A MAP OF THE COUNTY OF GLAMORGAN:

FROM AN

ACTUAL SURVEY,

MADE

By GEORGE YATES of Liverpool.

ON WHICH

Are Delineated the Course of the Rivers, and Navigable Canals;

WITH

The Roads, Parks, Gentlemens Seats, Castles, Woods,

1799

George Yates's Map of Glamorgan (1799)

A FACSIMILE EDITION
WITH AN INTRODUCTION BY
GWYN WALTERS AND BRIAN JAMES

South Wales Record Society
Volume 2, 1984
a joint publication with the Glamorgan Archive Service

First Published in this Edition 1984

Published jointly by the South Wales Record Society,
22 Redbrink Crescent, Barry Island, South Glamorgan,
and the Glamorgan Archive Service,
County Hall, Cathays Park, Cardiff.

ISBN 0 9508676 1 6

The South Wales Record Society acknowledges with gratitude the generosity of the Mid Glamorgan County Council (from its Welsh Church Acts Fund) and of The Twenty Seven Foundation.

The Glamorgan Archive Service wishes to acknowledge the kind co-operation of Mr. Alan Date, owner of the original map used for this fascimile.

Printed by D. Brown & Sons Ltd., Cowbridge and Bridgend, A38802/117L

INTRODUCTION *by Gwyn Walters and Brian James*

The map of Glamorgan surveyed by George Yates and published by John Cary on 21 May 1799 represents the culmination of a century's tradition of copper-engraved county maps at a scale of one inch or more to a mile.[1] Its publication, moreover, was on the eve of the issue of the first one-inch map, that of Kent, by the Board of Ordnance. Thrust upon it therefore, whatever other merits it displayed, was a special chronological position in this *genre* of map production. This uniqueness requires us to fathom its lineage and to place it in its Welsh, wider British and even, in one particular, its European context.

The English County One-Inch Map from Gascoigne (1700) to Baugh (1808)

A certain chronological stridency also accompanies the first private English county map on the one-inch scale, for that of Cornwall by Gascoigne was published in the opening year of the eighteenth century. There were earlier examples of the use of this scale but not for county maps. Areas such as the Fens (1684) and Romney Marsh (1662) had been thus mapped; and John Ogilby's *Britannia* strip-maps (1675) also used this scale. Ogilby became the King's Cosmographer, having earlier been entrusted with the 'poetical part' of James II's coronation. His printing and bookselling establishment survived the Fire of London. After Gascoigne progress in other counties was, for the first half of the century, desultory. The period 1727-31 witnessed a sudden spurt of activity with the appearance of Henry Beighton's *Warwickshire*, Senex's *Surrey* and Gordon's *Huntingdonshire*, the latter on a scale of 1½in. to the mile. 1736 saw Gordon's *Bedford* and Kirby's *Suffolk* emerging from the rolling presses, then inactivity reigned until 1752-54 when John Rocque's *Shropshire* and Isaac Taylor's *Herefordshire* became the first large-scale maps of the English Marcher counties.

In the following year a letter from the notable Cornish naturalist and antiquary William Borlase (1695-1772) to his friend Henry Baker (1698-1774) is significant for a number of reasons. Baker was already a member of the recently founded Society of Arts. One of its more imaginative activities was the award of premiums for useful inventions and other accomplishments in the arts.[2] Borlase now sought Baker's aid in giving the Society's terms of reference a cartographic slant: 'Our maps of England and its counties' he wrote, 'are extremely defective'. He suggested that 'if among your premiums for drawing some reward were offered for the best plan measurement and actual Survey of City or District, it might move the attention of the public towards Geography, and in time perhaps incline the Administration to take this matter into their hands (as I am informed it does in some foreign Countries) ... till the whole Island is regularly surveyed'. There can be no doubt that Borlase had in mind the case of France where Louis XV's commissioning of Cassini de Thury to supply a trigonometrical basis for the mapping of that country highlighted the inadequacies of English official mapping, which ironically had only been concerned with a survey of the Highlands of Scotland[3] (sometimes called the Duke of Cumberland's Map, but more properly William Roy's)[4] in the wake of the Jacobite Rebellion of 1745. Seldom can one letter have been more successfully provocative: by 1759 the Society of Arts had been pressurised into awarding premiums for original surveys of counties based on the 1in. scale;[5] by 1784 the Board of Ordnance had commenced a full-scale trigonometrical survey of England and Wales, and in the early nineteenth century was to produce a series of 1in. maps which more than vied with the 182 sheets of French areas for which Cassini was responsible from 1756 onwards.

Awards by the Society of Arts were dependent not only on the 1in. scale but on such stringent requirements as correct bearings and adequate and authenticated topographical in-filling. The standards set by the Society were high. This, coupled with the quality and quantity of contestants, resulted in such accomplished map-makers as John Rocque, Isaac Taylor and Thomas Jefferys failing to secure awards. But some won double awards—the excellent William Faden for instance, later publisher to the Board of Ordnance, for his *Hampshire* (1791) and *Sussex* (1795). Richard Davies of Lewknor, a farmer, is of interest in that he surveyed the Gogerddan estate of the Pryses in Cardiganshire, and was later rewarded with the sum of fifty guineas by the Society for a 2in. survey of his native *Oxfordshire*. Two Welsh maps, as we shall see, were accorded recognition in 1795 and 1803. The final recipient was Robert Baugh for his map of *Shropshire* (1808).[6] The nature of publication from county to county varied with the potential demand, but the combination of wealthy patron and the opening of subscription books at key centres was the norm, for the high cost of survey seldom justified a straightforward commercial venture which eschewed these vital safeguards.

