

The background of the cover is a vibrant, abstract painting of a landscape from an aerial perspective. The land is divided into numerous irregular, colorful patches of yellow, orange, red, green, and blue, suggesting different types of terrain or vegetation. A small church with a dark, pointed steeple is visible in the middle-left area. In the upper right, a biplane is depicted in flight against a cloudy sky. The overall style is expressive and painterly.

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**Hommage à Roger AGACHE**  
pour 35 ans de prospections aériennes dans le Nord de la France

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Glibent



THE IMPACT OF AERIAL RECONNAISSANCE IN DEVON  
(GREAT BRITAIN)

Frances M. GRIFFITH \*

Résumé

Tandis que les débuts de la prospection aérienne en Grande-Bretagne ont été effectués, dans la plupart des cas, dans le Sud et l’Est du pays, la recherche dans l’Ouest est, en revanche, beaucoup plus récente. Ici, la prospection et la photographie se sont appuyées sur les vestiges bien préservés des hautes terres de l’Ouest, comme Bodmin Moor (Cornouaille) et Dartmoor (Devon), où la photographie aérienne a joué un rôle très important pour établir la cartographie des sites archéologiques. L’étude du Sud-Ouest de la Grande-Bretagne a été dominée depuis longtemps par l’archéologie des landes montagneuses où on a cru que ces régions des hautes terres étaient occupées préférentiellement à l’époque préhistorique. Depuis les années 50, cependant, la prospection aérienne par le Professeur Saint Joseph et David Wilson de Cambridge a indiqué que ces pays de l’Ouest pouvaient aussi faire preuve d’anomalies de végétation dans les plaines cultivées. Depuis les années 80, les programmes régionaux de reconnaissance ont examiné ces terrains bas par des survols plus intensifs. Le climat, les sols et les cultures sont également moins propices aux anomalies phytographiques dans l’Ouest que dans l’Est et la reconnaissance par les prospecteurs aériens régionaux, ou locaux, offre certainement la méthode la plus efficace pour saisir les occasions limitées pour la prospection par avion. Les résultats des dernières années ont transformé également notre vision sur l’occupation préhistorique et romano-britannique des plaines du Sud-Ouest de l’Angleterre et du Pays de Galles, sur la nature de la conquête romaine aussi bien que notre perception de la relation entre les terres hautes et basses de ces régions.

Abstract

While some of the earliest regular aerial reconnaissance for archaeology was carried out in the south and east of Britain, work in west has been of more recent date. The emphasis has chiefly been upon the well preserved archaeology of the western uplands such as Dartmoor and Bodmin Moor, where aerial photography has played a very important role in the mapping of the upstanding monuments. The archaeological understanding of the South West England and Wales has been dominated by the archaeology of these uplands, which were long believed to have been preferentially occupied in the prehistoric period. Since the 1950s, however, reconnaissance by Professeur St Joseph and David Wilson from Cambridge, has indicated that these areas can also be productive of cropmarks, and the last ten years have seen the development of regional flying programmes examining these areas through more intensive survey. Climate, soil and cropping conditions in the west are all substantially less favourable to cropmark production than in the east, and locally based flying represents the most efficient and effective way to exploit the narrower windows of opportunity. Results over the last fifteen years have transformed our perception of the later prehistoric and Romano-British settlement of the lowlands of South West England and Wales, the nature of the Roman Conquest and the changing relationship between highland and lowland areas.

Devon is a county of some 650,000 ha in the south west of Britain. It has two coastlines, between which lie a varied geology and landscape, ranging from the uplands of Dartmoor (granite) and

Exmoor (slates and shales), through fertile well drained Permian soils, Devonian limestone and Greensand to the heavy poorly drained clays over slates and shales of the Culm Measures (fig. 1). Like all of the west of Britain, Devon enjoys an atlantic climate, wet but comparatively mild, and its agricultural regimes reflect this, with an emphasis on stock-keeping and grassland. There is a lower proportion of the county under arable cultivation at any one time than in the regions further

