

# The Lead Mines of Glamorgan and Gwent

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The mining of lead ore in the old counties of Glamorgan and Monmouthshire has been on a much smaller scale than in some western and northern counties of Wales. It has, in consequence, attracted little attention from historians and industrial archaeologists. Nevertheless there were numerous lead mines in Glamorgan and a few in Monmouthshire. Tables 1 and 2 and the map set out those which seem reasonably certain; 17 sites, representing a much larger number of individual mines, have been positively located and inspected[1]. Nearly all these sites had been worked at some time before the resurgence of the lead industry in the mid-nineteenth century, and some of them have evidence of ancient working, particularly in Roman times. As far as can be ascertained, only five of the sites were positively worked from the mid-nineteenth century onwards (two more probably were), and none after 1878.

Little has been published on the history of lead mining in Glamorgan and Gwent. W.J.Lewis[2] gives some valuable information on the lead mines of this area in the seventeenth and eighteenth centuries; William Rees[3] gives some scattered facts over a long period, roughly the thirteenth to the eighteenth centuries; Samuel Lewis[4] gives some useful observations up to about 1840; Morgan Rees[5] gives some interesting notes including observations on the present-day remains at Llangan mine-site. For the renewed activity of the mid-nineteenth century, including its physical remains at the present day, there is the account[6] which my wife and I prepared in 1974; this was based mainly on a previously unexplored collection of manuscripts[7] and on reports in the *Mining Journal*, together with field work. Since our paper was printed, a good deal of additional information has come to light, and the tables now presented include many more sites than we previously recorded. The detailed histories of the various mines which we presented will not

be repeated here; instead, I propose to give a more general and much briefer discussion.

### *Before 1850*

While it is possible that lead was mined and smelted in Glamorgan and Gwent before the Roman occupation, the first positive evidence is of activity during Roman times. Part of an inscribed pig of lead[8] was found during excavations at Caerwent in 1947, and thought to have come from works in the Rudry — Machen area; and the discovery and exploration of a Roman lead mine at Cefn Pwll-du (ST218 877, site no. 13 on the map) in 1965 by the Tucks[9] leaves little room for doubt. The evidence of Roman working is strong, being based partly on the finding of sherds and coins of the 3rd century A.D. clearly deposited after earlier mining activity. The silver which is generally associated with lead ore was probably at least as important to the Romans as the lead.

Evidence of medieval lead mining is very scanty, but Rees[10] quotes the *Annals of Tewkesbury* as stating that lead ores were found in the thirteenth century at Rudry, Pentyrch, Llangan, and Brocastle; and Criddle[11] quotes evidence for lead mining at Llantrisant in 1262. Rees also suggests that there may have been mining and smelting of lead and silver in Glamorgan in the twelfth century. He states that lead ores were being worked at other places in Glamorgan in 1530, as indicated in Tables 1 and 2. At Llantrisant, in particular, lead was being mined in 1531 and ‘throughout Tudor times’, three mines being mentioned, each worked by a team of four men producing about 5 cwt. of lead ore each day[12].

Lead mining activity increased in the seventeenth century. At Llantrisant, a mine at ‘Green Close’ (not identified by me) produced ore to the value of over £2,000 in the 1660s[13]. In the same decade, ‘fair quantities of lead were shipped from Cardiff and Aberthaw’[14]; and M. Williams quotes details of cargoes shipped from Cardiff in 1666 which show that approximately 5 to 10 tons of lead were sent monthly to Bristol[15]. Williams also shows that lead ore was shipped to Bristol from Newton in the 1670s and 80s in smaller quantities[16]. There is some evidence that mines near Machen were working in 1665[17]. At the end of the century there

was also lead-mining around Coychurch near Bridgend and Piercefield near Chepstow[18].

For the eighteenth century there is again only scattered and fragmentary information. Probably the most active lead mine was the Park (i.e Clun Park) mine at Llantrisant, which, starting up only slowly from around 1727, reached a high level of activity by 1754, raising 402 tons from August 1757 to June 1760[19]. Between 1754 and 1760 over 400 tons of ore was sent from this mine to Bristol, being carried to Penllyn at 6 shillings per ton and thence to Cardiff for shipping at 3s. 8d. per ton[20]. The mine was worked by Edmund Traherne for several decades from 1727; in the 1770s it was worked by Lord Bute and was supposed to have employed some 500 men, many probably migrated from mid-Wales owing to the slump there. In the 1750s the mine suffered from flooding and 'engines' were installed to pump it out; what these engines were is not known.