Mention has already been made of the military mapping of the Scottish Highlands on a large scale (1747-55). In Ireland too there was military mapping from 1765, associated with Roy, Vallancey and Taylor. Ireland, in fact, was the setting for the first really large-scale survey of an official nature when Sir William Petty directed the 'Down Survey' on behalf of the Commonwealth government a century earlier. Military expediency was not the only factor in the history of early Irish mapping however,[7] for the Physico-Historical Society of Dublin from 1744, and the 'Grand Juries' map system from 1774, may be seen as the civil equivalent there of the work of the Society of Arts in England and Wales.

The Mapping of Wales from William Williams (1720) to John Evans (1795)

At the opening of the eighteenth century the cartographic portrayal of the Welsh counties was patently inadequate.[8] There had been no real advance in original survey since the pioneer efforts of Saxton and Speed in 1579 and 1611; and at the end of the seventeenth century the maps of Morden, commissioned by Edmund Gibson for his new edition of Camden's *Britannia* (1695), were clearly of the same mould. Neither were they county maps, with which the English counties in *Britannia* were furnished, but two regional maps of North and South Wales. This downgrading of the cartographical face of Wales to a regional rather than a county basis incurred the displeasure of Edward Lhuyd who accused the publishers (Swalle and the Brothers Churchill) of having 'put a trick upon us'.[9] The national slight conferred by smallness of scale was enhanced by Lhuyd's further strictures on the faulty orthography. It is interesting in passing to note that a map in Lhuyd's miscellaneous papers, Jansson's map of South Wales, betrays by its folded and worn state that it was in all probability Lhuyd's working map on his antiquarian sorties into South Wales before 1695.[10]

In 1720 William Williams's *New map of the counties of Denbigh and Flint* heralded, it seemed, a new dawn in Welsh mapping. Here was a map on the scale of one inch to a mile, plotting and naming all settlements and houses of note, and tracing the lines of the frontier earthworks of Offa's Dyke and Watt's Dyke. Embellishment was a further feature, Williams stating, in his *Proposal* to publish, that he intended to have engraved 'the elevation of the best building, protracted by a large scale in the vacant part of the mapp'. This added enormously to the aesthetic appeal of the map, with Gadlis Workhouse at Bagillt (a smelting house) vying with the more expected Wrexham and Gresford churches as display pieces. It is easy to see from the evidence of these illustrations why Williams went on to publish that fine folio book of drawings, *Oxonia depicta* (1732-3). The map was engraved by John Senex and, on the evidence of the imprint, printed by John Felton of Oswestry. Most of the principal gentry and landowners of North Wales subscribed to the undertaking.

Nine years later, in 1729, Emanuel Bowen, the London commercial cartographer, published *A new and accurate map of South Wales ... from an actual survey and admeasurement*. The scale of 3 inches to 5 miles is sufficiently large to engage our attention, but the claim to 'actual survey' is merely a conventional formality. While it is possible to say that the representation by symbols of the industrial and rural economy of early eighteenth-century South Wales is here more detailed than hitherto, there can be little doubt that the topographical in-filling is a product of information received rather than true ground survey. The engraved names at the bottom margin of the map indicate that some 400 leading citizens of South Wales subscribed to the venture. The map was re-issued in 1760, with the subscribers' list omitted, by the mapsellers Carrington Bowles and Robert Sayer.

The next large-scale map of any part of South Wales was Robert Snell's *Map of the county of Monmouth*, engraved and printed by J. Ames, Clare Street, Bristol, in 1785. The one-inch scale would lead us to expect that it was in the standard tradition of English county surveys of the second half of the eighteenth century. This would be to misrepresent the map, for it was a crudely engraved, sketch-like compilation, almost devoid of the usual topographic detail. We may, however, use the date of Snell's map to report a rather startling contrast, for whereas by 1785 in Wales, only Denbigh and Flint had been properly surveyed on the 1in. scale, the position in England was that every county had been surveyed (and often re-surveyed)[11] except Cambridgeshire, Norfolk and Lancashire.

The situation in Glamorgan was soon to change drastically with the publication of three maps. Thomas Dadford's plan of the Glamorganshire Canal (Merthyr-Cardiff) appeared in 1790; Thomas Sheasby's plan of the Swansea Canal in 1793. The latter was on the 2in. scale and

featured a elevation profile to supplement the ground plan. Both plans set and illustrated their canals firmly in the context of existing mineral resources and the location of mills, forges etc. On altogether a different plane was the multi-sheet *Road from ... Milford to the New Passage of the Severn*, engraved and published in 1792 by John Cary for the newly constituted South Wales Association for the Improvement of Roads. The 2in. scale of this noble undertaking, coupled with rich topographical (which is to say industrial and rural) detail on either side of the mail-coach route, allowed it to complement the plans of the proposed canals. The road and environs west of Swansea were surveyed by the idiosyncratic Charles Hassall of Haverfordwest, the eastern portion being under the charge of John Williams of Margam. The engraving throughout was of the highest order, perhaps Cary's finest work.

