The background of the title page is a detailed engraving of a landscape. On the left, a river flows through a wooded area. In the center, a large, leafy tree stands prominently. To the right, another large tree is visible. In the distance, a castle or fortified building sits on a hill. The entire scene is rendered in a fine, detailed style typical of 18th-century book illustrations.

BY PERMISSION,
*To His Royal Highness,
George Prince of Wales,
Duke of Cornwall & Rothesay,
and Earl of Chester, &c. &c.*
This Survey of the County Palatine of
CHESTER,
is most humbly Dedicated,
*by His Royal Highness's
most Devoted Servant,*
P. P. Burdett.

Two hundred years ago the publication of Burdett's map provided the people of Cheshire with the first authentic survey of their county since 1577 and the first detailed survey ever. At a scale of 1 inch to 1 mile it vividly portrays the Cheshire landscape on the eve of a period of great change, recording villages, hamlets, country houses and parks, woodlands, commons, watermills, and many other features in far more detail than any written history. It is an indispensable document for the historian of Cheshire. The introduction outlines the history of how it was made and illustrates the ways in which it can tell us about late eighteenth-century Cheshire.

This volume is published by the Historic Society of Lancashire and Cheshire. The map facsimile is also available in four large sheets, as originally published in 1777, protected by a cardboard tube. Volumes and sheets may be obtained from:
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Also published by the Historic Society, William Yates's *Map of Lancashire, 1786*.



The Historic Society
of Lancashire and
Cheshire

LIVERPOOL

THE HISTORIC SOCIETY OF LANCASHIRE AND CHESHIRE
Occasional Series Volume 1

A SURVEY OF
THE COUNTY PALATINE OF CHESTER

P. P. BURDETT

1777

Reprinted in Facsimile with an Introduction by
J. B. HARLEY and P. LAXTON

Printed for the Society by
LUND HUMPHRIES

1974

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Council and officers of the Historic Society 1974

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Abbreviations

CRO	Cheshire County Record Office
THSLC	Transactions of the Historic Society of Lancashire and Cheshire
TLCAS	Transactions of the Lancashire and Cheshire Antiquarian Society
RSA	Royal Society of Arts

EDITORIAL NOTE

This facsimile edition of P. P. Burdett's *Survey of the County Palatine of Chester* is the first occasional volume to be published by the Historic Society and is supplied to members this year instead of the usual volume of *Transactions*. The map is also available as a set of four large sheets, the format in which the original was published in 1777. It is reproduced at a scale of exactly 1 inch to 1 mile.

Grateful acknowledgement is made to the City of Chester Library for the loan of an original copy from which this facsimile has been taken, and thanks are due also to the National Library of Wales for the loan of their copy of the map when this publication was first considered. The idea of reproducing the map was first conceived by J. J. Bagley and the editors are grateful for his constant encouragement. The Council of the Historic Society would especially like to thank Cheshire County Council and the University of Exeter for generous grants which greatly assisted publication.

The Society owes a debt of gratitude to the joint authors of the introduction both for their study of Burdett and his survey, and for their advice and guidance on the publication. Thanks are also due to Messrs Lund Humphries who have been most accommodating and helpful in printing this historic record of Cheshire.

P. J. BUCKLAND

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University of Liverpool

May 1974

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Peter Burdett's Map of Cheshire, 1777: The Theory and Practice of an Eighteenth-century County Survey

Introduction

Burdett's survey and the printed maps of Cheshire

Among nearly 700 separate printed maps of Cheshire relating to the period from 1577 to 1900¹ only a handful were based on systematic and first-hand surveys of the countryside. If we confine our review to maps ranging from the publication of Christopher Saxton's survey in 1577, to 1833, when the first Ordnance Survey sheet relating to part of the county was published, then the list is even shorter and comprises:

1577	Christopher Saxton	c. $\frac{1}{2}$ inch to 1 mile
1777	Peter Burdett	1 inch to 1 mile
1819	Christopher Greenwood	1 inch to 1 mile
1830	William Swire and W. F. Hutchings	$\frac{3}{4}$ inch to 1 mile
1831	Andrew Bryant	1 $\frac{1}{4}$ inches to 1 mile
1833-43	Ordnance Survey	1 inch to 1 mile

It will be seen that between Tudor and Georgian times the gap in the topographic record of the Cheshire landscape is especially large, in which respect it is worse served than some other English counties,² and the appearance of Peter Burdett's map exactly 200 years after Saxton's is an especially important event in its cartographic documentation. All earlier 17th- and 18th-century maps, many of them at smaller scales and published in general atlases of the counties of England and Wales, were almost wholly derivative as far as the basic matrices of their topography were concerned. Although they sometimes contained more up-to-date information on particular features – such as roads, town plans, and coastal sandbanks copied from specialised surveys – their foundation was still Saxton and such modern characteristics as they displayed were frequently only window dressing by the London map sellers to disguise the obsolete nature of their geographical raw materials.³ Even with the publication of Burdett's map, an era of regular topographical surveys was not initiated and it remained the standard map of the county – subject to widespread plagiarism – for almost another half century. A 'revised' edition, described below, was printed from the copper-plates in 1794. Only after the end of the Napoleonic wars, as the publication programme of the Ordnance Survey began to gather strength, was it replaced by fresh original surveys, such as those of Greenwood and Bryant, which sought to 'catch-up' with the accelerating changes wrought in Cheshire by the local effects of industrialisation and agrarian change.

Against such a climate of neglect in original map-making, Burdett's survey, even though it did not inaugurate a completely new age in Cheshire cartography, stands as a remarkable 18th-century achievement. The survey was new in more ways than one. It incorporated some of the latest ideas about county surveying, especially the use of a scientific framework of triangulation on which to plan its detail, while the adoption of the relatively large scale of 1 inch to 1 mile enabled the cartographer to accommodate a new range of conventional signs to depict the face of Cheshire in much fuller detail than had been possible before. Far from being unique in these characteristics, Burdett's map typified the 'new cartography', an epithet which has been applied to the achievements of a general

1. H. WHITAKER, *A descriptive list of the printed maps of Cheshire 1577-1900*, Chetham Society new series 106 (Manchester, 1942).

2. E. M. RODGER, *The large scale county maps of the British Isles 1596-1850* (Bodleian Library, Oxford, 2nd edn, 1972), contains comparable lists for other counties.

3. J. B. HARLEY, 'From Saxton to Speed', *Cheshire Round* 1 (1966-7) pp.174-84; 'Ogilby and Collins: Cheshire by road and sea', *ibid.* pp.210-25; 'Maps of early Georgian Cheshire', *ibid.* pp.256-69. These provide an introduction to some of these maps.

period of innovation in English regional cartography during which, to meet a widespread demand stimulated by improvements in the economic life of the nation, most counties were mapped at larger scales, with improved instruments and more refined techniques.⁴

While it is helpful to note the family relationship with similar events in other counties it would be misleading – and indeed disastrous from the standpoint of the correct interpretation of Burdett's map as a record of the Cheshire landscape – to regard it as merely one of a series of 'standard' 18th-century county maps. The student of the cartography of this century needs to start from very different assumptions than are appropriate (for example) for an examination of present-day Ordnance Survey maps. In particular, before the modern age of standard specifications for surveyors and draughtsmen, and of photo-mechanical reproductions,⁵ printed maps owed much more to the individual skills and preferences, even the idiosyncrasies, of the craftsmen who made them. Many of the critical inputs into the map-making process – and hence the reliability of the maps – were influenced, occasionally capriciously as with some aspects of Burdett's survey, by events and perceptions personal to a single cartographer. This is the justification for the brief portrait of Burdett which follows. It precedes a fuller reconstruction of the theory and practice of his survey, which in turn is followed by a thematic evaluation of Burdett's success (or otherwise) in mapping the principal features of Cheshire in the 1770s.

'The ingenious Mr Burdett'

Peter Pery Burdett was still remembered in the 1780s as an 'ingenious'⁶ man and as a 'celebrated surveyor and mathematician';⁷ that is some twenty years after the publication of the map of Derbyshire on which this reputation rested. Whatever our verdict on his delineation of the Cheshire landscape, in the context of the mid-Georgian period we can hardly deny either his innate ability or his zeal to bring new ideas to practical fruition. Among many who were taking up the opportunities offered by an expanding economy in north-west England at this time, Burdett will always rank as a minor figure, yet in his efforts to bring improved standards into regional surveying, as well as in his attempts to apply his artistic skills to the industrial processes being perfected by Wedgwood, he illustrates the essential supporting role of a host of lesser men in cultural and technological progress. At the same time we can catch glimpses of an impulsive and restless man, whose search for livelihood to match ambition brought him from the Midlands to Liverpool and then took him into the service of the Prince of Baden; in other moments it encouraged him to offer his services to Frederick the Great of Prussia⁸ and, in correspondence with Benjamin Franklin, to range his sights to the North American colonies.⁹ In fact Burdett only lived in Liverpool from 1769 to 1774,¹⁰ and thus a definitive biography is less relevant than an assessment of the salient facts of inheritance and character which probably most impinged on his map of Cheshire. They can be summarised under four headings: his social origins as a gentleman; his scientific aspirations and his knowledge of the theory and practice of regional surveying; his considerable artistic talents; and – more intangible – his unpredictable and erratic tendencies of character.

Facts about Burdett's life and family connections are disappointingly elusive. Whatever the family significance of his Spanish sounding middle name (rendered by some of his contemporaries

4. J. B. HARLEY, 'The re-mapping of England, 1750–1800', *Imago Mundi* 19 (Amsterdam, 1965) pp.56–67.

5. For comparisons with the methods of Burdett's day and a description of modern processes and their constraints see J. B. HARLEY, *Ordnance Survey maps: a descriptive manual* (Ordnance Survey, Southampton, 1974).

6. *Derby Mercury* 23 December 1784.

7. J. THROSBY, *Select views of Leicestershire* (Leicester, 1789) p.137.

8. J. MAYER, *History of the art of pottery in Liverpool* (Liverpool, 1855) p.36.

9. W. T. WHITLEY, *Artists and their friends in England, 1700–1799* (London, 1926), vol.2, p.30; he was a sympathizer with the Revolutionary cause and was the agent by which Baron von Steuben was recommended to Franklin: J. M. PALMER, *General von Steuben* (New Haven, 1937) pp. 82–3. Five out of at least seven letters written by Burdett to Franklin between August 1773 and August 1787 are extant. Burdett originally sought Franklin's opinion on the opportunities in America for his talents both as a surveyor (especially of canals) and artist. We are grateful to William B. Willcox, editor of *The Papers of Benjamin Franklin* for this information.

10. J. B. HARLEY, 'William Yates and Peter Burdett: their role in the mapping of Lancashire and Cheshire in the eighteenth century', *THSLC* 115 (1963) pp.117–19, summarises the evidence for Burdett's Liverpool period.



Plate 1. PHILOSOPHER GIVING A LECTURE ON THE ORRERY. A painting by Joseph Wright c.1764–66. P. P. Burdett is seen sketching on the left.
Reproduced by courtesy of Derby Art Gallery

as Perez),¹¹ the most likely possibility is that he was related to some collateral branch of the household of Sir Robert Burdett of Foremark Hall in Derbyshire, yet he is not recorded in the parish registers there.¹² In the 1750s and most of the 1760s he lived partly in Derby and partly in the Leicestershire home of the 5th Earl Ferrers at Staunton Herald. That he should appear in 1763 as joint signatory with Earl Ferrers on a bond (undertaking to repay Joseph Wright, the Derby painter, a loan of £160 within the year) implies that he was not necessarily his inferior¹³ and as much is confirmed by the social intimacy portrayed in Wright's painting of a 'Philosopher giving a lecture on the Orrery' (Plate 1) in which Burdett, who is taking notes, is grouped with Laurence Roland (1757–1773), son of Robert 6th Earl Ferrers. To the foot-loose Burdett such contacts were obviously useful – not least in the profession of a county surveyor: his access to private property, for example, still as much a trial to some early Ordnance Surveyors as it had been to John Norden in the 16th century,¹⁴ was probably made easier, while his acceptability in the drawing room as well as in the estate steward's office must have been a help as he canvassed the countryside for advance subscribers to his county maps.¹⁵ Both in Derby, and then after 1768 in Liverpool, he would have obtained an easy *entrée* to the tight social, intellectual and business elites of these towns, perhaps with an element of a familiar *quid pro quo* in 18th-century society, so that the rising Liverpool merchant or iron master, always ready to mix or

11. E. R. DIBDIN, 'Liverpool art and artists in the eighteenth century', *Walpole Society* 6 (1917–18) p.65. The name was also spelled Pery.

12. We are grateful to Mr Dudley Fowkes of the Derbyshire Record Office for establishing this fact.

13. W. BEMROSE, *The life and works of Joseph Wright, A.R.A. commonly called 'Wright of Derby'* (London, 1885) p.77, publishes a transcription of the bond.

14. See COLONEL SIR CHARLES CLOSE, *The early years of the Ordnance Survey* (Chatham, 1926; reprinted with an introduction by J. B. Harley, Newton Abbot, 1969) pp. xv, 50, for a hint of the problems faced by Ordnance Surveyors in the early-19th century. On suspicion of the land surveyor in Tudor times see JOHN NORDEN, *Surveyors dialogue* (London, 1607).

15. Apparently not in Lancashire where the failure of subscribers to pay their subscriptions in advance was probably a reason for Burdett abandoning his project to survey that county: see Appendix 3.



Plate 2. SKETCH AND LETTER FROM PETER BURDETT TO JOSEPH WRIGHT. The letter was sent from Liverpool on 4 February 1771 with the sketch for Wright's painting *The Alchemist in Search of the Philosopher's Stone discovers Phosphorus on the reverse*. In a later letter he addresses Wright as 'Dear Joe'.
Reproduced by courtesy of Derby Art Gallery

marry with a good family, would welcome Burdett's aristocratic connections, while from their worldly success he found ways of making money. The known facts of his career after he left Liverpool also seem to presuppose that the map maker was a gentleman. In January 1775 he entered the service of the Markgraf of Baden, apparently as a geographical engineer recruited to direct the first official topographical survey of that state, attaining the military rank of Major, as well as a considerable scientific reputation before his death at Karlsruhe in 1793.¹⁶ It is unlikely that he would have secured such an appointment without powerful friends – especially in view of the cartographical abilities of many continental engineers at this date¹⁷ – and his commission was moreover obtained in an age when rank was given either by purchase or through the personal favour of a noble commander-in-chief.¹⁸

A regrettable lacuna in Burdett's biography is the lack of any details about his education. But however he acquired his mathematical and scientific knowledge, or had cultivated his gifts as an artist, it left him like many of his contemporaries imbued with a lively curiosity for experimental science; a curiosity however which was consistently brought down to earth by a keen interest in the application of scientific discoveries to practical matters. The fad for experimental science is captured in two pictures by Joseph Wright in which Burdett has been identified: the painting of the Orrery – a working model of the planetary system – and 'An experiment on a Bird in the Air Pump'.¹⁹ Such subjects featured as engravings in the scientific literature of the mid-18th century²⁰ and sometimes, as in his drawing for Wright 'The Alchemist', done in his Liverpool period (Plate 2), Burdett researched the scientific background for an artist who insisted that every detail in his paintings, mechanical or natural, was rendered with precision.²¹

Burdett's interest in the practical application of science was also a major influence in his life. In the period of his English county surveys (c.1762–1774), he can perhaps be characterised by his moving if not in the centre at least in the penumbra of the Lunar Society of Birmingham whose members embraced as their mutual interest '... the sciences, pure and applied – particularly as applied to the problems of industry'.²² Burdett's contacts, reaching over surveying, art and industry, gave him introductions to some members of the Lunar Society,²³ while in Liverpool he rubbed shoulders with the sort of men who subscribed to the aims of the Warrington Academy – offering a mathematical and scientific curriculum as opposed to the classical bias of the public schools and the two English universities.²⁴ It was, then, in the culture of the local 'philosophical' society²⁵ that Burdett was nurtured and to which general background we may relate his projects. His experiments with aquatint engraving, for example, as a means of printing decoration on pottery, reflect a nice blend of art and science with a practical objective in mind, but it is also likely that Burdett would have regarded his county surveying, especially its trigonometry, as fulfilling a similar role, that is the application of mathematics to the 'improvement' of a branch of 'geography' (i.e. map making).

16. A. SCHÄFER, 'Die erste amtliche Vermessung und Landesaufnahme in der Markgrafschaft Baden im 18. Jahrhundert', *Veröffentlichungen der Kommission für geschichtliche Landeskunde in Baden-Württemberg*, Reihe B, Band 46 (Karlsruhe, 1968).

17. In the mid-18th century recruitment was usually in the opposite direction with continental surveyors being accepted for service, especially with the British army.

18. B. BOND, *The Victorian army and the Staff College, 1854–1914* (London, 1972) pp.8–11, discusses the aristocratic origins of the officer ranks in European armies, although admission to the 'scientific corps' or artillery and engineers was somewhat freer.

19. B. NICHOLSON, *Joseph Wright of Derby. Painter of Light* (London, 1968) vol.1, pp.111–22, discusses the context of these paintings and illustrations.

20. *Ibid.* p.115.

21. *Ibid.* pp.118–20.

22. R. E. SCHOFIELD, *The Lunar Society of Birmingham. A social history of provincial science and industry in eighteenth-century England* (Oxford, 1963) p.3. For a critical discussion of some of Schofield's views see A. THOMPSON, *The dynamics of the industrial revolution* (London, 1973) pp.79–92.

23. Notably Wedgwood, but probably others such as Erasmus Darwin who were known to Wright.

24. On the role of such academies see SCHOFIELD (1963) pp.10–11. On the Warrington Academy see W. TURNER, *The Warrington Academy* (1813–15; reprinted with an introduction by G. A. Carter, Warrington, 1957). Its curriculum is discussed in J. W. A. SMITH, *The birth of modern education: the contribution of the dissenting academies 1660–1800* (London, 1954) p.161. Dr William Enfield, whose book Burdett illustrated (footnote 32), was a tutor at the Academy in the 1770s.

25. T. KELLY, *Adult education in Liverpool* (Liverpool, 1960) discusses the early development of Liverpool learned societies in the 18th century. The Liverpool Philosophical and Literary Society was founded in 1779 (p.11).

Above the triangulation diagram on the Cheshire map (section VII) he explained how he 'Submitted [it] to the Inspection, and intended for the use of the curious in Geography' – clearly the sentiment of a man who hoped to impress his scientific contemporaries, moreover, at a time when trigonometrical surveying was attracting the attention of a number of members of the Royal Society.²⁶

That Burdett the artist was esteemed as a practitioner in his own right is indicated by the fact that in 1769, shortly after his establishment in Liverpool, he was elected first President of the Liverpool Society of Artists;²⁷ and, between 1770 and 1773, he exhibited at the Society of Artists in London some of the first aquatints to be produced in England.²⁸ But even in the role of artist it is significant that his work was often practical in intent – as in the service he offered to Wright by the provision of rough drawings for some of his subjects;²⁹ as in the advice he gave him in the technicalities of perspective;³⁰ as in his drawings of dead game for use by Wedgwood on pottery – the cause of an acrimonious correspondence;³¹ and not least as in his superb drawings of public buildings in Liverpool done for Enfield's history.³² Again he is not just a good draughtsman but one who was *au fait* with theory, for Enfield acknowledged that 'For the preceding remarks on *Architecture* of the Public Structures, the Editor is indebted to the ingenious Mr. Burdett.'³³

Such artistic ability had direct relevance to topographical surveying and, in fact, the combination of artist and cartographer was not uncommon in the 18th century. While some county surveyors such as John Rocque,³⁴ and indeed many more surveyors of private estates,³⁵ were often excellent draughtsmen and colourists, the dual skills of surveyor and artist were perhaps most carefully cultivated in military survey. This could help to account for the recognition of Burdett's qualifications in Baden. At Woolwich Academy, for example, the officers training for the artillery and engineers³⁶ had both landscape drawing and surveying in their curriculum, and could count among their masters Paul Sandby, who had worked as a draughtsman on Roy's famous military survey of the Scottish highlands (1747–1755).³⁷ Regional surveying was literally an art as well as a science in the 18th century, with sketching in the field, especially of hills, being a major supplement to observations made by instrument.

Burdett as an engraver is also relevant to the Cheshire map. His advanced knowledge of the aquatint process may have been acquired on a tour of France in 1771³⁸ and, although his claim to

26. William Roy was elected a member of the Royal Society in 1767, the year of publication of Burdett's Derbyshire. This interest culminated in the foundation of the Ordnance Survey in 1791 as the 'Trigonometrical Survey of England and Wales'; CLOSE (1926) pp.5–24, gives some of the background. See also R. A. SKELTON, 'The origins of the Ordnance Survey of Great Britain', *Geographical Journal* 128 (1962) pp.419–22.

27. J. MAYER, *Early exhibitions of art in Liverpool* (Liverpool, 1876) p.23.

28. NICHOLSON (1968) vol.1, p.117.

29. *Ibid.* pp.118–19.

30. *Ibid.* p.120.

31. A. FINER and G. SAVAGE (eds.), *The selected letters of Josiah Wedgwood* (London, 1965) pp.115–19, print letters documenting the relationship with Burdett. Five letters from Burdett to Wedgwood (in the Wedgwood Museum, Barlaston, Stoke-on-Trent) supplement the printed correspondence.

32. W. ENFIELD, *An essay towards the history of Liverpool* (Liverpool, 1773). The eight illustrations concerned are: the Customs House; the Exchange (dated 1770); the Poor House (dated 1770); the Sailors Hospital; the Blue Coat Hospital; St Paul's Church; St Thomas's Church; St Peter's and St Nicholas's Churches.

33. *Ibid.* p.62.

34. J. VARLEY, 'John Rocque. Engraver, surveyor, cartographer and map-seller', *Imago Mundi* 5 (Amsterdam, 1948) pp.83–91; A. HORNER, 'Cartouches and vignettes on the Kildare estate maps of John Rocque', *Quarterly Bulletin of the Irish Georgian Society* 14 (1971) pp.57–76. But cf. H. PHILLIPS, 'John Rocque's career', *London Topographical Record* 20 (1952) p.10.

35. See for examples the illustrations in: F. G. EMMISON (ed.), *Catalogue of maps in the Essex Record Office, 1566–1855* (Chelmsford, 1947); F. HULL (ed.), *Catalogue of estate maps 1590–1840 in the Kent County Archives Office* (Maidstone, 1973). The ability of some 18th-century estate surveyors as topographical artists is also brought out by P. EDEN, 'Land surveyors in Norfolk 1550–1850', *Norfolk Archaeology* 35 (1973) pp.480–1.

36. W. D. JONES (ed.), *Records of the Royal Military Academy* (Woolwich, 1851) *passim*, gives contents of the syllabus.

37. A. P. OPPÉ, *The drawings of Paul and Thomas Sandby in the collection of His Majesty the King at Windsor* (Oxford and London, 1947) pp.4–8. See also D. G. MOIR, 'A history of Scottish maps', *The early maps of Scotland to 1850* (Royal Scottish Geographical Society, Edinburgh, 1973) pp.103–12.

