

# Recent Aerial Photography

by Stephen Upex

The 1975 season was the fifth in which I have carried out aerial surveys in the lower and middle Nene Valley for the Nene Valley Research Committee. Almost thirty parishes have been covered and many hundreds of sites noted. Some sites already recorded have revealed additional features; other sites have proved to be completely new.

The main target in reconnaissance has always been the Greater Peterborough expansion area; for here housing, factory and road development is eating fast into land that was formerly safe. During the summers of 1974/75 the areas within the parishes of Castor and Werrington were covered in great detail to record as much as possible from the air before the landscape is completely changed under the respective townships developments. It would be impossible to excavate every site or feature recorded on the photographs; but selective examination based on the photographic evidence and supported by fieldwork and geophysical surveying techniques may provide first hand knowledge of some of the sites. Such information can throw light on similar sites recorded from the air, which must remain unexcavated. Air photographs also show where the maximum information can be obtained with the least possible earth moving.

Aerial photography proves increasingly expensive, especially with rising aircraft fuel prices; but this cost compares favourably with excavation costs. Adequate photographic cover allows certain features, roads, ditches, even individual buildings, to be pin-pointed, planned and then measured out on the ground — a substantial saving in many cases of manpower and time for the excavator.

The need to take aerial photographs in consecutive years really hangs on the fact that few years have exactly the same weather conditions. Each year the weather varies slightly, from very wet to wet and through to dry and very dry. A similar crop on the same field, therefore, can have infinite variations in climate during its germination, growing and ripening. Added to this, different crops and crop-types, different manures and different agricultural sprays can broaden the combination of factors in any one year. Obviously there is a need to fly and record many different crop reactions to all these factors.

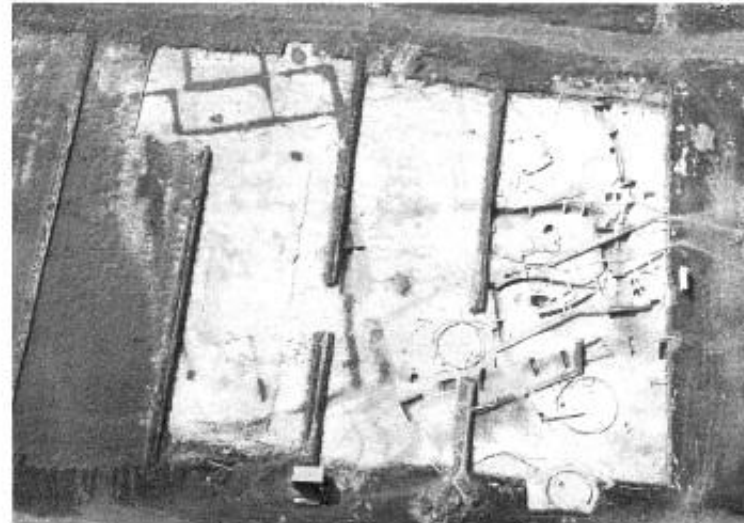


Fig 22 Fengate, 1975

*This photograph, taken in July 1975, shows the excavations in progress on an Iron-Age village at Fengate (see p. 10). The circular excavated trenches are the eaves-drip gullies for the Iron-Age houses. The dark linear markings are the unexcavated paddocks or stockyard ditches belonging to the Roman farmstead to be excavated by Frances Pryor in 1976.*



**Fig 23 Tansor (TL 09066902)**

*This settlement area is situated east of Tansor on heavy soils with an underlying bedrock of cornbrash. Such geology and soil-type often prove unsuitable for aerial photography, but during the summer of 1972 approximately 80-100 acres of crop markings were photographed, revealing new features. The crop markings often show differing phases of enclosure-construction, with primary ditches and ditch recuts or new ditches on slightly different alignments. Some of the enclosures were large (3-5 acres) and shared common corner entrances, suggesting field groups, perhaps for stock.*



