

ART. XI.—*The Hodbarrow iron mines.* By ALAN HARRIS, M.A., Ph.D., and RONALD B. DAVIS, C.Eng., A.M.I.M.M.

*Read at Grange-over-Sands, September 1st, 1967.*

ALTHOUGH iron mining in Cumberland has a long history, the middle of the 19th century may be regarded as the beginning of the greatest age of all, for the industry then experienced a series of changes which eventually altered profoundly both the landscape and economy of several parts of the county. The Hodbarrow iron mines in south Cumberland illustrate these changes exceptionally well. Moorbank shaft, the only part of the mine that is still in production, lies on the edge of a great expanse of semi-derelict, broken ground out of which rise crumbling engine-houses, shattered chimneys and the untidy remains of more than a century of mining activity (Fig. 1, Plate I). This impressive visible record of intensive exploitation is matched by a rich collection of minute books, geological data, plans and miscellaneous papers, which are housed in the General Office of the mine at Steel Green. Although there are gaps in the documentary material, particularly before 1860, the changing fortunes of the Hodbarrow venture can be followed in some detail from its inception more than a century ago down to the present time.

Early discoveries of iron ore in Millom failed to reveal the great deposits of haematite which were later won from the Carboniferous Limestone rocks at Hodbarrow. Although outcropping veins of ore were worked by both shaft and level on the Lonsdale royalty near Hodbarrow Point during the first half of the nineteenth century, none of the finds was extensive,

and mining activity was seldom sustained for very long.<sup>1</sup>

In 1855, however, the Earl of Lonsdale, who had previously tried to exploit the Hodbarrow ores on his own behalf with little success, granted a licence to search for minerals on Hodbarrow Farm.<sup>2</sup> The individual most directly concerned with this new attempt was John Barratt, a Cornishman whose father had been for many years resident manager of Wheal Friendship copper mine, near Tavistock.<sup>3</sup> Barratt had come to Hodbarrow by way of Grassington, where he had acted as the Duke of Devonshire's agent at the local lead mines, and Coniston, where he was engaged in mining copper at the time of the Hodbarrow project.<sup>4</sup> In 1855 Barratt was in his sixties, and had behind him a lifetime's experience of mines and mining.

With the help of his nephew William and other members of the Barratt family, John proceeded to explore the limestones in the vicinity of Towsey Hole, close to Hodbarrow Point. Preparations for sinking a shaft were put in hand early in 1855, and by the following spring work was sufficiently far advanced to allow negotiations to be opened in Whitehaven for the purchase of a steam winding or pumping engine.<sup>5</sup> Accounts written later in the century indicate that ore was discovered in 1856, and the detailed record of events contained in the Hodbarrow Cost Book confirms that ore was in fact being raised at this time. But to judge from the erratic nature of the yields the

<sup>1</sup> *Trans. Inst. Mining Engineers* xvii, 1898-1899 (1900), 313; H. A. Fletcher, *The Archaeology of the West Cumberland Iron Trade*, CWI v 21.

<sup>2</sup> Hodbarrow records (hereafter referred to as H.R.), letter, Messrs. Arnold & Greenwood to Vaughan, 23 October 1882.

<sup>3</sup> *Mining Journal*, 21 April 1866.

<sup>4</sup> British Parliamentary Papers (1864 XXIV, evidence of John Barratt); W. G. Collingwood, *The Book of Coniston*, 3rd ed. 1906), 60; letters and newspaper cuttings relating to the Barratt family, in the possession of Mr J. W. B. Hext, Coniston; A. Raistrick, "The Mechanisation of the Grassington Moor Mines, Yorkshire", *Trans. Newcomen Soc.*, xxix (1953-55) 184.

<sup>5</sup> H.R., *Cost Book* (1855-1864).



*Photo F. Strike*

PLATE I.—Moorbank Mine. Haverigg.  
This is now the only working shaft at Hodbarrow.

