Title: Mapping the Sussex Landscape

Author: John Henderson

Date: November 2016

Summary: This paper offers an overview of the history of the mapping of the Sussex landscape from the 16th to the 21st centuries with particular reference to the *Secrets of the High Woods* project area covered by the LiDAR survey.

Acknowledgements: Except where otherwise indicated, illustrations used in the text are the property of the author. All other permissions are gratefully acknowledged and indicated below each illustration. The abbreviations WSRO and SDNPA are, respectively, West Sussex Record Office and South Downs National Park Authority.

This article is published with the kind permission of the author. This article is the work and views of the author from research undertaken in the Record Offices by volunteers of the Secrets of the High Woods project. South Downs National Park Authority is very grateful to the volunteers for their work but these are not necessarily the views of the Authority.

Mapping the Sussex Landscape

from Saxton to LiDAR

John Henderson BA MA

Preface

This overview of the history of the mapping of Sussex from the 16th to the 21st centuries is the outcome of my research as a volunteer on the Secrets of the High Woods project. Hosted by the South Downs National Park Authority and funded by the Heritage Lottery Fund the project set out to rediscover, through archaeology and archive research, human activity in the wooded estates of West Sussex over several thousand years. Using airborne laser scanning known as LiDAR (Light Detection and Ranging) a lost landsape was revealed beneath the woodland cover and new evidence found of human activity in this landscape, from the first farmers through Romano-British settlements and medieval deer parks to present day woodland activities.



1. Secrets of the High Woods project area (© SDNPA)

The project was made up of field surveys, archive research and oral history, for which volunteers were recruited from a variety of backgrounds, some bringing previous archaeology and historical research experience, others completely new to these disciplines. Embarking on individual research topics, whether on Iron Age hill-forts, medieval farms or Second World War training camps, most volunteers had to consult maps, modern or historic, and consequently I decided to research the depiction of the Sussex landscape in maps over the past four hundred and fifty years. Through these maps and plans I sought to identify a common purpose and a changing perception of the Sussex landscape and in the process to trace the development of the cartographer's skill.

This study does not explore the development of scientific instruments and methods in cartography; it does not catalogue every map, map-maker or engraver who has ever produced a map of Sussex; nor does it examine individual sites revealed by LiDAR in the course of the project. It is simply intended to provide those interested in the project, and in maps of Sussex in particular, with background and context for many of the other studies in the project. The bibliography may also assist those who want to study the subject in greater depth. As many as possible of the illustrations used have been, for ease of comparison, centred on the area west of the River Arun that includes Rewell Wood to the north and Torrtington Common to the south, the last remnants of the great medieval Forest of Arundel.

Note: unless otherwise indicated, illustrations used in the text are the property of the author.

Until the 19th century Sussex remained a relatively isolated county, despite its close proximity to one of the great cities of western Europe. The dense Wealden forest made travel to Sussex from the north, especially in winter, very difficult. But Sussex, while a challenge for the traveller, was by no means an economic backwater. Indeed its economic prosperity enriched the great landed estates that had evolved since the Norman Conquest and which had been supplemented by the 16th century property boom following the Dissolution of the Monasteries.

The character of the landscape was, broadly speaking, already determined by those centuries of isolation but was also preserved by a prosperous gentry keen to consolidate their wealth in estates, deer parks and plantations. It has been noted that the area of the wooded estates in the western part of Sussex had fewer landowners per parish than any other part of the county and this was a factor ensuring more continuity than change in that landscape.¹ But the need to survey, quantify and visualize the landscape was as strong here as it was anywhere else and landowners, Crown servants, military strategists and other travellers increasingly sought what we take for granted today - maps.