**Fig 24 Castor (TL 19117979)**

*Normangate Field, Castor, has the rare combination of densely packed archaeological features situated on light, well drained gravel soils which in turn stimulate suitable modern agricultural techniques and crop-types. All these factors promote both negative and positive crop-growth markings, showing the Roman industrial suburbs with great clarity. Recent deep ploughing, however, is beginning to blur this image as the plough bites deeper into the subsoil. Soon only the bottoms of the pits and ditches will be left undamaged. The photograph (1974) show part of the Normangate Field complex, taken from the north-east. The clarity of the cropmarkings here is increased by the shadow effect of late evening.*

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Many soils, especially on the heavy clay land to the south of our region, began to reveal sites for the first time in the arid conditions of 1976. Our ideas and information on settlement patterns in areas that have long been considered archaeologically sterile need now to be re-appraised. After 1976 a new aspect of 'upland archaeology' based on aerial photography is sure to develop.

The importance locally of the 1976 season was not the discovery of any major new site, but simply the number of new sites in previously unproductive areas and of course additions to known sites. Within the Greater Peterborough area much new information was recorded, especially for the parishes of Werrington, Longthorpe, Ailsworth and Castor. At Castor a 60 acre addition must now be made to the industrial suburbs to the north and north-east of Durobrivae, whilst in the parishes of Chesterton and Waternewton suspected, but previously unrecorded, suburbs were shown. They extend out along the road to Irchester, which runs from the town's south-west gate. At right-angles to this road, and crossing it to run parallel to the town walls, another road was shown, perhaps serving the cemetery area outside the town walls. In this cemetery three huge circles were photographed. One, containing at least three concentric ditch-lines, had an overall diameter of about 80 metres. Another large circular feature was noted within the limits of the town itself.

Flights into the Welland Valley and the area to the south of Stamford showed a settlement pattern of great complexity and extent. Further up the Nene Valley, both on the responsive river terrace soils and the valley crests of heavier soils, the pattern of intensive prehistoric and Roman occupation was seen to continue. The massive villa at Cotterstock (p. 24) and additions to the Ashton town (p. 6) indicate centres of settlement in the Roman period, in what now appears to be a very heavily populated region in both Roman and prehistoric times.

I am grateful to Mr R. Fray, my pilot, whose skill and patience in the air were enormous.

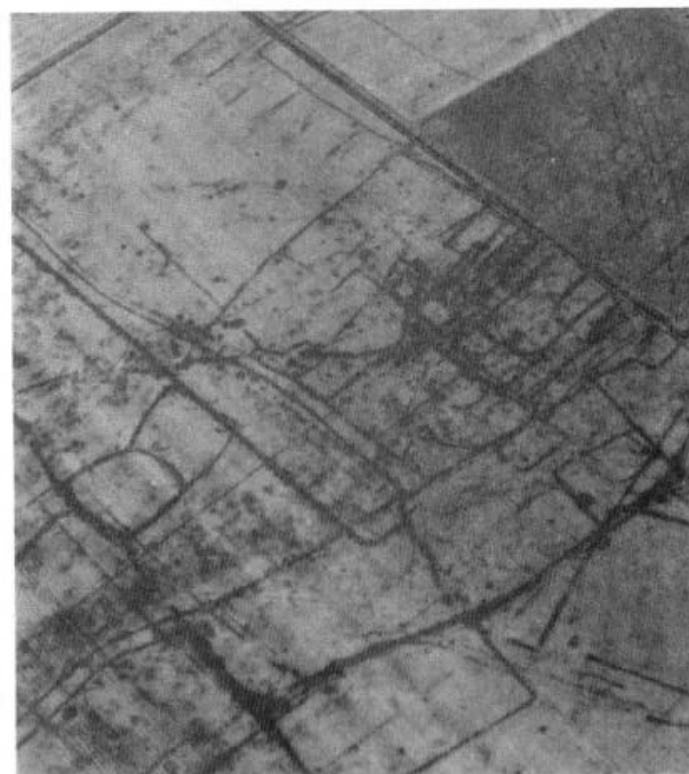
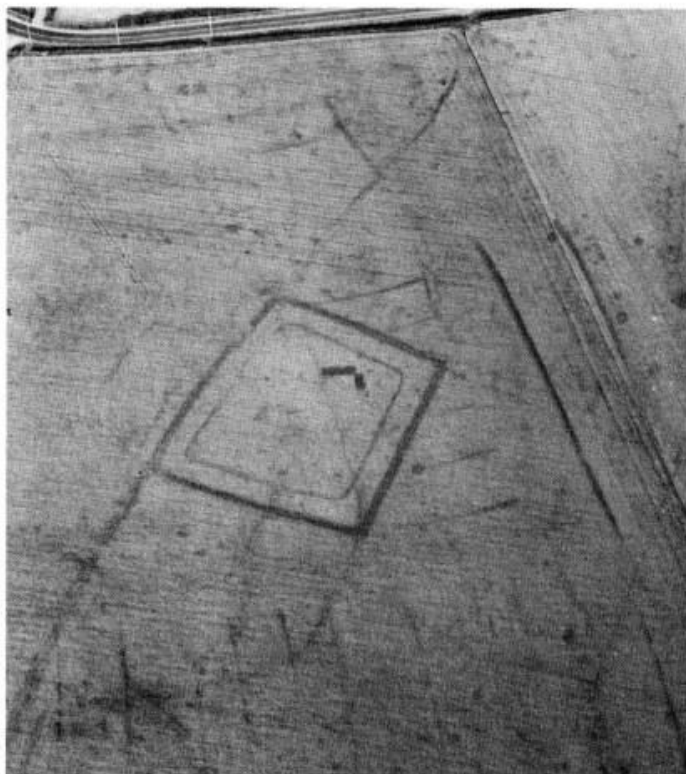