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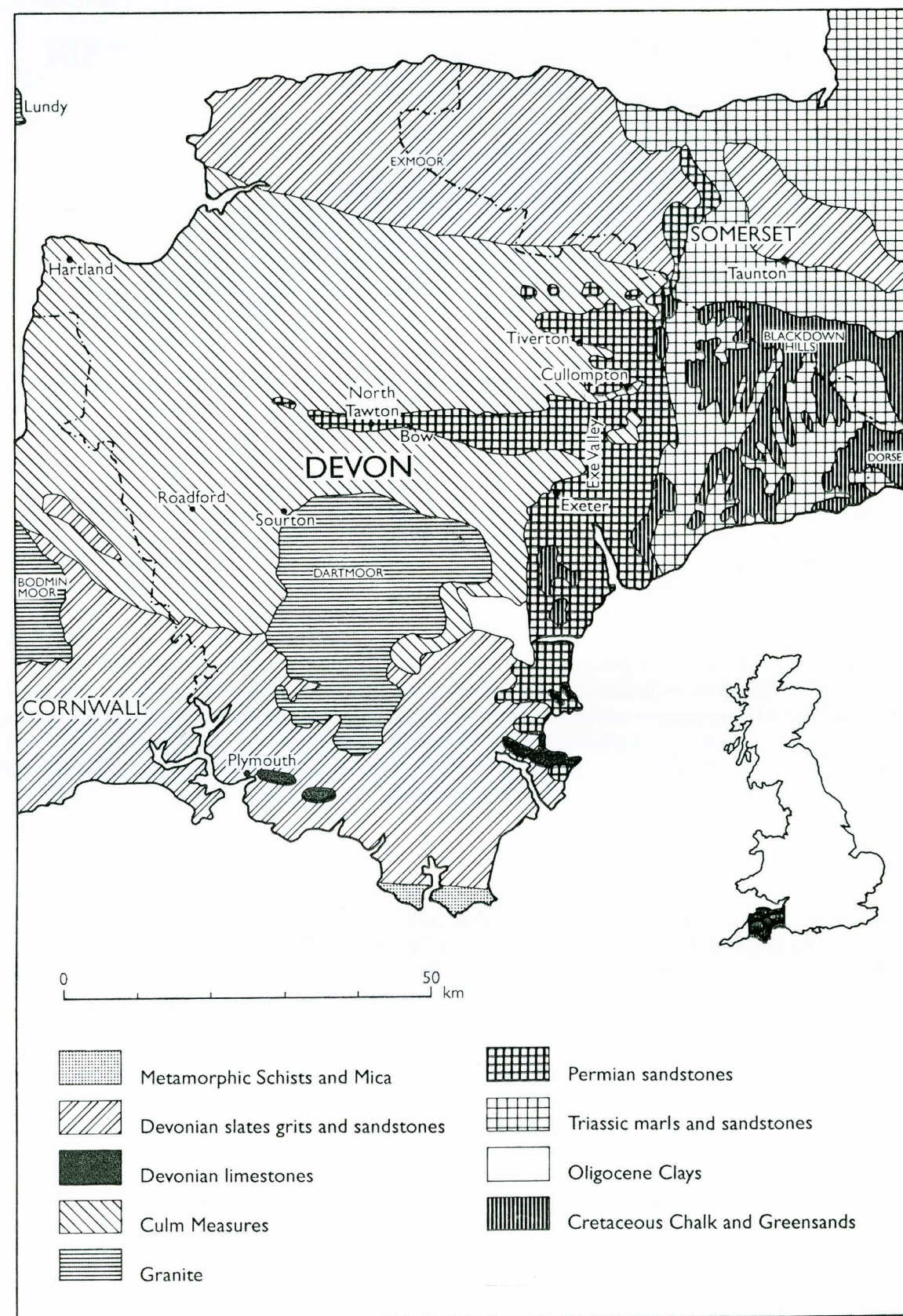


Fig. 1 : Devon - Solid Geology, and places named in text. (Drawn by Piran Bishop, Exeter Museums Archaeological Field Unit).

east. Most of the lowland area has, however, been cultivated intermittently in the past, with consequential detriment to the survival of upstanding archaeological features.