38. NICHOLSON (1968) vol.1, p.117.

have discovered 'A Mode of Etching, hitherto unknown in this country . . .'³⁹ was probably an exaggeration, he was certainly a pioneer of the technique. He also conceived the notion of etching plates to be printed on pottery and his approach to Wedgwood in November 1771 claimed a new method.⁴⁰ The experiments and the contact came to nought but the experience thus gained may have encouraged him to attempt the engraving of the Cheshire map. For Derbyshire, Burdett sent the final drawings of his map to the workshop of Thomas Kitchen, a leading London engraver, but for Cheshire a note on the map tells us 'The Roads Meres & Commons of this Map were engraved by P. P. Burdett and the rest by T. Billinge of Liverpool' (section XVI). The result, especially as far as minor roads, were concerned, is rather indifferent which implies Burdett's unfamiliarity with map engraving as opposed to etching.⁴¹ It is possible that he chose to engrave the map himself to avoid the heavy expense of a professional engraver rather than from any love (in this instance) of technical experiment.

A third albeit rather speculative 'artistic' influence may have filtered into the map as a result of Burdett's attitude towards industrial landscape. The period when he was in close touch with Wright and his circle, was also one when a number of English artists – including Sandby again – were finding inspiration in industrial scenes as well as in rustic landscapes.⁴² In 1771–2, for example, Wright was painting 'The Forge' and 'The Blacksmith's shop' – both epitomes of the fascination which industrial machinery, a symbol of the early industrial revolution, held for artists (and for that matter members of the Lunar Society). There can be little doubt that Burdett was on the same wavelength as some of his fellow artists and thus – to a certain extent – as the artist so also the surveyor. It may be more than a coincidence that, as noted in a later section, iron forges were located with particular care and completeness on Burdett's map of Cheshire.

There is, as a final biographical consideration, the enigma of Burdett's character. That he was possessed of great natural talents as well as a certain inborn restlessness will already be clear. The fact that in one year he abandoned his proposed survey of Lancashire and a few years later took up an identical project in Cheshire may point to his impatience in the face of difficulties or slow results.⁴³ And, as in his sharp exchange of letters with Wedgwood, in which he became 'insolent and violent and exacting',⁴⁴ a fieriness as well as ingenuity could sway his transactions. But his main personal problem seems to have been one of cash, for although endowed with the breeding and education of a gentleman, there are signs that he had to subsist on the income of an artisan. He was always seeking to make his fortune – through art, through industry and through surveying – and this constraint of having to earn a living is the key to his mobility as well as to other aspects of his work. It explains his relatively brief sojourn in Liverpool; it could account for the practical and often explicitly commercial nature of his scientific and artistic projects; and it seems to be conclusively confirmed by his record of debt. The bond with Earl Ferrers owed to Joseph Wright was never redeemed;⁴⁵ and Wright had received news in 1774 that 'M^r Burdett has sold up his goods and is off. M^r Burdett . . . [is] gone into lodgings, over head and ears in debt.'⁴⁶ At this time he ought to have been finishing the map of Cheshire; it explains why both the survey and engraving were completed by other hands.

The original map and its variants

Before considering the survey techniques adopted by Burdett and measuring the success they achieved, a description of the physical format of the map, together with an account of the circumstances of its publication and variant 'editions', is included to bring the objective of the survey into sharper

39. See under Burdett in *Candid observations on the principal performances at the new rooms of the Society of Artists . . .* (London, 1772).

40. NICHOLSON (1968) vol. I, p. 118; FINER and SAVAGE (1965) pp. 116–19.

41. This constraint could have restricted the range of symbols which Burdett could use on the map and explain, for example, his failure to show open roads by fine dotted lines. See below p. 18.

42. F. D. KLINGENDER, *Art and the industrial revolution* (ed. and rev. by Sir Arthur Elton, London, 1968), especially pp. 43–103, where there is a full discussion of the influences on the painting of both Joseph Wright and Paul Sandby.

43. From their reading of the correspondence with Wedgwood, FINER and SAVAGE (1965) pp. 120–1, decided that 'Burdett was a self-opinionated and unpleasant character, and lacked stability and strength of purpose'.

44. E. METEYARD, *The life of Josiah Wedgwood, from his private correspondence and family papers* (London, 1866) vol. I, p. 233. Wedgwood's biographers seem to have taken his side against his detractors!

45. BEMROSE (1885) p. 78.

46. *Ibid.* pp. 77–8.

focus. Compared with that of many 18th-century county maps the publication history of Burdett's Cheshire is relatively straightforward. On 1 January 1777 the *Manchester Mercury*⁴⁷ carried the following announcement:

This Day is Published Dedicated (by Permission) to his Royal Highness George, Prince of Wales A New and correct MAP OF THE County Palatine of CHESTER From an actual Survey thereof, in the Years 1774 & 1775. By P. P. BURDETT This Map is neatly engraved on Copper, and printed on four Sheets of Elephant Paper, on the Scale of one Inch to a Mile, wherein are accurately delineated, all the Roads, Rivers, Navigable Canals, the Division of Hundreds, and the Situation of Noblemen and Gentlemen's Seats &c. &c. Price in Sheets . . . 2l.2s.0d. On Canvas and Rollers . . . 2l.11s.6d. Sold by C. Bowles, in Cornhill, and A. Drury, in Duke's-Court, St. Martins-Lane, London, by the Book sellers of Chester, Manchester, and Warrington, by T. Billinge, Engraver, in Castle-street, and James Parker, in Lord-street, Liverpool.

Of the two formats described in this advertisement, the fully mounted copies on rollers – like all wall maps in everyday use⁴⁸ – stood little chance of withstanding the wear and tear of 200 years and most surviving copies⁴⁹ are either in the original four sheets or on linen dissected and folded. The scale of the map is fractionally less than its stipulated 1 inch to 1 mile (the scale bar of 6 miles measures 5.88 inches on the original copies)⁵⁰ and further evidence of departure from the theoretical standard is provided by the fact that the four sheets vary in size. The vertical neat lines range between 543mm and 552mm and the horizontal between 724mm and 732mm so that the adjoining sheets cannot be precisely matched, a not uncommon feature of such 18th-century county maps, and one, moreover, of which Burdett was conscious: in justifying his Derbyshire map before a committee of the Society of Arts in 1767, he explained how 'his Survey was drawn on the Plate upon a scale of one Inch to a Mile, but in Printing off from the Plate on Paper there is a small contraction'.⁵¹ The observation is entirely valid. Burdett had put his finger on a basic technical problem which the Ordnance Survey had still failed to solve over a century later when it despaired of the fact that its large-scale plans embodied 'distortion [which] was not uniform in any one direction or in any one part of the map'.⁵² Other discrepancies, however, involving lack of accord between topographical features crossing sheet lines, are owing to lapses on the part of the draughtsman or engraver. The hachuring of Helsby Hill, for example, ceases abruptly at the bottom edge of the north-west sheet; but although Burdett overran the neat line on the right-hand side of the south-west sheet, there is no other engraving outside the neat lines and fully mounted copies contain all the information on the map.

None of the copies examined by the authors is watermarked and there are no chain lines in the paper. This might imply a paper of local origin and fairly indifferent quality⁵³ – all the impoverished cartographer or the inheritor of his project felt able to supply – and certainly there is no evidence, as with maps of other counties, of presentation copies printed on fine paper or vellum.⁵⁴ Nor can we estimate how many copies were printed initially since no accounts or lists of subscribers have survived.

47. A similar notice in *Adams Weekly Courant* 7 January 1777 advertised the price as 1l.1s.0d or 1l.11s.6d.!

48. R. A. SKELTON, *Maps: a historical survey of their study and collecting* (London and Chicago, 1972) pp.26–33.

49. See Appendix 2.

50. The scale in this facsimile is very slightly larger than in the original copies, the scale bar being 6.0 inches as Burdett had originally intended.

51. RSA, minutes of committee (Polite Arts) 5 June 1767.

52. *Report of the progress of the Ordnance Survey to the 31st March 1896* (London, 1896) p.11.

53. Before the general availability of wove paper the lack of a watermark and 'chain' or 'laid' lines would normally indicate poorer quality paper: E. J. LABARRE, *Dictionary and encyclopaedia of paper and paper-making* (2nd edn, Amsterdam, 1952) p.332.

54. W. L. D. RAVENHILL, Introduction to *Benjamin Donn: a map of the county of Devon 1765* (Devon and Cornwall Record Society and University of Exeter, Exeter, 1965) p.11, cites the evidence for copies printed on vellum. All the copies seen by Professor Ravenhill had Whatman watermarks. The advertisement of Burdett's map of Derbyshire which appeared in the *Derby Mercury* 24 April 1767 offered 'A few of the best Impressions on exceeding fine Paper'. No record has survived of any such promise to Cheshire subscribers.

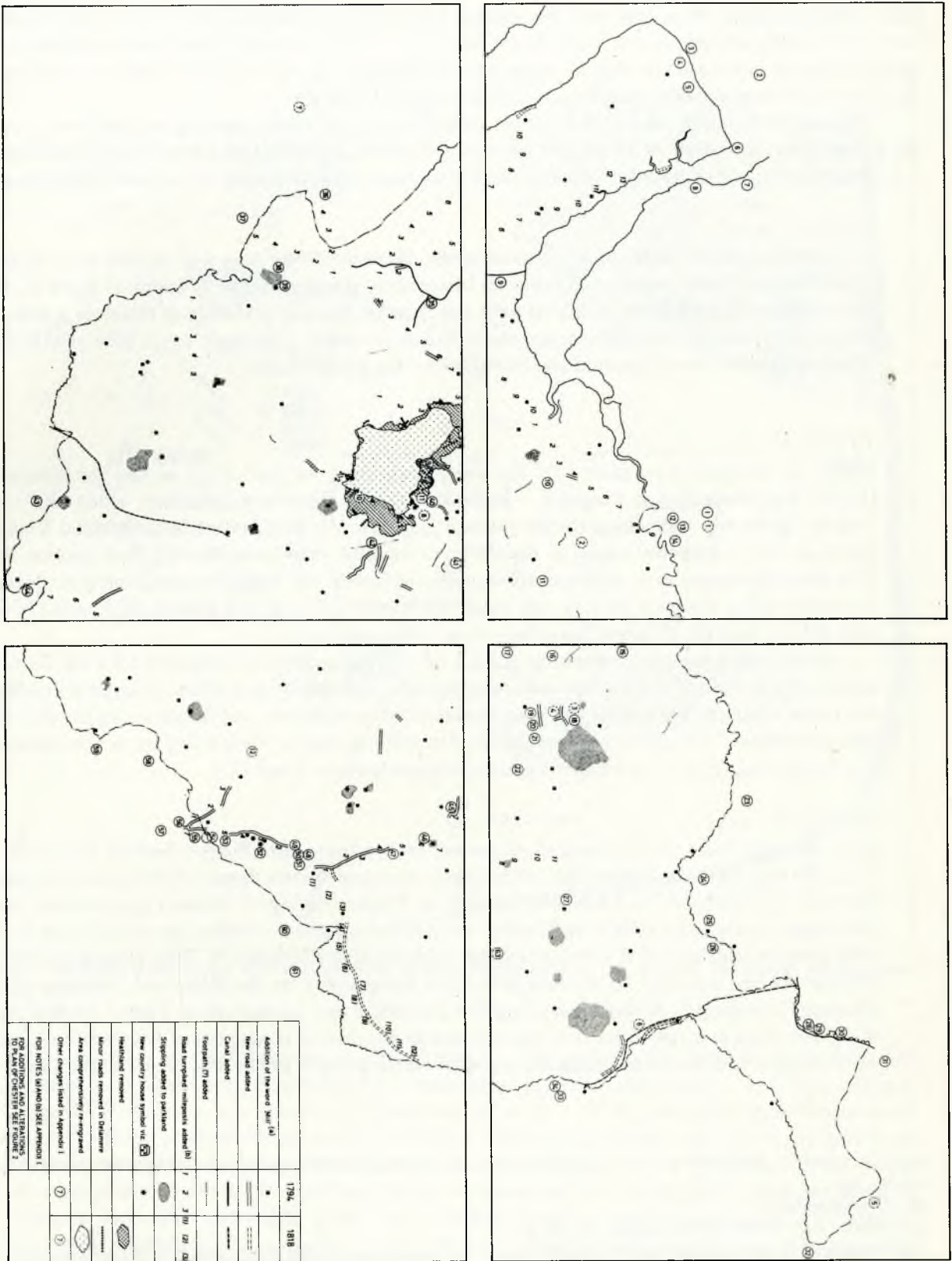


Figure 1. Additions and other changes to the plates by William Faden on the 1794 and 1818 editions.

Most similar county maps had over 200 initial subscribers and several ran to over 500 copies,⁵⁵ but with Burdett's Cheshire our only clue is indirect – the map-maker's own statement about his abortive survey of Lancashire that he required a guarantee of 400 subscribers before he would begin to work.⁵⁶ This may provide some measure of his target in Cheshire.

Turning to the carto-bibliography of the map, four variant states, ranging in date from 1777 to 1818, have been identified. With the first two states, however, issued within a short time of each other, it is incorrect to speak of different 'editions', and in any case only two sheets are subject to variation.

STATE I: 1777

In its earliest known state, as reproduced in this facsimile,⁵⁷ the map was printed without date of publication. Some county and hundred boundaries, specified below as added to State II, and part of the Middlewich branch canal were also missing. An interpretation of this state is that the sheets were printed from the copper-plates before or about 1 January 1777, after which date minor omissions were discovered and corrected for the second state.

STATE II: 1777

Added to the south-west plate are: the date, 'Published 1st Jan^y 1777 as the Act directs'⁵⁸ (below the triangulation diagram – section VII), the Hundred boundary along the river Weaver in the top right-hand corner (section VI), and the Middlewich branch canal from its junction with the Chester Canal at Barbridge to the sheet edge near Weaver Hall (section VI). The only other sheet to be affected is the north-west, with the additions comprising the county boundary along the river Mersey, the boundary between Wirral and Eddisbury Hundreds just west of Ince, and the Hundred boundary along the river Weaver.

Some copies have been made up of *STATE I* of the north-west sheet and *STATE II* of the south-west, a result of the printer making up whole maps simply by pulling off single sheets from the plates when the immediate stock position made this necessary, and disregarding the fact that the correction of one plate was incomplete. On this argument, 'mixed' copies, unless old stock was being used up, may be regarded as intermediate between *I* and *II*.

STATE III: 1794

Even the 1777 states of the map had, of course, been printed after Burdett had left Liverpool in 1774. He may have disposed of the partly-engraved copper-plates to pay off debts and thereafter they were probably held in Liverpool, possibly by Thomas Billinge.⁵⁹ Before 1794, however, they were again up for sale and if they followed the path of a number of other provincial maps in the 18th century, this was in a London auction room such as Christie's.⁶⁰ They were acquired by William Faden, successor to Thomas Jefferys as Geographer to the King and inheritor of his Charing Cross shop.⁶¹ As the leading London map-seller and cartographer, Faden stocked most of the new county maps of the 18th century and to increase his monopoly of this trade he bought up the copper-plates of these maps whenever a chance arose.⁶² There is no record of the Cheshire

55. J. B. HARLEY, 'The Society of Arts and the surveys of English counties 1759–1809', *Journal RSA* 112 (1963–4), pp.271, 541.

56. See Appendix 3.

57. From a copy in Chester City Library, H 1B 150.

58. A reference to the Copyright Act. Not until 1734 did an English statute offer legal protection to the owner of copy-right in an engraved map or chart: R. A. SKELTON, *Decorative printed maps of the 15th to 18th centuries* (London, 1965) p.9.

59. For some details of Billinge see J. B. HARLEY, Introduction to *A map of the county of Lancashire, 1786 by William Yates* (facsimile edn, Historic Society of Lancashire and Cheshire, 1968) pp.13–14.

60. *Derby Mercury* 23 December 1784, records that the copper plates of Burdett's Derbyshire 'were sold out last week by auction, at Mr. Christies in Pall Mall'. For other evidence see HARLEY (1965), p.67.

61. On Jefferys and Faden see J. B. HARLEY, 'The bankruptcy of Thomas Jefferys: an episode in the economic history of eighteenth century map-making', *Imago Mundi* 20 (Amsterdam, 1966) pp.27–48.

62. His success in this activity is confirmed by his catalogue of 1822: W. FADEN, *Catalogue of the geographical works, maps, plans &c. Published by W. Faden, 5, Charing Cross, Geographer to His Majesty* (1822. Reprinted by the Map Collectors' Circle, no date).

of his ageing investment. Far fewer changes had been made to the plates than in 1794 with the notable exception of the area of Delamere Forest; here some twenty square inches of the south-west plate were beaten out and completely re-engraved (Figure 1). The new material was derived from the same source as that used by Greenwood, probably the enclosure map accompanying the award of 1819 or an earlier version of it.⁶⁴ Whatever the impact of Greenwood's survey on the sales of Burdett's Cheshire, Faden was still advertising the map – with the four sheets offered at £1 in his catalogue of 1822.⁶⁵ The plates may have been sold as scrap, along with those of many other 18th-century county maps, when Faden retired from business in 1823.

Reduced version of Burdett: 1794

In 1794 William Faden and James Stuart of Chester each published a half-scale reduction of Burdett's map. We cannot be sure on whose initiative the project was started but either one or other of the two partners – probably Stuart as he did the engraving – had possession of the finished copper-plate first. This partner then added his imprint to the plate and ran off sufficient copies for his own stock. The plate then passed to Faden who, while leaving Stuart's name as engraver, added his own imprint so that the map could serve the London trade. There are thus, apart from the varying imprints, two identical 'editions' of the 1794 'small Burdett'⁶⁶ – reflecting a convenient way of spreading the risk of publication by the map-sellers concerned.⁶⁷

The Theory and Practice of the Survey

In terms of aspiration, survey technique and format, Burdett's map of Cheshire was imitative of what were recognised in his day to be the most advanced methods of county surveying. To understand the Cheshire survey, however, we need to go back specifically to his map of Derbyshire, surveyed between 1762 and 1767, published in the latter year, and which was his formative experience as a county surveyor. In the early 1760s Burdett could have had several survey models in mind, including techniques and instruments described in some of the latest text books;⁶⁸ the recently completed county maps of John Rocque⁶⁹ and Isaac Taylor;⁷⁰ and even, as an additional spur and example, reports of county surveys in progress as he was planning his Derbyshire.⁷¹ The key concept, however, still working itself out in Cheshire, was undoubtedly derived from the Society of Arts in London. Before Burdett began to map Derbyshire he had certainly seen either the 1759 or 1762 advertisement of the Society which sought to stimulate original mapping in the English counties:

The Society proposes to give a Sum not exceeding one hundred Pounds, as a Gratuity to any Person or Persons, who shall make an accurate Survey of any County upon a Scale of one Inch to a Mile; the Sea Coasts of all Maritime Counties to be correctly laid down together with the Latitudes and Longitudes⁷²

From our later knowledge of Burdett's precarious financial position such a handsome premium

64. *Infra*. p.20.

65. FADEN (1822) p.7.

66. *Map of the County Palatine of Chester. delin. & engr. by James Stuart. Chester, 1794; The County Palatine of Chester reduced from the large survey, in four sheets, by P. P. Burdett. Copied and engraved by James Stuart, Chester. London, published by W. Faden, Geogr. to His Majesty and to H.R.H. the Prince of Wales, Charing Cross, Sept. 1st. 1794.* See WHITAKER (1942) p.88.

67. Such partnerships were common in the 18th-century London map trade: J. B. HARLEY and D. HODSON, Introduction to *The Royal English atlas: eighteenth century county maps of England and Wales by Emanuel Bowen and Thomas Kitchin* (facsimile edn, Newton Abbot, 1971) pp.7–13.

68. A. W. RICHESON, *English land measuring to 1800: instruments and practices* (Society for the History of Technology and M.I.T. Press, Cambridge Massachusetts, and London England, 1966) pp.142–88, for a summary of some of the alternatives.

69. P. LAXTON, Introduction to *A topographical map of the county of Berks, by John Rocque . . . 1761* (facsimile edn, Lympne, Kent, 1973). Rocque also published maps of: Shropshire (1752); Middlesex (1754); Surrey (c.1768).

70. Taylor published maps of: Herefordshire (1754); Hampshire (1759); Dorset (1765); Gloucestershire (1777).

71. For example those of Benjamin Donn and Thomas Jefferys.

72. HARLEY (1963–4) p.45, reproduces the original advertisement.

may have attracted him into county surveying. Soon after the appearance of the second notice in the newspapers, the Society of Arts' minutes for December 1762 recorded his wish to be a 'Candidate for the Premium on a survey of the County of Derby'.⁷³ The Derbyshire map was accordingly prepared to the Society's specification. It was dedicated to the 'Right Hon. and Learned the President and Members of the Society for the Encouragement of Arts', while in both his published proposals and on the map itself he stressed that he had met the criteria of observing latitude by 'Astronomical Observations',⁷⁴ and that he had likewise proceeded to survey by a system of triangulation and was producing the final map at the prescribed scale of 1 inch to 1 mile.

It was this model of what a county map ought to be, doubtless enshrined by the receipt of the Society of Arts' premium, which Burdett brought to Liverpool in 1768 and indeed the prospect of a sequel may have influenced his decision to leave Derby. The proposals for his intended Lancashire map give ample confirmation that he was translating the ideas of the Society of Arts into another county:

It has long been a Matter of very just Complaint, that amidst the general Improvements of all useful Arts and Sciences, and particularly in Geography, for which this Country has been so remarkably distinguished, that England should be the only Part of His Majesty's Dominions of which we have not a correct Map: It is true, *new* Maps of England are daily published; but it is equally notorious, that they only serve to transmit to us the Errors of those from which they were copied, and generally with *new* ones – Sensible of this many public spirited Gentlemen, in different Parts of this Kingdom, have encouraged the taking [of] actual Surveys of their respective Counties, from which correct and elegant Maps have been made on a large Scale. We have thus obtained very good Maps of several Counties, and many more are now preparing – These laudable Works have also received great Encouragement from the Society of Arts . . .⁷⁵

We can thus take it for granted that the same cartographical ideas were carried over into the Cheshire survey, but if further proof is sought for parallels between the maps of Derbyshire and Cheshire then it will be found in their conventional signs and in the notes accompanying the triangulation diagrams. Apart from the inclusion of some symbols particular to each county,⁷⁶ the former point to very similar terms of reference in the topographical surveys: the latter are identical.

Burdett thus approached Cheshire with a clear concept of what he intended to do and, moreover, with adequate experience to execute it. Although he finally abandoned the Lancashire survey sometime after February 1771,⁷⁷ he had been keeping his eye in as a surveyor. In 1769 he had surveyed a route for the Liverpool promoters of the Leeds and Liverpool Canal⁷⁸ – a task which involved a technique of precise levelling which the Society of Arts also hoped to encourage;⁷⁹ in 1771 he had surveyed and published a chart of the harbour of Liverpool;⁸⁰ and, in the same period, he was associated with Thomas Boydell in the production of a plan of the river Dee.⁸¹ Sometime in 1771 or early in 1772 his thoughts must have been turning to the survey of Cheshire.

73. RSA, minutes of committee (Polite Arts) 8 December 1762.

74. *Proposals for publishing by subscription, a map of Derbyshire, from an actual survey, by P. P. Burdett . . .* (1767) broadsheet in Derby Public Libraries.

