A Fruitless Quest for Wealth: The Mining of Alum and Copperas in Dorset c 1568–1617

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Writing during the 1630s, Sir John Oglander of Nunwell on the Isle of Wight declared that it was impossible for a country gentleman to prosper by depending solely on agriculture.

> He must have some other vocation with his inheritance ... By only following the plough he may keep his word and be upright, but he will never increase his fortune.[1]

Many of the aristocracy and gentry took the same view. They faced not only price inflation during the reigns of Elizabeth and the early Stuarts, but also increasing social pressure forcing up the levels of expenditure expected of any level of landed society. As Sir Thomas Smith noted during the late sixteenth century, 'A Gentleman, if he will be so accounted, must go like a Gentleman'.[2] Such sentiments demanded an increasingly lavish and expensive lifestyle.

Tenurial restrictions, concern for tenants and manorial custom often meant that agricultural rents could not be increased easily or quickly. A possible solution for some landowners lay in the exploitation of whatever industrial or mineral possibilities were offered by their estates. Some enterprises were highly successful. Coal-mining in the north and the midlands, lead extraction in Derbyshire, the mining of tin in Cornwall, the iron industry in the Weald, all provide examples of the wealth which could be secured. But many gentlemen entrepreneurs were to find numerous pitfalls lay in wait for the unwary. As well as natural hazards, commercial uncertainties and transport difficulties, there were other potential barriers to success. These included costly legal disputes over rights, crippling initial expenses, royal monopolies granted to courtiers and interference from the Crown always keen to find new sources of revenue which were not subject to Parliament. An example of the problems which could be encountered is found in the attempts of successive owners of lands in east Dorset to exploit the alum and copperas deposits on their estates.

Alum was an important mordant in the dyeing of wool and cloth, and was also used by tanners, illuminators and painters. Copperas or sulphate of iron, sometimes known as green vitriol, was likewise used to fix colours in the dyeing process and in the production of ink. The demand for both substances grew during the sixteenth century as the production of coloured cloth increased. Until the middle of the fifteenth century most alum was imported from Genoa; thereafter the control of the trade passed to the Papacy which controlled the production at Tolfa in the Papal States. After the Reformation there was a religious as well as an economic incentive to find an alternative English source, and intensive searches were started to find home-produced supplies. An early attempt was made on the Isle of Wight, where Alum Bay serves as a reminder, but the main activity soon moved to the manor of Canford in east Dorset, which included large areas of heathland surrounding Poole and extended as far as the coast.[3]

In 1558 James Blount, 6th Lord Mountjoy, then 24 years of age, inherited two-thirds of the manor of Canford; at the same time he also acquired the manor of Puddletown. Because of his pressing debts, incurred because of his conspicuously lavish lifestyle, costly military service to the Crown and protracted law suits over other parts of his inheritance, he was obliged to mortgage most of his property. But he reserved to himself the right to search for alum and copperas at Canford. He was persuaded that the exploitation of these hidden riches would provide the answer to all his financial difficulties. Mountjoy began operations in 1562, and in 1566 he addressed a long treatise to the Queen stating that he confidently expected to repay all his debts by the production of alum and copperas on his estate at Canford. He would be able 'to supply the whole realm with copperas at four-fifths less than the present price, to the benefit of the realm and the annoyance of the Pope'. In response the Queen granted him a 25-year monopoly in the production of alum. The grant stated that this 'verie necessarye commoditie for the use of Drapery' would replace imports, and added that a great quantity of ore had been found on Mountjoy's estate and that 'he hath growen to such knowledge and perfection of the said Workes as heretofore hath not been atteyned unto by any within Her Majesty's Realme.'[4]

The production of alum and copperas was laborious and time-consuming. The alum-bearing shale had to be dug up from the ground, and then piled in heaps for some months to weather. The liquor which drained from the ore was collected and then boiled in lead pans filled with old iron and urine which supplied the necessary alkali. The solution was then left to cool so that the alum or copperas could crystallise.[5]