The 1790s in Wales generally were to prove more fruitful in conventional county mapping. One project which misfired was that of the ambitious Thomas Lewis, who issued proposals in 1791 for a one-inch map of Cardiganshire, noting confidently that his intended map, in relation to the English county tradition, represented the 'first attempt in South Wales'. London-based, Lewis was certainly an estate surveyor of some success in South West Wales and his correspondence bristles with vanity: he assured Nathaniel Phillips of Slebech that 'I have the good fortune to excel everybody in this Country'.[12] But Lewis appeared not to have secured the support of a patron and the necessary number of intended subscribers. It was eventually John Cary, using the survey of Joseph Singer, who in 1803 published a 1in. map of Cardiganshire (with Thomas Johnes as patron) and who, as a consequence, secured a Gold Medal of the Society of Arts.

The year 1795 witnessed the publication of one eminently successful 1in. map, that of the *Six counties of North Wales* by John Evans of Llanymynech. Bearing the imprint of Evans's house, Llwynygroes, the map was probably based on a survey by John Furnival and engraved by Robert Baugh. In conjunction with a reduced version of this map published by his son in 1797, the Evans enterprise eventually resulted in the award of a bounty of 45 guineas from the Society of Arts.

The map attracted massive local support. Sir Watkin Williams Wynn of Wynnstay responded to the honour of being the map's dedicatee by subscribing to 100 copies. Eleven other North Wales notables subscribed to twenty copies each. Thomas Pennant, whose *Tour of Wales* (1778) carried an advertisement of the first known *Proposal* on the final leaf, bought five. Pennant is often credited with having been interested in supervising a map of North Wales,[13] but his *Map of Scotland* (1777) alone represents the fruit of his cartographical endeavours.[14]

George Yates, Surveyor, and the One-Inch Map of Glamorgan, 1799

Williams Wynn of Wynnstay's counterpart as dedicatee of the map of Glamorgan was the major Glamorgan landowner, the first Marquess of Bute. It was the second marquess, his grandson John, who was primarily responsible for the commercial development of Cardiff and its hinterland in the early nineteenth century,[15] but the name of the first marquess (son and heir of the third Earl of Bute) confers on the map a suitably symbolic liaison with the family which more than any other represents the greatest of Glamorgan landowners, which in their turn could be traced back to the Herberts, Earls of Pembroke and Montgomery.

If much is known about the ownership of estates in Glamorgan, the same is not true about knowledge of the land survey executed by George Yates for John Cary.[16] Cary, we might reflect, could have chosen as his principal surveyor one of the names already referred to in this introduction: Christopher Hassall or John Williams, his road surveyors in the Milford-New Passage series of maps; Thomas Sheasby, surveyor of the Swansea canal; Joseph Singer, his surveyor for Cardiganshire in 1803; or even the Thomas Lewis who abandoned his independent plans for a survey of that county. Alternatively he could have favoured others notable for their estate surveys in South Wales and Monmouthshire—John Aram, William Couling, or Samuel Minshull. His choice fell upon one with experience of county mapping, and one moreover who came from a notable family of cartographers, the Yates family of Liverpool.[17] George Yates's father, William, had been associated with county surveys in surrounding counties (Derbyshire, Cheshire and Staffordshire) before he undertook the first 1in. map of his native Lancashire published in 1786. The general insecurity of a surveyor's life is illustrated by his taking up a post at the Liverpool Custom House in 1772. This combination of activities had been paralleled in Wales when Lewis Morris, surveyor of the Anglesey Bodorgan estate, undertook similar duties at Beaumaris. William Yates had several sons, and George, although following him into the Customs service, also helped with the field survey of Warwickshire prior to the map of that county being published in 1793. It would appear that George was the son singled out to follow his father in the business of map-making, for his father's will of 1802 bequeathed to him alone the tools of the trade—William Yates's surveying instruments and books.

J.B. Harley has been able to call upon some convincing documentation relating to the laying out of base lines and the establishment of a primary network of triangulation used by William Yates in his work on Lancashire—the map of 1786 indeed features the diagram of interlinking triangles which served as a matrix for the subsequent topographical (infilling) survey, the latter doubtless executed by theodolite bearings and linear traverses and supplemented by use of the plane-table. Sophisticated triangulation was not the norm for the ordinary county map, although ironically the theory was known as early as the sixteenth century. William Cuningham's *Cosmographical glasse* (1559) illustrates the triangular linking of church sites in Norwich, 'Swerston' (Swarston), and 'Windham' (Wymondham), while Gemma Frisia had surveyed in the Netherlands using this method a quarter of a century earlier.[18] In Wales the first map to display a triangulation network in the manner of Yates's map of Lancashire was the map of North Wales published in Llanymynech by the brothers John and Edward Furnival in 1814. But the Furnivals had the advantage of using the official Board of Ordnance Trigonometrical Survey returns edited by the first Director, William Mudge.[19] In a letter to the Rev. Walter Davies ('Gwallter Mechain') on 14 October 1811 John Furnival reported: 'I have just received the third volume of the Trigonometrical Survey of England and Wales, in which the triangles in South Wales are very full'. He went on to instance such primary stations as 'Precilly top' (1734 ft); 'Radnor Forest' (2163 ft); and 'Trecastle Beacon' (2596 ft).[20]