There was a smelting works at Llangyfelach near Swansea which received ores from many Welsh lead mines. In the records of 'Lead Received at Languvelach Works' for the years 1731-1743 are shown the quantities of ore received from the various mines and the mode of transport — overland or by sea[21]. From the mines in Glamorgan, which included only Golden Mile, Ogmores Down, Newton, and Llangan (which may have also included Tewgoed or Penllyn), the quantities were quite small, typically between 1 and 20 tons per consignment, with totals over the 12-year period of only about 100, 17, 60, and 28 tons for the four mines respectively, and a price of around £7 a ton. It must be remembered, however, that many mines had, at this period, their own smelting houses— certainly Llangan, Penllyn and Park had — and that much ore was also sent to Bristol; thus the ore sent to Llangyfelach would probably have been only a small proportion of the output of these mines. It was recorded in 1763 that an assay of lead ore from Llangan or Penllyn gave 50% lead and 9 oz. of fine silver per ton of ore[22].

According to Rees, other mines worked during the eighteenth century included Golden Mile (1727), Goldsland Wood near Wenvoe (up to 1764), St. Hilary (c.1760-70) (quite extensive workings according to M.Davies *et al.*[23]), and Piercefield[24]. The taking

of lead ore at Piercefield is confirmed for the year 1784 by Waters[25]. At Bishopston, a 'notable discovery' was made in the latter half of the century which was supposed to have provided £12,000 clear profit for the promoter[26]. Known as the All-Slade mine, it seems to have been the first lead mine in Gower.

Early in the nineteenth century, there seems to have been some activity at Llantrisant, Coed-Lai (i.e. Coed-Ely or Coed-elái), Tewgoed, and the All-Slade mine, but Lewis considers that this was unlikely to have survived the Napoleonic Wars[27]. It seems probable that there was no lead-mining activity in Glamorgan and Gwent during the second quarter of the nineteenth century. The revival of the 1850s, which will be discussed below, was comparatively unsuccessful.

It seems clear that the general level of lead-mining activity in Glamorgan reached its peak during the eighteenth century. From the few figures available, it appears that many thousands of tons of ore were raised, probably tens of thousands. But this must be viewed against the background of national production of lead. Burt[28] has estimated that the total lead production in England and Wales was approximately 28,000 tons *per annum* in 1705/6; 24,000 in 1725/6; 31,000 in 1755/6; and 59,000 in 1769/70. Thus the Glamorgan contribution was only a tiny proportion of the national production, even at its peak no more than perhaps one or two *per cent*.

### *The Resurgence of the Mid-Nineteenth Century*

The complete cessation of lead mining in Glamorgan and Gwent during the second quarter of the nineteenth century was not typical of the industry as a whole; in other parts of Britain the production of lead continued, albeit on a reduced scale because of low prices caused partly by competition from Spain and partly by reduced demand[29]. It was, indeed, during this slump period that the great mining engineer and entrepreneur, John Taylor, established himself in Cardiganshire[30] and was thus ready for the resurgence of the industry around 1850. During the late 1840s there was a marked deterioration in the quality of Spanish ore, and simultaneously an increase in home demand for lead, so that in spite of new

competition from North America the price of lead rose by about one-third over the years 1848 to 1852[31]. This stimulated a great expansion in the British lead-mining industry which lasted for about a quarter of a century. But in the 1870s the price of lead began to fall again and by the early 1880s had been halved; coupled with the increasing costs of extraction from ever-deepening mines, this was almost fatal to the industry, and it never recovered[32].

The mid-century resurgence of lead mining was reflected in Glamorgan, but its success there was very small. Activity seems to have been restricted to the Bishopston, Penllyn/Llangan, and Rudry/Machen areas. I will take these in order. There was almost certainly no significant activity in Monmouthshire.