Mountjoy's operations were concentrated on the heathland east of Poole, an area which is now densely covered by houses. The search for suitable shale was also extended to Brownsea Island. Mountjoy took up residence at Canford to supervise the work, and had high hopes that the project would speedily make his fortune, although he confessed that close management of mines was an unsuitable occupation for an aristocrat.[6] Experienced workmen were brought from Italy, and large sums of money were spent on equipment and mining. The main centre of mining named in the contemporary documents was Okeman's House, while other mines were said to be located at Alum Chine, Darling's Chine, Haven's House, Branksea (Branksome) and on Brownsea Island. The survival of the name Alum Chine at Canford Cliffs is a reminder of the hopes that were once entertained. In 1566 Mountjoy could write enthusiastically of the copperas being 'wrought with weekley gaine over and besides all expenses', and of his confidence concerning the production of alum. A map of Purbeck drawn by Ralph Treswell in 1585 shows the area of heathland, east of Poole which is labelled 'The Mynes'.[7]

Sadly, although considerable quantities of copperas were produced, only small amounts of the more profitable alum were found. The income received from the sales of copperas was never enough to cover the expenses of mining and production, and Mountjoy's debts mounted steadily. In 1568 he mortgaged his share of Canford to his wife's uncle, John Browne, and to safeguard the interests of his wife and two sons, he delivered his lands into a trust for their benefit. Soon afterwards he was obliged to abandon the attempt to work the mines himself, and to lease them to his wife's kinsman, George Carlton and to John Hastings, a relative of the Earl of Huntingdon. The two men also acquired from Mountjoy a mortgage of his manor of Puddletown.[8] One of Mountjoy's servants later wrote that 'the great and very large expenses that he [Mountjoy] was at in tryinge and bringinge to perfection the makinge of allome and coperas was a greate parte of his overthrowe.'[9]

In 1570 the manor of Puddletown and the two-third share of Canford were bought by Henry Hastings, 3rd Earl of Huntingdon. The Earl possessed widespread estates, chiefly in Leicestershire, but including manors scattered through the midlands and the west country. His principal residence was his castle at Ashby-de-la-Zouch in Leicestershire. He played a prominent part in public affairs, and in 1572 Queen Elizabeth appointed him Lord President of the Council of the North, a powerful position in which he acted as the Queen's representative throughout the north of England.[10] Consequently, he had little time or opportunity for close personal supervision of his estates, but like Mountjoy, he cherished high hopes of the fortune to be made from the production of alum and copperas at Canford. Unfortunately for Huntingdon, although he possessed most of the manor, the mines themselves and the right to work them were still claimed by Mountjoy. There followed a long period of complex and expensive legal wrangling. Elizabethan law suits were notoriously slow and costly, and the complicated dispute over the mining rights at Canford was no exception. The arguments, claims and counter-claims continued throughout the 1570s and the matter was not finally concluded until 1586, producing during those years an overwhelming quantity of legal documents.[11] Many of these legal records describe the mines and the production process.

Since the Earl of Huntingdon was occupied with the Queen's affairs in the north, the supervision of the long legal battle was entrusted to his younger brother, Sir Francis Hastings, who took up residence at North Cadbury, Somerset, where he rebuilt the manor house by the church.[12] James, Lord Mountjoy died in 1581, still heavily in debt, but the legal conflict continued under his son, William, Lord Mountjoy. One of the legal documents made in 1583 includes an inventory of materials at Canford which gives an indication of the character of the operation there. It is noteworthy that although quantities of copperas are included there is no mention of any alum. The equipment and materials listed were as follows:

25	hogsheads of copperas redy made and filled in caskes
30	hogsheads more of copperas by estimation, not casked
7	furnices of leade
14	vessells of lead coolers set in the grounde for the congelinge of coperis
1	furnis of leade to boyle allam in
10	whele barrowes
1	rowles to carry lycour in
11	gonne mowthes of olde iron
1	little ricke of turffes for Fuel
50	pittes of oare full without doores.
3	shoots of tymber for lycore

Lycore left in the howse, boyled and congelinge . . . to the quantite of 14 hogsheads. Oare reddy digged and caste upp in great heapes above a hundred in number, some bigger than some to lye a – seasoninge before they come to the workinge.[13]