Maps had been produced for a variety of reasons throughout the Middle Ages, but few of these have survived. We know of several maps of England made in the great monastic centres of the 13th and 14th centuries. But the *Gough Map*, one of the earliest maps of the British Isles, thought to date from about1360, depicts few features of the landscape. It does however show the major towns of Sussex, its cathedral and larger churches and, importantly, its coastal towns and major rivers. It seems likely that this map was commissioned by the Crown and used by Crown servants such as administrators, tax collectors and lawyers and may be connected in some way with the aftermath of the Black Death.²

Before the 16th century monks often surveyed their own monastic lands and Stewards on the great landed estates of the aristocracy would take on the role of estate surveyor. However, such surveys were often written descriptions of the property, lists of its agricultural and economic activity and its value. But by the late 16th century professional surveyors were increasingly required to have a formidable set of skills to carry out their tasks and these included knowledge of arithmetic, of Latin and common law as well as the ability to understand property deeds, legal documents and to assess the value of the land they were surveying.³

¹ Kim Leslie and Brian Short (eds.), An Historical Atlas of Sussex (Chichester, 1999), pp.98-99.

²David Kingsley, *Printed Maps of Sussex*, (Lewes, 1982), p.x; Nick Millea, *The Gough Map, the earliest map of Great Britain*? (Oxford, 2007), pp.23-25.

³ F.W. Steer, A catalogue of Sussex Estate and Tithe Award Maps, (Lewes, 1962), pp. v-vi.

The ability to produce a plan or a map became an essential requirement for the surveyor. But drawing skills at this level of the cartographers art can be seen, in many a depiction of the occupants of rabbit warrens or deer parks, to be seriously wanting. The age of skillfully engraved maps, with elaborate cartouches, topographical views and sometimes portraits of patrons, was just dawning. One notable and enduring expression of this art form was the late 16th century emergence of the English county map.

As early as 1539 Henry VIII, fearing invasion by Spain, had called for a coastal survey of England, particularly the vulnerable south coast. The resulting series of maps had little interest in the landscape other than those coastal features which were either vulnerable in the event of an invasion, or were strategically important if fortified. When Christopher Saxton undertook his own survey of the whole of England and Wales sixty years later, producing county maps between 1574 and 1578, he established one of the most recognizable cartographic units ever produced for these islands.

Here was a mapping genre that could give an instant impression of the character of an English county, depicting landscape features as well as towns, hills as well as rivers and defences as well as mere coastlines. It could depict borders in relation to the rest of the kingdom and what was just beyond those borders. Furthermore, the cartographer, or his engraver, could emblazon it with the arms of the county's major families and all of this information could be taken in at little more than a glance.

Though his map of Sussex was combined with Kent, Surrey and Middlesex it nonetheless shows prominent features of the landscape such as rivers, forests, hills, towns and some large houses. It also indicates 'The Downes' in text with a few graphic but uninformative representations of hills.

The choice of this unit of land, the county, was important because as well as meeting the specific needs of those commissioning the map, it would eventually alter peoples' perceptions of the very land where they dwelt.

The county was also the primary unit of administration below central government. John Norden (1595) and John Speed (1610) both followed Saxton in producing county maps, including Sussex, as supplements to written surveys of England's antiquity and topography.



2. Detail from Saxton's map of 'Kent, Surrey, Sussex and Middlesex' (1575)

Both included that administrative unit unique to Sussex, the Rape, and both included a plan of Chichester in their respective maps. The numerous enclosed deer parks that existed throughout Sussex were added to Saxton's rather less wooded landscape. As travelling became more common, especially by those on Crown, church or legal business, the county map also became an important tool for national and local government.⁴

As had been the case in the Middle Ages, there remained reasons for making maps of areas smaller than the county unit. Landowners and their estate managers increasingly felt it important to measure and put a value on every farm, field, warren or wood. The Church collected a tithe and wanted to know what produce or revenue it could expect. From the 17th century local and parliamentary enclosure further increased the need to measure the land. Property was now a commodity, the sale of which touched the lives of all who lived and worked on it. Legal challenges to changes in property ownership, measurement and value now had to be supported by maps of the disputed area and in many cases the map would settle such disputes.