*Bishopston.* It was in March 1849 that Matthew Francis[33] became involved as consultant in the re-opening of the All-Slade mine at Brandy Cove. The promoters of the Bishopston Silver and Lead Mining Co. included Charles Low of Low's Patent Copper Co. of Penclawdd, Swansea; also Robert Dunkin and Thomas Routledge who were associated with him at Penclawdd. Matthew's brother Henry was sent to take charge as Agent, and made good progress at first, although it seems to have been June 1850 before ore was ready for sale. He was then very optimistic about the mine; a high-pressure, simple, non-condensing, steam engine was installed for pumping, and water was emptied by a sea-level adit at low tide. Over £4,000 had been invested in the work by October 1851 and additional capital was sought. But very little lead ore had been obtained, almost certainly less than 100 tons. Henry Francis left the mine probably early in 1852. It seems that there was in that year a thorough change of personnel, for the company also replaced its secretary and its mining consultant; also in that year it opened the Long Ash mine a mile or so inland from All-Slade. Arthur Dean, the new mining consultant, reported optimistically in September 1852; nevertheless no success was obtained and it is probable that work effectively ceased in 1853. It is clear from the physical remains at the Long Ash site that little work was done there; for instance, there is no sign of spoil.

Henry Francis had reported in 1849 on the earlier workings at All-Slade (late eighteenth century and 1810-13) which were quite

extensive. Possibly the mine had really been worked out, but if so, why were successive reports by different experts all so optimistic? At Long Ash, failure was probably due to lack of finance to get work properly started.

*Penllyn-Llangan.* In 1851, Charles Low, who was also involved at Bishopston, obtained the sett at the old Tewgoed mine on lease from Mr. Salmon of Penllyne Court. The Penllyne Court Mining Co. issued a prospectus[34] which described the sett and the extensive mining carried on there in the eighteenth century. Matthew Francis was again the mining consultant. Most of the 5,000 shares were taken up by a group which included Thomas Field who became Chairman. Operations began in May 1852. Two horse whims were used for pumping until a Medwin and Hall portable steam engine was obtained in February 1854. The sett was extended in 1853 by a lease of adjoining land from the Countess of Dunraven. In spite of the usual optimism, little success was achieved, and the company was dissolved in August 1855. It is unlikely that the ore obtained exceeded 100 tons.

There was no further mining on the Penllyn (Pen-llin) site, which although easily identified today by old shafts, spoil heaps, and stonework, has few remains of buildings. Interest moved to the Llangan site, less than a mile away; to exploit it the Llangan Silver Lead Mining Co.[35] was floated in mid-1855 with a nominal capital of £8,000. but it seems that this company never really got started on practical operations. The same fate apparently overtook the next venture, the Llangan Lead Mining Co.[36], which was formed in 1863.

The next company at Llangan[37] made its mark on the site, for the evidence of its work can still be seen in the form of the chimney of the engine house, across the road from the eighteenth-century site (which also has buildings still standing which almost certainly formed part of the mine works, including the eighteenth-century smelting house). It was formed in 1876, made a new engine shaft and erected a powerful Cornish engine; it provided modern ore-dressing equipment and produced at least 140 tons of ore in 1877-8[38]. Unfortunately it also failed.

Finally the Glamorgan Consolidated Lead Mining Co. was for-

med in 1879 with a nominal capital of £30,000 to purchase and operate the mine; but it appears never to have got under way[39].

*Rudry-Machen.* Here the main mid-nineteenth century working was the Clive mine, so-called because the property was owned by the Hon. Mr. Clive. Work seems to have started in 1850 and expanded in 1852[40]. A tramroad was provided from the mine shafts to the dressing-floor by the Draethen Brook, and a horse-whim and a water-wheel were installed. However, much trouble was experienced with flooding and bad ventilation, only about 36 tons of ore were produced[41], and operations ceased in June 1854.

In 1854 there were reports also of a Clive United mine and a West Clive mine, but little is known of their activities.

During the same period there were some other lead-mining activities in the same general area: the South Wales Mining Co. which was supposed to be opening a mine to the east of the Rhymney River (possibly no.16 in Table 1); Withers and Co. (raising 10 tons of ore) and John Edmunds (raising 60 tons in six weeks), both operating 'near Caerphilly'; and the Caerphilly and Carfunon Co.

In 1871 a fresh effort was made to mine lead in this area, almost certainly at the old Clive mine. The Glamorganshire Mining Co. was formed with a nominal capital of £12,000 and erected a steam engine for pumping. It did no more, however, and one reason may have been the objection of Lord Tredegar's agent to the washing of ore in the Draethen Brook.

The identification of the numerous mine sites in the area with these various nineteenth-century activities is very difficult. The only association of which I feel confident is that of site no.12 (see Table 1 and the map) with the Clive mine. The remains of the tramway formation from the shafts and adit down towards the Draethen Brook are a positive indication since they correspond with the description in the contemporary reports.