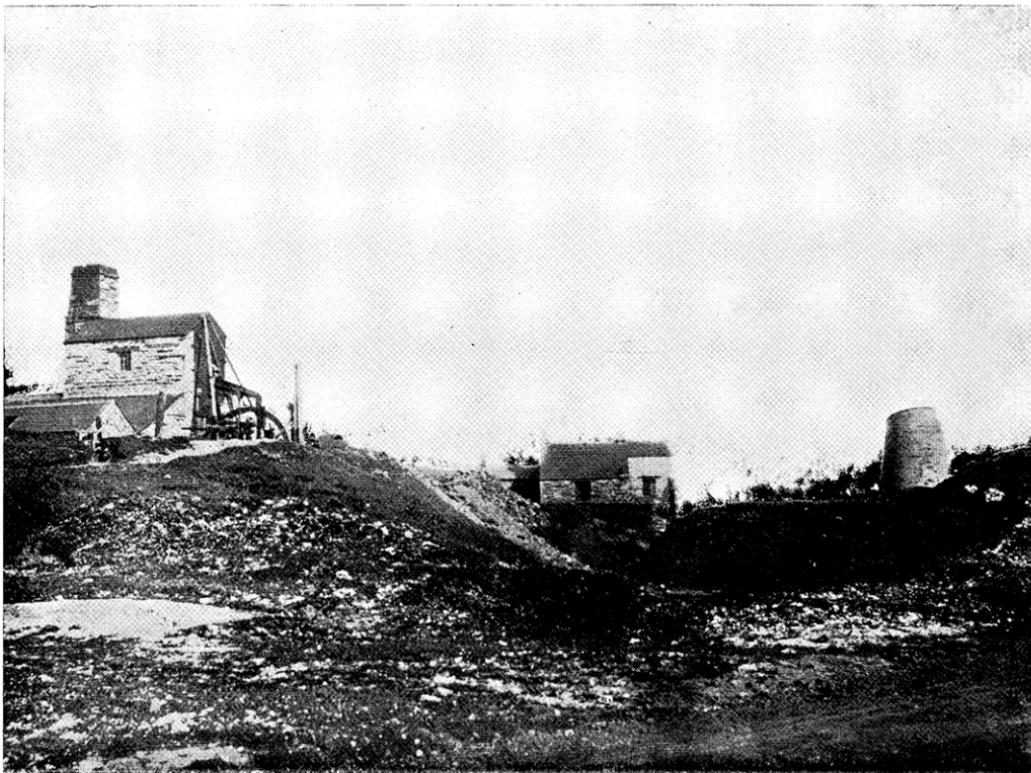


PLATE II.—An old photograph showing the early workings near Hodbarrow Point.  
The original is in the Hodbarrow offices.  
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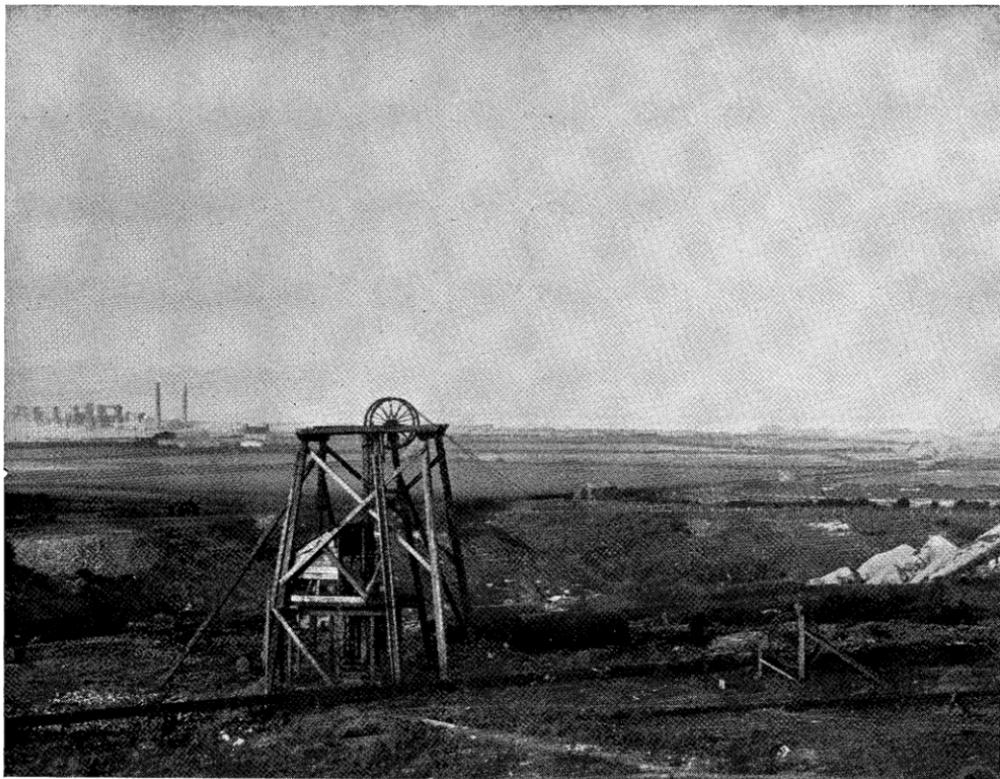