The Board of Ordnance official returns were clearly not available to George Yates at the time of his Glamorgan survey. How far Yates went in undertaking a major triangulation survey of his own is open to question. The map seems to have no obvious distortion of shape. Having served an apprenticeship under his father's eye and being contracted to a map publisher of the calibre of Cary are not circumstances which dispose us to think of slip-shod work. One striking fact emerges if we look carefully at the conventional signs listed in the legends of the Lancashire and Glamorgan maps—they are identical in symbol and wording, with the singular exception of certain letter designations which Yates senior used on the map of Lancashire thirteen years earlier for ecclesiastical features. In the matter of topographic style, then, Yates was very much his father's son.

John Cary, Engraver, Publisher, Map-Seller and Globe Maker

We have noted that the engraver and publisher of four of the maps already discussed was John Cary, a name not infrequently met with in the 'Tourist' literature of the 1780s and 1790s. Cary has become pleasantly burdened with the tag of having developed a new 'English style' of map.[21] It is an aesthetic verdict and accords with the clean lines and uncluttered detail of his engraving and orthography. His business prospered for a considerable time, both in his early period (1783-1820), when he traded as 'John Cary, Strand', and later, after a fire in the Strand premises, at St James's Street. Sir George Fordham, an inveterate collector of Cary wares, has referred to the business as a 'large family conglomerate'.[22] In the making of globes it was his brother William who was the master craftsman, the map business being handled by John and his brothers Francis and George, and later by his sons John and George. The great publishing dynasties, whether in the typographic or cartographic arts, tended of their own volition to produce a continuity of purpose—widows married apprentices or sons-in-law entered the business. In the case of the Cary family the whole concern with its entire stock of engraved plates was transferred in 1850 to G.F. Cruchley of Fleet Street. Twenty five years later, in like manner, Cruchley sold out to the Edinburgh establishment of Gall and Inglis.

Before the engraving of the Glamorgan map in 1799 Cary's reputation was already established, most notably for London and other road-books. In 1783 he published, in association with J. Wallis, *London, Westminster and Southwark; with the Hackney coach fares*, a venture which has been called 'Maps that made cabmen honest'. A year later he produced his *Survey of the great post roads between London and Falmouth*, and followed this up in 1790 with his *New itinerary ... Great roads throughout England and Wales*. Based on his government-sponsored survey of roads, and achieving eleven editions in thirteen

years, it was a major rival to the earlier and established work of Paterson. Other work included a *Chart of the Atlantic Ocean* and a *Map of Europe* as well as a *New map of England and Wales* in 81 sheets (quarto) at two inches to the mile. We may credit him with three fine atlases: the *New and correct English atlas* of 1787 (a large quarto with 46 maps), the maps in Gough's edition of *Britannia* (folio, 1789), and the unique series of *Inland navigation* canal maps which commenced publication in 1795.

The early nineteenth century saw a further widening of Cary's interest and achievements. The *New universal atlas* (1808) was a large folio of 55 maps. The imperial interests of Britain were served by John Cary junior's *Russian dominions in Europe* (1814) in four sheets, and *Hindostan* by G. and J. Cary (1824) in six sheets. Nor was there a slackening of interest in new British maps. The *Great Level of the Fens* (1829) was on a scale of 1½ miles to the inch; while the 15 sheet *Geological map of England and Wales* by William Smith (1815) was the great pioneering venture of geological mapping, the whole grounded firmly on Cary's outline engravings. The work of Cary, along with that of William Faden and Aaron Arrowsmith, represented a Golden Age of British map publishing. Cary's engraving and publishing of George Yates's survey of Glamorgan was a part of that achievement.

Glamorgan in 1799

The intention of the following observations is not to sketch a portrait of the county at the end of the eighteenth century but to attempt an assessment of the importance and reliability of Yates's map for anyone interested in the history—more especially the historical geography and landscape history—of Glamorgan at that period. To this end it is convenient to consider in turn each of the main elements which Yates included in his map.

The obvious place to begin is with the physical geography of the county. Yates shows the basic elements that would be expected of any one-inch map of this date. When compared with the preliminary Ordnance Survey map on a two-inch scale (1813-4) and the first edition of the one-inch O.S. map (published 1830-3 from a revised survey begun in 1825),[23] it can be seen that Yates's coastline is in general approximate and in particular the stretch of coast between Sker Point and Aberafan Bar is probably shown much too far to the east. (Admittedly this is a low-lying area of shifting sand-dunes.) The course of rivers is shown in much less detail by Yates than by the Ordnance Survey. Hachuring is employed by both maps to indicate relief; it is much more generalised on Yates than on the Ordnance Survey.

Several types of rural land-use are depicted. In the lowlands there appear commons, sand-dunes, marshes, woods and parks. The boundaries of commons seem to be shown with some care, especially in the Gower Peninsula where they were a major component in the landscape. This is particularly useful as historical evidence since it is known that several commons (e.g. the Great and Little Heath, near Cardiff) were enclosed after 1799 and before the preliminary Ordnance Survey of 1813. Further, a detailed comparison of the two maps indicates the extent of the encroachment upon common land which had taken place between the two surveys. In the uplands, the crucial boundary between mountain grazing land and enclosed farm land is not always clearly shown.