The dispute not only involved court proceedings, but was also accompanied by violence and intimidation at the alum mines and works. In June 1582, for example, the Earl of Huntingdon's men forcibly seized the works at Canford. Some of Mountjoy's servants were arrested, and there was considerable violence from both sides. Eventually the matter came before the Privy Council, and a temporary truce was agreed.[14] Finally, in 1586 a conclusion was reached, and there was an end to the interminable legal arguments. The Earl of Huntingdon was declared to be the rightful owner of Canford and the mining rights, but was required to pay William, Lord Mountjoy the sum of £6,000 as recompense for his claims. On 19 August 1587 Huntingdon wrote to Lord Burghley complaining of his poverty and the debts he had acquired in the Queen's service in the north. He also referred to 'my causeless contention with Lord Mountjoy' and stated 'The suit with Lord Mountjoy hath cost me, I might rightly term it, a *nemo scit*.' Huntingdon later estimated that his legal costs had amounted to £10,000 and that other expenses at Canford had cost him a similar amount. The monopoly for the production of alum and copperas which had been granted to Lord Mountjoy in 1566 expired in 1591, and in his successful petition to the Queen for a further grant of the monopoly, Huntingdon repeated the claim that he had spent £20,000 on Canford and its mines.[15]

During the long years of legal conflict, mining work at Canford did not cease, and the mines were leased to various operators. Although only small quantities of alum were produced, and alum production never came near to realizing the dream of replacing foreign imports, nonetheless the mines did yield considerable amounts of copperas. An indication of this is the price charged for leases. The lease of a mine granted by Lord Mountjoy in 1579 for £100, was renewed four years later in 1583 for £1,300. In 1585–6 the Earl of Huntingdon claimed to be making a clear profit of £400 per annum from one mine. A cargo of 100 tons of copperas despatched to London in 1584 was sold for £1,200, and in 1587 Philip Smith took a twenty-year mining lease at Canford for £1,300 per annum. It is significant that the Earl of Huntingdon, although he was in severe financial difficulties, with many of his manors mortgaged, did not dispose of his Canford property. Like Mountjoy, he never ceased to believe in the wealth to be derived from Canford, in spite of all set-backs and tribulations.[16] Both men felt that all that was needed was the good fortune to find larger deposits of the alum-bearing shale. Sustained by this belief, they both spent much more than they could afford on securing and working the mines. They also leased the right to search for and exploit the potential wealth to other adventurers. Some of these also incurred large debts and financial disasters through their involvement. The most pathetic example is that of Clement Draper, an ironmonger of London. In 1579–80 Draper entered into partnership with Richard Leycott and John Mansfield, to lease one of the Canford mines from the Earl of Huntingdon. The search for shale and the mining operations swallowed nearly £18,000, much of which was borrowed upon the bond of Clement Draper. He appears to have been the only member of the partnership with any financial assets. When in 1581 Draper was unable to pay the interest on one of these bonds he was arrested for debt and sent to Southwark prison. There he remained, in spite of frequent appeals, for the next twelve years. Philip Smith, who had leased the mining rights in 1587 was likewise declared bankrupt and imprisoned for debt early in the seventeenth century.[17]

Others also lost large sums of money from an over-optimistic assessment of the wealth which could be made at Canford. The Elizabethan lawyer and Secretary of State, Sir Thomas Smith, one-time Regius Professor of Civil Law at Cambridge, Provost of Eton, for several years ambassador to France, and the author of the important constitutional work *De Republica Anglorum*, was persuaded by a young adventurer, William Medley, that copper could be produced from iron by the use of copperas. Smith was apparently completely convinced of the truth of Medley's fantasy. In 1571, tempted by the prospect of a lucrative source of cheap copper, Smith persuaded William Cecil, Lord Burghley, together with the Earl of Leicester, Sir Humphrey Gilbert and others to join him in financing Medley and leasing a mine at Canford for £300 per annum to supply the copperas. This consortium of apparently hard-headed men was named the 'Society of the New Art', and in 1574 secured a charter from the Queen endorsing their work and granting them a monopoly on the process. More and more money was required by Medley, who was repeatedly able to convince the investors that the desired result was almost within reach. In 1576, after large sums had been given to him, the shareholders realised that Medley was a rogue. The project was abandoned, and Medley was imprisoned in London where he died soon afterwards. The gullible investors had lost large sums of money on this impossible venture. Sir Humphrey Gilbert was almost ruined through his involvement, and Sir Thomas Smith, who was the main instigator, also lost heavily. His biographer, John Strype, quotes Smith's remark concerning 'alchymists': 'Fain they would be fingering of money, but when it is once in their hands, we must seek it in the ashes.'[18]