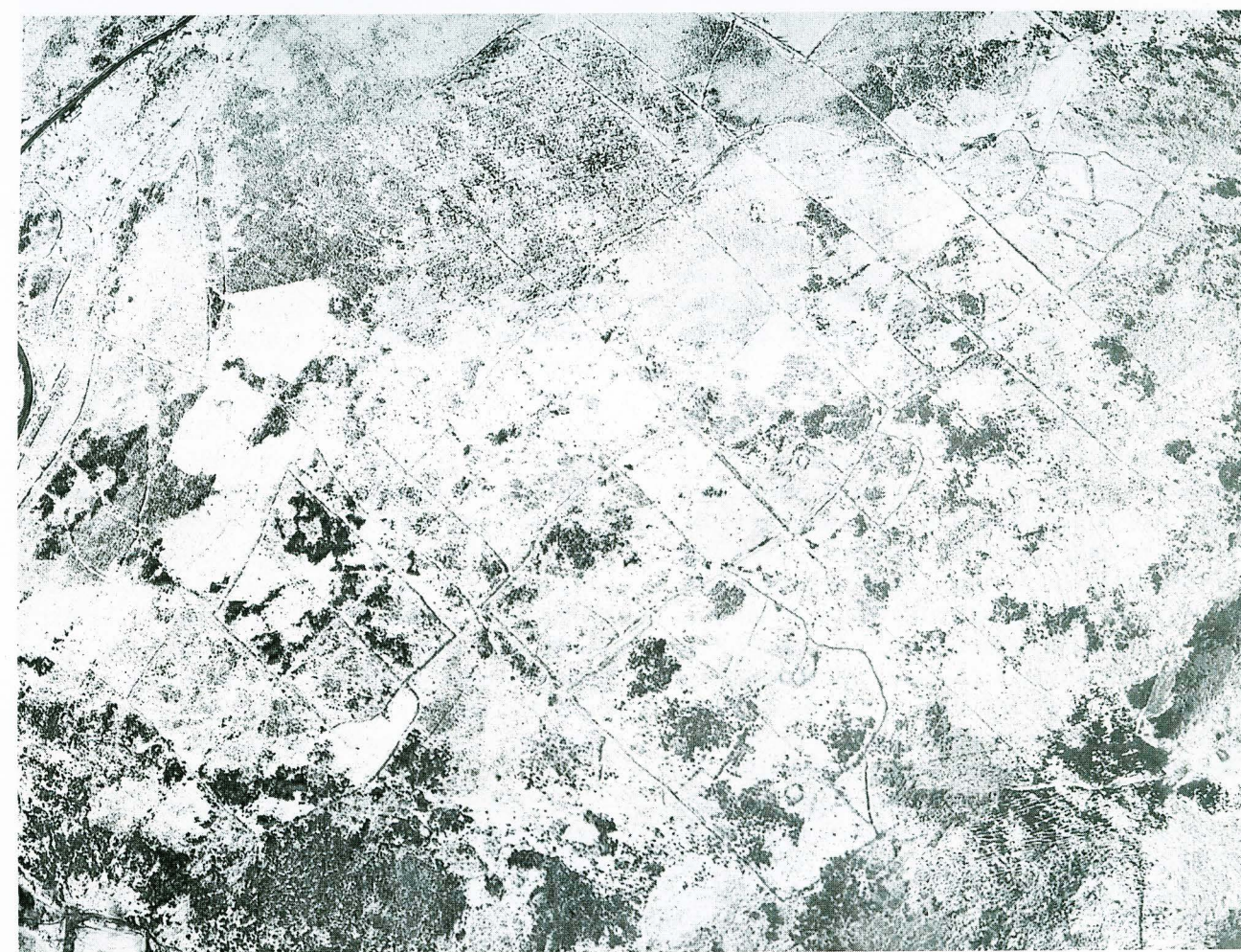
The uplands of Devon are now substantially covered by moorland, with some areas of improved grassland. Dartmoor is a predominantly granite landscape while Exmoor is a dissected plateau on slates and volcanic rocks. Both are today largely

used for rough grazing, although some "improvement" and tree planting still take place. Dartmoor was more intensively farmed in the third and second millennia BC than at any subsequent time, and this fact, together with the robustness of many of its archaeological structures, built of granite, means that the landscape is characterised by substantial Bronze Age cairns, enclosures and round houses, as well as the systems of parallel land boundaries -the reaves- whose recognition has been an important breakthrough in recent years (FLEMING 1988 and fig. 2). Dartmoor is thus one of the most famous and readily accessible upstanding prehistoric archaeological landscapes in southern Britain, and its importance is enhanced by the exceptional evidence for the exploitation of its rich tin deposits in later periods. Aerial photography played an important role in the early study of the reaves, and in helping to map the upstanding archaeology of Dartmoor, and a collaborative project between English Heritage, Devon County Council and the Royal Commission on the Historical Monuments of England (RCHME) in 1985 resulted in the preparation of a rapid sketch plot of the entire Moor at a scale of 1/10560. Although this relied principally on a limited set of

photographs, and more detailed mapping using a wider range of photography will certainly be essential in the future, it has provided the only complete publicly available mapping of Dartmoor's upstanding archaeology at a single scale.

Recent excavations (FLEMING, 1988, 71-93; WAINWRIGHT & SMITH, 1980) have shown that a number of the stone monuments on Dartmoor were preceded by timber structures, but comparatively little modern excavation has yet explored the earlier phases, and the study of the area is dominated by its lithic monuments. The same is true of Exmoor, although the upstanding remains are subtler and slighter. However, much of the remainder of Devon has little good building stone, and the structures of past ages have frequently been of earth and timber. This, combined with the pressure of subsequent cultivation, has left rather few upstanding monuments and so, until recently, much of Devon's landscape in prehistory has been seen by archaeologists and historians as relatively lightly exploited, except for a few hillforts and defensive earthworks. The traditional explanation for this was that much of the lowland was covered with

Fig. 2 : Bronze Age reave system and settlements, under snow, Yartor Down, Dartmoor, Devon. (Photo F. M. Griffith, Devon County Council, 17 March 1985).





