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An American in Gloucestershire and Bristol

THE DIARY OF JOSHUA GILPIN, 1796-7

By A. P. WOOLRICH

INDUSTRIAL archaeology is a comparatively new branch of study and one of the major problems facing the industrial archaeologist is the lack of record material. Compared with other fields of historical study, the amount of archive material which has survived is negligible, and for the great majority of concerns which have flourished since the beginning of the Industrial Revolution, nothing now exists. In an attempt to discover something about Bristol's industries in the eighteenth century research is being done into travellers' accounts of the area,¹ for a good contemporary account of a factory or mill, made by a traveller, is often more valuable than the information which can be gleaned from the random survival of records.

One such traveller was Joshua Gilpin, an American papermaker, who toured Britain and the Continent from 1795 to 1801 and again from 1811 to 1814.² Gilpin was primarily interested in papermaking, but noted all he could about industrial processes in general. He recorded his information in a series of notebooks, which still survive in the Pennsylvania State Archives at Harrisburg. In addition to these there are several series of letters, ledgers and collections of reports.³

Gilpin was a Quaker and was born in November 1765. His family had emigrated to America in the late seventeenth century, but he still had many relatives in England, amongst whom was the famous topographical writer, William Gilpin. In 1801, just before returning to America, Gilpin married Mary Dilworth, daughter of a Lancaster

¹ A. P. Woolrich, 'Swedish Travellers', *BIAS Journal*, iv, (Bristol 1971), 28-31. This paper contains details of 14 Swedes who visited the Bristol area from about 1690 to 1780, investigating the local industries.

² H. B. Hancock and N. B. Wilkinson, 'Joshua Gilpin: An American Manufacturer in England and Wales, 1795-1801', *Trans. Newcomen Society*, xxxii (1959-60), 15-28 and xxxiii (1960-61), 57-66.

³ In addition to the MS. Journals at Harrisburg, there is a large collection of Gilpin family papers, containing material relating to Joshua and his travels, in the collection of the Historical Society of Pennsylvania, at Philadelphia. A smaller collection of Gilpin papers is held by the Historical Society of Delaware, at Wilmington. In addition some single items are in private hands.

banker. They had eight children, several of whom became prominent in the political life of America. Gilpin died in 1841.

The Gilpin family was among the foremost of the Pennsylvania industrialists. Gilpin, together with his uncle, commenced paper-making in 1787. The Gilpin mills were the first in America to use chemical bleaching in paper manufacture, using information gathered during Gilpin's tour of 1795-1801,⁴ and in 1817, Thomas Gilpin, Joshua's younger brother, built the first endless-web paper-making machine in America, which was developed from information gathered during Joshua Gilpin's tour of 1811-14.⁵ In addition to making paper, the Gilpins owned cotton and woollen mills and ran a commission house in Philadelphia. They were also influential in the construction of canals in Pennsylvania and Delaware.

From the evidence of the surviving diaries it seems that Gilpin made four main British tours. Initially he travelled up the east coast of England to Scotland, and returned to Liverpool. From there he took coach to London, where he stayed during the spring of 1796, visiting the paper mills of Kent and Hertfordshire. He then made a long tour along the south coast to Plymouth, returning to London *via* Taunton and Bath. The third tour was to East Anglia. His fourth tour was to Ireland, *via* South Wales, and on his return journey to London he passed through the Black Country and the industrial Midlands. The diaries are fragmented after this and one of them contains an incomplete account of Bristol. The next major tour was to Europe, which took him to Holland, France and Switzerland. He then returned to Britain, but the diaries are fragmented again and it is not possible to work out any itinerary with certainty.

Very little of Gilpin the man comes through in the diaries. He was diligent and enquiring, and noted in voluminous detail everything which could be of interest to the furtherance of his business. He was a cultured man, very well read and he had an extensive library. He was something of a connoisseur of art and architecture, and recorded in detail the contents of many of the large houses and mansions he visited. One gets the impression that he was something of a social climber, and though by no stretch of the imagination can he be described as a rake, the impression lingers

⁴ S. M. Edelstein, 'An American Industry First . . .', *Tappi*, XLIII, no. 4, (April 1960); S. M. Edelstein, 'Papermaker Joshua Gilpin Introduces the Chemical Approach to Papermaking in the United States', *The Paper Maker*, xxx, no. 2, (1961).

⁵ H. B. Hancock and N. B. Wilkinson, 'The Gilpins and their endless papermaking machine', *The Pennsylvania Magazine of History and Biography*, LXXI, no. 4, (Oct 1957); H. B. Hancock and N. B. Wilkinson, 'Thomas and Joshua Gilpin, Papermakers', *The Paper Maker*, xxvii, no. 2, (1958).

that he was more worldly than one would expect of a Quaker. Gilpin usually travelled in a light chaise, accompanied by a servant and normally stayed at inns but he frequently had introductions to possible business contacts *en route*, as well as the usual contacts due to his religious persuasion, and so often he stayed in private houses.

There is a wealth of information in the diaries about many aspects of industrial life. In addition to paper-making, Gilpin noted details about pottery manufacture, roads and canals, coal and iron-mining, copper-smelting, nail-making, lead shot manufacture, frying-pan manufacture, pin-making, coining, salt-mining, glass manufacture, textiles, wire-drawing, ship-building, agriculture and many other trades and industries.

It may be wondered how Gilpin was able to get so much information. At that time, Britain was at war with France, and the American War of Independence was still fairly fresh in men's minds, so that Americans were sometimes regarded as agents of a hostile government. As Britain's industrial strength grew during the eighteenth century numerous attempts were made by foreign competitors to spy on new methods and processes, and there were frequent attempts to induce skilled workers to emigrate and introduce new methods abroad. This reached such proportions that there was an official ban on the emigration of skilled workers, on the export of machinery and of plans, but these laws were never really successful. The problem was the subject of Select Committees of the House of Commons in 1824 and 1841, and the laws regulating the emigration of skilled workers and the export of machinery and plans were not repealed until 1825 and 1842 respectively.⁶

Notwithstanding this, Gilpin seems to have had very little difficulty in getting into industrial premises. Indeed he seems to have been received with great hospitality and only very occasionally does he record that he was refused information. Although wartime restrictions were in force, Gilpin was allowed to tour the naval dockyards on the south coast, and obtained full details of the Admiralty telegraph on Shooters Hill, Kent. Perhaps the reason for his success was that he did it in such style. He drove about in a carriage and was obviously well educated. He was very much the whole man, in the eighteenth-century sense, and so he must have appeared to the practical British industrialists as more of a 'curious' gentleman, than the hard-headed entrepreneur he really was. In addition there was perhaps something of the attitude among the British industrialists that they were so far in advance in so many fields that the American

⁶ W. O. Henderson, *Britain and Industrial Europe*, (1965), 4ff.

'backwoodsmen' could never really catch up, and so could be disregarded as competitors.

In making this transcription from the diaries relating to Gloucestershire and Bristol, some editing has had to be done. All instances of Gilpin's use of 'ye' and '&' have been expanded to 'the' and 'and'. The entire punctuation of the text has been modernised. Gilpin's method of indicating the end of a sentence was to write a dash and he did not start the following word with a capital letter. He very rarely used any other punctuation to break up what he wrote. Apart from these modernisations the text is exactly as he wrote it. Gilpin illustrated his account of Wintle's pin mill, Gloucester, with some very rough sketches and also made one to show how ships were beached at low tide at Chepstow. These sketches are so rough, and do nothing to illuminate what is already in the text, so have been omitted.

The account of Cheltenham and Gloucester was written in two volumes, and that in the second, commencing from 23 July 1796, has been slightly damaged in one corner. This has resulted in a few words being indistinct, and in some cases missing completely, and these have been noted as they occur.

Gilpin's method of writing seems to have been to leave the job until some little time after the events occurred. He incorporated a lot of topographical and statistical material from contemporary guidebooks. He was not careful over spelling place-names, for example Lackington Hill for Leckhampton Hill, and he occasionally left gaps in the text which he perhaps meant to go back and fill in later. His style is frequently disjointed and in some places ungrammatical.

Notwithstanding these limitations, the account here presented is felt to be a most interesting one which gives a vivid impression of the experiences of one rather minor visitor to the neighbourhood.

THE DIARY OF JOSHUA GILPIN

[July 21st 1796]

Passing this place [Burford] I came on to North Leach. A short distance from Burford left Oxford and entered Gloucestershire; the road continuing much as before.