It appears from the above brief histories of mid-nineteenth-century lead-mining in Glamorgan that the amount of lead ore raised did not exceed 500 tons, and that all the companies failed quite quickly. Compared with the eighteenth-century operators,

these companies had the advantage of convenient steam power and more modern machinery. Yet they were clearly much less successful. The earlier workings have been reported by recent explorers as very extensive. Perhaps the mines had really been worked out, and the optimistic reports of the various mining experts who inspected the mines were designed only to encourage the raising of money by unscrupulous financiers.

Descriptions, interpretations and maps of the sites and the physical remains of the lead-mining operations are given in reference 6.

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**Acknowledgement:** Numerous institutions and individuals have helped with services and information in this study. A full list cannot be appended here for lack of space, but I would like to record my gratitude to them all.

#### NOTES

- [1] Generally the term "site" is used for an identifiable small area in which there may be several or many mine workings (e.g. shafts, pits, adits) believed to be (or have been) connected either physically or by common management.
- [2] W.J.Lewis, *Lead Mining in Wales* (Cardiff, 1967).
- [3] William Rees, *Industry before the Industrial Revolution*, 2 Vols. (Cardiff, 1968).
- [4] Samuel Lewis, *Topographical Dictionary of Wales*, Vol. 1, (1848).
- [5] D. Morgan Rees, 'The metalliferous mines of Wales', in *Amgueddfa*, XII (1972) 4-23; and 'Industrial archaeology in Glamorgan', in *Glam. Historian*, V (1968) 193-205.
- [6] M. and G. Tucker, 'The lead mines of Southeast Wales', in *Bull. Peak Dist. Mines Hist. Soc.*, VI (1975), 15-27 (reprints available from authors at cost).



- [7] National Library of Wales, Aberystwyth. Druid Inn MSS.
- [8] Now in the National Museum of Wales, Cardiff.
- [9] J. and N. Tuck, 'Roman Mine, Draethen, Glam.', Bristol Exploration Club, Caving Report no. 15 (1969).
- [10] W. Rees, *op.cit.*, p.38.
- [11] A. J. Criddle, M.Sc. thesis, University of Wales, (Cardiff, 1967), p.113.
- [12] W.Rees, *op.cit.*, pp.142-3 and 448.
- [13] *ibid.*, p.483.
- [14] W.J.Lewis, *op.cit.*, p.70.
- [15] Moelwyn Williams, 'A further contribution to the commercial history of Glamorgan', in *Nat. Lib. Wales J.*, XII (1961-2), 353-369.
- [16] *ibid*, XI (1959-60), 330-360.
- [17] As ref. 12.
- [18] W.Rees, *op.cit.*, p.448.
- [19] W.J.Lewis, *op.cit.*, p.163.
- [20] *ibid.*, pp.313-4.
- [21] NLW/MS 15101A
- [22] *Mining J.*, 1852, p.78.
- [23] M.Davies *et al.*, *S. Wales Caving Club Newsletter*, no.24 (1958).
- [24] W.Rees, *op.cit.*, p.483.
- [25] I. Waters, *Piercefield* (Chepstow, 1975), p.26.

- [26] W.Davies, *A General View of the Agriculture and Domestic Economy of South Wales* (London, 1814), p.76; quoted by W.J. Lewis, *op.cit.*, p.164.
- [27] W.J.Lewis, *op.cit.*, p.254; S.Lewis (see ref. 4) comments on the mine at Bishopston (the All-Slade mine).
- [28] R. Burt, 'Lead production in England and Wales, 1700-1770', in *Econ. Hist. Rev.*, XXII (1969), 249-268.
- [29] A.Raistrick and B. Jennings, *A History of Lead Mining in the Pennines* (London, 1965), p.279.
- [30] W.J.Lewis, *op.cit.*, p.175.
- [31] There seems some contradiction in the data given by W.J.Lewis, *op.cit.*, pp.186 and 317, but I think my statement is substantially correct.
- [32] G.Hall, 'A note on the decline of mining in Cardiganshire', in *Ceredigion*, VII (1972), 85-8.
- [33] The Francis family was, for half-a-century or more, one of the best-known groups of mining engineers, not in the same class as John Taylor, but nevertheless prominently involved in metalliferous mining in Cornwall (which was their home), Cardiganshire, Flintshire, and many other areas including Glamorgan. An outline of the family connections and some of their activities in Cardiganshire is given by D.E.Bick, *The Old Metal Mines of Mid-Wales*, Part 1, (The Pound House, Newent, Glos., 1974). A very large collection of papers relating to the Francis family is housed at the National Library of Wales and known as the Druid Inn Manuscripts; they are not yet catalogued, but a guide to them has been prepared by Mary Tucker. Much of the information relating to Bishopston which I give here is based on these papers; the rest is based on reports in the *Mining J.*
- [34] A copy of the prospectus is in the Druid Inn MSS; the remainder of this paragraph is based on reports in *Mining J.*
- [35] Again a copy of the prospectus is in the Druid Inn MSS.