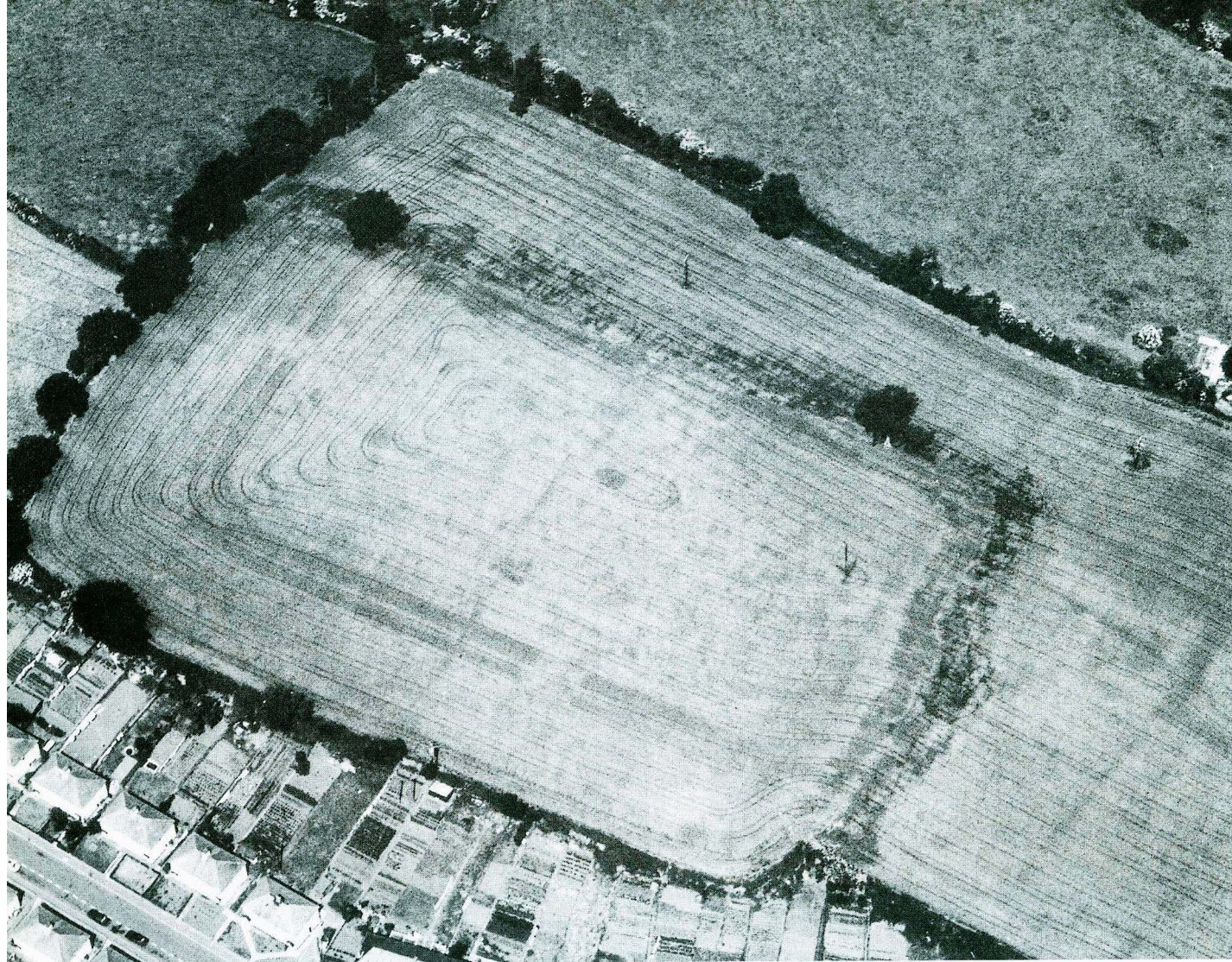


Fig. 3 : Roman fort, Cullompton, Devon, showing two phases of development. (Photo F.M. Griffith, Devon County Council, 25 June 1984).

impenetrable forest, not cleared until the Roman or Saxon period, and that the uplands were preferentially occupied in prehistory. This view persisted until surprisingly recently. For example, Simmons, writing in 1969, shows (his fig. 3) a reconstruction of the vegetation for the Late Bronze Age, where the higher areas of Dartmoor are shown surrounded by "forest" extending to the frame of the map on all sides.

As in many other areas, a combination of aerial reconnaissance and field-walking has proved a partial corrective to this perception, although it must never be forgotten how many aspects of the material heritage cannot be touched by these two methods alone (increasingly, large-scale geophysical survey is also important here). Recent work in eastern England has demonstrated the importance of deposits sealed by colluvium: little work of this type has been undertaken in Devon: where it has, significant sequences have been revealed (for example at Hayes Barton, Exeter (PONSFORD 1992, 115-6). The contribution of the aerial archaeologist to this work must lie in the identification of areas of colluvium and other deposits such as palaeochannels, and this forms an element of the present Devon survey.

Archaeological aerial reconnaissance has been carried out in Devon since 1947, when the late Professor St Joseph first included the county in his flying programme. Photography at first covered known sites, but from 1949 onwards cropmarks were observed. Over the following twenty five years, a considerable range of features was recorded in cropmark form, in a number of parts of the county. Work on the compilation of the Devon Sites and Monuments Register (hereafter SMR) entailed the accession of information on all the Cambridge material. The wealth of the results of Cambridge (CUCAP) photography over the years, by Professor St Joseph and more recently by David Wilson, was striking when seen in aggregate, particularly as the number of Devon sorties in any given year was often very limited. The photography undertaken by RCHME under John Hampton since 1972 had in general concentrated on the archaeology of the uplands, which provided a major input into the Dartmoor mapping programme described above.