Northleach is a neat little town seated on the river Leach. It has nothing remarkable but a good inn, the King's Head, where I dined. There is a school here endowed by a private gentleman with £80 the annum for the master. The Gentleman who endowed it, being afterwards reduced, applied to be appointed master, but was refused by the Trustees.⁷

⁷ Gilpin presumably refers to the Grammar School founded under the will of Hugh Westwood in 1559. The tale of the impoverished donor is not recorded in *V.C.H. Glos.*, II, 436, or W. J. Monk, *Northleach and around*, (Cheltenham (1935)), 68. Both sources give 1606 as the effective date of the school's foundation after the settlement of disputes over the trust. (BSS).

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We now enter high grounds; several ridges of hills running near here which may be considered as dividing the eastern and western parts of the Kingdom. From Northleach the ground is chiefly over high downs.

I came on till within 4 miles of Cheltenham. Just then beginning to descend the hill over Dowdeswell, my horse took fright and ran with all the fury possible down a very steep and rugged road.⁸ After running about five hundred yards, meeting with some cattle among whom he was entangled, he overturned the Chaise and I was thrown out with great violence. My hand and shoulder first reached the Ground, and my head falling among some stones, I lay senseless for some time. The Mail Coach passing by at that time, the coachman and passengers, concluding that I was dead, got out to raise me up. My servant, however, coming up they left me to his care and with the assistance of some peasants in the neighbourhood carried me into the house of a worthy farmer of the name of Thomas Rogers,⁹ where I was taken upstairs and put to bed, while my servant went to Cheltenham for a surgeon. On my recovering, which was in ab: half an hour, I knew not where I was or anything of the accident. However, finding myself hurt, I began to examine and found no bones broke. My Surgeon who arrived by this time proved a genteel young man of the name of Thomas Cother.¹⁰ He found I had received a contusion on my shoulder and wrist, a bruise on each of my hands and a cut on my chin. Deeming it not proper to be bled, in which he agreed, I took some medicament and went to bed where I rested tolerably well and found myself next morning with very little fever and, tho my left side was sore, not materially injured.

22nd.

Finding myself in the house of a most worthy man, an old Batchelor of considerable property, who lived here with his niece, a young lady named Eliza Richards, and her brother of the name of [blank]. I determined to remain there until my wounds were healed and my pain dissipated. My left Eye became closed, my right one nearly so and to add to my misfortune I had broke my spectacles. I sat up, however, half the day; my kind host, his nephew and niece paying me every attention. In the afternoon I made acct. to [illegible] London, not however touching on my misfortune. In the course of the day I received messages from Squire Rogers¹¹ and his lady, from Baker,¹² Parson of the Parish enquiring after me. I had now leisure to learn that my horse had righted the whiskey¹³ and run on near 3 miles where he stopt himself; that my things altho scattered were neither lost nor injured; my umbrella had, however, been taken up by a neighbouring farmer who, tho of considerable fortune, sent me word that unless I sent him half-a-crown for finding it he would not give it to me but to the first person that would give him that Sum.

I spent the day chiefly in conversation with my host and resting easily. Had a

⁸ The accident occurred on the steep 1 in 8 hill through the village. By 1796 the old London road from Cold Comfort inn to Dowdeswell Mill had been abandoned in favour of the road through the village. The mail road from London along the valley through Andoversford was not made until 1824-5. (Glos. R.O., PA 117) (BSS).

⁹ Thomas Rogers, a member of the old-established family of Dowdeswell, owned Andoversford and Lower House farms in 1775, and the same property until at least 1820. (Glos. R.O., Q/REL) (BSS).

¹⁰ Thomas Cother, surgeon, of High Street, Cheltenham occurs in 1800. He was well known locally. (BSS).

¹¹ Edward Rogers, Lord of the Manor of Lower Dowdeswell. (BSS).

¹² Revd. William Baker, LL.B., rector 1778-1826: (from 1803 he was also vicar of Stonehouse and did not reside at Dowdeswell). (Glouc. City Lib., Hockaday Abstracts. Cf. *V.C.H. Glos.*, x, 286). (BSS).

¹³ Whiskey - a type of light chaise.

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sound night's sleep so that in the morning of the 23rd I found myself much recovered and, wishing not to be too troublesome to a Gentleman who had used me with such kindness, I ordered a Post Chaise and came in to Cheltenham in the afternoon.

Dowdeswell, which was the Scene of my misfortune, is a village of no note. My host has a neat house built a few years past of freestone. He a Gentⁿ. of ab: 50. Has had a good education and noticed by the Gentry in the neighbourhood. His farm consists of ab: 140 acres of freehold land; much of it is grass, some corn. He has also a Malt House and Dairy which I was desirous but too weak to examine. His niece Betsy superintends the last and rises every morning to make Cheese. I enquired of her the mode and find that in theory it is precisely the same as with us. The quality of the Cheese country differs chiefly as the pasture and land, as some makes much better than others. The fine layer cheese is made all of one meal's milk—the mornings; but where the number of cows is not sufficient they skim the evening's milk and put milk and cream both into the morning's. The coloring is done in the milk by dry arnotto.¹⁴ Country use they do not cheese it colored at all.

23 July 1796

Came into Cheltenham ab: 5 in the evening; found it a neat town consisting of one main street; good deal of company. Took private lodgings meaning to try the effect of the Waters and being unable to go forward without further repose. Called on this evening by Josh Hawkes and F. Reeves. The Hawkes family all here.

24th

Rose at 7 and went to the walks; found considerable company on them but knew few. My head being dressed with a light bandage had numerous enquiries, report as usual having [magnified] my accident. This day spent chiefly in lounging and reading; too unwell to about much. Dined at the Hawkes. Present old lady and 3 daughters, Jane, Catherine and Georgina; F. Reeves and Miss Batty from London. Came home early and went to bed.

25th

Rose at 8 and went to public walks; much company. Called on a gentleman name of Rich, a Quaker; but 2 families in the town. Good number of ladies and Gentⁿ on the walk but no acquaintance but the Hawkes family. After breakfast took another walk; dined at the Plough with 3 Irish Gentlemen¹⁵—Kelly, who married the daughter of [blank] of Dublin, and Gowan. In the evening went to the public walks where I saw the following persons of distinction

Dutchess Gordon

Lady Lavinia Gordon

¹⁴ Arnotto or Anatto, a red dye made from the pulp of the seed capsules of the West Indian shrub Achiotte or Urucu, (*Bixa Orellana*). In appearance the dye is the colour of red lead. In Gilpin's time, and until the introduction of synthetic dyes, it was used extensively as a colouring agent in cheese, butter, chocolate, varnishes and waxes, textile finishing and as a substitute for saffron. In America it was prescribed as a laxative. In cheese colouring the dye could be used in two ways. In the first, powdered arnotto was obtained from the druggist and sprinkled in the milk as the cheese was being made. In the second a cake of solid arnotto was rubbed down with milk until the correct shade of red had been reached. One ounce of hard arnotto would colour about 20 thin cheeses of from 10 to 12 pounds weight each. A. Rees, *Cyclopaedia*, (1819), II, article 'Anotto', III, article 'Cheese colouring'. W. Marshall, *Rural Economy of Gloucestershire*, (1789), II, 110–12, 127–8, in describing the manufacture of cheese in the Vale of Berkeley comments on the fashions for colouring cheese by arnotto. (BSS).

¹⁵ Gilpin elsewhere refers to the presence of Irish visitors. There was a notable Irish colony in the town a generation later. G. Hart, *History of Cheltenham*, (1965), 203, (BSS).

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Lady [Blank] Gordon
 Lady Maudelina St Clair

Sir P. and Lady P., Sir John Mildmay, Mr Allen and Honbl Mrs Allen, niece to the Duke of Grafton—he an attorney with whom she ran away, Col Mackenzie, Mrs and Miss Crewe. Not introduced to [them]; sat next to Mrs Crewe and had a good deal of conversation. Fine sensible woman, has been very handsome. Wife to the Member for Essex.

27th

Rose at 7. Walkt on the walks as usual. Find the waters agree with me. After breakfast rode with J. Hawkes out to Dowdeswell. Passt over the scene of my late misfortune. Find the horse was stoppt by the reins getting round the wheel and being pulled by it. Went to Rogers; saw him—his name Thomas; has a nephew and niece and Eliza Richards. Find his house etc. very neat; has a large Malthouse, domestic Brewhouse and Dairy. 140 acres of land. Pasture of a fair and [MS. damaged]. Sells his malt chiefly in the neighbourhood. Brews beer for his own use. Makes ab: 600 lb of cheese to sell. House built of neat freestone, hewn; neat lawn before it. Troubled with complaint in the stomach as we eat. Roches¹⁶ of London called on him; an old school-fellow. Curious conduct of the large, fat busy London Merchant and the peaceable retired country farmer. Like the Town and Country Mouse. Talkt of their old school pranks.