Settlement is an important feature of Yates's map. The morphology of the towns is reasonably well shown and the use of capital letters for the names of eight towns is probably a sound indication of which places contemporaries regarded as having a truly urban status. Loughor, Kenfig, Aberafan, Llantwit Major and Llandaff were not accorded this status by Yates, though each place had some kind of claim to be a town. The shape and extent of villages and hamlets are indicated by means of square dots —these appear not to be precise plottings of particular buildings. Parish names are engraved in a bold Roman type; the names of hamlets and houses are in italics, but no distinction is made between the names of a substantial settlement such as Boverton and the neighbouring farmstead of Batslays. Many isolated buildings are marked (but not necessarily named), apparently with some care, but it would take a detailed study of every part of the county to establish how comprehensive Yates's survey was in this respect.

Most of the houses of the gentry are carefully marked, with their names and the names of their occupiers. Eliminating some duplication, about eighty gentry are named, including four peers and a French marquis, but ranging down to some quite minor gentry, such as William Davies of Cringell, near Neath, the would-be historian of Glamorgan. A few of the named occupiers of mansions were industrialists rather than landed gentlemen, especially in the neighbourhood of Swansea. Some gentry names are missing; for example, no one is named at Ewenny, Cilybebyll or Dyffryn (Aberdare).

The place-names recorded on the map are an interesting study in themselves. Here we can only make a few general points. The first is that the majority of the very large number of place-names appear on a printed map for the first time, although Emanuel Bowen's map of 1729 had made a very important advance in this aspect of mapping. Yates clearly did not make use of Bowen, so he had few precedents to follow when it came to the spelling of minor place-names. Sometimes he is inaccurate, a few times he blunders (*Llambob* for *Llambad*; *Caramour*, a romantic version of the prosaic *Cwarrau-mawr*; *Bromhill* for *Brombil*), though one may suspect that in some instances Yates has been ill-served by the engraver of the map. In general he gives recognisable versions of Welsh place-names (sometimes rendered into English spelling) which appear to derive directly from what local inhabitants told him. They reflect the Glamorgan dialect in a way that the somewhat artificial forms found on early Ordnance Survey maps do not.[24] Yates writes *Bryn Weath*, rather than *Bryn-chwith*, *Havod Taylog* rather than *Hafod Heulog*. But what is one to make of *Foot*, apparently a farmstead near the road from the Llynfi Valley over to Neath? Can it have any connection with *Bryn-troed-y-garn*, a farm adjoining the modern village of Bryn?

Two minor aspects of the rich pattern of the Glamorgan landscape to which Yates gave some attention are churches and antiquities. All Anglican places of worship in the county seem to be marked, even chapels such as Creunant, Aberpergwm and Llaniltern, and the newly built church at Morriston. A special symbol is employed which, according to the 'Explanation', appears to vary according to the presence of a tower or spire, or the absence of either. In practice the symbol is not used reliably. Here and there a Dissenters' meeting-house is marked. There were not many purpose-built Dissenting places of worship in Glamorgan in the 1790s but even so Yates has only indicated a few of them, generally the isolated ones; others are marked as unnamed dots, and may indeed, like Croes-y-parc in the parish of St Nicholas, not have been readily identified as such by the eye of a stranger. The meeting house in Llantwit Faerdre cannot be traced in the usual sources,[25] and the Anglican church symbol for *New Chapel* in the parish of Llansamlet is incorrectly used since this is the Calvinistic Methodist Capel-y-cwm. As far as antiquities are concerned Yates is not an especially useful guide. Many ruined castles are shown, some indicated by a special castle symbol. But very few other sites are noted. Two mountain tracks are identified as Roman roads; King Arthur's Stone on Cefn Bryn is named; the Pumpeius Carantorius stone, then standing on the roadside between Kenfig and Margam, is called 'Roman Monument'. Neath Abbey is marked by a special symbol.

Undoubtedly the most interesting elements mapped by George Yates are connected with the stage in the economic development of the county reached at the very end of the eighteenth century. His description of the road system distinguishes between turnpike roads and 'cross roads' (the eighteenth-century term for minor roads) so that a highly important picture emerges of the achievement of the trustees appointed under successive Acts of Parliament from 1764. The densest part of the network centres upon Swansea and Neath, doubtless a reflection of the earlier industrialisation of the western side of the county. Bridgend, Cardiff, and to a lesser extent Llantrisant and Cowbridge, were also foci of turnpike roads, confirming Yates's recognition of these places as six of the eight principal towns of Glamorgan. The map marks toll-bars, which were situated mainly at the approaches to towns, but the fewness of their number suggests that by 1799 tollgates could not yet be the objects of grievance that they were to become.