Fig 12 Northborough (TF 10 145064)

*Occasionally the combination of soil types, crop types, weather conditions and various other factors coincide to give intricate archaeological markings in a growing crop. The photograph shows an area to the south-east of Etton where such factors have all been favourable. The result here shows intensive occupation over, one imagines, many years, with certain ditches and enclosures seeming to run over or through earlier abandoned features. The total archaeological picture is thus very complex, with different levels of occupation being built up and then cut and disturbed by later levels.*

*It is possible, however, to abstract certain features from the sites which are contemporary with each other and so begin to unravel the sequence of the markings.*



**Fig 13 Northborough West (TF 10 148077)**

*The Welland Valley has long provided an area rich in archaeological crop-mark sites of many different periods. The light alluvial and fen soils respond well to most crop types and already in the parishes of Maxey, Bainton, Tallington and Helpston vast and complicated sites have been noted.*

*This photograph (taken in June 1976) shows a series of markings on the west side of the village of Northborough. It consists of two sets of sub-rectangular enclosure ditches, the outer enclosure measuring approximately 75 by 50 metres overall. Within the inner ditch are two rectangular 'pits', while on the north side of the outer ditch faint markings suggest the presence of a track or drove-way and an entrance in the outer ditch at this point.*



**Fig 14 Etton (TF 10 139063)**

*This photograph taken during June 1976 shows the central area of a very extensive series of crop marks to the west of the village of Etton (centre TF 10 139063). The large irregular circle may represent the limits of a farmstead enclosure from which run the boundaries of fields. These field boundaries extend for a kilometre to the north-west and south-west of the farmstead and have clear breaks in their lines, suggesting field entrances or gateways. Often drove-ways run between fields, indicating that at one period stock-rearing was an important part of the economy.*

*A small sub-rectangular enclosure can be seen in the centre of the photograph with an entrance and parallel ditches leading away from it.*

# Three Mediaeval Sites from the Air

by Stephen Upex

Little has been said in recent issues of *Durobrivae* about aerial photography and mediaeval archaeology. Perhaps our area has been overshadowed for too long by the Roman antiquities for which the Nene Valley has become famous. Not only has our understanding of local mediaeval society, housing and pottery suffered, but so have other areas of interest including the study of the mediaeval landscape.