After sitting a while, rode up to the top of the hill and thence along the ridge ab: 4 miles. Enchanting views to the right of all the vale of the Severn which spreads below extending up and down for as far as the eye can wander. Terminated on the west by the Malvern Hills; District of Dean. Its surface overspread with a profusion of cultivation, innumerable farms, villages and the cities of Gloucester, Tewkesbury; Upton Lea. Here and there catches of the Severn. Rode¹⁷ [MS. damaged] hill and Churchdown (vulgarly Chucen) standing in the vale like insulated hills. The ridge of hills we were now upon are the Coteswold hills and extending up and down the Severn from the eastern side of the vale. They are high and chiefly in sheepwalks. In them rises the Thames or Isis. Stopt at the fountain head to drink its waters at a little spot called Four Wells.¹⁸ The hill is composed of the stone precisely similar to that at Bath. It appears a light yellow or cream-colored stone; some of it, however, seems peculiarly like freestone, while other is formed of shells and marine substances. It lies in the hills in cliffs with numerous fissures or openings similar to the common limestone. Between these fissures on the strata is a soft white substance like snow, but of a soft calcareous kind, said to be the same on the [?] terra.

Returned and dined alone. Went to tea with the Fletchers. Twice saw the gent. of the name of Sherman from Ireland. After tea walked over the fields; found there were several mills¹⁹ on the little stream which runs by the walks, also a number of little hamlets and villages contiguous to Cheltenham not seen unless sought for on these walks. Went to Lord Falconbergs;²⁰ fine situation tho too late in the evening to see it to advantage. Has [MS. damaged] prospect of the Chucen, Robin Hood and of

¹⁶ Benjamin Roche was a London merchant, with whom Gilpin had extensive dealings while in London earlier in the year.

¹⁷ Rode Hill — Robin Hood Hill — Robin's Wood or Matson Hill, south of Gloucester. (BSS).

¹⁸ Gilpin appears to be mistaken about this name. The source now known as Seven Springs is so called by S. Rudder, *New History of Gloucestershire*, (1779) and is marked on Isaac Taylor's *Map of Gloucestershire*, (1777). (BSS).

¹⁹ Gilpin refers again later to the mills on the river Chelt. The Cambray and Alstone Mills were those nearest the town. (BSS).

²⁰ Lord Fauconberg built Bayshill House, the first of the Cheltenham villas in 1781. In 1788 it was taken for five weeks by George III and his family. Hart. *loc. cit.*, 203. (BSS).

the distant Malvern Hills. This house the King resided in when at these waters. Small house not neatly designed, 3 storey high not wide. Shaded thro trees around, more like a town house.

Returned from walk and went to walk in the public rooms.²¹ Full of company: Duchess of Grafton, fine, plump woman, said to be rather unkind; Lady Mildmay, fine hard woman; Lady [Lovell] tall figure, manly countenance. Saw and spoke to Mrs. Crewe.

28th

Rose at 7 and went to walks as usual. After breakfast went on a party to Winchcombe with the Hawkes, Reeves, Sherman and two gentlemen, viz. Cox and Penny, who was overturned in their Whiskey. Passt [MS. blank] a little village²² [MS. blank] miles from Cheltenham, then ascend the high hills again by a road of steep ascent for 3 miles. Enchanting views on the top all down the vale and up as far as Evesham. Descended the hill and came to the valley where Winchcombe lies. Several paper mills here,²³ but did not appear of much importance. Entered Winchcombe; mean little village formerly of great note having been a county of itself.²⁴ After the introduction of Tobacco²⁵ it raised a great deal and grew opulent [with it]. This being prohibited it became noticeably decayed. There being no good house in the village; the church, however, is large and has been a neat structure; formerly there was an abbey here.

Went ab: a mile further to see Sudley Castle,²⁶ the property of Lord Rivers. Now a fine ruin, part of which, however, is fitted up for a farm house, part for a barn and stables and part in a neat garden as it has [MS. damaged] considerable extent and was not defaced till the Civil Wars. The Church forms part of it, the Walls of which are pretty entire, only well washed with pug.²⁷ It once contained the tomb of Queen Catherine Parr, but nothing now remains of it.

Not far from here is Hales Abbey, now of little note, but formerly remarkable for having some of the blood of Christ given to it by Edward Plantagenet, nephew of Edw. 3 who brot it from the holy land. This blood was kept in a glass by the monks who declared [that any] one who had committed any sin could not see it, but after purified by a proper number of masses they gradually obtained sight of it. On the Dissolution this blood was found to be that of a duck which the monks took care often to renew; by changing the glass in which it was kept, a thinner for a thicker, after they had felt the pocket of the Sinner, one thin enough was found to give a clear view.²⁸ Returned home and dine [with] Sherman who studies at Oxford. Got considerable information about it of him. In the evening spent it with Hawkes.

²¹ These are probably the recently-built Assembly Rooms, designed by Henry Holland, c. 1782, and replaced in 1816. (BSS).

²² Little Village — Prestbury, approx. 1½ miles from Cheltenham. (BSS).

²³ There was a paper-mill at Sudeley as well as the better-known Postlip Mills, both at this time owned by Nathaniel Lloyd. E. Adlard, *Short History of Postlip Mill, Winchcombe*, (1949), 8-9. (BSS).

²⁴ Winchcombe was indeed a Mercian town of some importance, but Winchcombshire existed only from c.1016 to c.1060. (BSS).

²⁵ Tobacco was extensively grown about Winchcombe and Cheltenham throughout most of the 17th century. The Stuart and Cromwellian governments prohibited its growth to protect Virginian imports. (BSS).

²⁶ Sudeley Castle was probably uninhabitable from at least its slighting in 1649 until William and John Dent started its restoration in 1837. The church, also damaged in the Civil War, was rebuilt 1859-63; the effigy of Catherine Parr was placed in the church then. D. Verey, *Gloucestershire, the Cotswolds*, (1970), 437-8. (BSS).

²⁷ Pug — a wash of lime and clay, used for decorating walls.

²⁸ The Blood of Hailes was brought to the Abbey by Edmund, Earl of Cornwall, in 1270. This variation of the tale about the falsity of the relic is not recorded in W. St. C. Baddeley, *A Cotswold Shrine*, (1908). (BSS).

29th

Rose as usual and went to the Water and Walks; after breakfast took another ride down the vale in opposite direction and nearly same route as returned on the 27th. Wound up the side of Lackington Hill.²⁹ As we rise prospect of the vale again immensely entrancing. Got up to the top at the Balloon Inn³⁰ and went to Birdlip, a little village where there is [a small] country alehouse;³¹ from its garden a fine view. Took a rural regale of Cheese, bread and ale and returned home. At the foot of Lackington Hill came by the house and park of Doddington Hunt Esq.³² and the little village of Charlton which, tho within half a mile of Cheltenham, is so embowered in trees that neither are to be seen from it. Neat park tho not large; some very fine deer, chiefly the [?spotted] and fallow Deer, the largest I have seen in England.

Went to dine at the Hawkes. Introduced to Genl. Picke; he has served in India. Talks of St. Helena as tho there was good Society there. In the evening went to the Public Rooms where I walkt and saw many new faces; a family of the Ricardo from the neighbourhood, 5 in number, all small and handsome girls.³³

30th

After rising and walking, drinking the water etc., prepared to leave Cheltenham. Found it, on settling my bills, the most extravagant place with the worst accommodation of any watering place in England.

Cheltenham is a town situated at the foot of the Coteswold hills just on the edge of the great vale of the Severn. It takes its name from a little Rivulet called the Chelt which runs near it and turns a few [MS. damaged] mills. It consists chiefly of one street near a mile long in which the houses fare good, as most of these are let in part or altogether to the summer visitants. Tho the neighbourhood abounds in fine stone it is chiefly built of brick. It is neatly flagged and paved and has a good church built in form of a cross with high octagonal stone spire which forms a good object from the walks. Except this Cheltenham has nothing worthy of notice but its springs, its walks, [the] shops etc., fitted out chiefly to catch the loose money of the visitants.

The walk to the spring is ab: $\frac{1}{3}$ of a mile from the town, part thro the church yard, tho not thro the field. The main walks at the Spring are handsomely planted with elms facing a handsome parade for a large company: they are well gravelled and rolled. Near the pump is a large room³⁴ to walk in in rain or bad weather. From [this and] the walks is a fine view. There are no baths as the spring yields but merely sufficient for those who come to drink and indeed many times not enough.