All the major canals (except the Aberdare Canal) were built by the time of Yates's map and all are shown in adequate detail. The extension of the Glamorganshire Canal to the sea lock at the mouth of the Taff was completed as recently as 1798, and the northernmost section of the Swansea Canal, to Ystradgynlais and beyond, was opened in the same year.[26] Yates's map is thus very much up-to-date. Canals were even more intimately associated with recent industrial development than were the roads. The majority of sites of heavy industry in Glamorgan in 1799 were within fairly easy reach of a canal or navigable river. Yates marks and indicates as such four waggonways linking collieries with canals and industrial sites. A fifth waggonway is shown as a straight road running for more than a mile from a pair of collieries north-east to Hirwaun Furnace. This is a well known tramroad, but is not actually named as such on the map.[27]

The coast exhibits some evidence of increasing maritime activity. A pier is shown at the mouth of the Tawe at Swansea, and lighthouses are

located on Mumbles Head (1794) and Flat Holm (1739).[28] Apart from this, harbours and quays which had been in use for centuries are noted at such places as Cardiff, Aberthaw and Newton. Even Sully Passage rates a mention. Any hint of maritime traffic around the coast of Gower is lacking.

Yates seems to have taken particular care to locate ironworks, copper works and other industrial undertakings on his map. Each one of the copper works listed by R.O. Roberts[29] as being in existence in 1799 is marked in some way; Upper Bank, Middle Bank and White Rock (on the east bank of the Tawe) are named, though not described as copper works; the three adjoining sites of Ynis, Rose and Forest, on the west bank, are marked and indicated collectively as 'Copper Works'. Further, the iron and copper complex at Neath Abbey is marked, but names are not given. There were isolated copper works at Pen-clawdd and Tai-bach, which Yates duly marks. The iron industry of Glamorgan, apart from the concentration of four (named) works at Merthyr Tydfil, was rather more scattered. Furnaces, forges, a 'Tin Works' at Ynys-pen-llwch and a 'Rowling Mill' (Ynysygerwn) are found in many isolated sites in the Tawe, Neath and Taff valleys as well as at Cefn Cribwr, Caerphilly, Hirwaun (actually in Breconshire), Machen and Aberafan. Aberdulais forge is marked by a water mill symbol. The place-name *New Forge*, at Llanedern, must refer to a smithy rather than to a refining forge, just as various place-names incorporate the Welsh word *(g)efail* (smithy) without implying iron-making, e.g. *Evel Shingrug*, near Llancaeach. The iron industry as it existed at the end of the eighteenth century appears to be comprehensively represented on Yates's map.[30]

A few other miscellaneaous industrial sites are also marked. There was a paper mill on Afon Llan, between Swansea and Loughor; the famous pottery at Swansea is duly marked, as is the Quarella stone quarry north of Bridgend. There is no evidence to suggest the existence of a woollen industry[31] or of lead mining.[32] A smoking tower is intriguingly shown near the River Loughor, north-east of the town of Loughor; this may indicate a zinc works thought to date from about 1800, but it may equally well be a glass works which occupied an adjacent site.[33] But the main industrial element not so far mentioned is the 'coal pit' and 'iron mine' provided by Yates with the same symbol, occasionally differentiated by a phrase. Over seventy such symbols appear on the map; many are clearly associated with iron and copper works, but just as many along the southern outcrop of the coal measures have no such association and may indeed have served the domestic needs of Cardiff and the Vale of Glamorgan. It is unlikely that Yates managed to place every site currently being mined for coal on his map, since many were in remote places and small drift mines, which most of them were, would have made little impact on the landscape.

That water power was still vital to the economy is vividly demonstrated by the great number (at least 95) of 'water mills, engines &c' depicted on the map by a starred symbol. The great majority of these were obviously rural corn mills, while a few may have been fulling mills,[34] but several iron-making sites (e.g. Aberdulais) are also provided with the water mill symbol. In spite of the large number of water mills marked, it is certain that there were others which have been overlooked. It is probable that, for instance, Cuckoo (Cowcliff) Mill at Penmark and Tre-ôs Mill on the Ewenny river were working in the 1790s. Of the very few windmills in Glamorgan, one, *Old Mill* in Gower, is given a conventional windmill symbol; the others are distinguished by name. *Old Mill* in Sully was also a windmill.

In 1799 Glamorgan was still predominantly rural, its entire population no more than 70,000, and its heavy industry scattered except for appreciable concentrations at Merthyr, Swansea and Neath. But the main elements of the dynamic economic development of the county in the first four decades of the nineteenth century were already in position: the road system, the canals, the iron and copper industries with their associated collieries. The tourist-topographers, the artists and engravers provide us with glimpses of particular scenes or subjective descriptions of the routes they followed; Dadford, Sheasby, Williams and Hassall[35] provide detailed maps of narrow (though very important) strips of country adjoining the canals and the road which they surveyed, but Yates alone affords us a synoptic view—and a reasonably accurate one—of the whole of Glamorgan. Not only was he the first cartographer to do this on the one-inch scale, but his map catches the county at a crucial moment of history, the threshold of its industrialisation.

Notes

1 E. M. Rodger, *The large scale county maps of the British Isles 1596-1850: a union list*, 2nd ed. (Oxford, 1972), is still the most convenient and comprehensive inventory.

2 Sir H. T. Wood, 'The Royal Society of Arts VI: the premiums 1754-1851', *Journal of the Royal Society of Arts*, (1912), 268-270.