Needless to say, much mediaeval material lies locked up as it were beneath our modern villages. House replacement has taken place in some cases on the same plot of land for nearly a thousand years. Obviously the early structures of wood and thatch were replaced more quickly than, say, Tudor stone cottages, because of the fire risk or wood-decay. In some villages this house replacement shifted site slightly, and houses once abandoned or decayed were left or pulled down and new structures built nearby. From the air one can see that just this sort of thing has happened in many villages in the Nene Valley. Areas perhaps on the edge of a village have earthwork-remains of house platforms and tracks or lanes leading to them. It has been thought that all earthworks of this kind show the influence of plague, famine or economic depression, causing drastic reductions in population, with the result that houses were abandoned. In some cases this may be so, but it is becoming increasingly clear that through time villages move their centres over considerable distances, perhaps as a result of changes in communications or economic influences, and houses and streets and even church sites can be left behind. This accounts for some parishes having isolated churches away from the modern village core. Occasionally villages have declined until just a few houses remain, while a few villages show themselves to have been completely abandoned and often long forgotten.

Away from the village core, many other sites of mediaeval date remain, large and small. They have a multiplicity of uses from rabbit warrens and mounds to support windmills, to banks around parks and woodland and even the cultivation remains now seen as ridge and furrow.

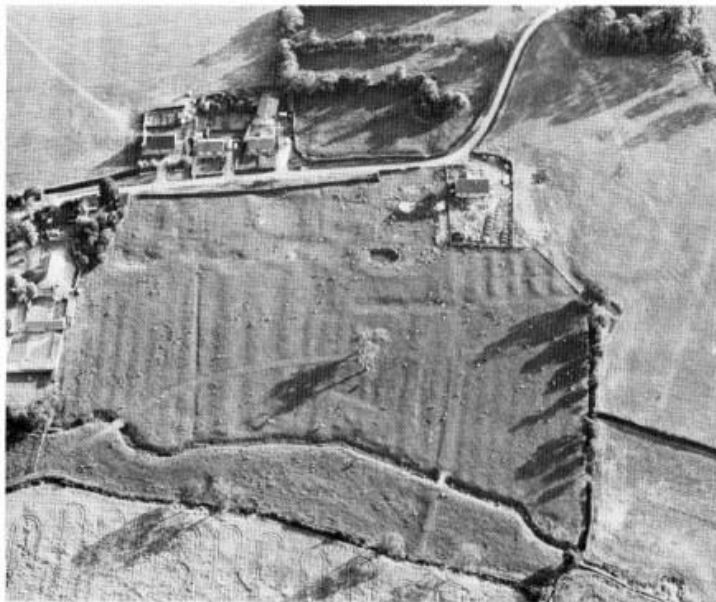


Fig 10 Wakerley (SP 956995)

*The parish of Wakerley lies in the Welland valley and it was here in the fifteenth or sixteenth centuries that a large manorial complex developed, possibly from humbler beginnings. The exact date of the house is unknown, but in 1615 it was referred to as 'The Great Place', and in 1633 the house is recorded as having 30 rooms as well as outbuildings and gardens. By 1720 the site was probably in ruins and abandoned, the reasons for this being unclear.*

*Today the site shows as a series of well preserved earthworks covering a large area. The house is probably represented by the hummocks near the road, while the large rectangular flat area is likely to be the gardens and garden terraces.*





**Fig 11 Caldecote (TL 144883)**

*The hamlet of Caldecote lies at the head of a low flat valley extending from the Fen Edge up to the Oxford Clays. The soils are wet and heavy and perhaps in the mediaeval period were never particularly attractive for farming. However, here it was that settlement grew, with the people working their comparatively small parish area of under 1000 acres.*

*Now the site lies semi-deserted. Some modern houses have filled in spaces between older farms, but where spaces still remain the house-sites of farms and cottages from long ago can be seen as earthworks, with the ridge and furrow of the open fields right behind.*

*The name Caldecote, meaning 'cold cottages', perhaps gives us a clue to the life of the mediaeval people who lived there.*



**Fig 12 Bainton (TF 094059)**

*On the outskirts of Bainton lies this small manorial site. The inner large ditch possibly contained structures, while there is a suggestion of an entrance on the eastern side of this circuit. Surrounding this large ditch is a smaller ditch circuit, perhaps not contemporary with the first. It is possible that the ditches were water-filled, because a small stream course leads into the site from the right-hand side of the photograph.*

*Nothing is known of the date or the desertion of the site, or how it related to the village; it is in this area that documentary sources may provide some of the answers.*

# Aerial Photography 1978

by Stephen Upex

For all our new techniques, we are left with an old problem. The new age of expansion is now firmly established in the Peterborough area. Inevitably, many sites of archaeological importance will be destroyed; but I suspect that even more sites were lost in the pre-expansion period of Peterborough's history. The Victorian expansion of many towns not only consumed much land, but caused many acres to be dug or quarried for gravel, sand and bricks. Many important sites were never recorded, and those which were identified often received only a short written description in a local newspaper or early parish or county history.