- [36] *Mining J.*, 1864, 147. It is believed that this was the same company, the Glamorgan Mining Co., as that announced in *Mining J.*, 1861, p.264.
- [37] Fifteen reports in *Mining J.*, 1877 and 1878.
- [38] R. Hunt, *Mineral Statistics* for 1877 and for 1878.
- [39] W.J.Lewis, *op.cit.*, p.254.
- [40] Unless otherwise indicated, the information in this section is based on 38 reports in *Mining J.*, 1852-54.
- [41] R.Hunt, *Mineral Statistics*, 1848-57.

**TABLE 1**

*Known Sites of Lead Mines in Glamorgan and Gwent*

Location		Place	O.S. Grid ref.	Remarks and references (Dates are known periods of working)
No.	Near			
1	Bishopston	Long Ash	SS 574 887	1852-53
2	do.	All-Slade	SS 584 876	2nd half 18th cent., 1810-13, 1849-53
3	Bridgend	Llangan	SS 956 772	13th cent., [1] 18th cent., 1855, 1863, 1876-8
4	do.	Tewgoed Penllyn Court	SS 965 768	18th cent., 1852-5
5	Cowbridge	St. Hilary	ST 010 735 to 012 733	18th cent., [2] At least 16 old workings in this area. [3] Said to be lead mines by North. [4]
6	do.	Llantridddy	ST 042 735	16th cent. [5] Probably old 18th cent. workings [6]
7	Llantrisant		ST 048 822	16th, 17th, 18th cents. [7] Numerous old pits and shafts; chimney still stands. 1727-60.

8	do.		ST 06 82	Old lead workings covering about 1 sq. km, eastings 058-067, northings 817-825.[8,9] 16th, 17th, 18th cents.[7]
9	Rudry	Cefn Onn	ST 182 858	Recorded by M.Davies[10]; probably 1850-55 working reported by J.Davies[11] Associated ore dressing at ST 180 844.[11]
10	do.		ST 192 862	"Old Lead Shaft" in 1901[12]; recorded by M.Davies[10]
11	do.		ST 204 868	Small pits, probably 18th cent. or earlier [13] N.B. Lead mined in Rudry in 13th cent.[14]
12	do.	Cwm Glesyn	ST 207 870 ST 208 870 ST 211 871	The Clive Mine of 19th cent. (1850-54) Associated ore dressing (1850-54) at ST 213 868[15]
13	Machen	Cefn Pwll-du	ST 214 875  ST 214 877  ST 218 877	Largely destroyed by road-making.[16] One shaft and workings explored by cavers in 1957 and 61.[17]. "Roman Mine" explored by J. and N.Tuck.[18]
14	do.	Rhydygwern	ST 215 883	Considered to be 19th cent. working by J. and N.Tuck.[18]
15	Risca		ST 231 894	"Old Lead Mine" c.1880.[19]
16	do.	Old Quarry	ST 233 898	Lead mine destroyed by blasting, 1958.[20]
17	Chepstow	Galley Hill	ST 530 936	1789.[21]

*References for Table 1*

Note: where no reference is given, the information comes from the text of this article.

[1] W.Rees, *Industry before the Industrial Revolution* (Cardiff, 1968), p.38.

[2] *ibid*, p.483.