A map, probably of 1596, of that part of the Earl of Arundel's lands from North Marden, north-west of Chichester, to Arundel and the River Arun, appears to depict an apportionment of this land, by way of marriage settlement, to the Earl's son-in-law, Lord Lumley.

⁴ P.D.A. Harvey, *Maps in Tudor England* (London 1993), pp.60-65.



3. A detail from a manuscript map thought to describe land to be transferred between the Earl of Arundel and Lord Lumley c.1596 (© His Grace the Duke of Norfolk)

Such 'private' mapping however was starting to follow conventions used in the state commissioned surveys, woodland and rabbit warrens being graphically depicted, roads and their names included and buildings distinguished symbolically. The 'Lumley' map though was as much a series of drawings as it was a vertical view of the landscape. Surveys for such 'business' purposes and the maps that followed them were increasingly common and later the tithe maps of the 19th century were the result of the application of such estate management methods on a national scale.

The impetus for the production of more maps by an emerging specialist profession was also underpinned by developments such as the application of triangulation and the use of scientific instruments such as the theodolite, the circumferentor and the plane-table. All had come into use in the 16th century and although the result was more accurate mapping and standardization of measurement there was still some resistance to scientific methods from both surveyors and landowners. John Norden, in his 1607 book *The Surveyors Dialogue* made the case for precision and by the 18th century scientific methods had become an indispensible part of the estate managers skills.⁵

⁵ Paul Hindle, *Maps for historians*, (Chichester, 1998), p.30; Harvey, *Maps in Tudor England*, pp.89-91.

The 17th century saw few developments in cartography, though John Morden's county maps showed a little more of the Sussex landscape than did Saxton's.

unfor Harhna S.Ih.m Deante unding HICHEST

4. Morden's 'Sussex' showing largely towns villages and deer parks (1695)

Although he had represented the Downs with little more than a concentration of grey lumps on the map he was clearly more concerned to show the towns and villages of the county, using symbol as well as text. There was also a noticeable proliferation of deer parks across the Sussex landscape.

There was one notable exception to this century's lack of cartographic innovation in John Ogilby's road maps, to be discussed later. So it is not until the publication of the first large-scale map of Sussex by Richard Budgen in 1724 that we do see major innovation. In this Budgen introduces a comprehensive use of scale, symbol and drawing to show what the surface of the landscape looked like as well as showing the spatial distribution of towns, roads and rivers. This map had most of the characteristics of a modern map and it was the first to use many features which we take so much for granted that most of us have ceased to notice them at all.

It was the first to be oriented to true north; the first to show marginal graduation and to have parallels and meridians traced across the map using the recently calculated English prime meridian; it was the first to use the statute mile instead of the variable 'common mile', although Ogilby had used the statute mile on his road survey, not considered here as a general survey of the Sussex landscape. It was also the first to include the road network throughout the county and through use of hachure Budgen also made the Sussex Downs, for the first time, a prominent and recognizable feature on the landscape.⁶



5. Detail from Richard Budgen's map of Sussex, 1724 (© WSRO)

A careful study of Budgen's map will also show that he was concerned to show the natural resources of the county and its industries and in so doing to reflect the social and economic life of Sussex. Of significance, in the context of the *Secrets of the High Woods* project, he was also the first to show many of the county's antiquities, including earthworks.

However, even Budgen's innovative map could be improved upon and Thomas Yeakell and William Gardner's 'Great Survey' of 1778 marked an even more important step towards modern map-making in Sussex as well as elsewhere.

Employed by Charles Lennox, 3rd Duke of Richmond, on his Goodwood Estate, Yeakell and Gardner abandoned Budgen's picturesque style for a more formal representation of all of the features on the landscape. At a scale of two inches to the mile they eschewed the use of symbols or textual information, other than place-names, but included every prominent physical feature as well as man-made structures of any significant size.