The waters were discovered ab: 50 years past, tis said by the pigeons resorting to eat the salt.³⁵ The quality of them is that a gallon yields 6 to 8 grains of sediment, the component parts are salt earth, hard air and a small quantity of Iron. They are of a bitter saline taste. It curdles with soap, [leaves] a white sediment with Salt

²⁹ Lackington — Leckhampton.

³⁰ The Air Balloon Inn at Crickley Hill was called the New Inn in 1782, (Glos. R.O., D/CE 88/11). Contrary to popular opinion it does not commemorate a local balloon ascent. (BSS).

³¹ Royal George Inn. (BSS).

³² Charlton Park and Charlton Kings. (BSS).

³³ The Ricardo family later acquired Gatcombe Park in Minchinhampton and Bromsberrow Place. (BSS).

³⁴ The Long Room by the spa had been built by William Skillicorne in 1776. At the time of Gilpin's visit there was great rivalry between the Long Room and the Assembly Rooms. Hart, *loc. cit.*, 129. (BSS).

³⁵ The legend of the pigeons is well known, but Gilpin erred in the date of the 'discovery' of the well, which was 1718. Hart. *loc. cit.*, 124. (BSS).

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Tartar or spirits of Sal-Ammoniac and it ferments with oil of vitriol and spirits of salt and Vinegar and turns dark green with syrup of violets.³⁶

It is said to be the best purgative water in England; forms 1 to 3 or 4 pints within the course of an hour; quite a fine discharge without pain or relaxation and increases the appetites.

It is resorted for numerous pickups for all complaints. [Have no] doubt some be improved as well as others much relieved. On the walks are to be seen every age and description, old and young, Ladies, Lords and even [some words erased from the MS.]. Besides these it is attended with all that crowd of persons who under the various shape of musicians, jugglers, etc., contribute to the amusement and gull the pockets of the visitors. Most conveniences are to be had here but a subscription is necessary for everything tho I determined not to comply. My stay was short and I was determined rather to have them thus

Coffee room and papers	5/-
Master of Ceremonies	21/-
Museums	5/-
Public walking room	5/-
Woman at pump	5/-

Cum multus lux

The soil of the Country around Cheltenham is light-colored clay. This is the general quality of all this part of the Valley as it continued so to Gloucester. It is a

³⁶ The water tested by Gilpin is thought to have been that of No. 1 of the Old Royal Wells. It was situated on land acquired by Cheltenham Ladies College and was built over during the later part of the last century and so is no longer accessible. No modern analysis appears to be available, and the most recent is that printed in H. Davies, *Cheltenham and its Mineral Spas*, (Cheltenham, 1849). 'Analyses of the Principal Mineral Waters of Cheltenham. *ROYAL OLD WELLS*,' by F. A. Abel and Thomas H. Rowney of the Royal College of Chemistry, London.

Sulphuretted saline Water—no. 1

Temperature of the water, 57.2°F; Temperature of the air at the time of observation, 71.6°F; Reaction of the water distinctly alkaline; Acetate of Lead paper blackened; Taste Saline; Smell of sulphuretted Hydrogen; Specific Gravity, 1.0064 at 60°F.

	Grains in an Imperial Gallon
Sulphate of Soda	234.0562
Chloride of Sodium	229.7876
Chloride of Magnesium	52.6197
Chloride of Calcium	9.2576
Bromide of Calcium	2.0272
Iodide of Calcium	Traces
Carbonate of Magnesia	1.9719
Carbonate of Lime	22.0808
Carbonate of Iron	0.5999
Phosphate of Lime	Traces
Phosphate of Iron	0.1834
Silicic Acid	1.0129
Organic Matter { Crenic Acid	16.8245
{ Extractive Matter	0.0231

570.4447

Amount of residue obtained by direct experiment, 572.2451.— Free Carbonic acid in the water at 57.2°F; 32.705 Cubic Inches in an Imperial Gallon—Sulphuretted Hydrogen not present in estimable quantities.'

Gilpin appears to have travelled with a small testing kit of his own, for elsewhere in the diaries he refers to Mineral Waters, and mentions visiting a London manufacturer of such equipment. This contained various reagents with which the amateur chemist could make his own tests. Some of these are well known today, but others, such as the Syrup of Violets test for acidity or alkalinity were later superseded by more effective chemicals.

fine grass country, but much grain also cultivated; this is of all kinds, Wheat, Rye, much Barley, oats, beans, Peas. There are also some orchards and the hedge rows are very thick and numerous so that the Country is [half] shaded and beautiful. The grass is just cut, the corn just ripening and in some places just beginning to be cut.

The Roads are all made with the stone from the hills which by the action of the weather soon wears into a kind of Clay: there is no ground to fill up the ruts, no broad-wheel wagons to beat the stone, so that the road is very bad. The ruts intolerable and indeed this may be said of all the country beyond Oxford and generally thro Gloucester.³⁷

Entered Gloucester ab: 2 o'clock. After dinner called on James Wintle³⁸ and went with him first thro his pin manufactory,³⁹ of which the following is a description.

The wire is brot from Fairfield⁴⁰ in a rough state ab: 3 times as large as wanted for any pins. From this wire it is first drawn out by hand at several times to the one wanted. In drawing, it is run thro holes punched in a piece of steel which is made with great care and after heat up and hardened as the heat of the wire going thro soon softened it. The form of it is thus. [Sketch omitted] This piece is laid flat on a bench and a man turns a little winch which draws it thro and puts it on a [reel] from whence another takes it and draws it a little finer, thus. [Sketch omitted] In drawing the wire becomes hard and it is annealed.⁴¹ It is then straightened which is done nicely by

³⁷ The local roads were greatly criticised by other eighteenth century writers, including Arthur Young, Samuel Rudder and William Marshall. (BSS).

³⁸ Wintle, Vaughan & Co. was one of several pin manufacturers listed in the trades directory in [W. Tunncliffe] *A Survey of the County of Gloucester*, [1789], 58, and Bailey's *British Directory*, (1784), 379. James Wintle is given as a pin-maker in Upper East Street (Eastgate Street) in 1802, *The Gloucester New Guide*, 166. The firm is not recorded in a directory of 1820. A document in the Gloucester City Library shows that Wintle was living at Eastgate Street in 1826, but it is not known if he was still manufacturing pins. (BSS).

³⁹ Pin-making was introduced into Gloucester by John Tilsby in the early seventeenth century and remained an important industry in the county for close on three centuries. By the time of Gilpin's visit attempts were being made to mechanise the handicraft, but it is not until the 1840s that this was successfully achieved. By 1854 the trade had died out in Gloucester, though it lingered on for another generation in the Bristol area. The trade gave employment to many people and contemporary observers noted that as many as 25 pairs of hands handled each pin during its manufacture. J. M. Good, O. Gregory, N. Bosworth, *Pantologia: a new Cyclopaedia . . .*, (1813), ix, article 'Pin'; C. Partington, *The British Cyclopaedia of Arts and Sciences*, (1835), II, 274ff; C. Hibbs, 'Great Manufacturers of little things', Part 4, 'Pins', in *Cassells Technical Educator*, (c. 1870), III, 109ff, 159ff; C. Knight, *The Practical Dictionary of Mechanics*, (c. 1880), II, article 'Pins'. An excellent series of engravings of pin-making processes of the eighteenth century is to be found in C. C. Gillespie, *A Diderot Pictorial Encyclopaedia of Trades and Industry*, (New York), (1959), I, plates 184-186. A recent contribution to the study of pin-making in Gloucester is R. F. Tylecote, 'A contribution to the metallurgy of 18th- and 19th-century brass pins', *Post-Medieval Archaeology*, vi, (1972), 183-190.

⁴⁰ Fairfield cannot be identified with certainty; neither Falfield nor Fairford is likely. Probably Fromebridge Mill in Frampton-on-Severn is intended. It was bought in 1760 by Joseph Fairthorne, a brazier, who with his partners William and John Purnell built about 1775 one of the largest wire-works in the country. Although Fairthorne had released his interest in the works in 1791, well before Gilpin's visit, the production of iron and brass wire continued into the 19th century. *V. C. H. Glos.*, x, 150-1 (BSS). The major source of brass wire for the pin trade in this area was Bristol, but no works remotely connected with the name Fairfield can be traced.