75. Lancashire Record Office, DDHe 61/22; printed in HARLEY (1964) pp.129–30.

76. In Derbyshire, 'Smelting Cupola' and 'Lead Mines'; in Cheshire, 'Salt Works' and 'Lakes or Meres'.

77. In February 1771 it was still advertised as in progress; see Appendix 3.

78. J. R. HARRIS, 'Liverpool canal controversies, 1769–1772', *Journal of Transport History*, 2 (1956) pp.158–74.

79. RSA, minutes of committee (Polite Arts) 24 March 1759. In addition to the premium for county maps a further gratuity was offered for 'an exact and accurate Level of the Rivers in any County Surveyed that are capable of being made navigable'.

80. P. P. BURDETT, *Chart of the harbour of Liverpool with the soundings at low water spring tides* (1771).

81. T. BOYDELL, *A plan of so much of the lands and premises belonging to the River Dee Company, as lye between the City of Chester and the towns of Flint and Parkgate . . .* (1772). The reclamation embankments of 1754, 1763 and 1769 were shown on this plan and were probably incorporated by Burdett into the map of Cheshire, inasmuch as he shows exactly the same areas.

The geodetic survey

As an aid to understanding Burdett's survey we are fortunate that John Ainslie, who was working for Thomas Jefferys as a county surveyor⁸² while Burdett was active in Derbyshire and Cheshire, should have later published a text book incorporating his ideas about county surveying.⁸³ Although this treatise was partly influenced by the early work of the Ordnance Survey, it is substantially a reflection of 18th-century practice and offers a theoretical guide to reconstruct Burdett's techniques. For Ainslie, as doubtless for Burdett, the mapping of a county represented the summit of a land surveyor's profession:

The surveying of a large district or county is an operation so extensive and complicated, as to require the utmost exertion of the surveyor's abilities in every branch of his department. . .⁸⁴

After he began work in Cheshire, probably in 1772, and accompanied by one or more assistants (possibly including William Yates, already a skilled local surveyor),⁸⁵ Burdett's first task was reconnaissance. This would have enabled him to become familiar, in Ainslie's words, with 'the names of the several towns, villages, seats, hills, and other remarkable objects . . . which will prove of the most essential service in the progress of the survey'.⁸⁶ In particular he could have made a preliminary selection of the prominent intervisible points – the 'stations' – to be used in the course of his triangulation and at the same time 'choose a proper piece of ground whereon to measure a base'.⁸⁷ The accurate measurement of a base-line, usually by chain, was an essential foundation to a scientific 'trigonometrical' survey, but in this vital respect a question mark must remain over Burdett's procedure in Cheshire. While George Perry's map of the Environs of Liverpool had earlier specified the measurement of bases, as did Yates in his subsequent survey of Lancashire,⁸⁸ Burdett placed nothing on record. An obvious site for a Cheshire base-line, close to sea level to assist reducing observations to a horizontal plane as claimed in Burdett's diagram, would be along the Dee estuary, but if such a measurement did take place it is not integrated into the main triangulation. Alternatively, there could have been several base-lines: Andrew Armstrong had surveyed County Durham in the 1760s using a large number of measured lines scattered about the county most of them less than 4 miles long. But the other possibility – consistent with an impatient Burdett cutting the cost, his mind already straying to overseas opportunities – is that he managed to link his survey with that of Perry around Liverpool, with Yates's Staffordshire, or with the triangulation of his own Derbyshire. All three had stations in common with the Cheshire survey and this could have obviated the need to measure another base-line.⁸⁹

If this was so then Burdett took his first angular measurements by theodolite from one of these previously established stations. After recording the 'principal bearings' in his field notebook, together with 'a circle of bearings all round',⁹⁰ the instrument would have been moved to the next station, where the observations would have been repeated, and so on till all the stations in the county had been visited. It is this part of the survey, the principal triangulation, of which the diagram engraved on the map provides a skeletal record. It is accurately drawn, showing the main stations and the lines of sight between them, though not all angles are given and it is not possible in all cases to make them tally correctly within the triangles. The missing angle at Beeston Castle for example must be $36^{\circ} 30'$ but this would make the angles in the appropriate triangle $180^{\circ} 30'$. It is also difficult to explain the bearing between Manley Mill and Childwall Summer House taken at Halton Castle: it should be $98^{\circ} 21'$ not $61^{\circ} 6'$. This apart, and ignoring Manchester which is connected with broken

82. J. B. HARLEY and J. C. HARVEY, Introduction to *A survey of the county of Yorkshire by Thomas Jefferys, 1775* (facsimile edn, Lympne, Kent, 1973), gives a list and context of Ainslie's work for Jefferys beginning in 1765.

83. J. AINSLIE, *Comprehensive treatise on land surveying, comprising the theory and practice in all its branches . . .* (Edinburgh, 1812).

84. *Ibid.* p.219.

85. HARLEY (1964) pp.119–20.

86. AINSLIE (1812) p.220.

87. *Loc. cit.*

88. HARLEY (1964) pp.110–11.

89. *Ibid.* diagram p.115.

90. AINSLIE (1812) p.221.



Figure 3. Burdett's geodetic survey. 101 randomly selected features in addition to the triangulation stations in the county are shown in relation to their positions on the first series of the Ordnance Survey. The excellent coincidence of the county boundary with only a few major deviations should be noted.

lines and for which no bearings are given, a total of twenty stations are shown and forty-two lines of sight between them.⁹¹ The only station not named is easily identified as Alderley Edge Beacon and, with the exception of Childwall Summer House, the others can all be located on the map and are within the county – although the *precise* sighting points cannot be traced on the ground especially in the case of hill-top sites. We may assume that 'Chester' refers to the Cathedral tower and that 'Bowden', 'Davenham', 'Acton', 'Sandbach' and 'Malpas' refer to the towers (or spire in the case of Davenham) of their respective parish churches.

The very fact that Burdett was able to carry out such a survey was only possible owing to great advances made during the 18th century in the design and construction of surveying instruments. The manufacture of precise theodolites, capable of taking bearings over long distances correct to one minute of arc or better,⁹² was especially critical in enabling areas as large as counties to be accurately surveyed for the first time. The explanation of the triangulation also informs us that 'Instruments graduated with great Care' were used, possibly those with which Burdett had surveyed Derbyshire. Ainslie had advocated that 'a good theodolite . . . ought to be at least 6 or 7 inches diameter'⁹³ and almost certainly it would have been equipped with a telescope. The average length of sight between principal stations in Cheshire was 9.0 miles, although thirteen rays exceeded 10 miles and the three longest (Chester to Childwall Summer House, Bowden to Lyme Crag, and Chester to Malpas) were just over 13 miles. Whilst these distances seem to be fairly typical of county surveying in the 1770s,⁹⁴ Burdett had sighted almost 40 miles in his Derbyshire survey and Yates, in the 1780s,

91. cf. Leicestershire, a rather smaller county, surveyed by Whyman (once Burdett's assistant) in 1775-7 with nineteen stations and forty-two rays, or Staffordshire, a rather larger county, surveyed by Yates in 1769-1775 with twenty stations and fifty-one rays.

92. RICHESON (1966) pp.142-88. The two vital developments for the 'new cartography' were the achromatic lens and the mechanical graduation of scales, especially vernier scales.

93. AINSLIE (1812) p.221.

94. Cf. Whyman in Leicestershire with an average distance of 8.3 miles. Yates, slightly later, took longer sightings in Lancashire and Warwickshire, and by the turn of the century the Ordnance Survey, equipped with Ramsden's theodolite, were able to use far fewer principal stations. See HARLEY (1965) p.59.

observed Coniston Old Man from Ingleborough – a distance of 32.5 miles. Such observations made telescopes imperative.

The results of Burdett's triangulation must be rated highly and it was at least as good as its counterparts in other counties and better than many.⁹⁵ Even an inspection of the published diagram reveals that the disposition of the triangles gives a good even coverage of Cheshire with few over-acute angles. Only the far north-east and south-central parts of the county are not penetrated by the principal triangulation and we cannot be sure that the diagram is comprehensive. There are no cross checks traversing other rays but again, where stations were intervisible, Burdett may have made further sightings as recommended by Ainslie. It is also possible to subject the survey to independent test by comparing known positions on Burdett's map with the same positions on the first edition of the Ordnance Survey map. As Figure 3 indicates, the coincidence is remarkable, in the siting not only of the principal stations, but also of 101 randomly selected buildings. Indeed, if we make allowance for the size of conventional symbols, scale variation and other factors, in their siting of these features the two maps can hardly be distinguished.⁹⁶ It will also be noticed that there is no recognisable difference between the degree of error found at sites which probably formed apexes in the network of secondary triangles – such as windmills or the tall Perpendicular towers of many Cheshire churches – and those less likely to have been used in this way – including many domestic buildings which, especially in well-wooded country, would have been less useful for taking observations. It is a fair testimony to the consistency of his triangulation that both types of building were accurately positioned by Burdett.

Late 18th-century cartographers, as well as surveying counties as independent units, were conscious of the need to correct their latitudes and longitudes – that is, to ensure that the maps were correctly located in a national system of co-ordinates. Text books, including Ainslie's,⁹⁷ gave instruction on appropriate instruments and their use, and the method was that observations were commonly taken 'astronomically' (i.e. to the sun) at convenient points in the county, and then simply graduated around the border of the map. It was technically possible to measure latitude and longitude to within a few seconds of arc but few county map makers, even if they had sufficiently finely graduated instruments, would have gone to this trouble. Some may have simply graduated the border of the map using the crude measure of $69\frac{1}{2}$ statute miles to one degree and others, simplest of all, merely copied their graticule from an existing map. Burdett's map, despite the excellence of its triangulation, may have been in this last category as far as the trickier calculation of longitude was concerned. Nowhere – as in Derbyshire⁹⁸ – does Burdett refer to astronomical observations for a meridian line. It was unlike him not to have advertised a scientific aspect of his work and, although the meridian of Chester appears on the map, it may have been a purely local device from which to protract the map unrelated to any national network. In the absence of direct evidence we can compare Burdett's values for longitude with those of the modern Ordnance Survey map and also a number of other 18th- and 19th-century map makers (Figure 4). The location of any longitude value on a map depends of course on which prime meridian (or zero line of the system) is selected; with Ordnance Survey maps this has always been Greenwich observatory. Some of Burdett's contemporaries, especially Jefferys, were also using Greenwich but this is clearly not so with Burdett in Cheshire. Like Emanuel Bowen, he places 3° west to the east of Chester, whereas, based on Greenwich, its true position lies between Liverpool and Birkenhead. Nor can we give him the benefit of the doubt of having used an older meridian, such as that of St Paul's or Cornhill, for in order for his 3° west meridian to have been correct a prime meridian nearly 6 miles *east* of Greenwich is required. To complicate the matter further at 2° west Burdett comes within almost half a mile of the true position based on Greenwich! A likely explanation is that longitude values were adapted from Bowen, probably after Burdett had left England, for certainly they are not based on accurate scientific observations. The first map of Cheshire to show

95. CLOSE (1926) p.37, quotes the Ordnance Surveyors in Dorset as having found '... an error of nearly three miles in a distance of eighteen ...' in Isaac Taylor's map of the county.

96. All buildings chosen have been checked to ensure that the site was precisely the same at the two dates of survey. N. PEVSNER and H. HUBBARD, *The buildings of England, Cheshire* (London, 1971); R. RICHARDS, *Old Cheshire churches* (London, 1947).

97. AINSLIE (1812) pp.229–30.

98. See footnote 74.

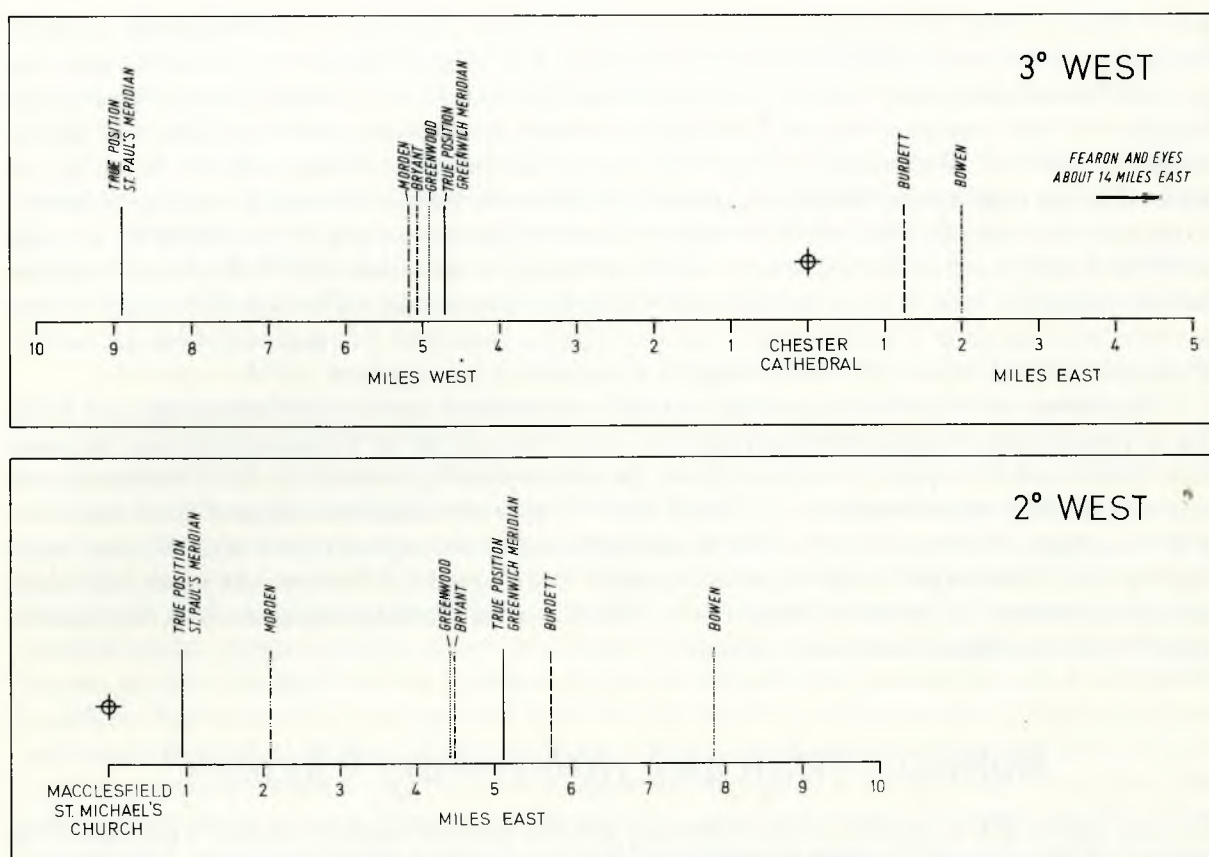


Figure 4. The positioning of the meridians 2° and 3° west on selected Cheshire maps. It is only possible to compare them in relation to a fixed point; Macclesfield Parish Church and Chester Cathedral respectively have been selected. The 'true positions' are taken from the Ordnance Survey 7th series. Note that Robert Morden's prime meridian was St Paul's.

longitude correctly was that of Greenwood which had the benefit of Ordnance Survey calculations.⁹⁹

The topographical survey

Once the triangulation had been plotted at the 1-inch scale it remained for Burdett to fill in the landscape detail of his map by other methods. There can be little doubt that some 18th-century surveyors, just like the Ordnance Surveyors who followed them,¹⁰⁰ tended to over-emphasise the work of triangulation and to treat the topographical survey as less deserving of meticulous attention. Such an attitude may even be implicit in the text of a surveyor as thorough as Ainslie for much of his description of county surveying is concerned with geodetic techniques, while for other aspects it was assumed that a map maker would draw on the general range of methods available to the local land surveyor. It is of course true that less precise angle and distance measurements, using less sophisticated instruments, are adequate for the subsidiary operations of the survey, but with Burdett the double standard gave inconsistencies of local mapping which are incompatible with the general aims of the survey.

There is, in any case, little explicit evidence as to how this part of the survey was carried out and we can only argue by analogy to methods documented in other counties or to practices described in text books. It is clear, however, that some details, especially buildings, were plotted at the same time as the main triangles were observed and at each station, as already noted, 'the circle of bearings all round'¹⁰¹ would have fixed the position of any sightable objects within range of the theodolite. There may, too, have been a measure of secondary triangulation, insofar as Burdett tells us that 'Inferior parts were drawn in like Manner', by which he means in the same manner as the main triangula-

99. J. B. HARLEY, *Christopher Greenwood county map-maker and his Worcestershire map of 1822* (Worcester Historical Society, Worcester, 1962) pp.28-30.

100. J. B. HARLEY, 'Error and revision in early Ordnance Survey maps', *Cartographic Journal* 5 (1968) pp.115-24.

101. AINSLIE (1812) p.221.

tion.¹⁰² Plane tabling, although favoured by county surveyors employed by Jefferys in the 1760s¹⁰³ (including Ainslie), was probably too time-consuming a method to commend itself to Burdett who can hardly have spent more than two field seasons in Cheshire. It is most likely that he 'filled-in' his triangles by road traverses, with the distances recorded on a perambulator (he had used such a measuring wheel in Derbyshire),¹⁰⁴ and with further intersections being made to buildings, to single trees and to patches of vegetation, probably by means of a small 'theodolite' – the circumferentor or common compass of the late-18th century. Certainly the 2,700 miles of road shown on the map would have been traversed by a pair of surveyors within say 30–40 weeks. As to hills, shown by rather formless hachures, there is no reason to believe that Burdett worked differently from other county surveyors who (again in Ainslie's words) had developed a technique '... generally done by an eye-sketch upon a blank corner of the field-book, or by a sketch in passing them ...'.¹⁰⁵

The survey was thus a combination of rapid instrumental survey, field sketching, and fairly liberal interpolation between fixed points. It is likely that not all of Cheshire had been surveyed when Burdett left Liverpool. Even if we ignore the rather puzzling assertion in the advertisement of 1777 that the map was surveyed in 1774 and 1775,¹⁰⁶ it bears unmistakeable signs of hasty execution in its final stages. Neither the work of the draughtsman nor of the engraver (and again Burdett had a large hand in these stages) could disguise the many blank spaces left between the roads and waste lands of the county. As far as the image in the printed map of Cheshire was concerned they were to persist as *terra incognita* for many years to come.

Burdett's Map and 18th-century Cheshire

The final section of this introduction is concerned with the trustworthiness of Burdett's portrait of the landscape and economic geography of Cheshire in the 1770s. R. A. Skelton has written that 'Every map, of whatever date or purpose, is a synthesis of experience, theoretical concepts, and technical craftsmanship',¹⁰⁷ and local historians too should evaluate the Burdett map in the light of the constraints and opportunities in the map-making process which have now been discussed. Some of Burdett's personal history is doubtless reflected in the map, as are the markedly different standards employed in the triangulation and topographical survey; and, for such varied reasons, often difficult to pinpoint let alone to measure, the map is often ambivalent as a record of 18th-century Cheshire – reliable in some features but remarkably unreliable in others. In some respects it compares unfavourably with contemporaneous maps of adjacent counties and the Cheshire historian, frustrated by inconsistency, may glance with envy at the regulated detail and well-balanced engraving of these other maps.¹⁰⁸ Nor, he may conclude, is it solely a question of the amateur and rather careless impression created by the engraving of some features, for in a more fundamental way – in the relative paucity of conventional signs used to codify the information on the ground – the map of Cheshire falls short of other maps such as Yates's Lancashire. The tally of features absent from Burdett (yet occurring on some other county maps) includes names of landowners, information on antiquities, parish or township boundaries, graded lettering to distinguish administrative or ecclesiastical centres, and unenclosed roads. The problem indeed is what is omitted from the record and this must be one yardstick by which to assess the information content of the map. This rather gloomy conclusion however is little help to the Cheshire historian, and despite such limitations a much more positive assessment can be made of the map. Provided due caution is exercised, it can provide valuable information about the landscape and economic geography of 18th-century Cheshire.

102. On his triangulation diagram (section VII).

103. HARLEY and HARVEY (1973).

104. See footnote 74.

105. AINSLIE (1812) p.226.

106. *Manchester Mercury* 1 January 1777. Burdett left Liverpool in April 1774 and presumably had to do his engraving before then.

107. SKELTON (1972) p.3.

108. The maps of Yates, Jefferys, Rocque, Hodskinson, Armstrong, and Andrews and Drury are all consistently better in both these respects though a few of them were at 2 inches to 1 mile. Probably only the maps of Hampshire and Dorset (1759 and 1765) by Isaac Taylor combine such lack of detail with such a 'scruffy' finish.

Land use and vegetation

By the 1770s the agricultural landscape of Cheshire consisted predominantly of small hedged fields liberally pocked with marl pits. A long history of piecemeal enclosure from common fields and open wasteland had left only tiny pockets of open arable fields and common meadows. With the exception of the most intensive dairying districts of the south west, and some parts of the Mersey lowlands which specialised in providing potatoes for the Liverpool and Manchester markets and some barley for the Manchester brewers, lowland Cheshire was characterised by mixed farming with a heavy emphasis on cattle.¹⁰⁹ Probably no more than 20% of the improved land of the county was tilled in any one year,¹¹⁰ mainly for oats and some wheat.¹¹¹ Many farm leases restricted the tenant to no more than 25% of his land in arable.¹¹²

Unlike some county map makers, notably John Rocque,¹¹³ Burdett made no attempt to portray field boundaries and agricultural land use, so that the agrarian character of the county does not emerge from his map. There is nothing to hint at the rich grasslands of south-west Cheshire or the small, hedged fields of Bucklow Hundred (Figure 5). Although open and enclosed roads are not distinguished, even on heathland, the map is much better as a guide to the state of enclosure – at least as far as open wasteland is concerned. Much of Cheshire was occupied by heaths, commons, mossland, moorland and small greens,¹¹⁴ but although the map shows the main distribution of these features,¹¹⁵ in detail they are depicted too crudely to compare the extent of commons with more detailed maps. Another problem arises from Burdett's decision to denote all open waste by the same convention and, inasmuch as only a limited number of areas of open land are named, it is impossible to differentiate categories of unimproved land. We still await a thorough study of Cheshire enclosure and meanwhile the main value of the survey is as a general stocktaking in a period when open land was being actively enclosed both by private agreement and by Act of Parliament – a process which was to accelerate in the 19th century. For the more tiny patches of waste or common Burdett's survey is a valuable record and this is especially so with the numerous small greens and roadside heaths in Cheshire for the enclosure of which there is little or no documentary evidence.¹¹⁶ The place name '... Green' appears over a hundred times and suggests a basic contrast in the enclosure history of the county. On the two western sheets forty-one greens are shown as still having open land, but only four appear to be enclosed: on the two eastern sheets – covering approximately the same land area – there are twenty-seven open greens and thirty-six enclosed ones, suggesting the earlier enclosure of many small commons in east Cheshire.

The most dramatic episode in Cheshire enclosure history was the reclamation of the Forest of Delamere. Most of what remained of the Forest was enclosed under the Delamere Forest Act of 1812 with the final award being made in January 1820.¹¹⁷ The 1777 states of Burdett's map portray the distribution of heathland in this area quite well, though the exact heath edges are far from clear and some small detached portions were omitted. The general picture is of a much more extensive area of open land including surrounding commons such as Norley, Kingsley, Frodsham, Alvanley and

109. H. HOLLAND, *General view of the agriculture of Cheshire* (London, 1808); A. YOUNG, *A six months tour of the north of England* (2nd edn, London, 1771) vol.3, pp.178–87.