PLATE III.—A late 19th-century view of part of the old mine.  
Borwick Rails and Millom Ironworks appear in the background.

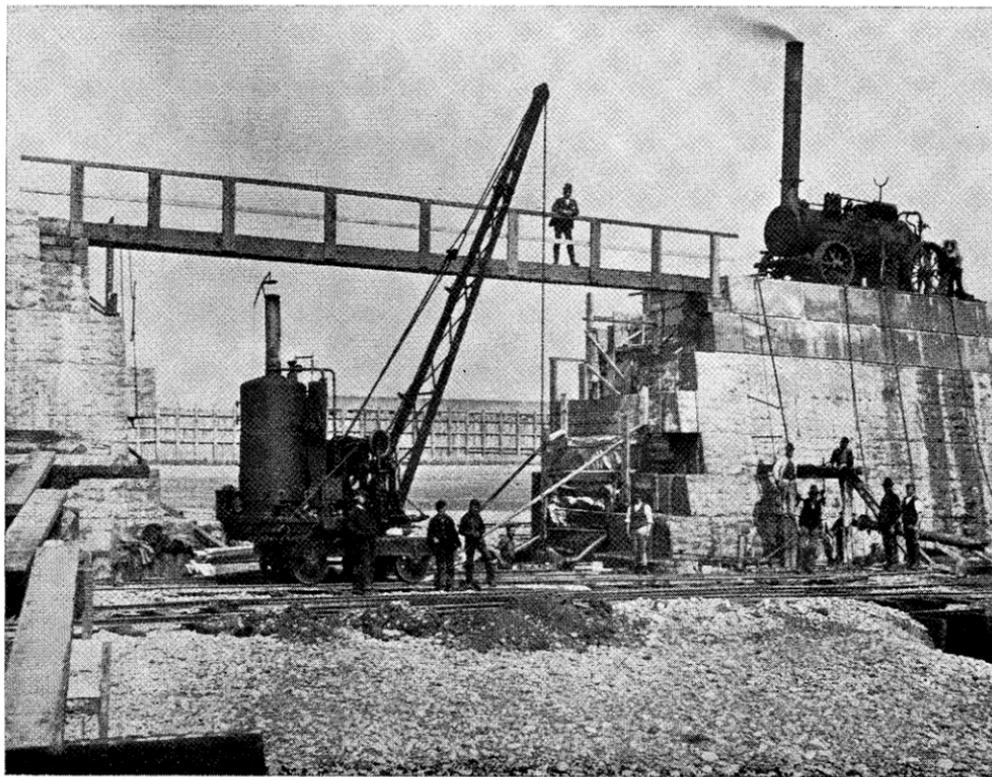


PLATE IV.—Building the inner barrier, *c.* 1890.  
An earlier timber barrier can be seen in the background. The original photograph is at Hodbarrow.