Study of the results of past reconnaissance demonstrated that a higher level of reconnaissance could be productive. Approaches to CUCAP and RCHME were met with the suggestion that local reconnaissance might be a productive avenue, and

results have borne out this approach and strongly confirm the effectiveness of such work. In 1983 trial sorties were flown by the writer, with very limited finance provided by local benefactors, and relying heavily on the collaboration of W.W. Dougan of Exeter Flying Club (GRIFFITH 1984a, 7). This provided an essential preparation to allow the writer to respond adequately to the spectacularly good cropmark summer of 1984, when 70 hours were flown and some 500 new "sites" recorded. Since that time, the flying programme has formed part of the writer's regular work for Devon County Council, and has been grant-aided successively by DoE, English Heritage, RCHME and Devon County Council. For English regional flying, central government grant was confined largely to the costs of aircraft and film, other direct and indirect costs being in general met by either the flyer or their employing body—most often, in England, the County Councils (GRIFFITH 1990, 28-31).

Since 1984, locally-based flying has been carried out in Devon every year (and since 1989, reconnaissance has also been carried out on an agency basis for Somerset County Council for the southern parts of Somerset). While the impact of the results of reconnaissance has perhaps been most clearly demonstrated in areas such as the study of Roman military activity in the south west, the impact on a range of current problems in Devon's archaeology has been profound. The single most numerous class of monument identified in reconnaissance in the last ten years has been the enclosure. The majority of these have no inherent datable features as they appear in the cropmark or earthwork record. Those found in Devon range from complex, clearly multi-phase types through double or triple ditched examples which may represent either a single phase or the replacement of one surrounding ditch. The most numerous are the single ditched simple enclosures, curvilinear or subrectangular, usually with clearly apparent entrance, which are found throughout the county and which, while ranging in size from 0.04 to 2.25 ha have an overall typical size of between 0.16 and 0.9 ha. It is fully appreciated that a ditched enclosure does not necessarily represent the earliest use of a particular site (as at Gussage All Saints in neighbouring Dorset, and the excavated 2nd-1st millennium enclosure at Shaugh Moor on Dartmoor (WAINWRIGHT and SMITH 1980): the value of the cropmark evidence is to permit the initial recognition of the location of archaeological features. The number of enclosures recorded has been augmented, to general surprise, by the identification of several upstanding but previously unrecognised hillforts (eg GRIFFITH 1984a, 10).

The wealth of recent discoveries in lowland Devon and Cornwall mean that more enclosures

are now being excavated, and a picture of their date range is being built up. Excavations on enclosure sites in Devon suggest that a substantial proportion of the simple enclosures date from the prehistoric and Romano-British periods (SIMPSON *et al* 1989, 24-5). The later end of the date range is however of particular interest. Work in Cornwall has demonstrated that some of the Cornish settlement enclosures or "rounds" (Johnson and Rose 1982) continue in use until around the 7th century AD (QUINNELL 1986, 122-30), while the circumstances and dating of their abandonment are still uncertain (PRESTON-JONES and ROSE 1986, 145-6). However, recent rescue excavations at Roadford and at Sourton in Devon by Exeter Museums Archaeological Field Unit have produced evidence of enclosing ditches around rural settlement sites and hamlets which have no indications of foundation earlier than the 13th century (HENDERSON and WEDDELL 1993). When drawn up, these enclosures would not stand out in any way from the generality of the enclosures recorded by aerial reconnaissance, to which a substantially earlier date would conventionally be attributed. This offers a stimulating extension of the potential interpretations of simple enclosed sites: excavated parallels are not at present known from elsewhere in southern Britain.

As elsewhere, the study of prehistoric ceremonial sites has been much enhanced in lowland Devon by the aerial reconnaissance programme. The distribution pattern of round barrows has been considerably modified by the identification of large number of ring ditches identified in cropmark form (GRIFFITH 1988, 30-1; GRIFFITH and QUINNELL forthcoming). As well as contributing singly to the overall picture, these discoveries have permitted the identification of previously unsuspected focuses of prehistoric ceremonial activity. One striking example of this may be seen when considering ceremonial complexes that conventionally might be dated to the Beaker/Early Bronze Age period. In 1983, Dr S.M. Pearce mapped the distribution of ceremonial complexes then known (PEARCE 1983, 132). With hindsight, and aerial reconnaissance, this plan can be shown to be a reflection of distribution of unimproved land in south west England, while the largest "gap" in Pearce's map can now be shown to be occupied by a substantial complex of ceremonial monuments in the Bow area of mid Devon. This comprises two oblong ditches, a substantial Class II henge, and 9 ring ditches and barrows (GRIFFITH 1985; HARDING and LEE, 1987, 118-21).