Henry Hastings, 3rd Earl of Huntingdon, died in 1595. In spite of his vast estates, his long years of public service, life-style and expenses meant that he was in severe financial difficulty, and his estates were loaded with mortgages, bonds and debts. In spite of this, however, he never abandoned the belief that Canford mines had the potential to bring him great wealth. In reality, he had spent far more than he had obtained from the rents, or from the copperas and small amounts of alum that had been produced.[19]

By the end of Queen Elizabeth's reign in 1603, the mines at Canford had fallen into decay, and hopes of obtaining an English source of alum were concentrated upon Guisborough in Yorkshire, where alum-bearing shale had been discovered.[20] During the early seventeenth century there was a short-lived attempt to develop alum production on the Dorset coast at Kimmeridge. This was undertaken by the energetic landowner, Sir William Clavell (1568–1644). Sir William's father, John Clavell, had been involved with Lord Mountjoy many years earlier. Sir William attempted to exploit the alum and copperas from his own estate, using the local oil-bearing shale as fuel. His operation soon ran into trouble with a powerful group of courtiers who had received a monopoly from James I to exploit the production of alum for the benefit of the Crown. After Clavell had spent, according to his own estimate, more than £2,000 on the work, the courtiers, Sir Walter Cope, Sir Anthony Ingram and Robert Johnson, 'laboured to drawe this worke into his Majesties hands'. In 1613 therefore, Clavell entered into an agreement by which he surrendered the works at Kimmeridge in return for £5,000 with which he was to build four alum houses with all the necessary equipment to produce 500 tons of alum per annum. Clavell was to receive half the profits.[21]

By 1617 Clavell had received £3,650 out of the £5,000, and according to the royal agents 'disbursed a greater some of his owne more than he hath received of his Majesty'. As well as the alum houses, Clavell had built a stone pier for the dispatch of the alum, and a tramway for transporting shale from the cliff-top. He boasted that 'never so much worke was done within so short a tyme, performed for so little money, and so exactly and substantially finished'.[22]

Some alum was produced, and the surviving records contain a receipt for the dispatch of 22 tons from Poole to St Malo on *The Marye of Poole*. But the amounts were never sufficient to compensate for the cost of the operation, and by December 1617 the Crown agents advised that work should stop and that payments should cease. They stated 'His Majestie hath not received nor is lyke to receive any benefitt by the said workes'. An inventory of equipment made before everything was dismantled and taken away includes the following:

Two alum houses, cisterns and coolers
Two roaching houses, 5 store houses and a smith's forge
10 pans of lead each standing on a bed of iron bars
32 coolers of timber
2 settling pans of lead
5 tunne of casks for uryn (urine)
A chest to keep alum
A great uryne cisterne with a pump to it [23]

Sir William Clavell evidently lost heavily by the collapse of this project. Undeterred by this disaster, Sir William Clavell turned to glass-making, again using the natural resources of his estate. When Thomas Gerard visited Kimmeridge in *circa* 1622 whilst compiling his *Survey of Dorset* he was able to give an exciting description of the scenes at the glass-works, filled with the dense black smoke produced by the oil-bearing shale. Sadly, this project also fell foul of a royal monopoly and was closed down in 1623–4.[24] Some copperas continued to be produced along the coast, however, and at the end of the seventeenth century Celia Fiennes described the copperas works on Brownsea Island, with details of the methods which were used.[25]

The ultimate failure of the search for alum and copperas in Dorset, after the expenditure of so much wealth, provides a stark example of the hazards associated with mines, industrial enterprises and commercial ventures. Both Mountjoy and Huntingdon were financially ruined, and Sir William Clavell's projects ended in failure and the loss of most of his lands. For most landowners, the slower path of improved estate management, the substitution of leases for copyhold, better farming methods and a careful balance between income and expenditure provided a more secure though less spectacular route to financial security.