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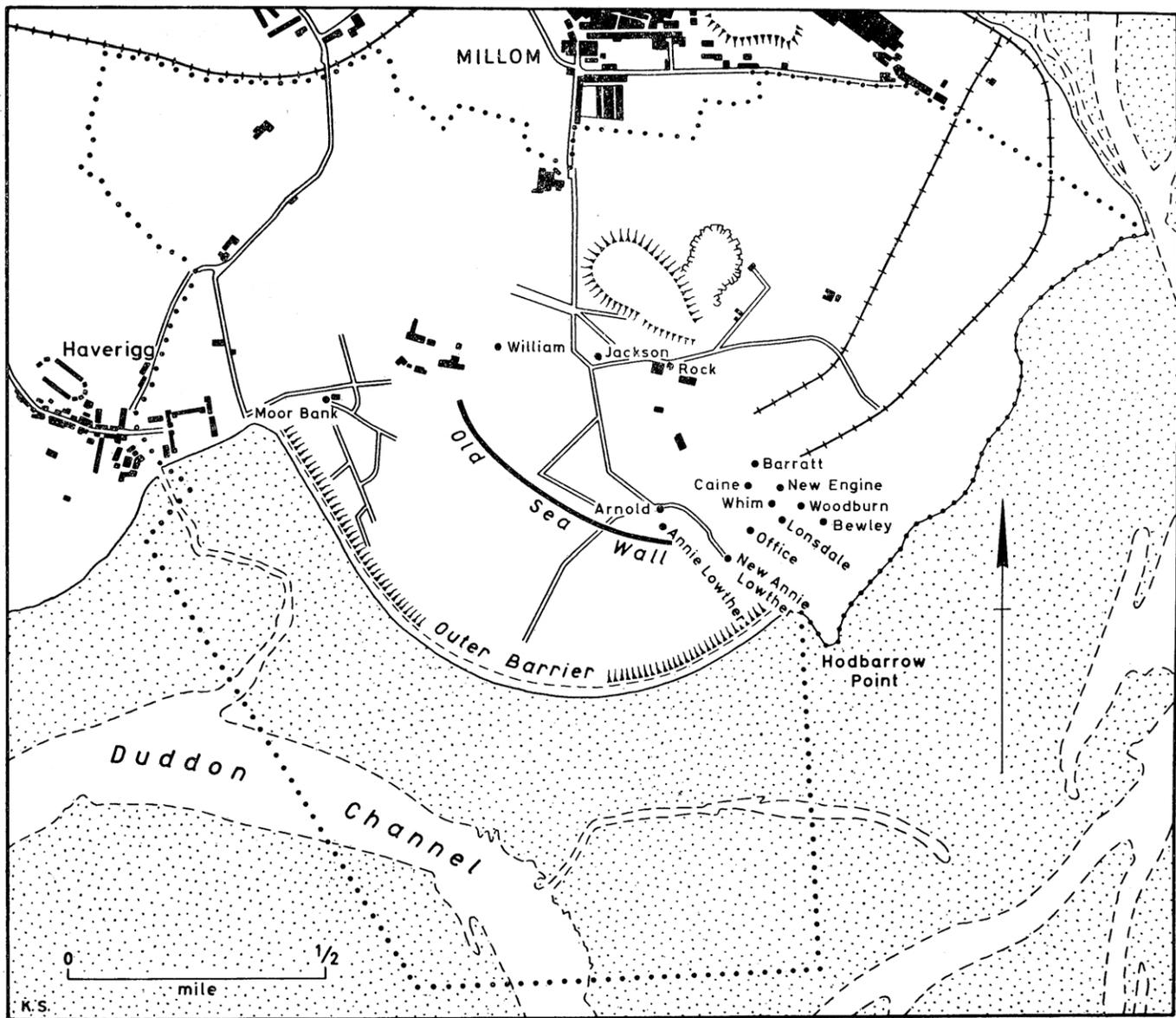


FIG. 1.—General map of Millom and Hodbarrow showing pits and (dotted) the area of the Hodbarrow Lease. The map is based on a plan in the Hodbarrow records.

find was not very substantial, though it undoubtedly prompted further exploration (Plate II).

