK). All the field work was done in the same manner. The distance between two points was 0.5 m

and also the increment between the profiles was 0.5 m. The resolution of the gradiometer was not better than 0.1 nT/m.

Because of a temperature drift, the data had to be corrected by a smoothing algorithm. This was done on the base of statistical calculations.

We can find out objects from different time scales. There are not only visible archaeologically but also are geological and modern structures.

Especially in the south-eastern part we can see some linear structures which can be composed to polygons. Excavations have confirmed the assumption that we have found geological structures which were formed during the glacial period. These former ditches are now covered by a layer of about 1 m thickness.

Younger geological elements can be seen in the north. From geological and archaeological studies we know, that the landscape has been changed in the past. The curved former border of meadow can be seen from west to east. In the north the covering layer consists of alluvial sand with variable thickness. That is why it seems to be unlikely that archaeological structures in this

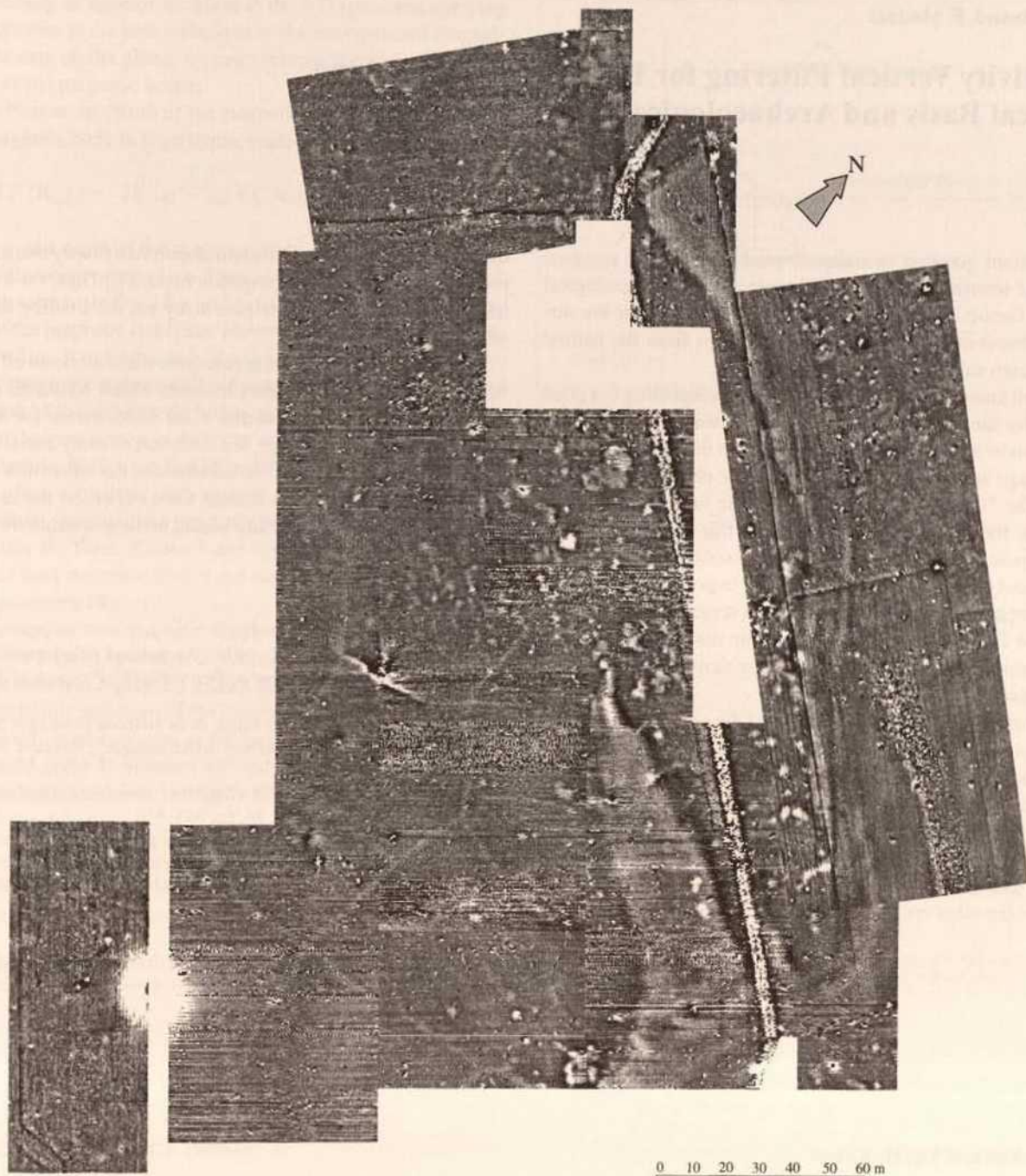


Fig. Results of all measurements done in this region within a scale of $\pm 5\text{nT/m}$

area can be detected by geomagnetics. South of this border we see a lot of narrow restricted positive anomalies. They are caused by pits, holes and vestiges of states. The excavation has shown that these anomalies belong to different time periods. Not only old German but also Neolithic marks are visible.

The sharp linear elements are caused by old field boundaries. Additionally we see younger and modern structure. The more or less linear anomaly in the northern part of the investigated area is due to a modern field-path covered with basalt. Some metal causes the large anomaly in the south-east.

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