110. It is extremely difficult to form a precise estimate of land use at this time. YOUNG (1771) pp.246, 250, lists eight farms in the Knutsford area with an average of 14% of their land in tillage. He describes the tillage in that area as 'too trifling to admit a general description.' Some estate maps and surveys distinguish ploughland from grassland, generally sown in long leys (Figure 5). But all this constitutes slender evidence.

111. HOLLAND (1808) p.125. But cf. YOUNG (1771) p.242 and C. S. DAVIES, *The agricultural history of Cheshire, 1750–1850*, Chetham Society 3rd series 10 (Manchester, 1960) p.128, who suggest barley as a poor second to oats.

112. HOLLAND (1808) p.125.

113. LAXTON (1973).

114. HOLLAND (1808) p.12, estimated 28,600 acres of 'Waste lands, heath, commons, and woods' and 18,000 acres of 'Peat-bogs, and mosses', the two categories comprising respectively 4.2% and 2.7% of the county. 29,043 acres of common waste were enclosed by Act of Parliament between 1750 and 1900 (chiefly 1770–1820); A. R. H. BAKER and R. A. BUTLIN (eds.), *Studies of field systems of the British Isles* (Cambridge, 1973) p.71.

115. The vegetation has been plotted from Burdett's survey in E. P. BOON, *The land of Britain, part 65: Cheshire* (Land Utilization Survey of Britain, London, 1941) p.149, and HARLEY (1964).

116. Some enclosures by agreement are described by C. S. DAVIES (1960) chapter 3.

117. E. S. SIMPSON, 'The reclamation of the Royal Forest of Delamere', in R. LAWTON and R. W. STEEL (eds), *Liverpool essays in geography* (London, 1967) pp.271–91.

Tarvin, which were enclosed by various Acts between 1780 and 1869 (mainly before 1815). The 1794 state of the map embodied no changes to the heathland area but in the 1818 edition Faden had some of the peripheral commons removed,¹¹⁸ and the boundary of the area enclosed by Act of Parliament was engraved on the map as 'The Boundary Line of Delamere Forest' (Figure 1), though it did not represent the area of crown land.

Returning to the county as a whole, the depiction of woodland is an unsatisfactory aspect of the map, certainly not conveying any impression of a well-wooded county. Not a single tree, for example, will be found in the northern half of Wirral and it is obvious that woodland should have been recorded on many heaths and commons, while only in the New Pale are trees shown in Delamere Forest! The conventional sign for woodland – that of single trees throwing a shadow and having no clear boundary around them – is strongly atavistic and had been in use on county maps since the 16th century. Indeed his depiction of woodland is strongly reminiscent of the maps in Emanuel Bowen's *Large English Atlas* containing a map of Cheshire published in 1751.¹¹⁹ The main difference is that Bowen, despite equally indiscriminate use of the conventional symbol, conveys a better impression of a well-wooded county. Burdett himself, we may recall, did not engrave woodland onto the plates and this detail, as with longitude, could have been added after his departure from Liverpool. His treatment therefore of this aspect of the landscape generally falls short of the greater precision attained in other county maps, including indeed his own map of Derbyshire, although few of them added a perimeter line round woods and plantations. Only two impressions – for they are no more – can be derived from Burdett's map: the first is that he tended to favour plantations or ornamental woodlands (like most of his contemporaries ignoring the many more trees in hedgerows or scattered in fields);¹²⁰ the second is of an eastern half of the county with more woodland than the west. This impression is supported by the maps of Greenwood and Bryant, but the student of land-use changes will need to undertake many more detailed studies with local documents and large-scale plans, before the maps of Burdett and his successors can be properly assessed as a record of the heaths, mosses and woodland of Cheshire.

The settlement geography of late 18th-century Cheshire

Rural settlement: To the study of the distribution and form of rural settlement in Cheshire Burdett's map can add a useful dimension. While it is true that towns and major villages appeared on a succession of small-scale county maps from Tudor times, neither these early printed maps, nor the numerous other sources which may be used to trace the existence of settlements at different periods, enable the historian even to begin to reconstruct the whole spectrum of rural settlement from isolated farm to nucleated village. In Cheshire the discrete nucleated village predominated only in some western areas of the county: elsewhere hamlets and scattered settlements were the rule, and in many areas large villages were not to be found at all.¹²¹ For many of these lesser rural settlements Burdett's map provides the first cartographic evidence, containing as it does many hundreds of named country houses and farms traceable both to older records and into more recent times.

It is not, however, a record which can be accepted without scrutiny. A comparison with contemporary estate plans¹²² indicates that it is not definitive, but that Burdett used several rules of thumb to

118. Some 350 acres of Budworth Common were deleted though they were not enclosed until some time between 1830 (Bryant's map) and 1874 (Ordnance Survey 6-inch); an even larger area of Newchurch Common, similarly deleted from the map, was also enclosed between these two dates. No documentary evidence for these enclosures has come to light. Weetwood, Willington and Mouldsworth Commons (enclosed in 1814, 1795 and 1795 respectively) were still on the map in 1818. These are typical of the errors resulting from the 'revamping' of old copper plates by map dealers.

119. See HARLEY and HODSON (1971) pp. 10–11, for a discussion of Bowen's sources.

120. HOLLAND (1808) p. 197, states '... the number of trees in the hedgerows and coppices is so considerable, that, from some points of view, the whole country [*sic*] has the appearance of an extensive forest.' In fairness to Burdett, however, the 1-inch scale imposed severe constraints on the amount of such detail which could be shown, and the Ordnance Survey soon abandoned the attempt to show field boundaries (and associated hedgerow trees) on their 1-inch maps.

121. For the background to this theme see D. SYLVESTER, 'Rural settlement in Cheshire; some problems of origin and classification', *THSLC* 101 (1949) pp. 1–37, and also her *Rural landscape of the Welsh Borderland* (London, 1969).

122. Comparatively few good 18th-century estate plans are extant for Cheshire. Due to the fragmentation of many large estates even the best plans of the period only show portions of townships. It is therefore difficult to reconstruct the precise settlement and road patterns for most areas, and reliance has to be placed on the tithe surveys of the mid-19th century.

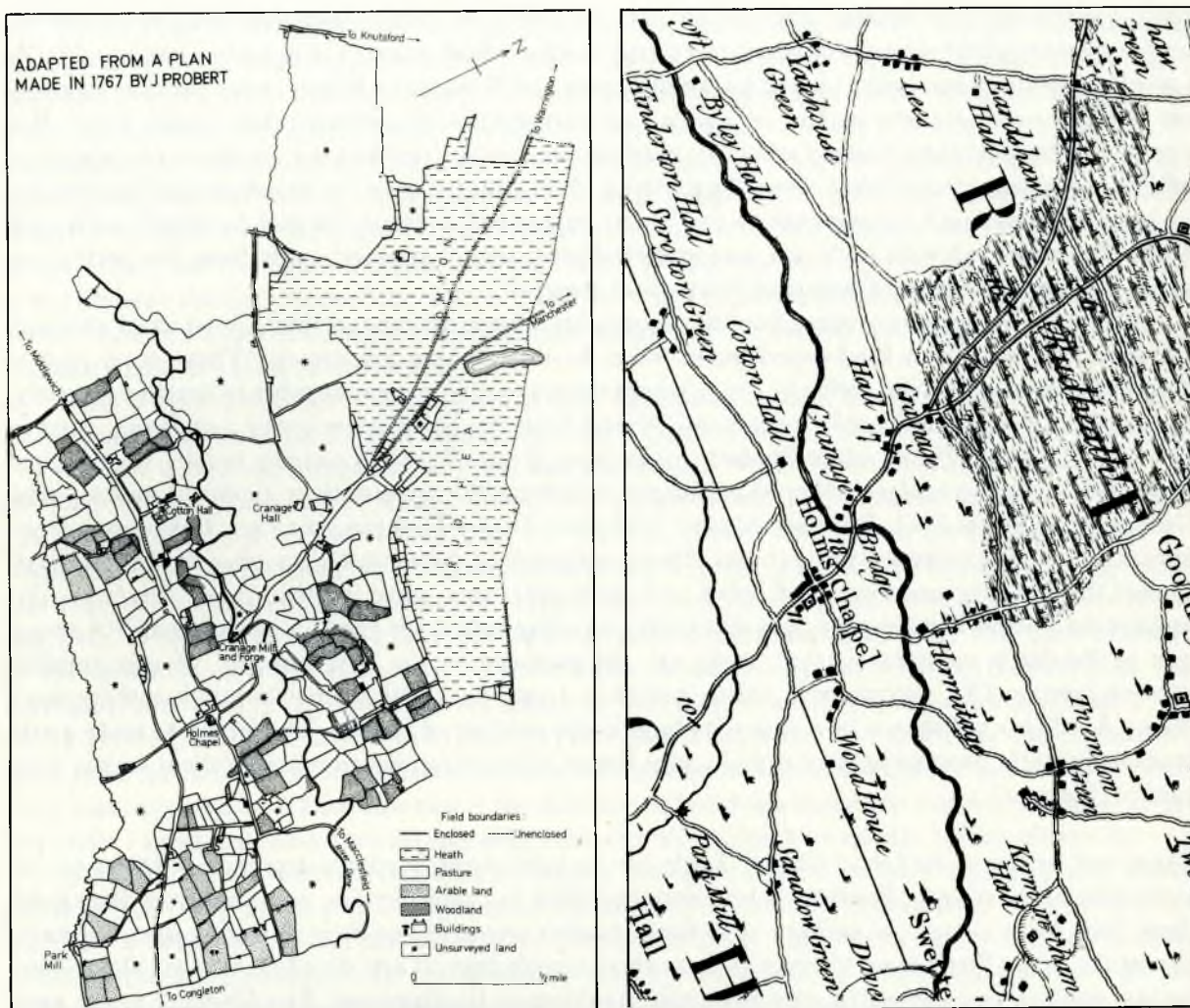


Figure 5. The Holmes Chapel and Cranage district in the late-18th century. The plan by J. Probert (CRO DDX/329) illustrates a typical Cheshire landscape, the field boundaries consisting of hedges and mature trees. Comparison with approximately the same area as shown by Burdett indicates the degree of generalisation in the county map. Probert's plan is reproduced here at about 1.4" to 1 mile; the portion of Burdett at 1.0" to 1 mile.

generalise settlement on the ground to fit the 1-inch scale. First of all, not every isolated country house and farm is shown and even some manor houses are omitted, though it would take a great deal of research to establish exactly how many.¹²³ Secondly, much Cheshire settlement consisted of single or grouped cottages at road junctions or on the edge of greens and commons and the treatment of these features is uneven. Many tiny hamlets do seem to be shown with a fair degree of accuracy¹²⁴ (Figure 5), though the conventional symbols must never be taken to represent the disposition of individual buildings, but other groups of cottages are denoted only by single symbols and most isolated single dwellings are omitted altogether. Thirdly, the relative size of settlements, villages and hamlets alike, cannot be deduced from the map with any certainty, although, as with other deficiencies, it is impossible to say how far this is owing to poor survey technique or to deliberate elimination of detail. It is likely that Burdett plotted settlement in the field at the 1-inch scale and thus as he mapped he also generalised by eye, rendering the survey even more a personal record of his perception of the landscape.

Looking at Burdett's map we are liable to forget that the 18th century was an age of taste and elegance in the design of the English countryside.¹²⁵ For county cartographers the most prominent

123. For example Bradley Hall (Appleton township), Swinyard Hall (High Legh township) and Minshull Hall (Church Minshull township) – all medieval moated homesteads – were omitted.

124. See for example Figure 5. The same conclusions would be reached from a comparison with: CRO DDX 70 *A map of the allotments on the green & waste lands in the township of Clive . . . 1779*; CRO DET/1424/23 *A map of the lands in High Leigh [sic] . . . 1786*; CRO DCH/H/516 *A map of Rocksavage demesne and lands in Frodsham lordship . . . 1778*.

125. H. C. PRINCE, 'Georgian landscapes' in A. R. H. BAKER and J. B. HARLEY (eds), *Man made the land: essays in English historical geography* (Newton Abbot, 1973) pp.153–66.

result of aesthetically-inspired improvement was the landscape parks which were laid out around the country houses of the gentry and aristocracy and to which most maps paid suitable attention.¹²⁶ The same landowners who commissioned Lancelot Brown and Humphrey Repton were listed as subscribers to new county surveys and in return (a nice cartographical courtesy) their names were often engraved alongside their country seats. We may assume that the prudent map maker took care not to offend prominent county landowners by omitting their country seats, by drawing them incorrectly, or by giving too much prominence to one at the expense of another. Formal parkland landscapes were often engraved with such care and embellishment that they stand apart from the portraiture of the ordinary landscape of farmland, heaths and moors.¹²⁷

From these general practices Burdett, despite his aristocratic connections, stood aloof although Cheshire had numerous landscaped parks when he was making his survey. 'There is no part of England', observed Daniel Defoe in 1724, 'where there are such a great number of families of gentry, and of such ancient and noble extraction';¹²⁸ and Dorothy Sylvester mapped 143 family seats in Georgian Cheshire.¹²⁹ Yet while Burdett marks most, if not all, of the country houses, he exercised little care to show parkland other than simply indicating the approximate extent of major parks. Only around Eaton Hall, Dunham Massey Hall, and Tatton Hall are there any indications of the formal layout of plantations and avenues of trees, although in these cases it is authentic if generalised, so that the long curving avenue of beech and Scots pine trees noted by Humphrey Repton whilst replanning Tatton Park in 1791, and still partly standing today, are easily distinguished.¹³⁰ A symptom of Burdett's approach is that parks are not included in the 'Explanation' of conventional symbols (section IX), though park pales – except at Lyme Park which is marked with nothing more than a fine line – are shown by a ring of palings in the manner of Saxton. The failure to make parklands sufficiently prominent may explain why Faden added stippling to many of them on the 1794 edition (Figure 1).

Towns and the plan of the City of Chester: Little can be said about Burdett's depiction of towns on the main map of the county. Fourteen towns were engraved in capital letters, presumably to distinguish them from large villages or perhaps to indicate market towns,¹³¹ but their character does not stand out on the map. There is no attempt to show their morphology in any detail and no ancillary information enables their industrial or commercial functions to be diagnosed. Few Cheshire towns were of any great size at this time. In 1775 Chester had a population of about 15,000, and Macclesfield, the second largest town in the county, about 6,000. None of the other towns exceeded 5,000 inhabitants.¹³² Many had specialist manufacturing industries: textiles in Stockport, Macclesfield, Congleton, Nantwich, Knutsford and Altrincham; salt in Northwich, Middlewich and Nantwich; tanning at Nantwich, Congleton and many other centres; shoemaking at Sandbach. Others were market towns: Tarporley, Malpas, Frodsham and Great Neston, all of which had two or three annual fairs in addition to their weekly market.¹³³

126. H. C. PRINCE, *Parks in England* (Shalfleet, 1967).

127. The maps of Chapman and Rocque are outstanding in this respect. See LAXTON (1973). Rocque sometimes incorporated simplified versions of his elaborate plans of formal gardens into his county maps. (We are grateful to Dr H. Bilborough for comments on this point.)

128. DANIEL DEFOE, *A tour thro' the whole Island of Great Britain* (London, 1724; Penguin English Library edn 1971) p.395.

129. D. SYLVESTER and G. NULTY, *The historical atlas of Cheshire* (Chester, 1958) p.33. This includes families with manorial rights and/or arms in the Georgian period up to 1820. See also D. SYLVESTER, 'The manor and the Cheshire landscape', *TLCAS* 70 (1960) pp.1–15.

130. *Tatton Park* (National Trust guide, 1962) p.10.

131. But cf. the 'Explanation' (section XVII).

132. Congleton c.2,900; Nantwich c.3,300; Northwich c.3,000; Stockport c.4,600. These figures, derived from local censuses and visitation records, are taken from C. M. LAW, 'Some notes on the urban population of England and Wales in the eighteenth century', *The Local Historian* 10 (1972) p.23. [J. POOLE], *History of Chester* (Chester, 1778) vol.2, p.890, prints a census of Knutsford taken in July 1777; 1,674 inhabitants were enumerated. J. AIKIN, *A description of the country from thirty to forty miles round Manchester* (London, 1795) p.245, gives the population of Altrincham in 1772 as 1,029.

133. Descriptive material on towns will be found in: [P. BROSTER], *The Chester Guide* (1781); HOLLAND (1808); N. SPENCER, *Complete English traveller* (London, 1771); W. TUNNICLIFFE, *A topographical survey of the counties of Stafford, Chester and Lancaster*

By inserting a plan of Chester into the south-east sheet of his map Burdett was not only following his own practice in Derbyshire, but also a much older convention in English regional cartography originating in the 16th- and 17th-century county maps of Norden and Speed. Unfortunately for the historian, his plan of Chester, unlike his county survey, contains little that is original. It was an ill-disguised copy, without acknowledgement, of the plan made in 1745 by Alexander De Lavaux, the military engineer, as part of the preparations for improving the city's defence against any possible threat from Charles Stuart, the Young Pretender.¹³⁴ The area surrounding the city, for example Brewers Hall and the adjacent fields, was not revised in any way and even the land use in the fields is suspiciously similar. Most of the details taken from this source moreover differ significantly from James Hunter's more reliable plan of 1789, thus confirming the mechanical copying of the errors on Lavaux's plan as well as its obsolescence.

Only a limited number of developments were inserted to up-date Lavaux. The most striking of all was the addition of the Chester Canal, excavated north of the city wall between 1772 and 1774, but the new infirmary, completed in 1759, was also added.¹³⁵ The streets between Watergate and the river (Crane Street or Old Crane Street, New Crane Street and Paradise Row) were likewise new – they had been laid out in 1768 on the site of a timber yard shown on Lavaux's plan¹³⁶ – while the 'House of Industry' or workhouse, completed in 1758, is shown as a square building beside the wharves.¹³⁷ One revealing attempt at revision occurs on the south side of King Street where the engraver, probably Billinge, copied the built-up ground from Lavaux's plan and then added a further shaded area at the west end of the street which shows up very clearly on the finished plan. But such is the sum total of change that, even assuming that these features had been sketched or surveyed on the ground, they can hardly have taken up more than a day's visit armed with a copy of Lavaux's plan. Such hurried alterations do not constitute a comprehensive record of change in the city between 1745 and 1777 and in at least one case – the addition of buildings inside the north-east corner of the city walls – there may have been an engraver's error for they appear on no other plans of the city.

Burdett's plan of Chester can thus be largely disregarded as a primary topographical source for as well as being out of date it perpetuated Lavaux's somewhat crude portrait of the city. Most of the narrow alleys, courts and entrances which characterised the historic city were subsumed in areas of undifferentiated shading, and this is made worse by the failure to name any features with the single exception of the 'Canal to Middlewich &c.' In yet another aspect of Burdett's map we may be looking at what was in effect an unfinished job.

William Faden must have noticed these inadequacies, and the result was a substantially changed plan on the 1794 edition (Figure 2), but as with the 1794 state of the main map, this was not derived from resurvey on the ground. The most obvious source available to Faden was Hunter's plan of 1789, yet several of the details seem to derive only indirectly from this via one of the many plans based on Hunter's work. The most likely of these derivatives was a plan published in 1791 by John Poole,¹³⁸ publisher, bookseller and printer of the *Chester Chronicle*. Many features on this plan are identical to those added by Faden especially in the north-east corner and on the Roodee, where they differ from Hunter's plan. Neither the lime kilns and iron foundry beside the Dee, nor the 'Cotton Works' near the Water Tower are named on Hunter's plan, though the first two were on Poole's. A number of features added between the 1777 and 1794 states can be precisely documented. The new gaol in the centre of the castle was begun in 1789 and completed in 1798;¹³⁹ the New Linen Hall was

(Nantwich, 1787); Bowen's map of Cheshire in *The large English atlas* (London, 1751). In addition to the market towns already mentioned Halton retained its weekly market into the 19th century (HOLLAND p.314) but many markets had ceased to function in smaller settlements well before the 18th century.

134. For a discussion of the plans of Chester see HARLEY (1966-7) pp.290-3.

135. [POOLE] (1778) vol.2, p.642. Cf. H. E. BOULTON, 'The Chester Infirmary', *Journal of the Chester and North Wales Architectural, Archaeological and Historical Society* 47 (1960) p.10.

136. *Ibid.* p.644.

137. *Ibid.* p.642.

138. Commissioned for [J. POOLE], *A concise history of the county and city of Chester* (Chester, 1791).

139. D. and S. LYSONS, *Magna Britannia* (London, 1810) vol.2, part 2, p.412.

built as a shopping precinct in 1778;¹⁴⁰ but the race-course chairs on the Roodee were erected in 1768 and more properly should have been noticed for Burdett's original edition.¹⁴¹

Although Faden improved the plan immensely, in view of its composite nature, embodying features from several dates and sources from the middle to almost the end of the century, it cannot be accepted as an accurate picture of Chester in 1794. After this spurt of activity on the copper-plate it was again allowed to slip out of date: in 1818 it was reprinted without alteration.

Roads and canals

An obvious feature of the map is that it is the earliest published guide to the minor road system of Cheshire however imperfectly it might be portrayed in detail. Some 2,700 miles of road¹⁴² are shown for the county as a whole – an enormous advance over cruder small-scale maps which, beginning with Robert Morden in 1695,¹⁴³ had shown only main routes: Bowen for instance marks only about 200 miles of road. Nevertheless, Burdett's survey of roads, lanes and trackways is not entirely comprehensive. Comparison with early 19th-century maps, such as Swire and Hutchings (actually at a slightly smaller scale), confirms that more roads could have been accommodated without loss of clarity. Nor does shaky and imprecise engraving help to dispel the conclusion that at a local scale the roads were sketched in very hurriedly. It seems doubtful if they were all carefully traversed and their wayward courses suggest that compass bearings were taken more often to fix churches and country houses rather than to record the intricate twists and turns of the road system. For this reason the interpretation of the minor road pattern from Burdett is fraught with dangers for the unwary and there is often considerable difficulty in identifying which later routes his roads represent. The historian is likewise given little guidance on the sometimes important question of road status. Only two types of road are distinguished – the turnpikes and the 'Cross Roads'. The turnpikes, with mileages shown along them, seem to be accurately mapped – albeit not without a few anomalies¹⁴⁴ – and they were later brought up to date by the Faden editions (Figure 1). 'Cross Roads', however, is such an umbrella term that it leaves us in the dark about the character and status of many stretches of minor road. As already noted, Burdett does not make the customary distinction by continuous and dotted lines for when, respectively, roads traverse enclosed and open ground; the question of whether a particular road was a public highway or privately owned must again be sought in other sources.

'Few counties in the kingdom', wrote Henry Holland, 'derive so many advantages from [canal transport] as Cheshire . . .'¹⁴⁵ Apart from a mile or so at Norton Priory, the Cheshire section of the Bridgewater Canal was already completed by 1774.¹⁴⁶ The construction of the Trent and Mersey and Chester Canals however coincided exactly with the making of Burdett's map. Most of the line of the former from the junction with the Bridgewater at Preston Brook to Harecastle Tunnel in Staffordshire was opened in a number of stages between February and September 1775, leaving only the difficult section between Middlewich and Northwich which was opened in May 1777.¹⁴⁷ The Chester Canal was practically completed from Chester to Beeston Brook by early May 1775, and only 3½ miles of the remaining distance to Nantwich remained to be cut.¹⁴⁸ Building materials were being requested for the line between Beeston and Nantwich in 1776¹⁴⁹ and several months after the publication of Burdett's map tenders were still being invited to complete the final few miles to Nantwich.¹⁵⁰ The purchasers of the map would not have been made aware of this fact from their

140. *Ibid.* p.605.