⁴¹ In the course of drawing, the wire would harden and become brittle. It would then need to be annealed before it could be drawn without snapping. This was done by heating it to redness and allowing it to cool slowly. The wire would scale over and would need to be pickled in an acid to remove this scale. It is probable that no more than two or three passes could be made before the wire needed to be annealed again. In an account of a wire mill in Ireland (September 12, 1796), he mentions that steel wire for wool cards was drawn 26 times and that it was annealed 11 times in the process.

fixing a few iron pins in a certain position and, taking hold of the end of the wire, drawing it quickly thro, thus,⁴² [Sketch omitted] or in profile thus. [Sketch omitted].

The wire thus prepared is cut into lengths of ab: 6 ins. and given to the person who points them. He takes up a number in his hand, points them by holding them against two small iron rollers fixed like 2 grindstones, only made like a file, one of which points and the other polishes them. The person turning them in his hand so that every point is done alike. From thence they are taken to the cutter who cuts from each the proper pin length and returns the rest to the pointer who again points each end till the length of the wire is exhausted. The heads are made by a little wheel which twists one wire round another which is for a center.⁴³ This twisted wire is then cut to form exactly two rounds and that forms the pin's head. These are also annealed and then given to the girl who heads them; who, having a number of heads in a little heap, takes up a pin with her left hand and runs it among them until a head fixes on it, which she puts under a little stamp similar to a coining press which is raised by her foot and then falls of itself so as with one stroke to form a neck, press the head together and rivet it, thus.⁴⁴ [Sketch omitted].

Thus the pin is made. A [number] are then put into a large barrel like a churn and turned round with bran which polished them. They are put into a mixture of block tin and acid of wine which gives them their color.⁴⁵ The papers are folded by hand and the pins taken up and the paper is put in between two irons with grooves left for the number of pins.⁴⁶ All the papers almost all marked with a London mark as they are all sent to London to be sold or to order.

Went to see the Cathedral: old Saxon building,⁴⁷ the pillars inside round and immensely heavy; beautiful tower of the reign of Henry 6th; fine east window, well

⁴² The iron pins referred to here would be more like stout nails. They would be hammered into a piece of flat board, which in turn would be fixed down to the drawing bench. The positioning of the pins called for great skill and judgement, for the idea was to so fix the pins as to cause the wire to make a slightly serpentine course as it was drawn between them. This alternate flexing and stretching would cause the wire to lose any local kinks and it would emerge from the end of the set of pins perfectly straight. The pins also needed to be nicely adjusted to take account not only of the thickness but the hardness of the wire. The wire would be drawn out into lengths of about 20 ft, and a bundle of straight wire then would be cut into shorter lengths by means of a guillotine. Gillespie, loc. cit., plates 184, 185; Rees, loc. cit., xxvii, article 'Pins'; xxxviii, article 'Wire drawing'.

⁴³ The heads were made on a kind of spinning wheel. One wire was held by both ends and rotated about its axis. The wire to form the heads was gripped at the end of the first and wound spirally along it as it rotated, in the form of a close spring. When the rotating wire was full it was removed from within the coiled wire and this was then chopped up into short lengths of about 2 coils each. Gillespie, loc. cit., plate 185.

⁴⁴ Gilpin's account of the riveting process is somewhat vague. In many cases the riveting machines were arranged in sets so that six or eight workers could sit round one large bank of machines. Gillespie, loc. cit., plate 186.

⁴⁵ Gilpin seems to have got his processes reversed here. The pins were first boiled in an acid solution and then mixed with granulated block tin. This had the effect, by means of electrolytic action, of plating the pins with a fine coat of tin. The pins were then polished in a container of bran, and the residue of this was winnowed away from the finished pins. Mourning pins were japanned with black varnish. Hibbs, loc. cit., 110.

⁴⁶ Gilpin here refers to the hand process of mounting the pins in paper. A strip of paper was folded longways in concertina fashion, and was gripped along the fold in a vice. The jaws of the vice had grooves filed in them into which the pins were placed with the points next to the paper. When all the grooves were filled the heads were pushed simultaneously so that the points passed through the fold. This was done twice so that each strip of paper had two rows of pins along its length. Hibbs, loc. cit., 110.

⁴⁷ Gloucester Cathedral is chiefly Norman and Perpendicular, not Saxon. (BSS).

painted; whispering gallery over the Chapter House.⁴⁸ There are twelve small chappells on each side. Ceiling of the Choir very good. No modern monuments of any note except to the learned Warburton the friend and commentator of Pope.⁴⁹ The Cloisters very fine and extensive. Immense lavatory. Monument to the unfortunate Henry 2⁵⁰ who was murdered in Berkeley Castle and Robert, Duke of Normandy, Son and Heir of the Conqueror who was disposed by Henry 1. Had his eyes put out and imprisoned 23 years in Cardiff Castle. His effigies are of oak, painted, and look very well.

Went to see the gaol, a new building on Howard's plan;⁵¹ number of articles made by the prisoners; had not time to examine it. Went to see the Canal;⁵² a large dock is formed here for the shipping. Was to be out of the way of tides and freshes. Near 50 ft. deep and very extensive. From this a canal extends down along the Severn to Berkeley. As there are no falls there [are no] locks. The water is mainly let in by gates from the Severn. The canal is to be deep enough to admit Sea ships of any size, it merely to avoid the foul rifts, rocks and sand in the Severn. Immense undertaking; object is to introduce these vessels without lightening. Trade chiefly in Oporto.

The Severn here a very narrow river say 50 yds wide; at low water not above 6 or 7 ft water. Banks very high and steep, tide runs ab: 30 ft and sometimes 50 or 60 so as to overflow all the meadows on each side; the river tide comes in immensely rapid.

Gloucester an ancient town called Glaevum by the Romans, Gleavcester by the Saxons. It is a tolerably well built city, 4 streets running at right angles but is remarkable for little. Its chief manufacture being that of pins, with a little twine, sacking, cords etc.

Left Gloucester at 7. Crosst the bridge which is an old ill-built narrow thing.⁵³ A kind of causeway extends for some distance with arches to vent the water for the meadows in time of fresh; soon drained as they lay 30 ft. above the river; extend a considerable distance.

Fine ride along the river which is close on my left. More like a ditch as it is narrow and deep. Grounds along well cultivated; great deal of grass, wheat, rye, beans etc. Many fine orchards. To the right a delightful country, numberless valleys and eminences, plenty of woods. At a small distance the forest of Dean crown the eminences.

Soil dark brown on clay, very rich. Roads very bad, full of ruts and hilly. Most enchanting prospect on the right of the dales, hills, woods, grass grounds, corn lands and catches of the distant hills. As we mount the eminences, which continually cross the road, fine views off to the left over all the flat country on the other side of the Severn to Coteswold hills. As we approach Newnham the river becomes $\frac{3}{4}$ mile wide.⁵⁴

⁴⁸ The Whispering Gallery is over, not the Chapter House, but the entrance to the Lady Chapel. (BSS).

⁴⁹ Tastes and judgements vary. In D. Verey, *Gloucestershire, the Vale and Forest of Dean*, (1970), 216-9, the Warburton monument by Thomas King of Bath, 1779, receives less attention than those to Dame Mary Strachan, 1770, and Bishop Anthony Ellys, 1761, both by Ricketts of Gloucester; King's monument to Ralph Bigland, 1784, or John Flaxman's monument to Sarah Morley, 1784. (BSS).

⁵⁰ Not Henry II but Edward II. (BSS).

⁵¹ The county Gaol was built in 1791 at the instance of Sir George Onesiphorus Paul of Woodchester. They were described as 'a model for all England'. (BSS).

⁵² The Berkeley canal was started in 1793, but owing to rising costs was shortened to run only to Sharpness, being completed in 1827. (BSS).

⁵³ The Tudor bridge, built c. 1540, of eight arches over the west branch of the Severn and one over the Leadon was in a bad state of repair in Gilpin's day. It was replaced by Telford's Over bridge in 1826-9. *V. C. H. Glos.*, x, 16. (BSS).

⁵⁴ The river looks wide at Newnham, but is in fact only $\frac{1}{4}$ mile wide; the ferry terminals are directly opposite each other. The Bear Inn, the principal inn of the town, was connected with the ferry. (BSS).

Reach Newnham at 9 o'clock. Lodge at the Bear. Find the town of no note, some shipbuilding. This place near the old ferry. Ferry ab: $\frac{3}{4}$ mile wide. All the country on right as far as the River Wye called the Forest of Dean. Formerly so immense as to be the great source of supply for the navy. Spanish Armada had orders to destroy it. Much trimmed till Chas. 2 made some laws to preserve the timber. A good deal in it now and large supplies are brot down to the Severn and taken to Bristol and elsewhere.