The Duke was appointed Master-General of the Ordnance in 1782 and Gardner followed him to the Board of Ordnance becoming Chief Draughtsman to the Board. But for both men Sussex remained an important landscape in their burgeoning project. Here Gardner would produce in 1791, with Thomas Gream, a revised version of the 'Great Survey' now at one inch to the mile.

⁶ R.A. Skelton and Harry Margary (ed.), *Two Hundred and Fifty years of Map-making in the County of Sussex, a collection of reproductions of printed maps published between the years 1575 and 1825,* (Chichester, 1970).

However, as is so often the case with innovation, skill and opportunity alone could not provide the motivation for the extension of the survey to the whole of Great Britain. Not for the first time, fear of invasion by France, not to mention that nation's superior cartographic and technical skills, would add the necessary impetus to the project.⁷



6. Detail from Yeakell and Gardner's 'Great Survey' of 1778 (© WSRO)

Gardner and Gream's map, building on Yeakell's work before them, was virtually indistinguishable from the first series of the Ordnance Survey's maps published in 1813 and they could thus be said to be the Survey's most influential and visionary servants. Sussex could also lay claim to be the birthplace of the Ordnance Survey and the project remains one of Britain's greatest and most enduring public works and one which came to form the standard on which all professions in need of maps, throughout the Empire and beyond, came to rely.

In the 18th and 19th centuries there were major developments in communications which demanded mapping on a scale never before seen. No major highways had been built in England between the Roman occupation and the construction or improvement of turnpike roads.⁸

The western part of Sussex was particularly resistant to road and rail building throughout this period, partly because of its geography but also because of its economy and the location of its markets. North-south road and rail links remained few and far between but the coming of the railways and better east-west roads in Sussex were major factors breaking down the county's isolation, particularly on the coastal plain.

⁷ Rachel Hewitt, *Map of a Nation, a biography of the Ordnance Survey*, (London, 2010), p.106.

⁸ Millea, *The Gough Map*, p.23.

One cartographer in particular had identified an opportunity presented by increased travel by road. John Ogilby carried out the first large-scale measured survey of the English roads and in 1675 produced a road atlas.⁹ It included one sheet relevant to the area of this study, *The Road from London to Arundel ...with the Continuation from Arundel to Chichester*. What Ogilby did that his predecessors could not do on a county scale was conduct a survey from what he saw on the ground, noting hills, rivers and roadside woods, indicating road junctions and man-made features on the landscape such as windmills, bridges and churches. These strip maps satisfied a need that would only increase with the arrival of new modes of transport, both public and private, and can be seen as the predecessor of the 20th century road atlas.

Even though Budgen would become the first cartographer to include the road network in Sussex, his county map of 1724 was not aimed at the traveller as Ogilby's was.¹⁰



7. Roads around Arundel: a. Ogilby's 1675 strip map; b. Mogg's 1817 touring map

And so successful was the format developed by Ogilby that more than one hundred and forty years later Edward Mogg was producing road maps in a similar style. By 1817, when Mogg published his *Survey of the High Roads of England and Wales*, the landscape and any difficulties it might present to the

⁹ Skelton and Margary, *Two Hundred and Fifty years of Map-making*, Introduction.

¹⁰ Leslie and Short, *Historical Atlas*, p.78.

traveller had become of secondary interest. It is in this series that Mogg's map, *The Road from Bath to Brighton*, typifies the Regency coach traveller's particular needs when travelling between two of England's most fashionable towns. Because not only does it include the names of coaching inns *en route* but adds the names of notable families, their houses and their estates if they too were near the road. This map was intended to be used by someone whose journey was not so much a necessity as it was a pleasure.