141. [POOLE] (1778) vol.1, errata.

142. Calculated by measuring the length of all roads in four sample squares totalling 100 square miles (9.6% of the county).

143. J. B. HARLEY, Introduction to *The county maps from William Camden's Britannia 1695 by Robert Morden* (facsimile edn, Newton Abbot, 1972) pp. vii–xii.

144. The road from Mottram to Ashton under Lyne, turnpiked in 1752, is not actually marked as a turnpike though it is coloured brown on many copies. The same is true of the road from Northwich to Middlewich, not turnpiked on the south-west sheet; though its course on the south-east sheet is turnpiked!

145. HOLLAND (1808) p.306.

146. C. HADFIELD and G. BIDDLE, *The canals of north-west England* (Newton Abbot, 1970) vol.1, pp.32–3.

147. C. HADFIELD, *The canals of the west Midlands* (Newton Abbot, 1966) pp.31–2.

148. *Chester Chronicle* 2 May 1775.

149. *Ibid.* 29 January 1776.

150. *Ibid.* 22 August 1777.

copies, for Burdett, in common with other county cartographers, incorporated the canal route on his map from plans issued in advance by the canal company, in the case of the Chester Canal at least as early as June 1772.¹⁵¹

In a similar fashion William Faden had inserted the Ellesmere Canal from Chester to the Mersey on the 1794 edition (Figure 1), including the branch to Bridge Trafford which was never constructed.¹⁵² The Huddersfield Canal, also added by Faden in 1794, had only been surveyed a year earlier, and the Act was not passed until 4 April 1794, five months before the first Faden edition and over three years before the Cheshire section was completely open.¹⁵³ To complete the list of waterways the Peak Forest and Ellesmere (Whitchurch Branch) Canals were also anticipated on the Faden editions. So anxious was Faden to impress with the latest knowledge of such a prominent feature as the Whitchurch Branch of the Ellesmere Canal that he included it on the 1794 edition some two years before the final plan was deposited with the Clerk of the Peace: his vague knowledge of the intended route probably accounts for the inaccurate way it is portrayed on that edition. It is clear that Faden, like Jefferys before him,¹⁵⁴ had developed a system by which intelligence of major provincial developments reached his workshop. The approach to canal sources was often uncritical, accepting promoter's plans at face value, but in Cheshire we may note that at least he resisted the temptation to include the proposed canal from Stockport to the collieries at Poynton. Perhaps, with the bad record of the London cartographers in mind, James Stuart, who produced the reduced edition of Burdett's map with Faden, was slightly more cautious: he did not include the line to Whitchurch and showed the Middlewich Branch Canal, not completed until 1833,¹⁵⁵ as 'Proposed'. Nevertheless he did show the Trafford branch of the Wirral canal! The mapping of canal undertakings is a cautionary tale for those who would use maps for dating purposes. In such cases it is the map which needs testing against other evidence rather than the reverse.

Industry

As industrialisation gathered momentum in the late-18th century, the spread of factories and workshops, particularly in rural areas, caught the imagination of the new generation of county map makers. Just as it found expression in the painting and literature of the age so it is often found reflected in its maps. The new mills, furnaces, forges and mines were striking features in the countryside which only the careless map maker would fail to notice and Peter Burdett, with his artistic bent, and with his scientific and industrial interests, should have been especially aware of their growing importance in the economic landscape. In fact his record of industrial sites is of mixed quality; some industries seem to have caught his attention whilst others were partly, in some cases wholly, overlooked.

The record of watermills and windmills, one of the most noticeable features of the new county surveys, is in addition to its historical interest a readily available way of verifying the map as evidence. Burdett's survey was completed at the critical time when the steam engines of Boulton and Watt were being applied to manufacturing industry for the first time.¹⁵⁶ In Cheshire a wide range of industries which were to take advantage of steam power during the next forty years or so were still dependent on water or wind power in the mid 1770s. Burdett marked 156 watermills (Figure 6), or one for every 7 square miles of the county. Although, as is shown below, several watermills known

151. Robert Murray advertised such plans in *Adams Weekly Courant* 30 June 1772, and an undated copy of such a plan by the same engraver is preserved in the Liverpool Atheneum Library (C910.11) and was probably engraved before 1770. The section to Middlewich follows a route quite different from that actually taken. Burdett however shows the correct route.

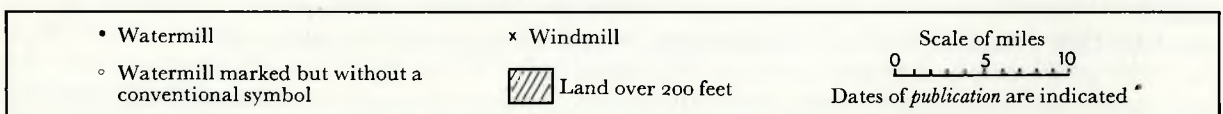
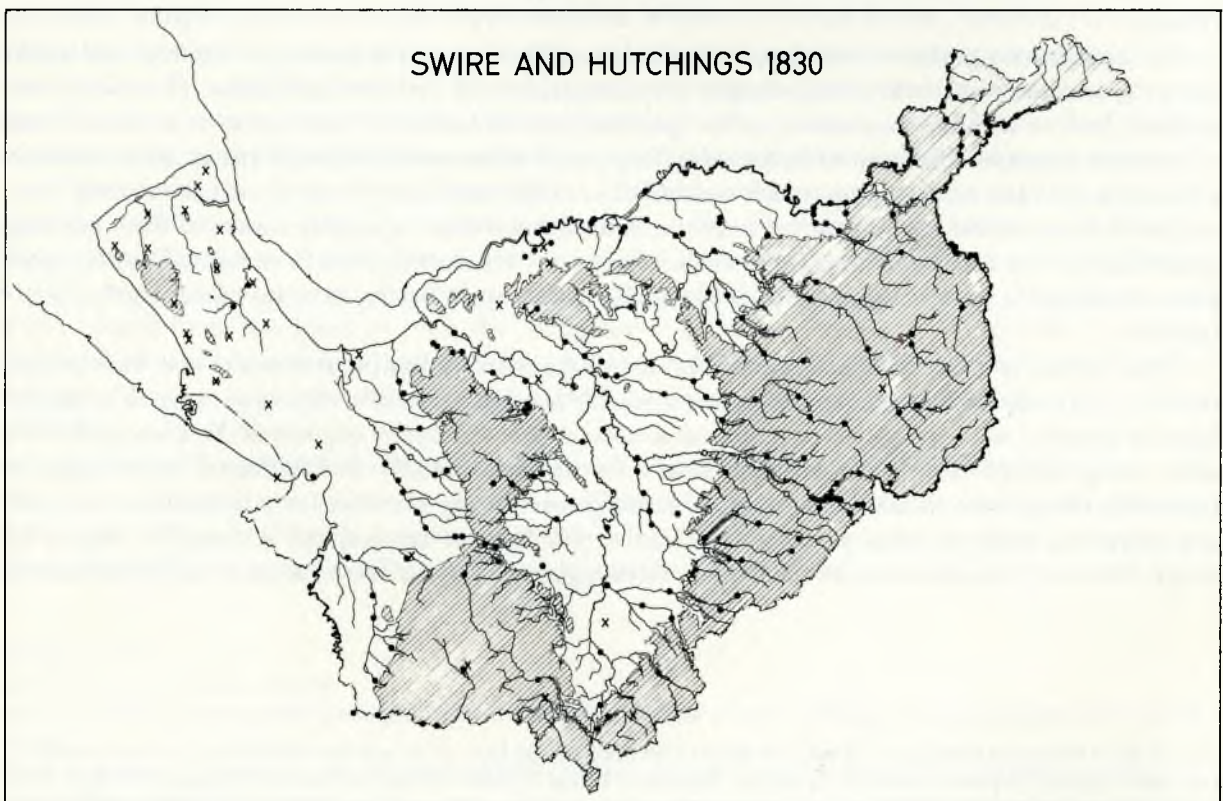
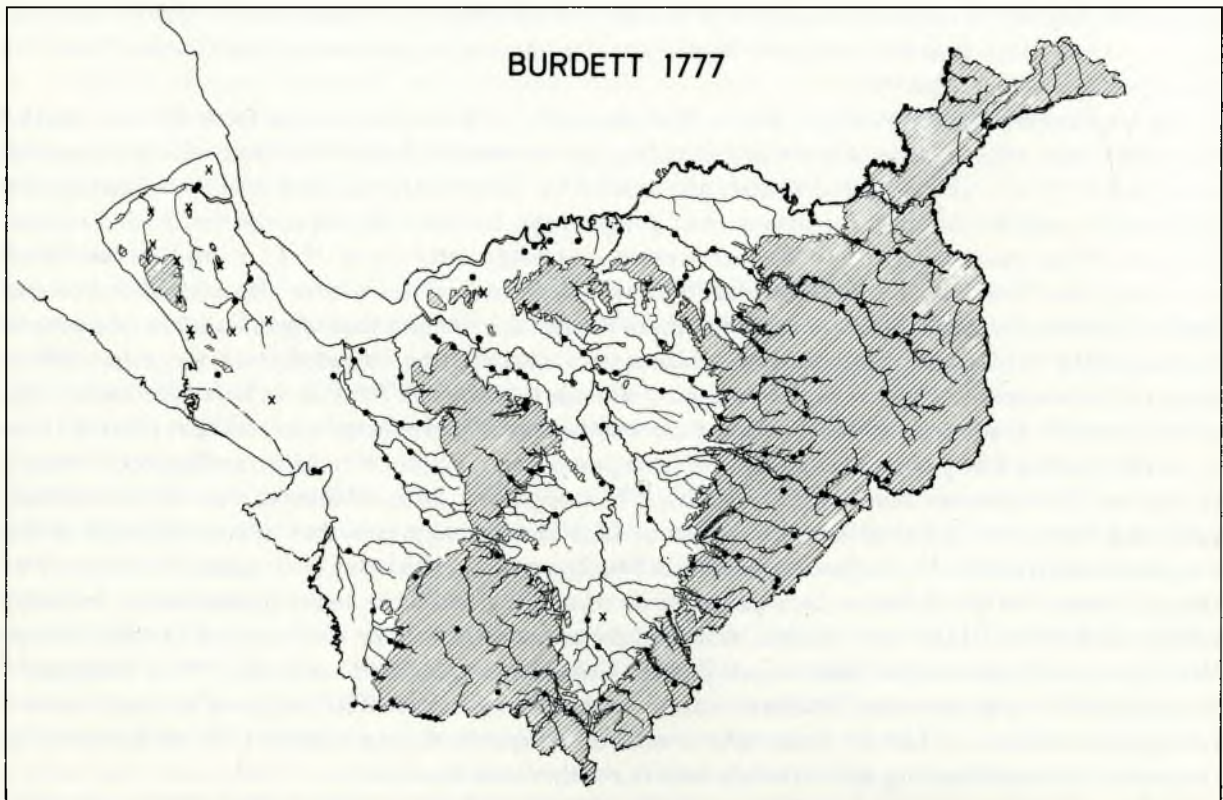
152. CRO QDP 3 *Plan of the Wiral [sic.] Canal and branch to Trafford* was deposited 11 November 1792.

153. CRO QDP 6. See also HADFIELD and BIDDLE (1970) pp.322-4.

154. HARLEY and HARVEY (1973) discuss some of the secondary sources, including canal plans, collected by Jefferys for his map of Yorkshire (1775).

155. HADFIELD (1966) p.181.

156. Boulton and Watt's partnership began in 1775. The spread of their engines in Cheshire is traced by W. H. CHALONER, 'The Cheshire activities of Matthew Boulton and James Watt, of Soho, near Birmingham, 1776-1817', *TLCAS* 61 (1949) pp.121-36.



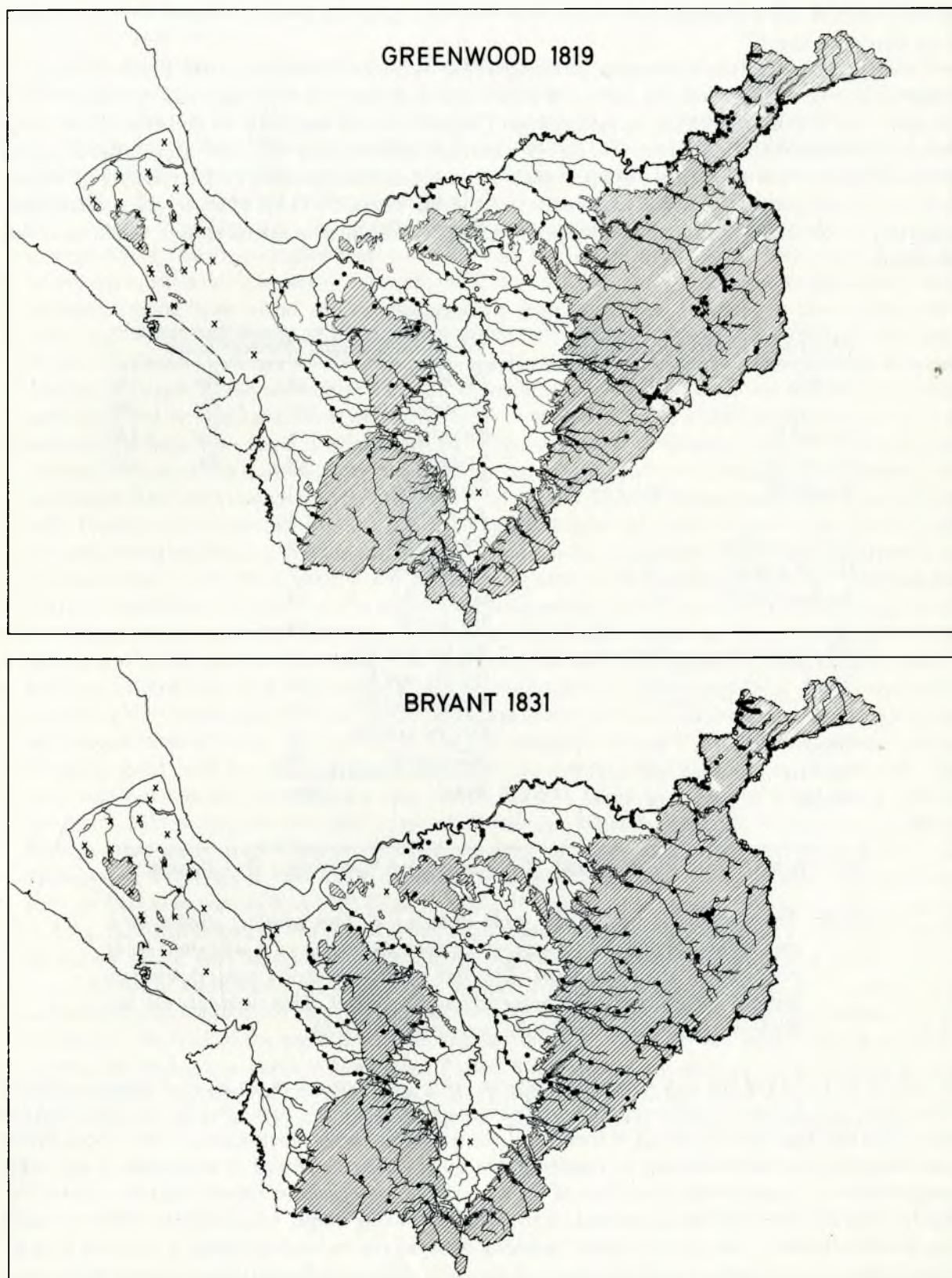


Figure 6. Windmills and watermills on the large-scale maps of Cheshire 1777-1831. The open symbol is used only where the mill is marked on at least one of the maps. Bryant marks several 'factories' without conventional symbols; some of them may have had waterwheels.

to be at work in the 1770s are omitted, this is a creditable tally and some watermills are only known from Burdett's map.¹⁵⁷

Comparison with the later maps of Greenwood, Swire and Hutchings and Bryant is again a valuable way of testing Burdett's survey of these industrial sites but it raises several problems. It is obvious that in the half century or so between Burdett's survey and those of the other three map makers a considerable growth in the number of watermills in east Cheshire accompanied rapid industrialisation. Yet this alone cannot explain the marked discrepancies in the marking of water-power sites revealed by a detailed examination of the four maps.¹⁵⁸ Table I, which gives a statistical summary of the watermills on all four maps, identifies the difficulty in interpretation which faces the historian.

TABLE I Watermills

Watermills marked by Burdett		Watermills on all 4 Cheshire maps			
Bu only	32	Bu only	32	Bu	159
		Gr only	33	Gr	182
Bu and Gr	4	Sw only	14	Sw	190
Bu and Sw	4	Br only	43	Br	254
Bu and Br	15	Bu and Gr	4		
		Bu and Sw	4		
Bu, Gr and Sw	4	Bu and Br	15		
Bu, Gr and Br	9	Gr and Sw	8		
Bu, Sw and Br	24	Gr and Br	26		
		Sw and Br	39		
All 4 maps	64	Bu, Gr and Sw	4		
Total	156	Bu, Gr and Br	10		
		Bu, Sw and Br	24		
On Gr	81	Gr, Sw and Br	31		
On Sw	96	All 4 maps	66		
On Br	112	Total	353		

Bu = Burdett Gr = Greenwood Sw = Swire and Hutchings Br = Bryant

N.B. The right-hand side of the table includes all sites whether shown by a conventional symbol or not provided they are shown as a watermill on at least one of the four maps. The left-hand side shows only those sites marked by Burdett with a conventional symbol. This accounts for the slight discrepancies between the two sides of the table.

It will be seen that of the 353 sites only sixty-six (18.7%) are marked on all four maps and only fifty-seven (16.1%) have a conventional symbol in all four cases. 165 sites (46.7%) can be found on more than one map but not on all of them, and the number of mills missing from Greenwood, Swire and Hutchings or both leads one to conclude that while Burdett's record of watermills is not fully comprehensive, it is no worse than those of these two other map makers. Fifteen mills are marked by Burdett and Bryant while being omitted on the two intervening maps; most of them were corn mills and it is hardly likely that they all ceased working between the two survey dates. It can also be seen from Table I that Bryant marked far more of the mills shown on Burdett than the two other map makers (112 or 71.8%). Of the thirty-two mills found only on Burdett some do not appear on the other maps because they were outside Cheshire (as with some of the mills along the river Tame).

157. For a full list of sites and discussion of the field evidence see J. H. NORRIS, 'The water-powered corn mills of Cheshire', *TLCAS* 75 and 76 (1965-6) pp.33-71.

158. A fuller discussion of the cartographic evidence for power sites in Cheshire will be published in a later volume of *THSLC*.

Others, however, cannot be traced after 1777 and in these cases the evidential value of Burdett's survey is greatly enhanced.

It is important to realise why these discrepancies arise and why such maps are always a difficult source of evidence on waterpower sites. In the first place, and this is especially true of Burdett, it is not at all easy to identify a mill with a similar site shown on a later map, or indeed to pinpoint it on the ground today. Where several mills occupy a short stretch of water identification is made doubly difficult, and this is one reason why the totals in Table I must be regarded with caution. Secondly, the appropriate conventional symbol, in the manner of an asterisk or wheel, was not always used. The Ordnance Survey, although it carried on many conventions from the private cartographers, does not employ such a symbol and Bryant, perhaps taking advantage of a slightly larger scale, omitted it in many cases. Thus it becomes increasingly difficult to distinguish active watermills from those whose names survived after they had ceased to work, or those whose water-wheel had been temporarily or permanently replaced by a steam engine. These mills are shown on Figure 6 with an open symbol. Thirdly, map makers did not always take account of the sometimes frequent changes in the name and function of particular mills. Fourthly, waterwheels and watermills must not be confused; some mills had several wheels and some wheels powered more than one concern, perhaps even more than one process. The map maker's intention is never absolutely clear. Burdett's two symbols at Bidston were clearly one concern with two (or perhaps more) waterwheels, and yet at other sites one symbol represents several wheels. Table I counts each symbol as a separate mill. Finally, apart from obvious omissions, comparison with the other maps reveals some straightforward errors by Burdett. Four of his watermills were in fact windmills (Ince, Burton, Harthill and Cholmondeley), and these were owing either to an error in draughting – perhaps resulting from hurried notetaking in the field – or to misinterpretation of the drawing on the part of the engraver.¹⁵⁹

Documentary evidence and local newspapers shed further light on the inconsistencies in this catalogue of mills, and illustrate some of the problems just outlined. Mickle Trafford Mill, for example, had two waterwheels and was virtually two separate mills but is denoted by a single conventional symbol only.¹⁶⁰ Cogshall Mill near Great Budworth is marked on all four maps with a single symbol but was advertised for sale in 1776 as having two overshot wheels.¹⁶¹ Both these instances are confirmed by field evidence which suggests that there are several other examples in Cheshire.¹⁶² There are, moreover, several water-power sites which Burdett failed to record entirely. Corn mills are known to have existed in the mid 1770s at Prestbury, Church Minshull, Congleton, Sandbach, Beeston (two mills) and Tilstone.¹⁶³ Field evidence is rarely conclusive regarding dates but a datestone at Coddington Mill indicates that it was rebuilt in 1775.¹⁶⁴ It was advertised for sale in 1777 as 'that new-erected WATER CORN-MILL'¹⁶⁵ but Burdett, whose field work came to an end in 1774, failed to record it. No doubt a thorough search of local records would reveal other gaps in the survey and, in the context of other industries, some further examples are discussed below.

One might anticipate that windmills – as more prominent landscape features – would be more correctly represented on the map. Sixteen of them will be found on Burdett, represented by a 'propeller' symbol, instead of the more usual drawing in profile, so that they are often difficult to pick out when superimposed on areas of heathland. Figure 6 shows the very obvious concentration of windmills in west Cheshire: twelve of them were located on the Wirral and three near the lower reaches of the Mersey. Table II compares Burdett's record with those of the three other Cheshire maps.

159. James Stuart, presumably having the advantage of local knowledge, corrected three of these errors on his reduced edition of 1794. He also added three watermills on Beeston Brook.

160. *Chester Chronicle* 10 October 1777 refers to '2 separate mills'.

161. *Adams Weekly Courant* 30 January 1776.

162. NORRIS (1965–6) pp.54, 64.

163. Mills at the last two places are found on *Plan of the intended navigable canal from the City of Chester to Middlewich*, engraved by R. Murray but undated (Liverpool Athenaeum Library C910.11).

164. NORRIS (1965–6) p.56.

165. *Chester Chronicle* 10 October 1777.