31st

Rose at 6 and got off. Road still continuing along the Severn. Extremely hilly as it crosses the several points of hills which project into the Severn. Soil changes to a deep red earthy clay, under which is a red lime stone. Having nothing but this stone to make the roads, they are extremely bad, very stoney and full of ruts, especially for the first 8 miles when we came to Lydney where there are considerable iron works,⁵⁵ also a handsome house belonging to Mrs. Bathurst⁵⁶ with a fine park and views of the Severn Channel etc. Here the road is mended for some distance with the iron dross and is admirable. A little further however, tho not so bad as I had coming tis still hilly and rough.

The soil still continues of the reddish earth with limestone barrs. The same kind continues all along the Severn till I reached Chepstow and on the opposite side of the Severn lies Berkeley Castle and manor which is of the same kind and is the great district for making the fine Gloucester Cheese. If there is anything in the soil which contributes to the peculiar quality this soil must have it. Perhaps there is nothing more in it than that of being a clay with limestone underneath. It produces a rich and luxurious grass as I have remarked in most of the [limestone] countries.

I reached Chepstow at 11. Previous to entering it descended an immense hill down to a Bridge over the river Wye. From this hill and indeed for some distance before had a view of Piercefield⁵⁷ the seat of — Morris Esq.; the grounds of which are romantically beautiful. The shores of the Wye are all highly picturesque, the rocks on each side are upwards of 100 ft in height and perpendicular. The brows are crowned with lofty trees and the hills rising over them have on most of them a house, castle or some other object which adds to their beauty.

The Wye is here a considerable river half as wide as the Thames. The bridge over it is of wood and immensely high,⁵⁸ not less than 70 ft as the tide generally rises here near 40 or at some times 60 or 70. It was now low water and the river lookt like an exhausted canal, the mud on each side being very high and steep. A number of vessells lay on it in a position seemingly very dangerous as I should have supposed from so immense a weight pressing on the mud it would have given away and slid with the ships or tumbled them over, yet I am told no accident of the kind happens. Their position is thus. [Sketch omitted] The tide rises so rapidly the bore or swell is so much

⁵⁵ Lydney Furnace. C. Hart. *The Industrial History of Dean*, (Newton Abbot 1971), 82–92. This was situated just to the south of the road through Lydney to Chepstow. Other travellers of the period commented on the use of furnace slag for repairing roads in the Forest.

⁵⁶ Lydney Park.

⁵⁷ The landscaped gardens of Piercefield, a famous attraction for tourists of the late eighteenth century. They were created for Valentine Morris (d. 1798) from 1753. By the time of Gilpin's visit, Morris had gone bankrupt and left Chepstow. I. Walters, *About Chepstow*, (Chepstow 1952), 70–73. (BSS).

⁵⁸ The wooden bridge was taken down and replaced by the present one in cast iron in 1816. This was designed by John Rastrick, who worked under the famous Cornish engineer Richard Trevithick. He had much experience in iron foundry work, and when he was asked to design the new bridge he chose the new material. J. Gloag and D. Bridgwater, *A History of Cast Iron in Architecture*, (1948), 97, 100.

checked by the fresh water coming down as to make the rise gradual tho quick. It flows $4\frac{1}{2}$ to 5 hrs; ebbs $7\frac{1}{2}$ to 7.

As the river separates Gloucester and Monmouthshire I must give a little description of the former county before I commence with Chepstow. Gloucester is generally divided into three parts. The north east is called Coteswold and is hilly country chiefly employed in sheep walks. The towns, particularly those bordering on Wiltshire are much in the woollen manufacture. The middle part is called the Vale and is a highly rich country well cultivated and here the cheese is made. The west part lying between the Severn and Wye is called the forest of Dean and abounds in Timber. Although the land in the Vale is generally well tilled I saw some instances of great neglect; the fields run up with weeds; hedges, walls etc., in bad order.

The price of common laborers is from $1/4$ to $1/6$ per day from harvest to harvest and they get a guinea for harvest complete with their board or $\pounds 3$ 10 and find themselves.⁵⁹ The harvest lasts near a month. The hay was now all cut, Rye ripe, some corn also barley and oats not ripe. Some new corn had been sold this day at Gloucester for 11/- which was 2/- less than last market day—the Winchester Bushell.

Gloucester abounds in iron ore, coal and limestone yet they do not lie together so as to form any works.

On leaving Chepstow, Gilpin passed along the South Wales coast *en route* for Ireland. While in South Wales he visited many of the major industrial sites and described most of them in detail. He took ship from Milford Haven for Waterford and on reaching Ireland toured the country for the next two and a half months, when he recorded in considerable detail his impressions of many aspects of the country's life and made many contacts which would be of use in his business activities.

At the end of October 1796, Gilpin left Dublin for Holyhead, *en route* for London. His journey took him through the Black Country and the industrial Midlands and lasted about five weeks. This series of diaries ends abruptly with him in a mail coach passing through Bedfordshire, nearly at the end of his journey. The diaries for the next ten weeks are missing, but the numbering of the survivors indicates that there were twelve of them. The next surviving diary commences with his leaving Bath for Bristol in the middle of February 1797.

Febry 12th

Left Bath ab: 11 and took the lower road wending along the Avon.⁶⁰ Fine views of the crescents and buildings at Bath. Numbers of houses in the lower part in grounds. Soil Calcareous; grey stone everywhere. This reaches for 2 miles. Touch upon the bluish opaque limestone. Ab: 5 miles on the red and white limestone which runs across from Wells and is met with in South Wales. This continues to Bristol where intermixed with several strata of ironstone.

⁵⁹ The rates for farm labourers compare with those quoted by Marshall a few years earlier. Marshall loc. cit., I, 83. T. Rudge, *General View of the Agriculture of the County of Gloucester*, (1807), 387-8 gives similar or slightly lower rates. (BSS).

⁶⁰ via Saltford, Keynsham and Brislington.

TRANSACTIONS FOR THE YEAR 1973

Near Bristol the roads winds along the Avon. Enter Bristol over the grand stone bridge.⁶¹ Fine terrace on the river above the bridge and below the key extends. Drove to the White Lion Inn.⁶² Called at Ed. Harford's.⁶³ Saw there J. Collinson and Miss Ford. Asked to dine. Went to see Samson Lloyd⁶⁴ at Widow Rogers. From thence to dress and dine with J. H. Noble, son of [MS. blank] Noble Esq. Met there a Mr Stafford of the house of [MS. blank] in Oporto, their friends John Roberts & Co, Lime Street, London. Several other gentlemen also dined there. Returned and spent the evening at home.

13th

Rose at 8 went to Ed. Harfords to breakfast. S. Lloyd breakfasted there. After breakfast went to look at Miss Ford's drawings. Very fine on flowers. A great taste; drawn from nature. Fine conversation with J. Collinson. Went from there to J. Storrs Fry;⁶⁵ Joseph Smiths; Ames; Williams & Sons;⁶⁶ Doc. Fox;⁶⁷ John Lury; John Warings; Dowell and Evans.⁶⁸

Went to dine with S. Lloyd at Jno. Harfords.⁶⁹ His wife a charming woman, her name — Grey, the sister of Vick Taylor's wife. Charming family of children. I staid there till 9 o'clock and then went home and to bed.

14th

Rose at 8. After breakfast J. Harford called on me in his Post Chaise. Rode out by the Clifton road. Fine view of the town as we mounted the hills. Rode on soil road: clay with a basis of calcareous soil mixed with red ironstone. After passing several country seats and particularly a fine one of Mr Wedgewoods which he has lately purchased,^{69a} reached Blaise Castle⁷⁰ the seat of J. Harford. A good old house there. Building a new one of exquisite elegance. Of a square form with the offices extended at the back. Entrance front a fine circular [MS. illegible] with a recess. The grounds are

⁶¹ Rebuilt to designs by James Bridges; opened September 1768. R. A. Buchanan & N. Cossons, *Industrial Archaeology of the Bristol Region*, (Newton Abbot 1969), 180.

⁶² Situated in Broad Street. Matthews's *Bristol Directory*, (Bristol 1794), 94. (Noted hereafter as Matthews I.)

⁶³ At 20 Kings Square, Matthews I., loc. cit., 41. Edward Harford was a prominent Bristol Quaker. He was a partner in Harford's bank and had connections with local industries and their offshoots in South Wales. C. H. Cave, *A History of Banking in Bristol*, (Bristol 1899), 92.

⁶⁴ Either Sampson Lloyd III (1728–1807) or his son, Sampson IV. Sampson Lloyd III was a prominent Quaker banker, partner in the London bank of Taylor, Lloyd, Hanbury and Bowman of 60 Lombard Street. A. Raistrick, *Quakers in Science and Industry*, (1950), 121, 325.