Actual finds of material such as pottery or tools could be seen as tangible evidence of 'British' or 'Roman' sites and were often sold with minimal background information to local antiquarian collectors. Some of this material eventually found its way into local museums, while other collections seem to have been lost. At Ashton near Oundle there are brief references to Roman pottery which was found by a Mr Beals, a local landowner and antiquarian, during the construction of the railway. It is disappointing that all trace of his collection is now lost; for such finds could add much to the information about the small Roman town currently being excavated (p. 29).

In certain areas mediaeval quarries and pits have been dug into earlier sites. Between Elton and Warmington one quarry (operating before 1600) had been dug through a Bronze-Age or Iron-Age settlement, and there are many others, now hardly discernible from the ground, which have similarly obliterated archaeological sites.

Above-ground sensing devices are nowadays capable of locating burial sites and the use of aerial photography has increased our knowledge of the locations and extent of sites. At Werrington and Castor, for example, four seasons of flying have shown where many sites are situated and detailed ground work can be undertaken to glean as much information as time allows. So, although it is true to say that with present expansion proposals sites will be destroyed, we are today able to have a preview of what is to be destroyed, and to recover, if opportunity offers, that information.

Thanks are again recorded to Mr Robert Fray for piloting the aircraft and spotting new sites!



Fig 15 Oundle (TL034894)

*The Oundle Middle School is now being built over this crop-mark site discovered during 1976. The small ditched enclosure surrounded by modern housing seems to have a subsidiary enclosure to the south-east. Rescue excavations during 1978 attempted to retrieve some information, but working conditions were very wet and only a limited examination was possible. The results suggest that the site is a late Iron-Age or early Roman farm. It would be very interesting to know the exact relationship between this site and the surrounding crop-mark sites including the Ashton complex, which lies about 1 km away.*



**Fig 16 Maxey (TF128077)**

*The Welland Valley soils drain very freely through the underlying gravel deposits. Archaeologically this is very important because it allows the development of good crop-marks for aerial photography. Unfortunately the gravel beds also provide a much-sought-after building material for modern development.*

*In this picture taken to the south of Maxey village the crop-marks are seen running into the quarry sites. The main field shows a series of rectilinear ditched enclosures with pits, overlain by ridge and furrow. On the left the standing buildings are part of the present quarry depot and to the upper and lower left can be seen the worked out and now flooded quarry pits.*



**Fig 17 Helpston (TF118065)**

*Many early quarries and pits must have cut through archaeological sites. Some early accounts of the Nene Valley briefly mention 'ancient remains' being found. This photograph taken in Helpston parish shows two quarried areas, either of which may have cut through prehistoric material. The first, to the extreme right-hand side of the photograph, shows the tree-lined edge of a now flooded gravel pit. To the left of centre a much earlier quarry appears as a dark, irregular, shape. The quarry may be of considerable age; for it appears to have traces of ridge and furrow running over it. In the surrounding fields the boundary lines and ring-ditches of the prehistoric landscape can be seen.*



# Some Pitfalls in Aerial Archaeology

by Stephen Upex

'Confessions of an aerial photographer' might be an apt subtitle. In the last few issues of *Durobrivae* I have discussed various sites of a particular date or type. In this issue I want to outline a topic that perhaps is a taboo among many aerial photographers. People who take aerial photographs admit verbally, although not very often in print, that they photograph sites which on later examination are found to have no archaeological connections at all, but which from the air looked remarkably convincing. As I hope to demonstrate, it is very easy to misinterpret features from an aircraft.