TABLE II Windmills

Windmills marked by Burdett		Windmills on all 4 Cheshire maps			
Bu only	1	Bu only	1	Bu	18
Bu, Gr and Br	1	Gr only	6	Gr	34
Bu, Sw and Br	2	Sw only	1	Sw	32
All 4 maps	12	Br only	2	Br	34
		Bu and Gr	—		
		Bu and Sw	—		
		Bu and Br	—		
		Gr and Sw	1		
		Gr and Br	1		
		Sw and Br	3		
		Bu, Gr and Sw	—		
		Bu, Gr and Br	1		
		Bu, Sw and Br	2		
		Gr, Sw and Br	13		
		All 4 maps	12		
		Total	43		
Total					
16					
Marked as watermills:					
i. On the other 3 maps	2				
ii. On Stuart's reduction	2				

Bu = Burdett Gr = Greenwood Sw = Swire and Hutchings Br = Bryant

A rather different interpretation is called for than that which was offered in connection with the table of watermills. At first sight it appears that Burdett's record is less satisfactory than for water-power sites, because, although all but one of his windmills are found on at least two of the other maps, these total well under half of the forty-three windmills found on all the maps. The reason for the shortfall would seem to lie in the fact that the use of wind power was spreading into new areas of Cheshire in the late-18th and early-19th centuries and, although Burdett's map contributes a slightly smaller proportion of the windmills than it does for the watermills, his tally of windmills for the 1770s is probably fairly comprehensive.

Supporting evidence is not plentiful, but we can be sure that a number of windmills ceased working in the 18th century. Burdett's triangulation station at Manley Mill is named on the map as 'an old Mill' and appears on none of the other maps, and it may be regarded as one of several mills which ceased working at uncertain dates before Burdett's time. A windmill is recorded on a map of Poulton township of c.1719,¹⁶⁶ for example, and some of the mills marked on Morden's map (1695 but derived from Speed's map of 1611) are not to be found in the late-18th century. With 'Windmill Hill', marked on the modern Ordnance Survey map at Norton, we have the slightly different case of a windmill recorded on Burdett but which thereafter disappears from the cartographic record as an active site. At the same time, new mills were being constructed in Burdett's day. Gibbet Mill in Great Saughall township is labelled 'A new Mill' on his map and indeed it was advertised in April 1777 as 'a new-erected BRICK WIND-MILL'.¹⁶⁷ On the other hand he may have been just too late to plot the building of Charles Roe's new windmill erected in 1776 to grind copper ore at his Macclesfield works.¹⁶⁸

Again we have been able to see that great care must be exercised in using the map as evidence; it is sometimes just as important in the process of evaluation to be aware of what the map does *not* tell us as to be cautious with those features which it does portray. One obvious limitation of Burdett is that we are told nothing about the particular uses to which waterwheels and windmills were

166. Eaton Hall estate office, Grosvenor MSS., estate plans 6.

167. *Chester Chronicle* 4 April 1777.

168. W. H. CHALONER, 'Charles Roe of Macclesfield (1715-81): an eighteenth-century industrialist. Part II', *TLCAS* 63 (1952-3) p.53. Nor for that matter did Burdett record Christ Church Macclesfield built by Roe in 1775 (*ibid.* p.81). This is further evidence that the survey was completed by 1775.

harnessed. In view of industrial growth in east Cheshire, and the widespread emphasis on grassland farming, large numbers of mills were clearly not for grinding corn. Other contemporary sources point to the textile and metallurgical industries as claiming a substantial stake in the developed water-power resources of the county.

In the 1770s waterwheels drove silk, cotton and to a lesser extent woollen mills in Cheshire, but Burdett was seriously deficient in his recognition of these industries. In Macclesfield only one water-mill is shown. Later maps indicate that this was one of the silk-throwing mills powered by water diverted from the River Bollin – possibly the mill newly established on Park Green by Dainty and Ryle in 1775 or, perhaps more likely, the original Macclesfield silk mill established in 1743 by Charles Roe.¹⁶⁹ There were however many other silk mills in the town at this time. As early as 1761 there were seven major firms employing between them 2,470 people, as well as ‘Twelve Silk Mills of inferior Note’ employing a further 1,000 people.¹⁷⁰ A directory for 1781 lists eight silk throwsters and manufacturers in the town,¹⁷¹ and a ‘new erected silk water mill at Macclesfield’ was advertised in 1771.¹⁷² Similar failure to record the existence of the industry can be found elsewhere, most notably in Stockport and its environs, where numerous water-driven factories mainly producing cotton goods had been established.¹⁷³ In Congleton too, a number of silk mills are not recorded by Burdett. It is difficult to imagine how he could have overlooked the mill established on the north bank of the river Dane in 1752 by Nathaniel Pattison and John Clayton and equipped with a 20-foot waterwheel set up by James Brindley. By 1771 it employed over 600 people and must have been among the most impressive industrial buildings in north-west England.¹⁷⁴ In April 1773 there were, according to a witness before the committee investigating the depression in the silk industry, ‘four or five silk mills in the town’.¹⁷⁵ The textile industry was growing so fast at this time, in spite of periodic depressions in some branches, that it is difficult to measure the precise extent to which Burdett failed to record it. In addition, of course, there was a bewildering variety of products being manufactured in the county through the domestic system – silk buttons, gloves and ribbons for example, as well as the weaving of a variety of fibres. But trades such as these, disguised in farms and cottages, never received the attention of the map maker.

In the 17th and 18th centuries Cheshire had been an important area for iron making, especially in the south east of the county.¹⁷⁶ By the 1770s however the end was in sight for charcoal as the main iron-smelting fuel, and the Cheshire industry, originally based on local timber supplies, was declining as regions with better access to coal expanded their production. Nevertheless Burdett marks several metal-working sites which appear to have been still operating:

TABLE III Forges and Furnaces marked by Burdett

Forges

Marston	North of Northwich
Warmingham	On the river Wheelock
Lea	Near Wybunbury
Bug Lawton	Near Congleton
Street	South east of Sandbach
Bosley	On the Staffordshire border
Warnford Bridge	A misspelling of Quarnford Bridge on the Staffordshire border

Furnaces

Doddington	Near Lea forge
Disley	On the river Goyt

169. C. S. DAVIES, *A history of Macclesfield* (Manchester, 1961) pp.125–6.

170. *Journal of the House of Commons* 30 (1765–6) pp.215–19.

171. [BROSTER] (1781).

172. *Manchester Mercury* 25 June 1771.

173. TUNNICLIFFE (1787) gives a list of manufacturers in the Stockport area (confined to within 5 miles of the town with the exception of Bollington) including 13 manufacturing calico, 10 cotton, and 9 check. This was of course a decade after Burdett’s survey.

174. W. B. STEPHENS (ed.), *History of Congleton* (Manchester, 1970) pp.138–9.

175. *Journal of the House of Commons* 34 (1773) p.240.

176. B. G. AWTY, ‘Charcoal ironmasters of Cheshire and Lancashire, 1600–1785’, *THSLC* 109 (1957) pp.71–124.

Iron manufacture is not mentioned at any of these sites and it seems certain that two of them, Bosley and Bug Lawton, represent the brass and copper works established in the 1760s.¹⁷⁷ The forge at Marston is confirmed by a local plan of 1776.¹⁷⁸ It is also worth noting that only two are shown as watermills; yet there can be little doubt that all of them were water-powered.¹⁷⁹ In addition to the forges and furnaces some of the other watermills on the map are known to have been slitting mills where iron was cut into bars and rods. The site at Milbank on the Mersey, for example, is named as a slitting mill on William Yates's map of Lancashire,¹⁸⁰ and the two mills shown at Bidston are certainly meant to represent the tide-operated slitting mill which was still active in 1797.¹⁸¹ There was also a slitting mill at Lymm about 1770, shown as a corn mill by Bryant in 1831.¹⁸²

Sparse documentary evidence makes it difficult to know whether there were other iron works active in Cheshire at this time. Tib Green forge is marked on William Yates's map of Staffordshire, published in 1775, on the Cheshire side of the boundary near Wrine Hill: it is not shown by Burdett and there is evidence that it was out of production by 1750.¹⁸³ The forge at Cranage is not marked on any of the Cheshire county maps though waterwheels at the site operated both a forge and corn mill, a dual function which seems to have persisted till at least 1767.¹⁸⁴ Another forge is indicated at Acton on the Weaver by Greenwood, Swire and Hutchings, and Bryant. There was a forge there in the early-18th century, but it is known to have been inactive during the middle years of the century and there is no evidence that iron was made there in the 1770s. For the iron industry at least we can conclude that Burdett's map was tolerably reliable within its own terms of reference: it is even possible that all the furnaces and forges active at the time of the survey are marked. That this could partly be a result of a particular awareness by Burdett of the place of this industry in the early industrial revolution has already been suggested. But even so we must be cautious: the map cannot provide conclusive evidence that a works was actively engaged in iron production at the time.

The manufacture of brass and copper is also not specifically identified on the map although two works are marked. It had been an important industry in Macclesfield since Charles Roe established his smelting works in 1758 originally using ore mined at Alderley Edge.¹⁸⁵ In 1763 a mill for the manufacture of brass wire, and brass and copper plates and bolts, was established on the river Dane north of Congleton. The site, which was already occupied by the two waterwheels of a corn mill, was named Havannah after the British capture of the Cuban capital in 1762, and is found as a watermill on the later maps.¹⁸⁶ Burdett failed to mark a watermill and labelled the site as a forge leading the unwary into assuming the site was an iron works. A further works for hammering and rolling copper and brass was established at Bosley in 1766. This seems to be the watermill shown by Burdett, though there were in fact six waterwheels at the works.¹⁸⁷ Again the 'forge' on Burdett's map, perhaps an acceptable contemporary description, must represent this site.

Of the other industries represented on the map (coal, salt, lime and gunpowder) only coal mining is at all well mapped. Even here we cannot be sure that some coal pits, especially small upland mines, were not overlooked. Thirty individual coal pits are marked at nine separate locations: twenty-six (eight locations) on the Lower Coal Measures in the east, the remainder on the Wirral out-

177. *Infra*.

178. Survey by John Earl reproduced in A. F. CALVERT, *Salt in Cheshire* (London, 1915) p.211.

179. The works at Marston, Warmingham, Street and Doddington are shown as watermills on the other later county maps. In common with other such metallurgical works (e.g. Lea forge) the last three were converted to corn mills in the 19th century. See NORRIS (1965-6) pp.58, 64-5.

180. The site was also occupied by a paper mill and it is not possible to know which Burdett is denoting or indeed whether the waterwheel was shared. See AWTY (1957) p.107. The later county maps mark the paper mill.

181. *Ibid.* pp.107-8.

182. YOUNG (1771) map opposite p.236. AIKIN (1795) p.421, describes this as being '... for slitting and flattening [the iron] into hoops for the cooper's use.'

183. AWTY (1957) p.109.

184. NORRIS (1965-6) p.59. See also figure 5 which shows Cranage forge and corn mill, but AWTY (1957) p.112 suggests that this forge went out of production about 1750.

185. W. H. CHALONER, 'Charles Roe of Macclesfield (1715-81): an eighteenth-century industrialist. Part I' *TLCAS* 62 (1950-1) p.143.

186. *Loc. cit.* See also STEPHENS (1970) pp.144, 154. The site became an industrial village with a silk mill as well as the brass and copper works.

187. CHALONER (1950-1) p.144.

crop of the Flint coalfield near Little Neston where a small colliery had been opened about 1750.¹⁸⁸ Henry Holland in listing the townships where coal was worked in 1806 described a distribution pattern very similar to Burdett's.¹⁸⁹ Adlington and Lyme were the only townships named which are not shown with coal pits on the map. It seems possible that Burdett under-estimated the amount of mining activity in the Hyde and Duckinfield areas where coal was extensively mined in the 1820s.¹⁹⁰ Coal may also have been mined on the Cheshire side of Mow Cop at this time.¹⁹¹

All similar topographical maps leave us with the problem of distinguishing individual pits or shafts from collieries which may comprise several shafts including some for ventilation. Burdett may be indicating the general location of coal mining rather than attempting to portray individual shafts. It is impossible therefore to estimate the number of collieries at work in Cheshire in the 1770s beyond stating that according to Burdett it was at least nine. The collieries in south-east Cheshire, especially on Macclesfield Common, exploited poor thin seams. Holland described the coal near Macclesfield, presumably referring to pits on the common enclosed in 1796, as 'so thin as scarcely to repay the expense of working'.¹⁹² The poor productivity of these pits and the rising cost of coal brought from elsewhere were the chief stimuli to the abortive attempt in the 1760s to construct a canal from Macclesfield northwards to Norbury, Worth and Poynton where thicker seams were being mined.¹⁹³ Finally, in assessing Burdett's survey of coal mines it should be remembered that no other single source for the 1770s gives such an easily available list of pits: only detailed research could verify it. Furthermore, as a measure of the quantitative distribution of pits the map is at least as accurate as that of William Yates for Lancashire,¹⁹⁴ and considerably better than Swire and Hutchings' map which marks no coal pits at all in east Cheshire.

Salt production, by far the most important industry in mid-Cheshire, received scant attention from Burdett. It appears on the map at only three places: salt works are marked at Lawton and Middlewich, and brine pits at Hankelow south of Nantwich. The last of these may simply refer to Brine Pits Farm where, Holland stated in 1808, 'salt was formerly manufactured'.¹⁹⁵ The Lawton works may have been impressive enough to warrant his attention as they were described in 1779 as 'newly-erected' and were supplied with a Boulton and Watt steam engine for pumping brine in 1778.¹⁹⁶ Many other salt works go completely unrecorded. None of the brine works at Northwich, Winsford, Nantwich and smaller centres along the river Wheelock, all productive at this time, will be found on the map. The numerous rock-salt pits at Marbury and Witton and the refinery at Frodsham, which were certainly in existence in 1778, are also missing.¹⁹⁷ Why is it that an industry which shipped an annual average of over 74,000 tons of salt down the Weaver Navigation during the 1770s was so overlooked?¹⁹⁸ The salt-pan houses were after all fairly distinctive landscape features, and the three other Cheshire maps give a far better picture of the industry. Neither the map nor the circumstances of its production can offer a cogent reason for such an omission and it provides yet another example of the inconsistencies which can characterise the work of the 18th-century topographical surveyor.

188. LYSONS (1810) p.412. The *Chester Chronicle* 12 June 1775 reported an accident at Saughall sustained by a blacksmith 'returning from the coal pit', clearly a reference to this colliery.

189. HOLLAND (1808) pp.12-15.

190. See for example Greenwood's map of 1819.

191. STEPHENS (1970) p.156.

192. HOLLAND (1808) p.14.

193. CHALONER (1950-1) p.151.

194. HARLEY (1968) p.18.

195. HOLLAND (1808) p.21.

196. W. H. CHALONER, 'Salt in Cheshire 1600-1870', *TLCAS* 71 (1961) p.72. The works were probably built to receive the steam engine from the start: see CHALONER (1949) pp.122-4.

197. CALVERT (1915) pp.203-11, reproduces a series of 18th-century maps which, together with his other evidence, amply demonstrate the extent of salt extraction around Northwich. CRO DCH/H/516, a map of Frodsham dated 1778, marks the works where salt had been refined since the 1690s: see T. C. BARKER, 'Lancashire coal, Cheshire salt and the rise of Liverpool', *THSLC* 103 (1951) p.86.

198. T. S. WILLAN, *The navigation of the river Weaver in the eighteenth century*, Chetham Society 3rd series 3 (1951). Appendix v. This figure, for the period 1 April 1770 to 31 March 1779, represented 65.8% of the Weaver's trade by weight. Much of the remainder was coal for the salt works.

Conclusion

To the critical historian to end on a negative note may seem to provide a fitting epitaph for Burdett's survey. There is no doubt that as well as being a landmark in the mapping of Cheshire it is something of a missed opportunity. Burdett, although well-qualified and experienced, and fully aware of the importance of the landscape changes which made the task of survey so much more difficult, failed in the light of his own specification to produce a map of the highest quality. But it should still be viewed positively for its potential for topographical research, as well as in terms of the pitfalls which, in common with other maps, it contains for the unwary. Historians of different subjects will ask different questions of the map and to each it may have different strengths or weaknesses. There are so many facets to topographical research that the aspects of the map described in this introduction can only be a sample of the themes which interest the authors and have traditionally been a concern of local historians.

The most important general conclusion has wider implications for the study of all the printed maps of Cheshire down to the present. It concerns the need to define what we mean by accuracy when we look at an early map. It may be misleading to talk of 'accuracy' or 'inaccuracy' in the way we use these terms for more straightforward sources. For a printed map, though it survives as a single artefact, is as much a palimpsest as the landscape it seeks to record. It is an illusion to think of 'perfect correctness' when the map is the end product not only of its own terms of reference and of the constraints of the surveying and production processes, but also of the range of choices open to an idiosyncratic surveyor. Map accuracy is a composite quality. It means different things when we are talking, on the one hand, about precision of distance and position and, on the other, of topographical detail. We cannot even generalise about the topographical detail. For some themes the map is a primary document (occasionally it may contain *unique* information in the sense that it is the sole authority for a particular fact); but for others it may only add a fragment to better sources, or even, as with the plan of Chester, be inferior to other information. In the identification of these different strata of accuracy and their historical value, a study of the map-making processes goes hand in hand with cross-checking the map against independent topographical sources; both of these illuminate the map's limitations as well as its mode of production. As far as the county maps of Cheshire are concerned local history and the history of cartography are two sides of the same coin.



Authors' Acknowledgements

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APPENDIX 1 CHANGES TO THE PLATES BY WILLIAM FADEN 1794 AND 1818

The numbers refer to those in circles in Figure 1. Words etc. in italics were added to the plates.

1794 EDITION

1. *Published by W. Faden, Geog^r. to His Majesty, and to H.R.H. the Prince of Wales, Charing Cross June 1st 1794. 2^d Edition.*
2. *IRISH SEA*
3. *Bathing Place*
4. *Hoyle Lake*
5. *H* after 'Sea Light'
6.  *Rock Perch* (symbol and words added)
7. *Bootle Mills*
8. *Fort*
9. *Mersey*
10. *Tunnel*
11. *Gib Hill*
12. *From Liverpool 19M^s 188M-0F-3P from London*
13. *to Wigan 12 M^s* The road slightly extended at this point
14. *to Manchester 18 M^s* The road slightly extended at this point
15. *Sereton Heath*
16. *Bate Heath*
17. *Wineham*
18. *T.B.*
19. Park fence and road across Lower Tabley Park removed
20. *Sudlon* moved from north side of 'N.Knutsford Lane' to south side
21. *176M-0F-22P from London*
22. *T.B.*
23. *to Manchester 5 Miles*
24. *to Manchester 6 Miles*
25. *to Manchester 7 Miles*
26. *Portwood Mill*
27. *Bollin R*
28. *Staveley B*
29. *Mill*  (symbol and word added)
30. River Tame and county boundary substantially re-engraved to accommodate the addition of the Ashton Canal
31. *Canal from Ashton to Huddersfield*
32. *To Peniston*
33. *to Chapel in Frith*
34. *to Buxton 7 Miles*
35. *Junction of the Dee &.*
36. *To Holywell 13 Miles*
37. *To Wrexham 6 Miles*
38. *Eaton Hall*
39. Italic letters in the name 'Eaton' replaced by roman
40. *Delamer Lodge* Symbol added viz. ■
41. *Barnton*
42. *Casia Green*

43. *To Whitchurch*
44. *To Drayton 8 Miles*
45. Short stretch of road removed
46. South end of park re-engraved and a new mill pool inserted
47. *T.B.*
48. *T.B.*
49. *T.B.*
50. *161M-5F-24P from London*
51. Church symbol removed
52. *New Moreton Hall*
53. *T.B.*
54. *Red Ball*
55. Figure '1' removed as the result of the re-engraving of road
56. *145M-5F-6P from London*
57. *To Newcastle 6 Miles*
58. *8 Miles* added after 'to Newcastle'
59. *To Newcastle 6 Miles*
60. *6 Miles* added after 'to Leek'
61. *5 Miles* added after 'to Leek'
62. Date of publication removed
63. *Published by W. Faden, Charing Cross, Sept^r. 1st 1794.*

1818 EDITION

1. *Sept^r. 1st. 1818* replaces 'June 1st. 1794.' '2^d Edition' remains unaltered
2. *Nether Stretton*
3. Superfluous extra toll bar removed
4. *Nether Tabley*
5. *to Huddersfield*
6. *Peak Forest Canal*
7. *NOTE The BOUNDARY LINE of DELAMERE FOREST is coloured Purple.*
8. Watermill symbol removed
9. *Mere*
10. *Forest Boundary*
11. Stream shortened by about three quarters of a mile
12. *Grand Trunk or Trent & Mersey Canal*

Notes on Figure 1:

- (a) At Frodsham the word *Mills* is added. See also numbers 26 and 29 of this appendix.
- (b) Roads turnpiked are also more heavily engraved. New turnpikes are only indicated as new roads where the route was obviously new or substantially changed.

APPENDIX 2 COPIES OF BURDETT'S MAP OF CHESHIRE

This list includes only those copies in major libraries and local collections which enabled the authors to draw up the description of different states outlined in this introduction. s=uncut sheets; r=roll mounted; d=dissected and folded; * indicates a coloured copy.