⁶⁵ J. Storrs Fry (1768–1835). At the time of Gilpin's visit he was part-owner, with his mother, of the chocolate making business at 7 Union Street. T. Fry, *A Brief Memoir of Francis Fry, F.S.A.*, (1887), 13–14; P. H. Emden, *Quakers in Commerce*, (c. 1939), 190–191; Matthews I., loc. cit., 35.

⁶⁶ Ames and Williams, Drysalters, Castle Green. Matthews, I., loc. cit., 9.

⁶⁷ Edward Long Fox, M.D., Castle Green. This Quaker doctor was born in 1769, and became famous for his humane treatment of the insane. He founded his first asylum at Downend in 1794, which was moved to Brislington in 1804, where the buildings still stand. Matthews I. loc. cit., 5; Bryan Little, *The City and County of Bristol*, (1954), 188.

⁶⁸ Dowell, Gardener & Co. Hat Manufacturers, Wine Street. Matthews I., loc. cit., 29.

⁶⁹ John Scandrett Harford (1752–1815). Partner in the Harford Bank and in the many ramifications of the Harford empire. He was the eldest son of Edward Harford (1720–1806), and maintained his town house in Brunswick Square. Cave, loc. cit., 92; Matthews I., loc. cit., 40.

^{69a} Cote House on the Downs, owned by John Wedgwood, son of Josiah. S. Hutton, *Bristol and its famous associations* (1907), 112.

⁷⁰ Blaise Castle House, designed by William Paty. Work commenced on the site in 1795. N. Pevsner. *North Somerset and Bristol*, (1958), 468; W. J. Robinson, *West Country Manors*, (Bristol 1930), 30–3.

improving under the hands of Repton.⁷¹ Walked lower grounds, the views from which are more various and beautiful than anything I had seen. They include an immense stretch of the Bristol Channell, the coast and mountains of Wales and the interior country everywhere.

Returned in the afternoon and dined with J. Harford. A Miss England there who lives in Warwickshire; she a relation of the Lloyds. I spent the afternoon at J. Smiths. A number of Gentlemen and Ladies there.

Febry 15th

Walkt out with J. Storrs Fry. Went to see Champion's⁷² machinery for rolling lead. It is done with two iron cylinders ab: 5 or 6 ft. wide and ab: 1 ft. diameter. These are so formed as to turn either way by altering the crank. On a level with the top of the lower roller are a number of wooden rollers on which the sheet runs along as it is rolled out and is extended backwards and forwards.⁷³ At this place also are a large wire work which is done by pinchers worked to and fro by a crank and they draw the wire forward through the hole in a pin of steel or hardened iron. It is drawn through gradations of these until the required size.⁷⁴

Went to the iron foundry conducted by John and Thomas Winwood.⁷⁵ It was chiefly designed for casting for the neighbourhood. They cast screws,⁷⁶ cylinders etc. Got their prices.

J. Storrs Fry informs me he is getting a steam engine made to grind his chocolate of the power of four horses, which will cost ab: £250 stg.⁷⁷ There is a workman here who will make them compleat.

⁷¹ Humphry Repton, (1752-1818), Landscape-gardener. R. Dutton, *The English Country House*, (1949), 114.

⁷² Little is known about the later years of the Champion family of Bristol in the eighteenth century. It is probable that the Champion referred to here was the son of William Champion (1709-1789), member of the metallurgical branch of the family. A. Raistrick, loc. cit., 190-200; J. M. Day, *Bristol Brass: The History of the Industry*, (Newton Abbot, 1973).

⁷³ Rolled (or milled) lead was first made in this country c. 1650, but its introduction into Bristol was comparatively late, for in 1781 it was noted that milled lead had only recently been made in the city. This could not have been Champion's concern, which did not start until 1793. J. M. Day, loc. cit., R. A. Steedman, *A History of Lead Smelting in Bristol*, (1966), MS. Thesis in Bristol R.O., p. 11.

⁷⁴ Both the lead rolling mill and the wire mill were driven by a steam engine. J. M. Day, loc. cit.

⁷⁵ John Winwood, iron founder, Cheese Lane. Matthews I, loc. cit., 88. The Winwoods were well-known founders and engineers in the city during the late eighteenth and early nineteenth centuries.

⁷⁶ The screws referred to here were large screws used to operate heavy presses in such trades as paper making and textile finishing. It is probable that they were cast and then finished by hand, for it was easier to cut a thread in a wooden pattern and then true up the resulting casting by hand, than to cut a large thread from the solid metal. Gilpin makes other references in the diaries to screw makers, and the use of metal screws for this purpose was a recent innovation at the time of his tour. Before this all such screws were made of wood, which needed frequent replacement.

⁷⁷ This engine is reputed to have been the first steam engine in Bristol. T. Fry loc. cit., 12-13; P. H. Emden, loc. cit., 191. This is completely untrue. The atmospheric or Newcomen steam engine was used extensively in the Bristol and Somerset coalfields for mine-draining from at least 1724. The sites of more than ten of these is shown on B. Donn's *Map of the Country 11 miles round the City of Bristol*, (1769). Two atmospheric engines with 74-inch cylinders were in use at the Warmley Brass Co. works during the middle of the century. Sir Joseph Banks, Bt., 'A Journal of an excursion to Eastbury and Bristol . . . 1767' *Proc. Bristol Nat. Soc.*, NS., ix, part 1, (Bristol 1898). In about 1780 Matthew Wasborough made a steam engine to drive his workshop in Narrow Wine Street, G. Price, *A Popular History of Bristol*, (Bristol 1861), 220-3. In 1793 an 18hp engine was purchased of Boulton & Watt, by Castle and Ames, distillers of Bristol. Birmingham Ref. Lib., Soho MSS, Engine Book. A steam engine was used to bore cannon at a foundry (perhaps Winwoods) in St Philips. Matthews, *Bristol Guide* (1794), 40.

In conversation with J. S. Fry I find that his patent has expired⁷⁸ for many years. His father made money by the business and he is also making it. I talked with him about the type foundry.⁷⁹ He says his father did not cut the types but got a workman to do them. A person by the name of ——— in Birmingham cut the smaller letters. He says that he did not value the whole at more than £4 to £5,000 sterling.

Went to dine with Ed. Harford. No one but himself, J. Collinson and Miss Ford present. Staid till 9 and then came away. Much talk with J. Collinson about Italy, Spain etc. In the evening went home.

Febry 16th

After breakfast called at the bank of J. Harford⁸⁰ and walked out to Clifton. On the hill saw an immense number of buildings unfinished and nearly tumbled to ruin.⁸¹ One superb crescent of great beauty. The village of Clifton the handsomest in the world. All the houses nearly like palaces. Rodney Place unconsciously elegant: two houses together and then a space between them and another two occupied as an entry. A number of fine buildings in different situations. Nothing, however, equal to Bath. View extremely fine particularly on descending to the river.

The mills⁸² and baths seated on the river at the bottom of the hills. River about 100 yds. wide. Tides rise very high. Cliffs bold on each side and form romantic views thro them. All the shipping pass this way. Water always very muddy.

⁷⁸ Gilpin here refers to the patent awarded to Walter Churchman for an 'engine for the Manufacture of Chocolate', (1730, no. 514). This 'engine' seems to have been some kind of mill to crush the cocoa bean. The patent was purchased by Dr Joseph Fry, and he commenced the manufacture of chocolate in 1761. The chocolate referred to here is not the eating chocolate commonly associated with the word now. In Gilpin's time chocolate was a paste of crushed cocoa bean and spices which was mixed with hot water to produce the beverage. *English City* (J. S. Fry & Sons, Bristol 1945), 46.

⁷⁹ At the time of Gilpin's visit, the type foundry had moved to London, where it traded under the name of Fry and Steele. The business was founded by Dr Joseph Fry, Joseph Storrs Fry's father, and William Pine, the eminent Bristol printer, in 1750. The move to London occurred in 1768, where the business was managed by Isaac Moore. By 1782 Pine and Moore had retired and the business was managed by Joseph Fry's elder sons, Edmund and Henry. Dr Edmund Fry was one of the greatest typefounders of his era, and pioneered many new designs, including a type which embossed the paper for the use of the blind, and an ultra-small type, Diamond, of 4½pt size. A. Raistrick, loc. cit., 214-216; T. Fry loc. cit., 10-11; P. H. Emden loc. cit., 190; W. T. Berry and H. E. Poole, *Annals of Printing* (1966), 186, 216. Gilpin visited Fry and Steele's foundry the previous year (26 March 1796), and noted details of the processes.