The basic reason for the production of a crop-mark, simple disturbance of the subsoil, has been extensively discussed by many writers. Ancient or modern ditches, once cut and eventually re-filled, always retain a higher moisture content than the surrounding subsoil. The filling, too, generally contains more plant nutrients. Thus a crop growing over a filled-in ditch has more plant-food and moisture than crops growing over undisturbed soil. Such plants tend to grow better, reach a greater height and even remain greener for longer due to the underlying reservoir of moisture. The reverse happens when crops grow over stonework or other building materials. The plants seem starved of moisture and plant-food and their growth is shorter and weaker. When ditches and walls are located on the same site, the crop shows great variations in colour and height, as we can see at Castor (*Durobrivae* 4, 1976, 32, fig. 24).

From this it can be seen that any action that disturbs the soil or subsoil, at whatever date, tends to produce circumstances which are capable of providing crop- or soil-marks for the unsuspecting aerial archaeologist.

There is naturally an element of mis-interpretation common to all aspects of archaeology. For example it is notoriously difficult to assign a date or function to mounds in fields. They can range from the true barrow, through various classes of mediaeval monument such as rabbit warrens or windmill-mounds, to post-enclosure weed or ant-hill clearance mounds. At Brigstock (fig. 2) in 1978 a group of mounds was photographed overlying ridge and furrow of mediaeval date. The mounds themselves seemed to be flat topped and each had a small encircling ditch. From the air the date could only be calculated by the fact that they sat on the ridge and furrow, and no use or function could be

assigned to them. Local enquiries showed them to be the remnants of mounds used to support searchlight platforms in the Second World War.

Modern agriculture is notorious for producing marks in fields easily mistaken for real archaeological sites. The 'envelope' effect of a farmer ploughing, sowing or spraying a square or rectangular field by travelling around the field keeping parallel to the hedges can be very misleading. This produces a cross in a square field, or an 'envelope' pattern in a rectangular field. I suggest this has, on many occasions, given false hopes to those who are looking for Roman forts. Even the lines of tractor wheels through a standing or growing crop can, if taken from the wrong height and angle, produce odd photographs. Modern crop-sprays applied from the ground or air also give rise to differential crop-growth and colour if not applied correctly or evenly. Strip-grazing within an electric fence can cause odd linear marks; for the animals stand in lines, eat and at the same time manure a field, providing plant-food for the following season's crop. Manure heaps piled in field corners or distributed in regularly spaced heaps over a field also give rise to crop-marks which last several years.



Fig 2 Searchlight platforms at Brigstock (SP 946859) over ridge and furrow

Filled-in ponds provide blotches on air photographs easily interpreted as very large pits or even certain classes of prehistoric barrow. Quarries of all dates once filled in also need care in their identification. Many have regular edges representing working faces, others are haphazard in their overall plan. Recent removal of many hedge lines also gives rise to new crop-marks developing over the accompanying ditches. Hedges having ditches on either side, once the area is levelled, produce crop-marks closely akin to trackways of proven prehistoric or Roman date.

Geological and geomorphological features give rise to a variety of crop-marks. The gravel soils which are well suited to aerial photography and possibly represent over 75% of photogenic soils in the NVRC's area, exhibit a variety of natural features. They can be roughly divided into fluvial and periglacial. The fluvial features include many thousands of old and now filled water courses, formed as deltaic channels from the outflow of the Welland and the Nene into the Fen basin (*Durobrivae* 7, 1979, 8ff.). They can be of variable date, up to the mediaeval period, but one suspects that the majority were formed before the Neolithic period. Once filled in, these channels act in the same way as filled-in ditches and provide plant-food and moisture which in