STATE I [1777]

Bodleian Library, Oxford, (E)C17.20(6). d*
 John Rylands University Library, Manchester, 8075.4. s*
 Manchester Public Library, Q912.4271 BU1. d*
 Liverpool Athenaeum Library, C910.11. s
 Liverpool Public Library, Hg12 (71). s
 Cheshire Record Office, Chester, DL1 13/1. r*
 Cheshire Record Office, Chester, Printed maps acc.L41. r
 Chester Public Library, H 1B 150. Used in this facsimile. s
 Chester Public Library, H 1B 249. S.E. sheet missing. s
 Cheshire County Library, Chester, X912.B6a. d
 Warrington Public Library R912.4271 B21. r

STATE II 1777

British Library, K9.2.2TAB. r
 British Library, 1720 (17.). d*

Cambridge University Library, Atlas 2.77.7. d*
 National Library of Wales, NLW printed maps: Cheshire. s*
 Chester Public Library, H 1B 248. s
 Stockport Public Library, C/C90. d

STATE III 1794

British Library, 1720 (1.). d*
 Royal Geographical Society, England and Wales D7. s
 Cambridge University Library, Maps.aa.54.79.1-4. s*
 National Library of Scotland, Map R.5.e. r*
 Bodleian Library, Oxford, C17a.2. s*
 G. E. H. Allen collection (Lancashire Record Office, Preston), H Ches 3. d*
 Mrs F. Hardman. d*

STATE IV 1818

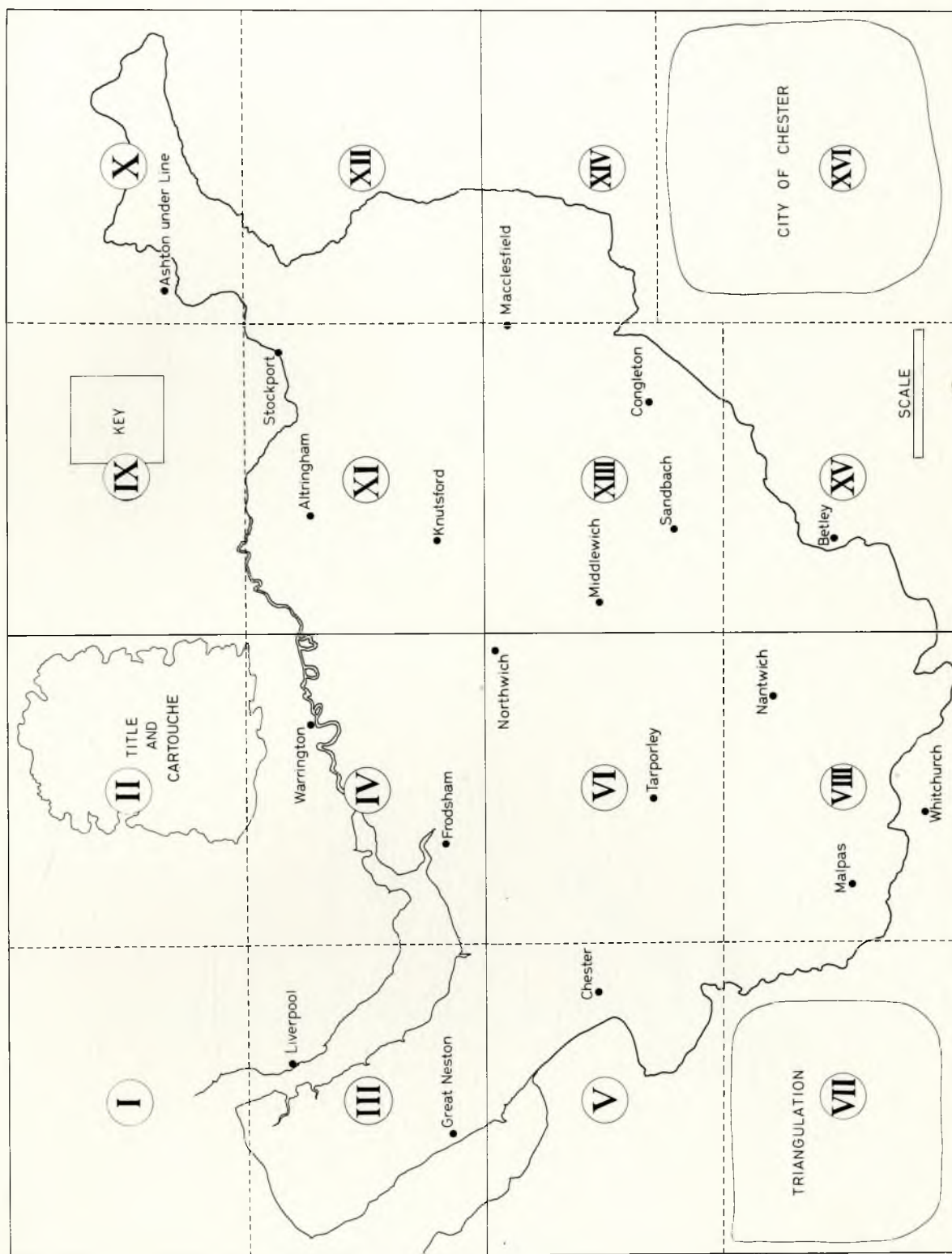
Brotherton Library, Leeds University, Whitaker Collection 375. d*
 Warrington Public Library, R912.4271 B22. r

APPENDIX 3 AN ANNOUNCEMENT IN THE MANCHESTER MERCURY 5, 12 AND 19 FEBRUARY 1771

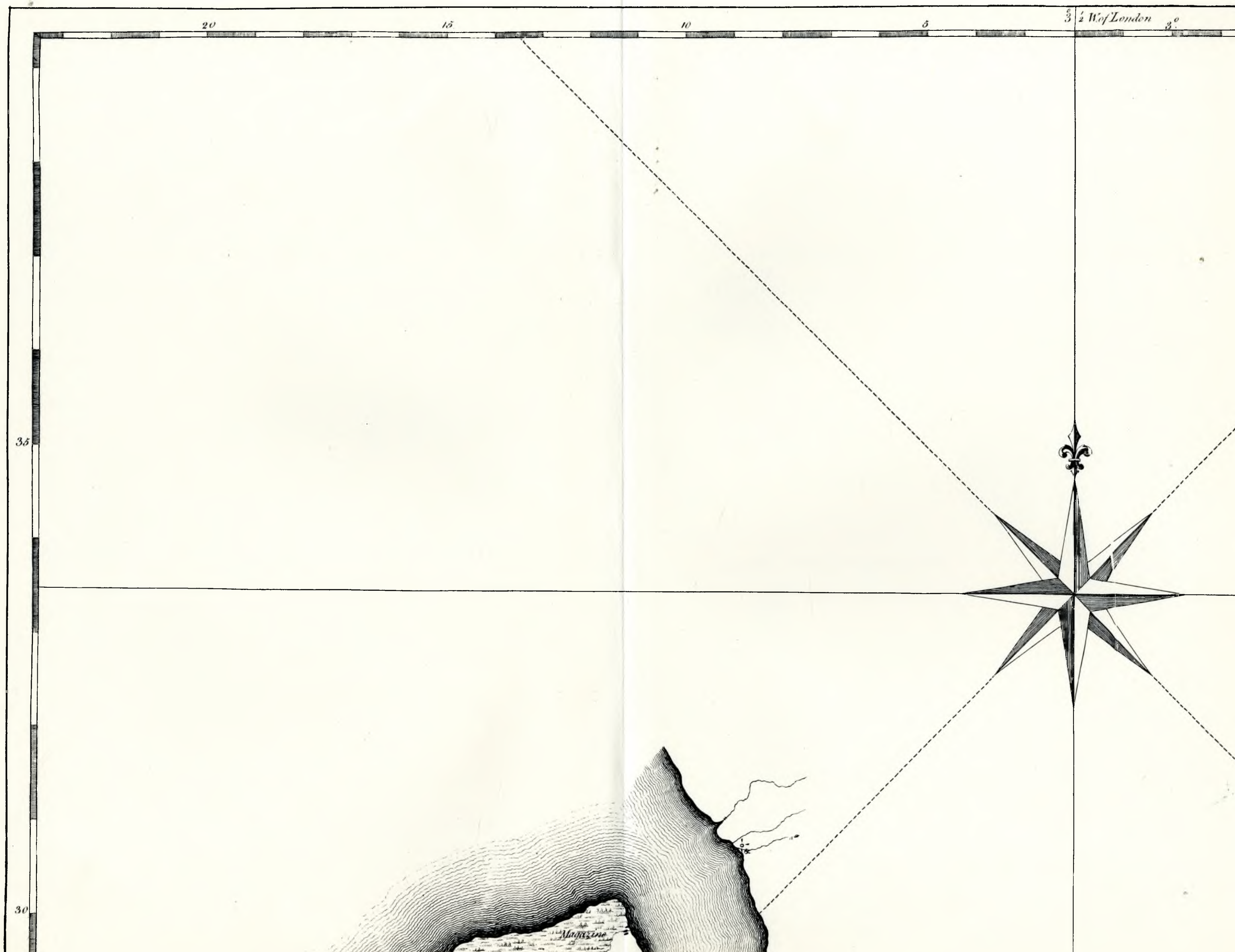
SURVEY OF LANCASHIRE

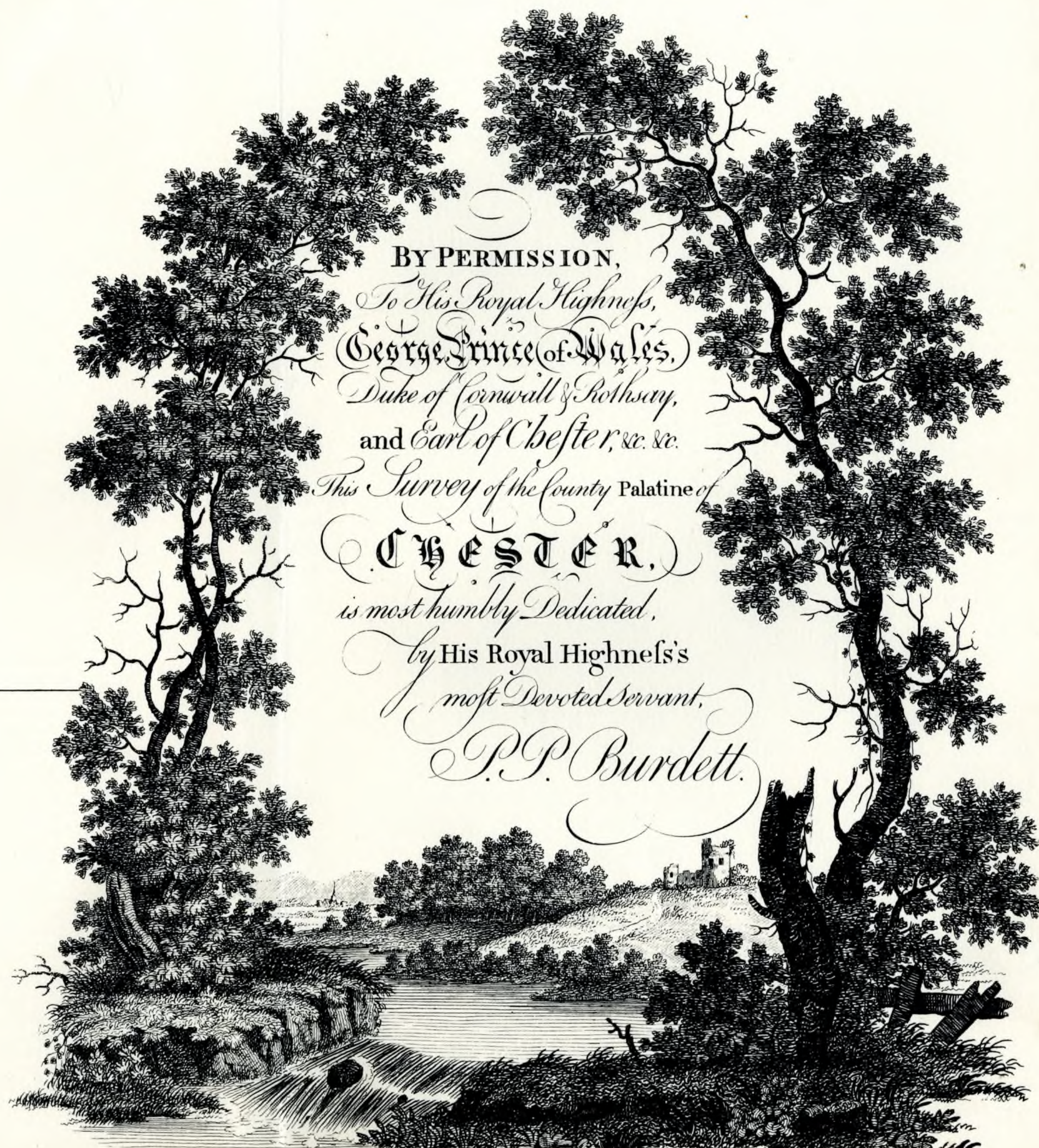
Liverpoole January 18, 1771.
 MR. BURDETT takes this Method to acquaint those who have honoured him with their Subscriptions to his intended MAP of the *County Palatine of LANCASTER*, That according to his printed Proposals, he began his actual Survey of the County in *April* 1769, and has made a very considerable Progress in the Work; which would have been finished this Summer had not near two-thirds of his Subscribers omitted to pay in their *first* Subscription of *One Guinea*; which, by the Second Condition in the Proposals, was to be paid *as soon* as the Survey commenced. Mr. BURDETT, therefore, earnestly desires that such of his Subscribers as have hitherto omitted it, will, *without Delay*, pay in their first Subscriptions to *Thomas Butterworth Bayley, Esq;* of *Hope*, near *Manchester*, and *Dorning Ramsbotham, Esq;* of *Farnworth* near *Bolton*, who will inspect the Progress of the Survey which Mr. *Burdett* will endeavour to carry on to the Satisfaction of his Subscribers, and to publish in the Spring of 1772.

N.B. Mr *Bayley* and Mr. *Ramsbotham* desire those Gentlemen who have received any Subscriptions for Mr. *Burdett*, to remit the Account and the Money to them, or to Mr. *John Wright*, near St. Ann's Square, *Manchester*, who is by *them* appointed to receive Subscriptions, and to give Receipts for them.



Key to map sections





BY PERMISSION,

To His Royal Highness,
George Prince of Wales,
Duke of Cornwall & Rothesay,
and Earl of Chester, &c. &c.

This Survey of the County Palatine of

CHESTER,

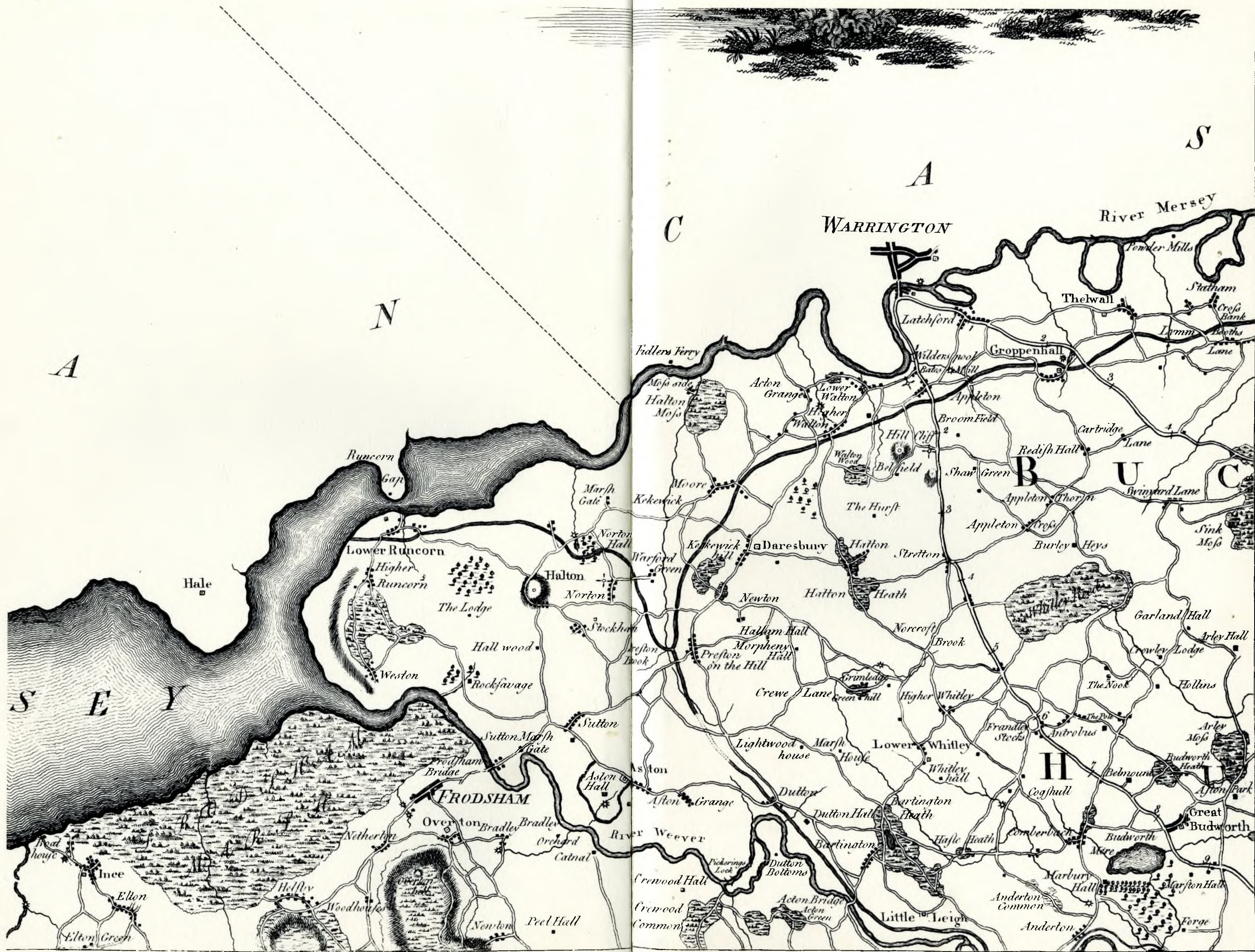
is most humbly Dedicated,

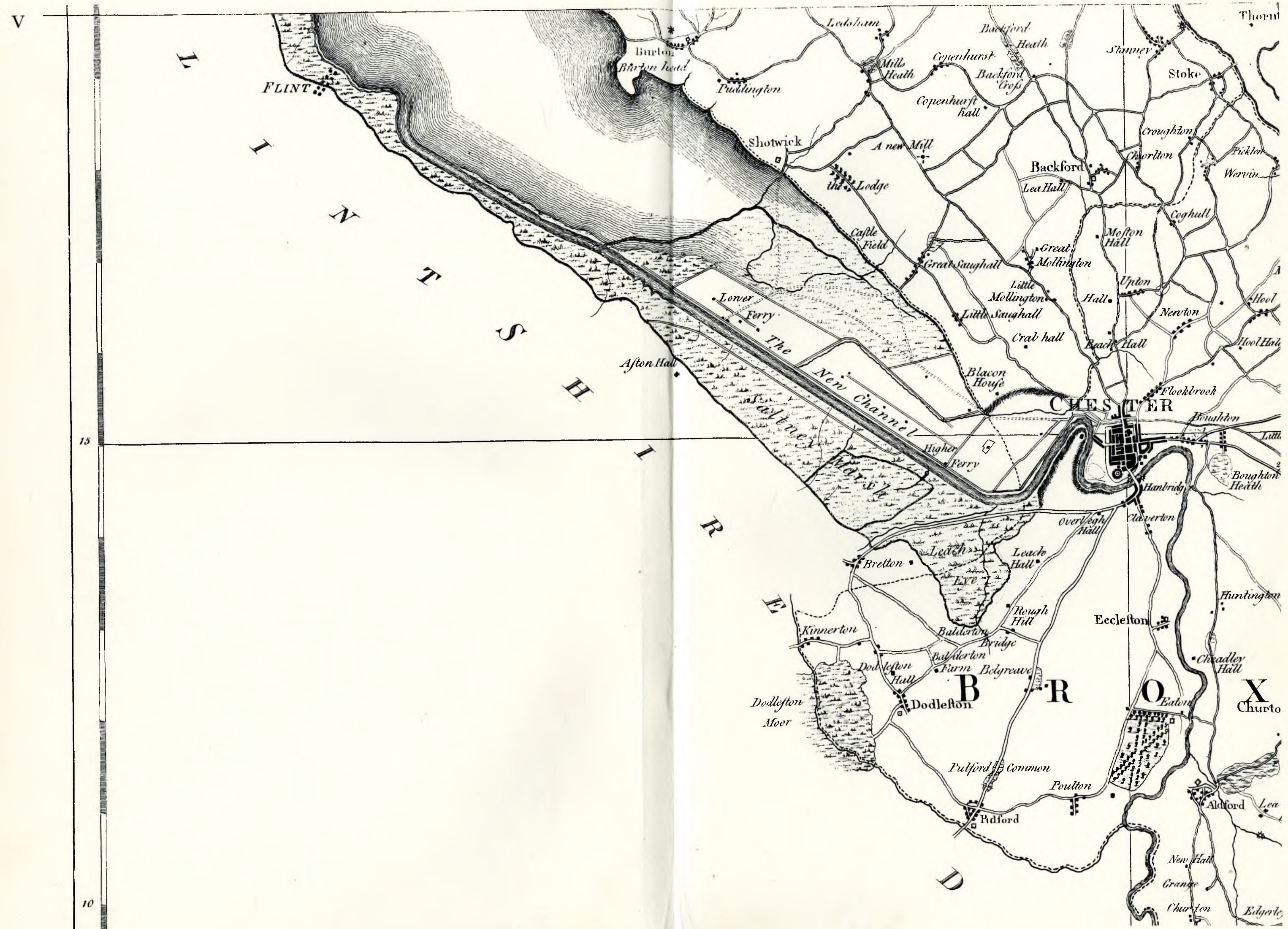
by His Royal Highness's
most Devoted Servant,
P. P. Burdett.