Though welcomed by the large farmers, by commercial interests and by church and Crown servants, few of the new roads built or improved in the 18th century crossed the wooded estates of Sussex. Likewise, the only railway line crossing the project area, the Chichester-Midhurst line, did not open until 1881 and once again had little impact on the surface of the wooded estates.¹¹

However, in Sussex's great rail expansion period, from the 1840s to the 1880s, maps of the county for whatever purpose they were conceived, had to be frequently revised and large scale maps which included railways demanded yet more precision and draughtsmanship. The increase in road travel by the general population and the coming of the railways would create yet another need for people to look at a map, to understand the relationship between distance and time, to visualize the landscape and understand our place in it.



8. Mapping the railways: Midhurst 1895 OS map (© WSRO)

The Ordnance Survey came to dominate British map-making in the later 19th and 20th centuries. As one of the greatest public works of that era it quickly became the standard for professions and public alike. It did however have competition in its early years with many notable private map-making and

¹¹ Ibid, p.79.

surveying enterprises, such those of Andrew Bryant and brothers Christopher and John Greenwood, producing maps to a very high standard. But the Ordnance Survey survived to continue the extension of its one-inch to a mile series and develop both its six-inch and 25-inch series.

There was also competition for the eye, if not the purse, of the general public in the form of highly decorative engraved county maps, admired as much in the pre-photographic era for their views of principle towns and notable landmarks as for their cartographic skills.

Thomas Moule's map of Sussex, produced in 1837, the year of Queen Victoria's accession, depicted the Downs rather inadequately through shading that bore little relation to the physical landscape. He also used colour to delineate the Sussex Rapes and included topographical views, coats of arms and an elaborate floral border. This was a map that competed with others for living room wall space, not for technical or legal acceptance.



9. Moule's map of Sussex (1837) showcases the engraver's art

The survey of south-east England that had been started by General William Roy in 1785 to connect the observatories in London and Paris by triangulation had been extended westwards to Sussex in 1792. Using points along the Downs, church towers and windmills the survey built on the work of Gardner and Gream. The early maps so produced were barely distinguishable from their Sussex map of 1791 or even from those produced earlier by Yeakell and Gardner. Nonetheless, when the project culminated in the Old Series one-inch map in 1813 it became the basis of the Survey's mapping for the rest of the 19th century.

Before the age of the Ordnance Survey few outside government, the military, the legal profession or the landowning classes and their surveyors had access to maps. Those who commissioned them, as well as those who used them, did so for a variety of reasons. That would now change as this great enterprise entered into the very fabric of professional and domestic life.

However, other events and considerations were shaping the Ordnance Survey and its maps and the scale, quite literally, of its task and there were many important milestones passed on the way.

The *Tithe Commutation Act* of 1836 indirectly caused the Survey to consider the recording of field size and valuation and the *Ordnance Survey Act* of 1841 gave the surveyors new rights to enter private property; the Ordnance Geological Survey was founded in 1836 as a branch of its parent organization, making a valuable contribution to industry and science; the coming of the railways from the 1840s demanded constant revision of existing maps in an ongoing process as big as the original triangulation survey and the Survey then prepared maps of France and Belgium during the Great War 1914-1918.

In the 1920s the Ordnance Survey expanded its range of maps for the leisure market and in 1920 it showed its concern for the interpretation of the historical landscape and how mapping could enhance this when it appointed an Archaeology Officer who was to develop the use of aerial photography as both a mapping tool and as an archaeology tool.



10. Prehistoric fields near Lamb Lea Woods revealed by aerial photography (©Historic England)

But most importantly the Ordnance Survey became the standard which the British public also embraced, with its instantly recognizable symbols and later its now familiar colouring. School-children were taught to read these symbols and though there had been folding versions of maps since the late 18th century, even the covers of the different Ordnance Survey series of folding maps became as familiar as any other household brand. That it had become such was an indication of the depth of penetration of British society that the 18th century Triangulation Survey had reached in 150 years.