Another complex is becoming apparent in the Exe Valley, where an area known from fieldwalking to be exceptionally rich in later neolithic lithic material has revealed through cropmarks barrows,





Fig. 4 : hilltop enclosure in Hartland, Devon, visible as a slight earthwork in oblique winter light. (Photo F.M. Griffith, Devon County Council, 22 December 1986).

ring ditches, an oval ditch, an oblong ditch and, most recently, one end of a cursus, the first known in south west Britain (GRIFFITH 1990, fig. 6). This last site is of particular interest in the consideration of the factors governing the recovery of information in an area such as Devon. The Exe Valley is one of the most regularly flown areas of the county, with both soils and cropping as favourable as anywhere in the county to the recognition of buried sites in cropmark form. However, the identification of the cursus demonstrates very clearly the case for continuing observation, since it appears to have needed the combination of an exceptionally dry summer and a crop of peas to cause it to show for the first time.

The study of Roman military activity has been, in Britain and Europe alike, a classic area for the contribution of the aerial archaeologist. The high degree of reliability with which such sites may be recognized makes it particularly easy to demonstrate the cumulative benefits of reconnaissance (fig. 5). This may be seen very clearly in Devon, where until recently the impact of the Roman conquest was believed to have been very slight. The excavations that have taken place in

Exeter since the 1939-1945 War have identified the existence of a legionary fortress, probably of Leg. II Aug., there, while the increasing recognition through reconnaissance of forts, marching camps and probable fortlets or signal stations has not only transformed our interpretation of the occupation of the south west in the later 1st century AD but warns us of the folly of interpreting the present picture as being definitive! Many of the sites that have been recognized have shown traces of more than one phase of construction, as in the case of Cullompton fort (fig. 3), where the interpretation of the existing field boundary as a second fort (GRIFFITH 1984 b, 13.6) has recently been verified by excavation (SIMPSON & GRIFFITH 1993). At Tiverton, a site originally believed to be a marching camp because of the apparent slightness of its defensive ditch, the fort has been demonstrated by Dr V. A. Maxfield's excavation of one gateway to have been remodelled, suggesting a large-scale reordering of the fort as a whole (MAXFIELD 1991). The greatest complexity of any of the south-western sites has been recorded at North Tawton, where the known earthwork fort was augmented first by a temporary camp recorded by CUCAP in 1976, and then by a mass of further cropmarks in 1984. Analysis of all

the information led to the interpretation of the site as showing at least seven separate episodes of development of the evidence of the cropmarks alone (GRIFFITH 1984b, 20-5) and this site is now seen as potentially a legionary establishment (FRERE 1987, 62).

Although this paper has so far concentrated upon photography for cropmarks, this by no means represents the total contribution of reconnaissance to the Devon scene over the eight years to 1992. Winter photography has been highly productive of earthwork sites both on the uplands such as Dartmoor, Exmoor and the Brendons, and also in the lowland areas, although in numerical terms new material has been less significant than the cropmarks. Apart from providing data for the monitoring of the condition of

sites and useful illustrative/interpretative material, it has been possible, through the targeted exploitation of unusual weather conditions and low-angled light, to record very slight earthwork features, such as a number of strip field systems on Exmoor whose existence had not previously been recorded. While Dartmoor flying has not been a priority area in the last few years, due to the existence of untranscribed existing photographs in the NMR, where reconnaissance has been carried out, significant additions have been made to the material at present mapped. In the lowland areas, traces of slight earthwork features are particularly valuable, in view of the probability of the better potential survival of stratified deposits, and a number of enclosures have been recorded in this way in the course of winter flying (fig. 4).