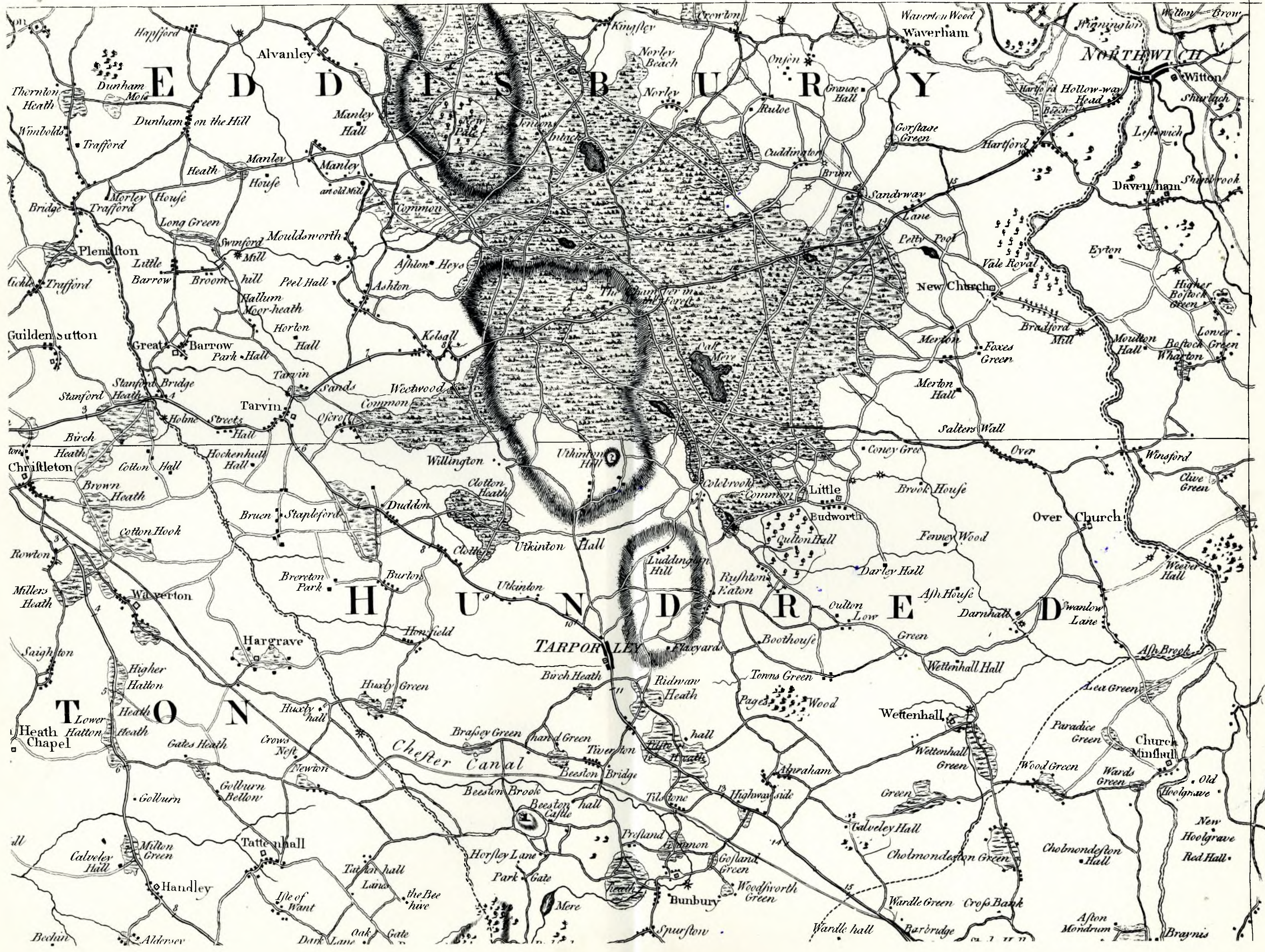


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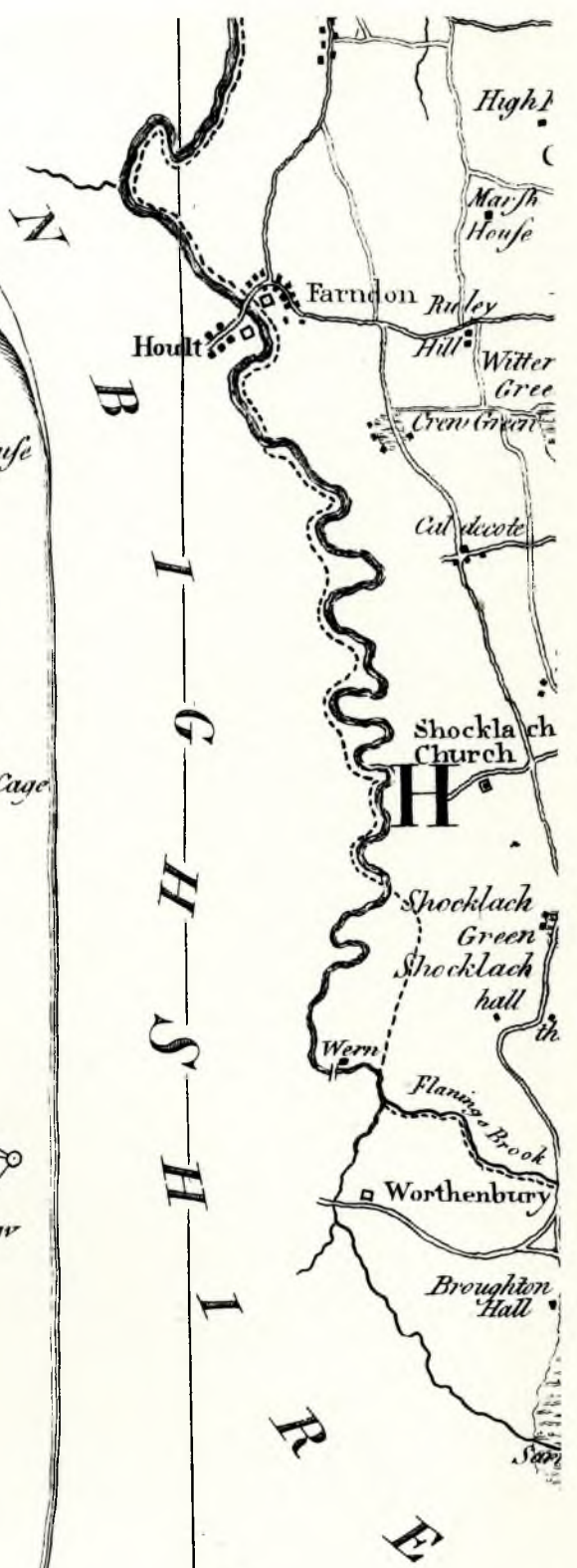
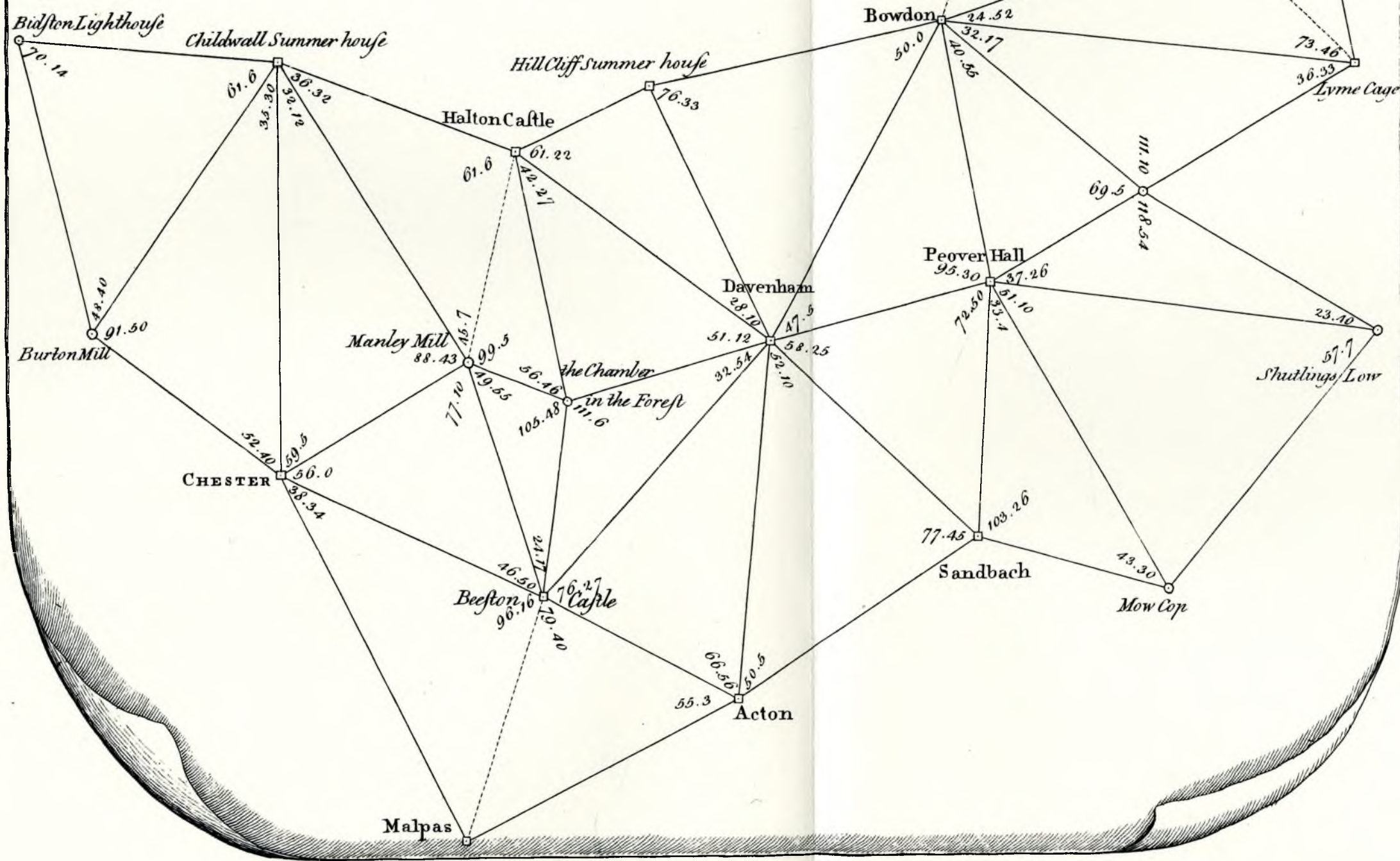


The Series of great Triangles reduced to an Horizontal Plane.

*By which the most eminent Places of this County were projected,
and from whence all the Inferior parts were drawn in like Manner.*

The whole taken with Instruments graduated with great Care.

*Submitted to the Inspection, and intended for the use of the
curious in Geography, as also for a testimony of the Accuracy
of this Work, which may with ease be examined in a variety of
Angles, both by Actual Observation and Calculation.*



5

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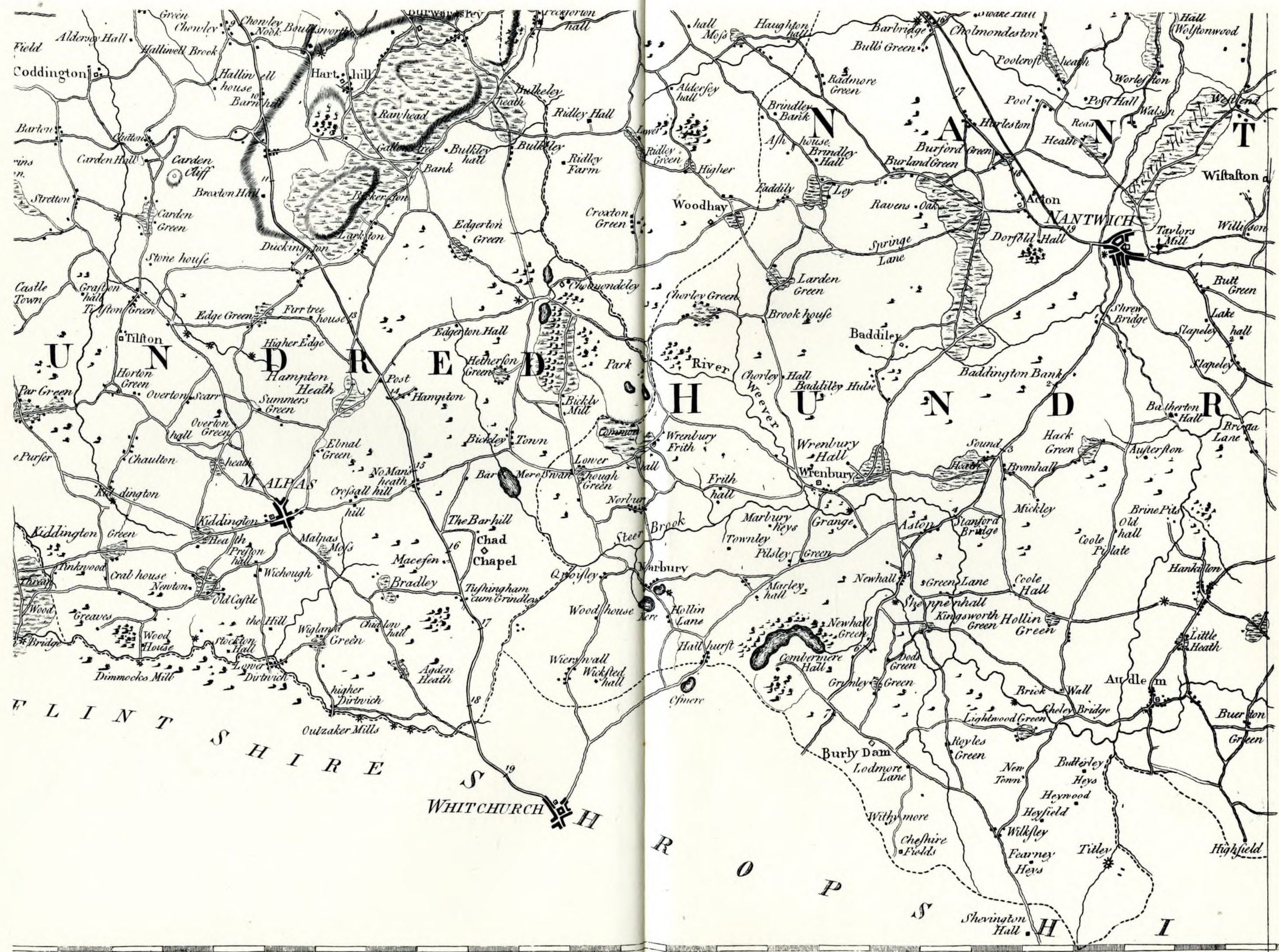
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5

3 1/2 W. of London 3'






FLINTSHIRE

WHITCHURCH

SHROPSHIRE

EXPLANATION

Plans of	(Market Towns & Villages.....)	in their true form	
	(Single Houses.....)		.
Churches and Chapels.....			□
Salt Works.....			△
Coal Pits.....			•
Water Mills.....			*
Wind Mills.....			+
Lakes or Meres.....			◐
Turnpike Roads with their true Measure in Miles.....			
Cross Roads.....			
The Division of the Hundreds.....			---

H

R. Inwell

Flixton



river Mersey

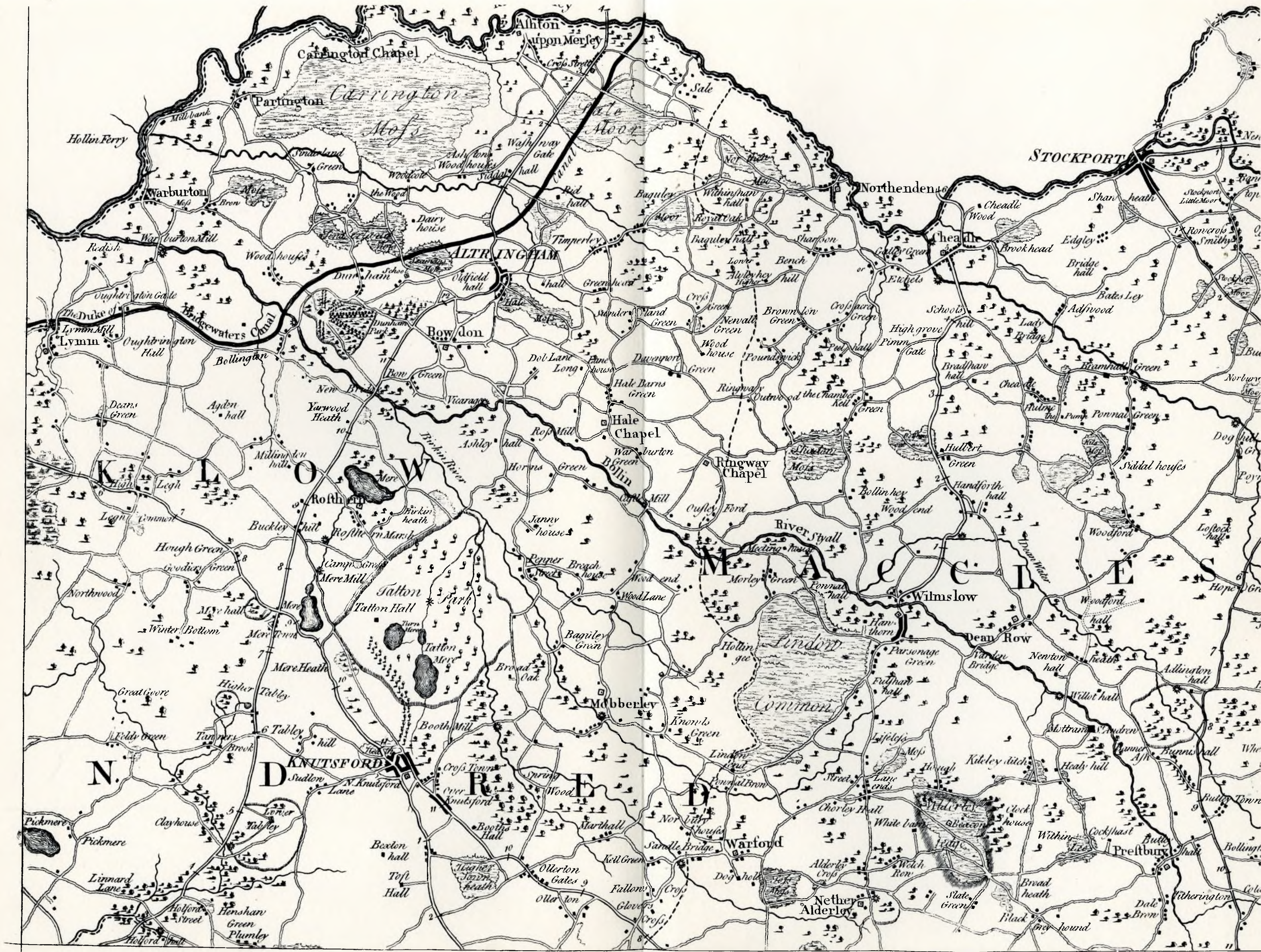
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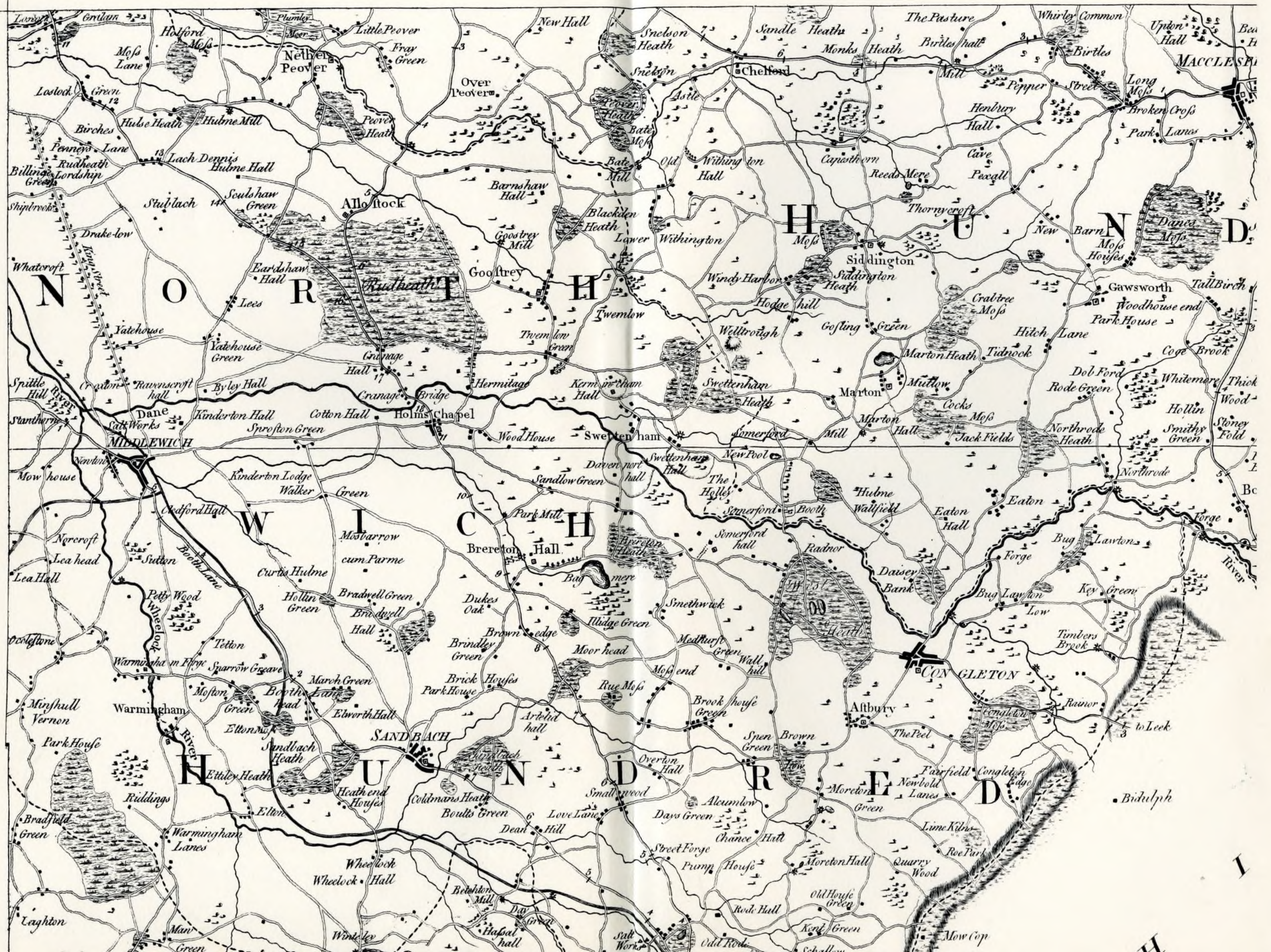
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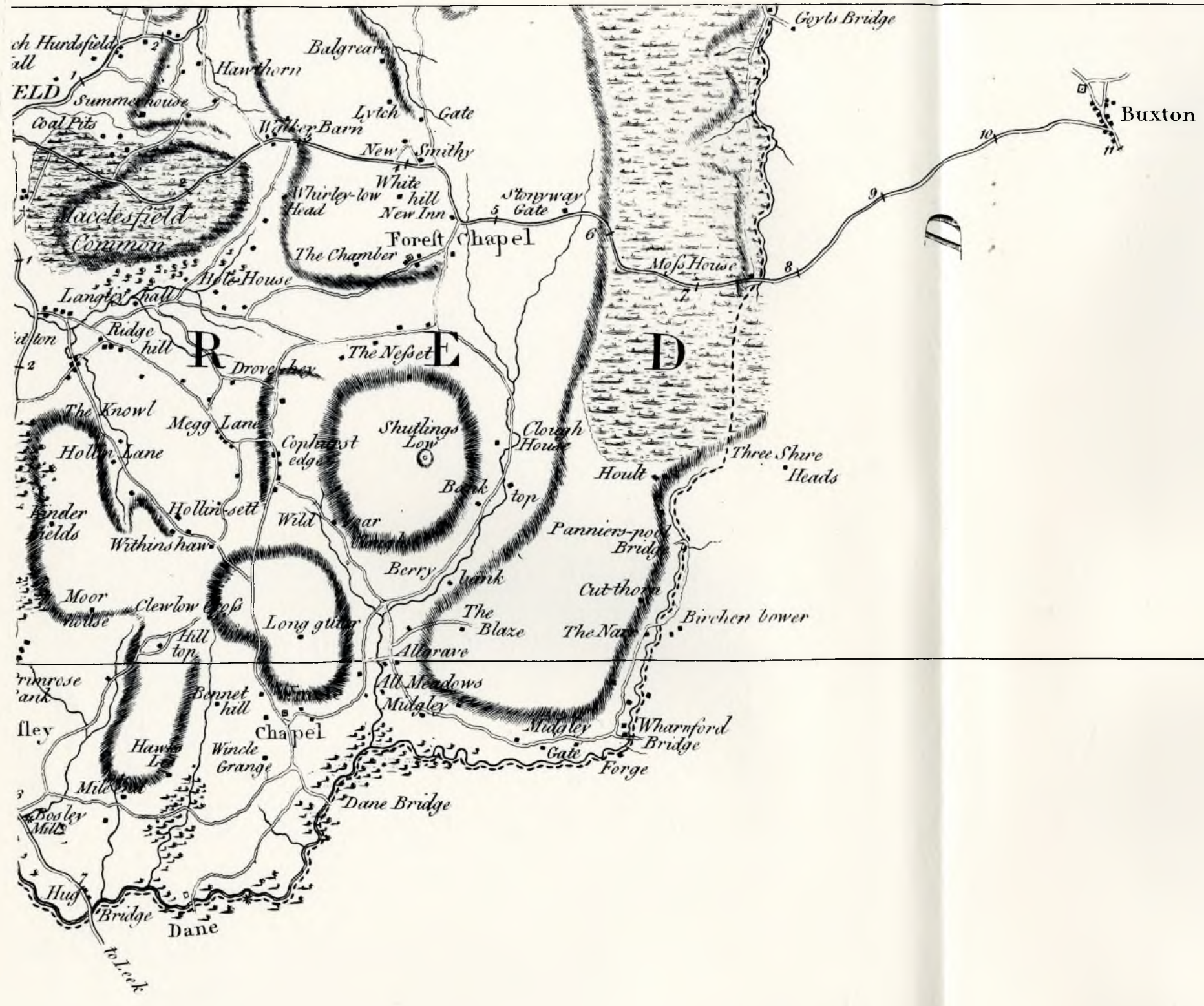
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R
E

A PLAN of the CITY of CHESTER



A Scale of 600 Yards



The Roads Meres & Commons of this Map were Engraved by P.P. Burdett and the rest by T. Billinge of Liverpool