Notes

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2. T. Smith, *De Republica Anglorum* (1636 edition), p. 57; F. Heal and C. Holmes, *The Gentry in England and Wales 1500–1700* (1994), pp. 99–123; C. Clay, *Economic Expansion and Social Change 1500–1700*, 2 vols. (1984), I, p.147; L. Stone, *The Crisis of the Aristocracy 1558–1641* (1979 edition), pp. 338–52.
3. R. B. Turton, *The Alum Farm* (Whitby, 1938); J.H. Bettey, 'The production of alum and copperas in southern England', *Textile History*, 13, 1 (1982), pp. 91–8.
4. *Calendar of State Papers (Domestic) 1547–80*, p. 534; *1566–69*, p. 24; *Calendar of Patent Rolls*, *1563–66*, No. 486, 3 July 1564; *Statutes of the Realm*, IV, p. 522; P[ublic]R[ecord] O[ffice], C2/Eliz. D3/58.

5. C. Singer, *The Earliest Chemical Industry* (1948).
6. Stone, *op.cit.*, p. 336.
7. *Calendar of State Papers (Domestic)* 1547–80, p. 272. D[orset] RO., D/BKL. J. Hutchins, *History of Dorset* (3rd edition, 1866–70), vol. I, pp. 451, 462.
8. Turton, *op.cit.*, pp. 38–41.
9. PRO., SP15/13/49(1); SP12/148/48; SP12/150/78; SP12/154/4; SP12/155/22, 26, 81; C24/1440. Stone, *op.cit.*, pp. 353–4.
10. C. Cross, *The Puritan Earl* (1966).
11. *Ibid.*, pp. 87–96. PRO., C54/820. *Acts of the Privy Council*, pp. xiii, 259, 339–41, 424–5.
12. C. Cross (ed.), 'The letters of Sir Francis Hastings 1574–1609', *Somerset Record Society*, LXIX (1969), pp. xxi–xxii, 24, 36. C. Cross, 'Supervising the finances of the Third Earl of Huntingdon 1580–95', *Bulletin of the Institute of Historical Research*, XL (1967), pp. 34–49.
13. PRO. SP12/163/56.
14. PRO. SP12/163/56; SP12/189/1. The old iron was added to the liquor when it was boiled.
15. PRO. SP12/177/42; E112/12/121. *CSPD*, 1591–4, pp 338–9; *Acts of the Privy Council*, pp. xiv, 134. *Historical Manuscripts Commission*, Cecil MSS, III, 1589, pp. 274–5.
16. PRO. SP12/244/109.
17. PRO. C2/Eliz. D3/58; C2/Eliz. D10/30; SP12/243/9; C3/224/12; C3/266/56; C3/306/89.
18. M. Dewar, *Sir Thomas Smith* (1964), pp. 149–55. PRO. C54/820; SP12/188/23. John Strype, *The Life of Sir Thomas Smith* (1820), pp. 100–5.
19. Cross, *op.cit.*, pp. 94–5.
20. W.H. Price, *The English Patents of Monopoly* (1913), p. 83. PRO. E134/22 Jas. I H28; E134/22 Jas. I H29.
21. A. F. Upton, *Sir Arthur Ingram* (1961), pp. 107–10.
22. *Somerset & Dorset Notes & Queries*, XXIX, (September 1969), pp. 81–5. Leeds City Library Archives, Temple Newsam Papers, TN/PO4/IV; TN/PO8VII/8; TN/PO8/VIII. DRO. Photocopies, 372/1–3.
23. Leeds City Library Archives, TN/PO8/VII/4; TN/PO8VIII/8; TN/PO8/VII/8.
24. Thomas Gerard, *Survey of Dorset* (c1630. Published, 1732), pp. 46–7. *Acts of the Privy Council*, 1623–25, 13 and 27 June, and 22 August 1623.
25. Christopher Morris (ed.), *The Journeys of Celia Fiennes* (1947), p. 10.