3 R. A. Skelton, 'The military survey of Scotland 1747-1755', *Scottish geographical magazine*, 83 (1967), 5-16.

4 George Macdonald, 'General William Roy &c', *Archaeologia*, 68 (1916-17), 161-228.

5 J. B. Harley, 'The Society of Arts and the surveys of the English counties 1759-1809', *Journal of the Royal Society of Arts*, 112 (1963-4), 43-6, 119-124, 269-275, 538-543.

6 *Transactions of the Society of Arts*, 27 (1809), 109-112.

7 J. H. Andrews (ed.), *Ireland in maps ... with a catalogue of an exhibition* (Dublin, 1961).

8 G. Walters, 'Themes in the large scale mapping of Wales in the eighteenth century', *Cartographic journal*, 5 (1968), 135-146.

9 R. T. Gunther, *Life and letters of Edward Lhuyd* (Oxford, 1945), 259.

10 Bodleian Library, MS Ashmole 1820b, f.17.

11 J. B. Harley, 'The re-mapping of England 1750-1800', *Imago mundi*, 19 (1965), 56-67.

12 National Library of Wales, Slebech Papers 11407.

13 Alexander Jamieson, *A treatise on the construction of maps* (London, 1814) is misdirected in referring to the maps in Pennant's *Tour of Wales*.

14 G. Walters, 'The map of Scotland, 1777', *Imago mundi*, 28 (1976), 121-8.

15 John Davies, *Cardiff and the marquesses of Bute* (Cardiff, 1981).

16 After this Introduction was written, Mr R.O. Roberts of the University College of Swansea kindly pointed out to the editors an intriguing reference to Yates's survey in W.H. Jones, *History of the port of Swansea* (Carmarthen, 1922), 358-9. Jones describes and illustrates a sketch of Swansea Bay which appeared in the Tide Table for 1795 with the explanatory note that it was 'taken from a map of the county of Glamorgan made on actual survey by Mr. Yates of Liverpool, which is now engraving by Cary in the Strand, London, and will shortly be published by subscription.' This implies that by 1794/5 the initial survey by Yates was virtually complete. Despite the claim that the map was at that date being engraved at Cary's office it would appear that a delay in the publication programme, possibly due to subscription difficulties, allowed Yates to incorporate final details of the canals being built in the county in the late 1790s. A further implication of the 1794/5 survey date is that Cary set about the organisation of the county map immediately following his publication of the Hassall-Williams road survey of 1792 and the Sheasby Swansea Canal plan of 1793.

17 J. B. Harley, *William Yates's Map of Lancashire, 1786* (Historic Society of Lancashire and Cheshire, 1968), Introduction.

18 Edward Lynam, *British maps and mapmakers* (London, 1944), 16.

19 William Mudge, *An account of the operations carried on for accomplishing a trigonometrical survey of England and Wales 1784-1809* (London, 1799-1811), 3 vols.

20 National Library of Wales, Crosswood MS 1890E.

21 Sir H. G. Fordham, *John Cary ... 1754 to 1835: a bibliography &c* (Cambridge, 1925).

22 Sir H. G. Fordham, *The work of John Cary and his successors* (London, 1924).

23 From J. B. Harley's notes to Sheets 66 and 67 of the David and Charles reprint of the first edition of one-inch Ordnance Survey maps.

24 The treatment of Welsh place-names by the Ordnance Survey and certain earlier cartographers is fully considered by J. B. Harley and G. Walters, 'Welsh orthography and Ordnance Survey mapping 1820-1905', *Archaeologia Cambrensis*, CXXXI (1982), 98-135.

25 E.g. David Peter, *Hanes crefydd yn Nghymru* (Caerfyrddin, 1816), 700-4; H. D. Emanuel, 'Dissent in the counties of Glamorgan and Monmouth', *National Library of Wales journal*, IX (1955-6), 35-6.

26 Charles Hadfield, *The canals of South Wales and the Border* (Cardiff, 1960), 50, 94.

27 Bertram Baxter, *Stone blocks and iron rails* (Newton Abbot, 1966), 219.

28 D. B. Hague & R. Christie, *Lighthouses* (Llandysul, 1975), 83-4, 220.

29 *Glamorgan county history*, vol.V (Cardiff, 1980), 86-9.

30 We are grateful to Mr Philip Riden for confirmation of this point.

31 There were some small woollen mills in Glamorgan, e.g. at Bridgend and Caerphilly, in 1790s. J. G. Jenkins, *The Welsh woollen industry* (Cardiff, 1969), 316-320.

32 There is no certainty that any of the county's lead mines were active in the 1790s. W. J. Lewis, *Lead mining in Wales* (Cardiff, 1967), 162-4; D.G. Tucker, 'The lead mines of Glamorgan and Gwent', *Morgannwg*, XX (1976), 39-40.

33 We are indebted to Mr R. O. Roberts for information on this site. Cf. *Glamorgan county history*, vol.V, 89.

34 The appearance on the map of *pandy* (fulling mill) as a place-name element is no proof that the site referred to was actually a fulling mill in the 1790s.

35 G. Walters, 'The mapping of Glamorgan in the eighteenth century', *Morgannwg*, XIX (1975), 28-9.

Published by J. Cary, N.o 181 Strand May 21.st 1799.

Published by J.Cary, May 21st 1799.

Published by J. Cary, May 21st 1799.