- [3] M.Davies *et al.*, *S. Wales Caving Club Newsletter*, no.24, 1958.
- [4] F.J.North, *Mining for Metals in Wales* (Cardiff, 1962), p.84.
- [5] W.Rees, *op.cit.*, p.38. †
- [6] O.S.map, 1:25,000, current edn; shown as on lead vein on 6-inch Geol. Survey map, GLAM sheet 47NW, 2nd edn., 1901.
- [7] W. Rees, *op.cit.*, pp.142-3, 144, 483.
- [8] 6-inch Geol. Survey map, 1960 edn.
- [9] Personal communication from John Perkins of Univ. Coll. Cardiff.
- [10] M.Davies, *S. Wales Caving Club Newsletter*, no.49, 1965.
- [11] J.Davies, 'Industrial History of the Rhymney Valley', M.Sc. thesis, Univ. of Wales (Cardiff, 1926), p.120.
- [12] 6-inch O.S. map, GLAM sheet 37NE, 2nd edn., 1901.
- [13] J. and N.Tuck, 'Roman Mine', Bristol Exploration Club, Report no. 15, 1971, pp.8-9.
- [14] W.Rees, *op.cit.*, p.38.
- [15] 6-inch Geol. Survey map, GLAM sheet 37NE, 2nd. edn., 1901.
- [16] J. and N. Tuck, *op.cit.*, p.10.
- [17] D.W.Jenkins and A.M.Williams, *Caves in Wales and the Marches* (Dalesman, Clapham, Yorks., 1963), pp.62-3.
- [18] J. and N. Tuck, *op.cit.*, main topic of report.
- [19] 25-inch O.S. map, 1st edn., sheet MON 28.13, surveyed 1878-82.
- [20] M.Davies, as ref. 10.
- [21] Gwent County Record Office. E.& E. 0736.

**TABLE 2**

*Lead Mines in Glamorgan and Gwent with sites not yet located.*

No.	Place	Approx. location (grid reference)	Period of working and references
18	Newton	SS 84 80	1729-43[1,2]
19	Merthyr Mawr	SS 88 77	1530[3], 18th cent. [4,5]
20	Ogmore Down	SS 89 76	1729-43[6]
21	Dunraven	SS 89 73	1530[7]
22	Corntown	SS 92 77	1530[7] [7]
23	Brocastle	SS 93 77	1282[7]
24	Coychurch	SS 94 80	1697[8] and 18th cent.[9,10]
25	Golden Mile	SS 95 76	1727[11], 1729-43 [12]
26	Coed-Lai	ST 02 85	Early 19th cent. [13.,14]
27	Pentyrch	ST 10 82	1282[15]
28	Wenvoe (Goldslan)	ST 11 71	pre-1764[16]
29	Barry Island	ST 11 66	18th cent.[17,18]
30	Sully Island	ST 17 67	pre-1840[19]
31	Flatholm Island	ST 22 65	18th cent. [20]
32	Piercefield	ST 52 95	1697[21], 1784[22]

NB There was in 1853 a lead-mining company called South Wales Consols operating in the neighbourhood of Bridgend, with offices at Pyle,[23] but the location of its mines is not known. At about the same time, also, lead mining was reported to have started at Wenvoe and at Cottrell (approx. ST 08 75)[24] but nothing more is known of these ventures.

*References for Table 2*

- [1] W.J.Lewis, *Lead Mining in Wales* (Cardiff, 1967), p.163.
- [2] Samuel Lewis, *Topographical Dictionary of Wales*, Vol.1 (1848).
- [3] W.Rees, *Industry before the Industrial Revolution* (Cardiff, 1968), p.38.

- [4] W.J.Lewis, *op.cit.*, p.164.
- [5] S.Lewis, *op.cit.*, p.357.
- [6] As ref. 1.
- [7] As ref. 3.
- [8] W.Rees, *op.cit.*, p.448.
- [9] W.J.Lewis, *op.cit.*, p.164.
- [10] S.Lewis, *op.cit.*, pp.259 and 357.
- [11] W.Rees, *op.cit.*, p.483.
- [12] As ref. 1.
- [13] W.J.Lewis, *op.cit.*, p.254.
- [14] S.Lewis, *op.cit.*, p.357.
- [15] W.Rees, *op.cit.*, p.38.
- [16] *ibid*, p.483.
- [17] W.J.Lewis, *op.cit.*, p.164.
- [18] S.Lewis, *op.cit.*, pp.71 and 357.
- [19] *ibid*. p.357.
- [20] W.J.Lewis, *op.cit.*, p.164.
- [21] W.Rees, *op.cit.*, p.448.
- [22] I.Waters, *Piercefield* ((Chepstow, 1975), p.26.
- [23] *Mining J.*, 1853, pp.398 and 449.
- [24] W.L.Jenkins, *A History of the Town and Castle of Cardiff* (1854), p.61.