If the results of the search were not immediately spectacular, these were nevertheless years of busy activity at the mine. Timber, coal, gunpowder, building materials and other supplies were assembled in a place which to the *Barrow Times* appeared "almost as isolated from the rest of the outer world (*sic*) as . . . the Shetland or Orkney Isles".<sup>6</sup> The southern part of Millom parish in 1855 was indeed largely rural and agricultural: the town of Millom had yet to be created, and for anything more than purely local services it was necessary to travel to Ulverston or Bootle. But the newly-opened lines of the Furness and the Whitehaven and Furness Junction railways were available to Barratt and his colleagues, as were the services of the small vessels which used the harbour of Borwick Rails and the beaching-places between Hodbarrow Point and Haverigg.<sup>7</sup>

Some of the supplies for the mine were purchased from William Gradwell, a prominent Barrow builder and timber merchant. Others came from such sources as the Elterwater Gunpowder Company, the Burlington slate quarries and the mines at Coniston.<sup>8</sup> Wages were drawn from the Ulverston branch of the Lancaster Banking Company.<sup>9</sup> Not all the company's needs could be met from local sources, however, and as early as 1856 payments for unspecified services were made to the Strontian Mining Company, in Argyll.<sup>10</sup>

Not the least important task at this time was to find shaft-sinkers, drillers, and other underground workers.

<sup>6</sup> 1 September 1866. The article contains an interesting account of Millom at a period of rapid physical and economic change.

<sup>7</sup> Papers amongst the Lonsdale archives in the Record Office, Carlisle, contain information about the coasting trade. Particularly useful are the "Minutes of Evidence as to Acts of Ownership in the Duddon Estuary" (1864).

<sup>8</sup> These details are recorded in the *Cost Book* for 1855-1864.

<sup>9</sup> H.R., *Ledger 'A'*, Hodbarrow Mining Co. (1856).

<sup>10</sup> *Cost Book* (1855-1864).

The local iron miners were said in 1864 to be "agricultural labourers, seamen, and shoemakers, and men of all kinds", rather than "thorough-bred miners, or men who have been brought up to it as a trade".<sup>11</sup> However true this may have been in the 'sixties, the situation a decade or so earlier was different. Many, if not all, the miners then employed by the company were skilled in the techniques of metalliferous mining, having already worked in the mines of such areas as Cornwall, West Devon, Flintshire, Furness and the Lake District.<sup>12</sup> Like James Floyd and his partners, who were allowed travelling expenses from Cornwall in November 1856, some of the newcomers make a brief appearance in the records, only to disappear after a year or two. Others, like Solomon Russell, a Cornishman from St Hilary, eventually became permanent residents in Millom.<sup>13</sup> The volume of specialized migration into the district at this time could never have amounted to more than a trickle, however, for before 1860 the total labour force at Hodbarrow seldom exceeded a dozen men at any one time.<sup>14</sup>

Though most of the exploratory work was carried out under the supervision of John and William Barratt, the mine was owned by a partnership which represented, broadly speaking, the Barratt family on the one hand and a number of commercial and financial interests on the other. The principal shareholder was John Barratt himself, who owned 52 of the company's 100 shares.<sup>15</sup> Two other members of the same family,

<sup>11</sup> *British Parliamentary Papers* (1864), XXIV, evidence of William Mitchell, of Coniston.

<sup>12</sup> These details are taken from the *Cost Book* and the unpublished Census Enumeration Schedules of Millom (1861). The census schedules are in the Public Record Office, London (R.G. 9/3955).

<sup>13</sup> Russell's name appears in the first Hodbarrow *Cost Book*, in the 1861 Census schedules and thereafter, for more than 30 years, in the lists of employees at the mine.

<sup>14</sup> The size of the labour force may be deduced from the information given in the earliest *Cost Book*, which records payments made for work performed at the mines.