In the 20th century the pioneering collaboration between aviators and photographers brought, quite literally, a new dimension to cartography. Finding an immediate reconnaissance role above the trenches in the Great War aerial photography would go on to aid archaeologists on the South Downs in better and more accurate identification of earthworks previously only seen from the ground. LiDAR images have now revealed those features on the landscape which were obscured by the tree cover and in the project area thousands of years of this new evidence of human habitation, often layered one on top of the other, are now at the disposal of archaeologists and historians.



11. Goblestubbs Copse, the triangular area centre-left (Map data ©2016 Google)



12. LiDAR imageshowing evidence of settlement at Goblestubbs Copse (©Historic England)

An important example of this evidence can be seen where LiDAR imaging has revealed late-Iron Age/Roman settlement enclosures and trackways in Goblestubbs Copse just north of the A27 outside Arundel. When interpreted and enhanced with coloured overlaying we can see the settlement and the tracks connecting the enclosures. Evidence of other earlier enclosures and fields can also be seen in the image below.¹²



13. An enhanced LiDAR image of Goblestubbs Copse (©Historic England)

Furthermore, a Roman road from Chichester to Brighton and possibly beyond which was little more than speculation for a generation, has also be revealed by LiDAR images taken for the *Secrets of the High Woods* project. The route, leaving Stane Street at Maudlin and passing through Fontwell, travels south of the A27 opposite Goblestubbs Copse through Binsted and Tortington woods.¹³

At one level such developments are little more than the realization of an image of the landscape that cartographers have craved and simulated for centuries. LiDAR is thus the latest tool available to the many professionals - archaeologists, historians, estate managers, engineers, solicitors, politicians - who need to know what lies beneath our feet, and the laymen to whom this information invariably cascades in the form of maps.

From William Saxton's 1575 map of Sussex to the LiDAR images of the wooded estates taken in the western part of the county in 2015 we can trace a common desire to depict the landscape in a way that enables us to better understand its shape, its scale and its detail. What is less obvious is a desire to describe human activity in that landscape, yet all but specialist scientific maps,

¹²E. Carpenter et al (National Mapping Programme), The High Woods from above, Research Report Series n0.14, 2016, (Historic England, 2016)

¹³ I. Margary, 'The Chichester-Brighton Roman road' in Sussex Notes and Queries, vol XI, no.8 (1947), p.161;

such as those describing the geology beneath that landscape, do record human activity even if it is at the level of applying place-names to specific points on the map.

While engravers, cartographers, photographers and digital technicians have much in common, they have invariably been employed for very different purposes. It is this variety of purpose which both enriches and obscures our reading of their maps because like the cartographers, we turn to these maps with our own very different reasons for studying them.

John Henderson

November 2016

Further reading

Peter Brandon, *The South Downs*, (Chichester, 1998)

Peter Brandon, *The Sussex landscape*, (London, 1974)

E.Carpenter, F.Small, K.Truscoe, C.Royall (National Mapping Programme), *The High Woods from above*, Research Report Series no.14, 2016, (Historic England, 2016)

P.D.A. Harvey, *Maps in Tudor England* (London 1993)

Rachel Hewitt, Map of a Nation, a biography of the Ordnance Survey, (London, 2010)

Paul Hindle, Maps for historians, (Chichester, 1998)

Paul Hindle, Roads and tracks for historians, (Chichester, 2001)

David Kingsley, Printed Maps of Sussex, (Lewes, 1982)

Kim Leslie and Brian Short (eds.), An Historical Atlas of Sussex, (Chichester, 1999)

I. Margary, 'The Chichester-Brighton Roman road' in *Sussex Notes and Queries*, vol XI, no.8 (1947)

Nick Millea, The Gough Map, the earliest map of Great Britain? (Oxford, 2007)

R.A. Skelton and Harry Margary (ed.), *Two Hundred and Fifty years of Map-making in the County of Sussex, a collection of reproductions of printed maps published between the years* 1575 and 1825, (Chichester, 1970)

F.W. Steer, A catalogue of Sussex Estate and Tithe Award Maps, (Lewes, 1962)