40
35
30
25
20
15
3° 10
5
55
50
45
BRECKNOCK SHIRE
MONMOUTH
Tonyvildra
Panwaun Byrddyn
River Dulais
Bryn Whith
Cascade
Chester
Roman Road from Neath to
Pontneddfychan
to Brecknock
Penderyn
Pontpren Llwyd
Pont y Delinas
NEATH
Mountain
Long
Aberpergwm Chap.
Revd. J. Aubrey
Aberpergwm
Abernant
Aber Grelach
Llynybont
Henwy
Rheola
Neath Canal
Maesewnna
Blaengwrach
Graig y Llyn fach
Baili Glase
Blaen Gwrelach
Upper Hirwaen
Rhy-goes
Hirwain Furnace
Hirwayn Wrgan Common
Mynydd Glyn Castle
Glyn Castle
Solfen Hill
Ynisfach
Tenewith
Melincourt Furnace
Llyn Vawr Pool
Carn Moisen
Graig y Llyn
Cefn Hirwain
Graig Llwyd
Aberdare
Waen
Melin Llwydgoed
Blaen y Wenallt
Meeting House
Ponty Stikill
Morlais Castle
Pant tonn
Pencoed Ivor
Dingle
Coed y Cummar
to Brecknock
Caeon Echa
Echa
New Bridge
Upper Garth
Gwaelodt Garth
Dowlais Furnace
Coed Myric
Cyfarthfa Iron Works
Penydarran Iron Works
MERTHYR TYDFIL
Rhydcar
Pynerheol Graig
Coal Mines
Coal & Iron Mines
Blaen Canode
Canode Mill
Plymouth Furnace
Blaen Rumney
Common
Pitwatt
Blaen Rumney
Dowlais Pool
Twyn y Wain
Tara Van
Duffrin Rumney
Bryn du
Cefn Merthyr
Cwm Borgoed
Great Barn
Brithdyr
CAERPHILLY
DREDD
MISKIN
Blaen Turch
Pan wen tory bedal
Cefn Mawr
Coal Pits
Blaen Corrwg
Corrwg
Vuchan
Glyncorrwg Chap.
Cefn Rhewllech
Corrwg R.
Troedrhew Newith
Ton Mawr
Cymmerglyncorrwg
Rhiw Glas
Gelly
River Avon
Hendre Owen
Chapel gy Vylchu
Pentwyn
Argoed Vawr
Graig y Bedw
Ynis Vowr
Blaen Llunvy
River Llunvy
Mynydd Caere
Ton y Cwd
Foot
Dyffryn
Llynfu
Nanty Granwd
Rhondda R.
Cefn Ty newydd
Ty Newydd
Ynis fayo
Tylau du
Nantores
Cryg yr Avon
Clyn Cori
Pentra
Blaen Garw
Wern Vawr
Nant du
Ystradyfodog
Bwlch y Clawdd
Craig Forchwen
Abernant du Gerran
OGMORE HUNDRED
NEWCASTLE
Brach Cammar
Comdee
Tred y Rhyw Garth
Tyny Cai
Tenewith
Mynydd
Langeinor
Mynydd Llynsewr
Bridge
Coal Pits
Ponty Gerdenon
Ynis Kynon
Cefn Rose
Gwair
Abergwair
Abernant y Grose
R. Cynon
Cefn Perna
Cwmpennar
Aberamon H. Lort Esq.
Blaenamman Vawr
Blaenamman Vach
Bedlwyn
Coed Cae
Aberamman
Cefn Gwingill
Rhonddafechan R.
Cefn Twin Rhondda
Duffrin Aberdaer
Forest
Pennerhewl Grotto
Cwm Clydach
Llettyr turnor
Darwenno
Ynis y Bwl
Lanwonno
Penrhewl Ycha
Rhewl Vach
Penrees Ucha
Penrees Isha
Pandy
Cefn Penrees
Llwynyperdaid
Ynis Hyr
Graig Wen
Ponty Cymmar
Meeting House
Kilelly
Fall of the Rhondda
River Taff
New Bridge
Twin Cwm
Twin Mawr
Cardiff Canal
River Cynon
Pont Cynon
Gelly
Penyrinn
Tyr Coli
Balinog
Blaen Lleinau
Cefn Isha
Killanune
Tillaglase
Meeting House
Ysgwyddgwyn Ucha
Ysgwyddgwyn Isha
Maendylach
Cefn Forest
Pengrau
Lower Cefn Forest
River Bargoed Taff
Black Brook
Melin Gwr
Quakers Yard
Aqueduct
Bryn Oer
Cefn Gellygar
Pencamowr
Cefn Llwynau
Gellygaer
Top Hill
Evel Shingrig
Gellyrgwellt
Llechwen Llaethu
Bryn Lleverith
Lanvabon
Garth Isha
Penrhewl Vawr
Eglwysilan Common
Cefn Eglwysilan
Park
Cefn Brithdyr
Troedrhyw Vach
Chapel Brithdyr
Cefn Bach
Rumney River
Ponteraber
Bargoed
Heol Belu
Kilvach Bargoed
Bedwellty
Cascade
Pontar Pengam
Berllan Lloyd
Can Gellin
Cefn Henwood
Meeting House
Gelly
Penaltau
Ystrad Manach
Pont ystrad
Lanbradach
Thos. Thomas Esq.
Mill
HUNDRED