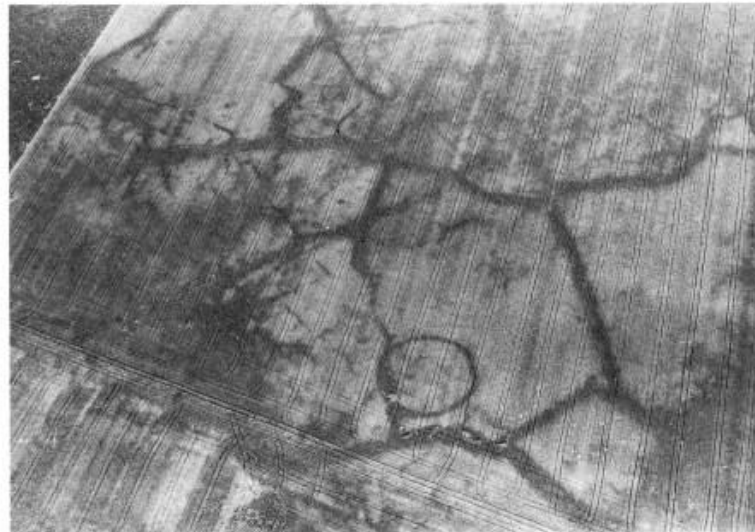


Fig 3 Natural geological features and ring-ditch at Werrington (TF 17290412)

turn produces ditch-like crop-marks. Periglacial features are the result of our area being subjected to the cold climatic environment induced by the glacial ice cover of the last Ice Age. Ice veins, wedges and involutions are produced under frozen ground conditions. Extremes of cold caused contractions in the ground and resulted in cracks and splits developing. Over a period of time these cracks grew quite large and have been recorded up to 10 metres wide. During their formation they were constantly infilled with wind blown debris and their own collapsed sides. Viewed from the air today they present themselves as linear, rectilinear or even polygonal crop-marks (fig. 3).

Where archaeological sites sit directly on top of such patterned ground, the results can be very difficult to interpret. As a rule of thumb the archaeological ditches and associated features tend to be sharper and narrower.

The natural features have slightly blurred outlines and are much broader. The 'noise' factor of such natural features is increased if both fluvial and periglacial features occur together.

From a thousand feet I have discovered innumerable new Roman roads. These seemed to appear with the development of Greater Peterborough. Do



Fig 4 Crop-marks of the former aerodrome at Polebrook (TL 092858)

all Roman roads lead to Peterborough? The answer really appears to be: only some. But a large number of pipelines serving various uses do now cross the area and look remarkably like old road-lines. At Fengate during a flight designed to take photographs of the excavation area I recorded in an adjoining grass field a circle of 15 metres diameter and thought it was a ploughed-out burial site. In fact gipsies who were encamped in the area had tethered their horses here and it seems that horses always insist on walking and eating to the very edge of their tether, producing the circular pattern.

In addition to the searchlight emplacements at Brigstock, other features relating to the war effort remain. Disused airfields provide many deceptive types of crop-marking. Often the concrete runways and aircraft standings have been ripped up by huge plough-like machines. They leave the subsoil scarred with a distinct ridge and furrow. Once removed, the concrete still leaves soil-marks and when returned to agriculture crop-marks develop. At Polebrook (fig. 4) the aircraft stands and aprons still show very clearly. Great care needs to be taken when photographing near airfields or former military sites and all suspicious markings need to be checked on the ground.

My biggest scoop of recent years was the near-discovery of the deserted mediaeval village of Milton in Castor parish. It has for long been considered that the Elizabethan mansion of the Fitzwilliams was enlarged over the levelled remains of Milton village in the sixteenth century. Little archaeological or documentary evidence for this has been forthcoming. During 1976, however, I photographed a series of rectangular parch-marks immediately to the north of Milton Hall which looked as though they could represent mediaeval Milton. Alas! The markings were made the weekend prior to my flight. I had in fact spent a long time in the air photographing marks left by Milton garden fete. The rectangles were the outlines of the marquees with the grass trampled down as people walked around inside.

The conclusion to be drawn from this article ought to be reasonably clear. It is essential to check every site, certainly those that look odd or suspicious. Dating or interpreting sites from aerial photographs can only be based on comparison with other known, dated and excavated sites. The need to check sites by field-walking and by basic documentary research is vital. Once in the air I try to look for datable features which either respect or cut across a suspected archaeological site. Hedges or railway lines are useful basic guides, but caution still needs to be exercised. I have seen a huge circle running under a hedge and through two fields that looked remarkably like a prehistoric henge monument. Closer examination from the ground showed this to be a motor bike scramble-circuit!