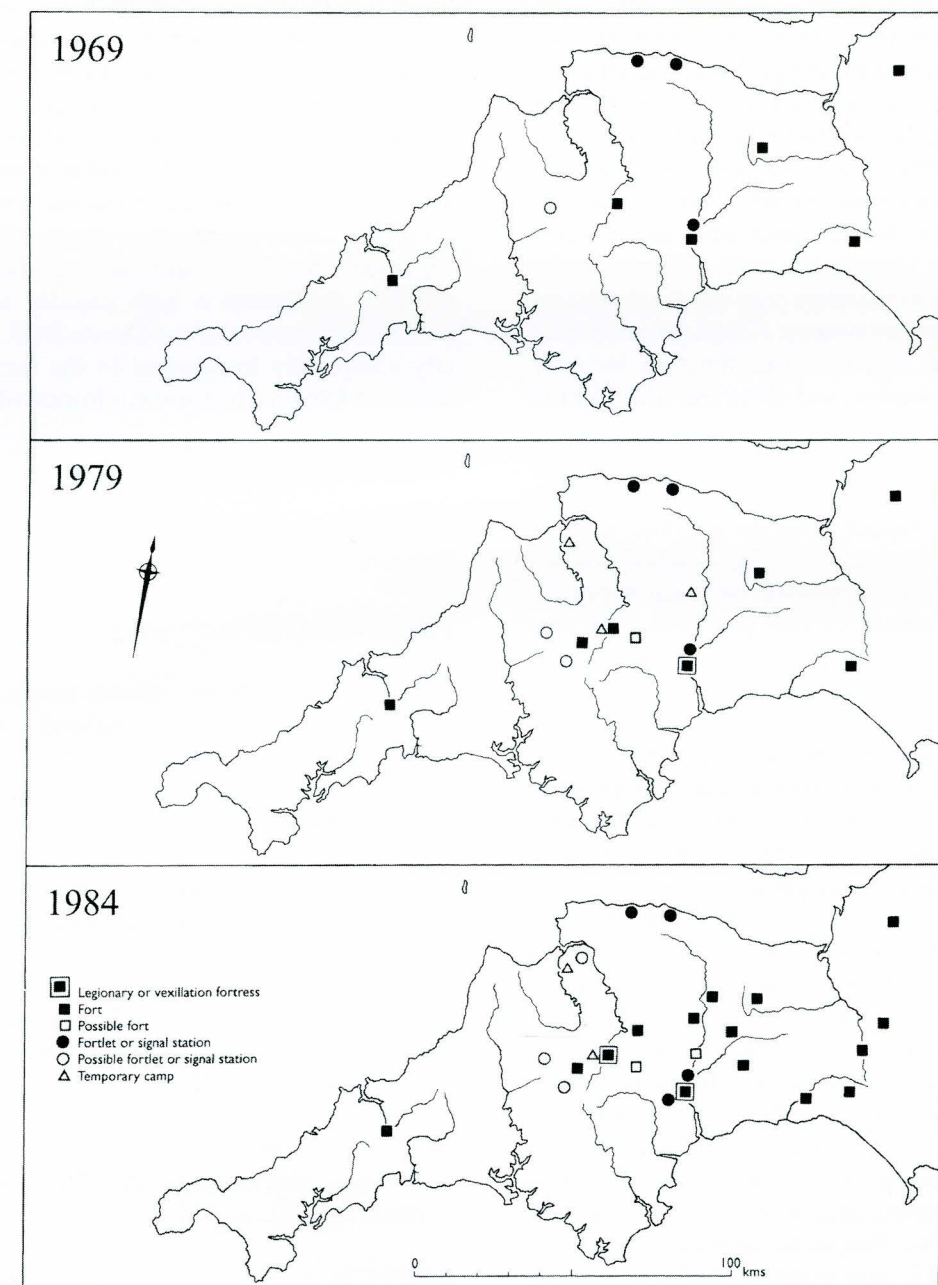


Fig. 5 : the expanding picture of the Roman military presence in South West England (after Fox 1974, Maxfield 1980 and Griffith 1984b, with one additional site 1989).



The overall impact of aerial reconnaissance on the understanding of the archaeology of Devon and south west England generally is perhaps most succinctly illustrated by the example of the perception of the Roman military occupation of south west over the last twenty-five years. Figure 5 shows the known distribution of Roman forts etc as published in 1969, 1979, and 1984, with the addition of one fort recorded in 1989. Not all the sites were identified first through aerial reconnaissance, but its influence is clear (for a complete discussion of this topic, see GRIFFITH, 1996). The late start to reconnaissance in much of the west of Britain -no work was done in the south west until after the 1939-1945 War- and the comparatively low intensity of work until the 1980s, means that it is only recently that the full benefits of the medium for the area can be appreciated. The factors militating against frequent and easy manifestation of cropmarks outlined in the opening paragraphs continue to obtain, and are likely to be intensified by the probable reduction in arable acreages in the next few years, even though this will be highly desirable for archaeological conservation in other ways. To build up a fair picture even of the potential for aerial reconnaissance in a western area of Britain takes time, and it is certainly true that a number of parts of Devon have only been known to manifest crop-marks in the one or two years in the last twenty. A high proportion of all sites recorded as cropmarks have so far only been seen in one season, and therefore much of the photo-interpretation work must be treated with circumspection. However, the continuing contribution that even a limited amount of flying can achieve, in terms of its impact upon the previous state of knowledge, may be seen from fig. 6, which shows the "productivity" of cropmark reconnaissance, in terms of sites recorded, for 1989 and 1990. 1989 was an exceptionally good year for the identification of cropmarks in many parts of Devon and Somerset (GRIFFITH 1990, 21), whereas the overall number of cropmarks recorded in 1990 was very much less. The histograms show, however, that the proportions of new to repeat photography in the two years stayed relatively constant, and that a striking level of effectiveness continues to be maintained by the reconnaissance programme in Devon. In other words, so much more remains to be done that after the first nine years of locally-based reconnaissance, targeted through close knowledge of local conditions and archaeology, there was not yet any evidence for any fall-off in the productivity of the reconnaissance programme. This is not surprising, given the relatively restricted area available for examination in any one year, and the limitations imposed by soils, cropping and weather, and it should perhaps be stressed that in terms both of the level of funding available and in terms of effective use of the writer's time, the reconnaissance programme

continues to represent the single most cost-effective means of expanding the total archaeological understanding of the county's archaeology.