⁸⁰ The Harford Bank, Corn Street. Founded 1769, amalgamated with Miles's Bank, 1820. Matthews, I, loc. cit., 7; Cave, loc. cit., 90-99.

⁸¹ Probably Windsor Terrace which overlooks the Avon above Hotwells; it would have been conspicuous. The Terrace was started by William Watts, who made a fortune from Patent Shot and is mentioned later in more detail. Work started in 1792, but Watts was declared bankrupt in 1794, and the houses remained unfinished until 1808. W. Ison, *The Georgian Buildings of Bristol*, (1952), 226. At the time of Gilpin's visit both Cornwallis Crescent and Royal York Crescent were lying abandoned with half-completed buildings owing to the failure of their builders. Ison, loc. cit., 228, 231.

⁸² Gilpin refers to the quite extensive series of industrial buildings on the Somerset side of the Avon, opposite the Hotwell. Several industrial spies made it their business to record what went on there, for there were copper and lead smelting mills operating there from the end of the seventeenth century. R. R. Angerstein (1754) recorded by means of most attractive sketches the processes involved in smelting and desilvering lead at the Rowham Meads mill. In 1788 a cotton mill, opposite the Hotwell, was offered for sale, and this was later used to grind logwood. This particular mill was used as a lead smelting mill in 1761, and was burned down in 1831. J. Latimer *The Annals of Bristol in the Nineteenth Century*, 184. The remains of these industrial sites were cleared away for the construction of the Portishead Railway c. 1865. MS. note in the Rhys Jenkins collection of the Science Museum Library, London.

AN AMERICAN IN GLO'SHIRE AND BRISTOL

Pump room and Wells⁸³ not on the elegant style they are at Bath. Water just milk warm and tasteless; frequented by consumptive invalids. Walked up to Bristol thro the dirty suburbs that connect it with Clifton.

Went to dine with J. Dowell. His brother and partner Evans both with us; plain men. Carry on the hat business; got their prices. Brothers to Mrs. J. Clifford; long known to our family. Went to sup with John Waring,⁸⁴ Elijah Waring's brother and sister both present and another young lady. John Waring is in the Porter and Cider business. Got from him the prices of them and of Cheese etc..

Febry 17th

Rose at 8. Called on Waring and Frank,⁸⁵ went with Waring to see the manufactory of Watts & Co.,⁸⁶ conducted under the patent by [MS blank].^{86a} The difference in making this patent shot and the others consists only in casting it in this place at a very high elevation so that it drops thro a sufficient space of air to cool it before it reaches the water. By these means it becomes perfectly round. There may also be some more particular pains taken in mixing the lead for their purpose. The preference, however, of this to other sorts of shot is so little that both sell for nearly the same price and now the patent has expired for the same price exactly. As well as a coal pit any other place of depth enough may be used for their purpose and its process in other respects is very simple. The whole process of making shot is explained in Watts's patent, published in the Repository.⁸⁷

The first process is in boiling the lead with a quantity of arsenic in a closed vessel so that it becomes impregnated or poisoned. This gives it the disposition to form itself into spheres. The lead is then put into a boiler and melted and workmen add more or less of pure lead and poisoned lead as they find it more or less disposed to be circular. In their left hand they hold a square iron or copper pan ab: 12 in long, 6 or 8 wide and 3 or 4 deep, the bottom of which is perforated with holes of the different sizes. This pan is kept nearly full of drossy lead which is not sufficiently fluid to run of itself but permits the melted lead to run thro it so slowly as that it has time to form itself into drops. Much is owing both in poisoning the lead, in regulating the fluidity and, in pouring it through the pans, to the experience of the workman. The pans are held over a pan or tub of water ab: 2 ft deep and kept 8 or 10 ins from the surface.⁸⁸

When the shot is made it is kept in water until ready then put into copper pans and dried over a slow fire to evaporate the water and render the shot dry. After this it is rolled by a handful at a time by boys over flat boards or troughs, a little inclined, so that all the perfect shot run off into boxes to receive them and the bad ones remaining are pickt to be melted down again. The last process is to put them into a small cast iron barrell on the inside of which are a small number of barrs. A little

⁸³ Hotwells pump room built in 1696; demolished 1822 for road widening and rebuilt in the Tuscan style. V. Waite, *The Bristol Hotwell*, (Bristol 1960), 6, 14.

⁸⁴ John Waring, Merchant, Queen Square and Quay. Matthews I, loc. cit., 83.

⁸⁵ Waring and Frank, Ironmongers, Bridge Street, Matthews I, loc. cit., 83.

⁸⁶ Full detail of Watts's process (1782, no 1347) can be found in Steedman, loc. cit., chapter 3. For a description of Redcliffe Shot Tower, which was demolished in 1967, see John Mosse, 'Redcliffe Shot Tower' in *BIAS Journal*, (Bristol 1969), II, 4.

^{86a} The Philip George and Patent Shot Co. J. Latimer, *The Annals of Bristol in the Eighteenth Century* (1893, repr. 1970), 454.

⁸⁷ Ackerman's *Repository of Arts, Literature, Fashions . . . etc.*

⁸⁸ Gilpin seems confused here. The distance of 8 to 10 ins. is the sort of distance used when making shot by the old process. Under Watts's process, the distance was more likely to have been 80-100 ft.!

TRANSACTIONS FOR THE YEAR 1973

blacklead is put in with them and the barrell is turned round by a horse mill for a certain time. When they are perfectly glazed, taken out and weighed into bags of the proper weight. They conduct at this place all kinds of lead work such as Pumps and Pipes. Their sheet lead, however, is cast not rolled. Their process is as follows.

A Trough of wood ab: 6 or 8 ft wide, 25 or 30 long and 3 deep is filled with fine sand which is levelled extremely well by a piece of board drawn over it leaving no holes and a very little descent from the head to the foot of the trough. At the head of it a small trough reaching quite across the large one which is of iron and will contain a large quantity of melted lead. This trough is not square but is of two sides meeting together at the bottom and the third side or top left open. Into this the melted lead is poured and the side next to the end being tilted the lead runs over from it over the whole of the sand to the bottom. The surface of the lead is regulated by drawing over it strips or pieces of wood edged with iron and so scrapes the sheet of lead of proper thickness. The trough is raised or tilted by a common tackle. In this way the largest sheets are cast and of any thickness. I obtained from these persons their prices etc. They make excellent pumps.

Called on James Harford's house conducted under the firm of Harford, Partridge & Co. They own the Tin works in Wales⁸⁹ and also the Wire works and are generally concerned in all the coarse Iron business. Their articles comprehend

Tin Plates
Bar Iron
Sheet Iron
Rod Iron
Hoops
Cast Potts etc.
Frying Panns
Anvills
Hammers and Sledges
Shovels and spades
Steel of all kinds
Bolt iron
Iron wire down to no. 21

The castings, anvils etc. they get from Coalbrooke Dale, and other places where they are manufactured. They also sell Lydford's Patent Boxes and Axle Trees,⁹⁰ which are no more than boxes with small long holes⁹¹ gouged out or cast hollow in the inside which confines the grease as it goes round so as to keep a constant supply. For this see more particularly their memorandum.

Called on the Brass company conducted under the firm of Harford and Bristol Brass Company.⁹² This company own the great works in Wales⁹³ and those for Brass wire and Spelter near Bristol and on the Avon.⁹⁴ Their articles are

Copper sheets and bottoms
Ingot brass

⁸⁹ At Melingriffith, on the outskirts of Cardiff. Gilpin visited this tinplate mill in August 1797, and recorded the processes in great detail, Raistrick loc. cit., 148-51.

⁹⁰ Lydford's Patent Boxes, (1784, no 1434).

⁹¹ Gilpin evidently means slots or grooves.

⁹² Another part of the Harford empire. J. M. Day loc. cit.

⁹³ The Harford & Bristol Brass Co.'s works were at Swansea. Gilpin visited them on 3 August 1797 and recorded in great detail what he saw.

⁹⁴ At Keynsham. This mill became the headquarters of the company and the production of brass wire continued until 1927. Parts of the original buildings still survive, though soon (1972) scheduled for demolition. J. M. Day. loc. cit.

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Brass wire not finer than 4 and 5 band
Brass kettles and pans
Latten and covers
Bright Latten

See their prices etc.

The next surviving diary begins on February 27th, with Gilpin leaving Bath *en route* for London. The numbering of the diaries indicates that during the missing ten days he filled another three volumes with notes and comments. Had these survived they would have given a useful account of the state of commerce and industry in the city and its neighbourhood, for it was Gilpin's invariable practice to write comprehensive accounts of these aspects of the life of the major towns and cities he visited.

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