The impact of the new material has been very marked in terms of the responsibilities of the County Council in conserving the archaeological resource of the county. A high proportion of all the archaeological comments on rural planning proposals are based on aerial information, and in the past few years a large number of sites not otherwise known have been protected from development as a direct result of their identification and recording in the county SMR. The reconnaissance programme has not only made an impact upon our understanding of Devon's archaeology in academic terms but has also contributed in the most direct way to its practical conservation. It is difficult to see how this level of effectiveness could have been achieved except by locally-based reconnaissance, which is rendered the more necessary by the less predictable weather windows and variable ground conditions of the west of the country (GRIFFITH 1990, 30), while the benefits of instant integration of reconnaissance with current rescue considerations is not negligible given the existing pressures upon our archaeological landscapes. The maintenance of the present programme represents a high priority for the continued development of the Devon SMR and its capacity adequately to respond to the increasing pressures on Devon's historic environment.

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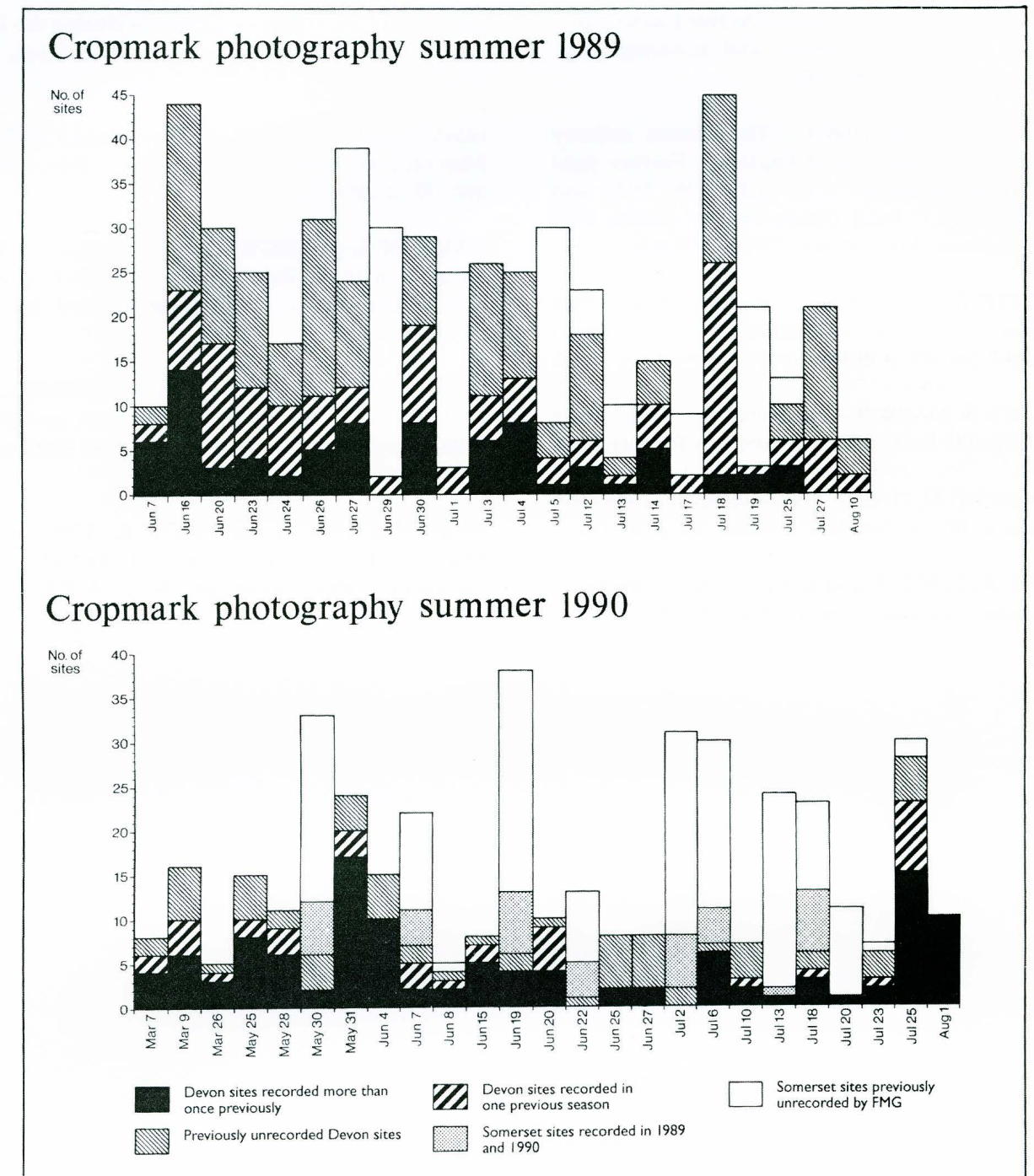


Fig. 6 : results of summer cropmark photography in Devon and Somerset, 1989 and 1990.

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