<sup>15</sup> H.R., *Hodbarrow Mines, Private Ledger*.

William and James Barratt, together held nine shares. Twenty-seven shares were in the hands of Nathaniel Caine, a Liverpool iron merchant with wide business interests in the north of England, and his brother William Sproston Caine. Thomas Woodburne, an Ulverston solicitor, owned ten shares and two were in the possession of R. T. Bywater, a surgeon, of Coniston. John Bewley, a Liverpool accountant, whose firm subsequently audited the company's books, had been admitted to the partnership by 1860, apparently through the acquisition of two Barratt shares. Apart from W. S. Caine, who lived in the south of England, all the partners were active participants in the venture and, particularly after 1860, were frequently at the mines. After John Barratt's death in 1866 his shares were divided amongst various members of the Barratt family, but otherwise the partnership survived with little change for many years.

There were times between 1856 and 1860 when the ultimate success of the mine must have been in doubt. During this period the partners were faced with calls on shares amounting to £4,000 and with a total capital outlay of about £10,000, none of which yielded any immediate profit.<sup>16</sup> A growing sense of frustration is apparent in Nathaniel Caine's complaint to William Barratt in October 1860 that, after several years of hard work, the company had only "an engine house and boiler and a few bore holes to show for it all".<sup>17</sup> In the following month, however, Barratt was able to inform Caine that the trial bores included "one 50 ft. deep in Ore and others 30 ft., 20 ft., 12 ft., 10 ft., and etc. etc. and none of them through the Ore . . . there cannot be any doubt but that a large deposit of Ore has been met with".<sup>18</sup> Caine was also told that "our

<sup>16</sup> H.R., *Hodbarrow Mines, Private Ledger*; John Newton. *W. S. Caine, M.P. : A Biography* (1907, 3). The subject of Newton's book was Nathaniel Caine's son, who was for a time on the board of directors at Hodbarrow.

<sup>17</sup> H.R., letter, Caine to Barratt, 25 October 1860.

<sup>18</sup> H.R., letter, Barratt to Caine, 3 November 1860.

chances of making discoveries in other parts of the grant are very great. The Great Vein (the one for which the Engine was erected) and all those other veins seen on the shore are converging and running into the flat south and west of the Red Hill quarry", where further ore was thought to exist. Encouraged by these discoveries, Nathaniel Caine and John Barratt in 1861 secured a lease of the mine from the Earl of Lonsdale, for a period of 21 years from April 1860.<sup>19</sup> The great days of Hodbarrow had begun.

The quickening pace of activity after 1860 is reflected in many of the entries in the Cost Book. During 1855 and 1856 the partners had spent about £1,600 on the mine, but the figure for the month of August 1862 alone was almost £1,000. The labour force, which at times had been allowed to fall to about half a dozen men, increased steadily after 1860 and in March 1862 nearly 30 men were employed in driving underground levels and sinking a new shaft. A small but growing number of ore pickers, carters, enginemen, carpenters and smiths was also at work. With seaborne trade in mind, the partners built a shipping pier at Crab Marsh Point, within the harbour of Borwick Rails, and connected it by tramway with the mines.<sup>20</sup> Steps were also taken to ensure that there were adequate facilities for handling ore at Holborn Hill (Millom) railway station.<sup>21</sup>

The newness of the mine at first proved a handicap, since the quality of its product was still largely unknown in the iron-making districts: shipowners were also reluctant to commit their vessels to a new and uncertain traffic in Hodbarrow ore.<sup>22</sup> Once agents had

<sup>19</sup> H.R., lease, Rt. Hon. William, Earl of Lonsdale to John Barratt and Nathaniel Caine, 12 February 1861. Lord Lonsdale was to receive a dead rent of £50 per annum and a royalty of 1s. per ton on ore raised.

<sup>20</sup> H.R., *Letter Book*, no. 1, 19, 22 May 1862.

<sup>21</sup> British Transport Historical Records, London. *Directors' Minutes, Whitehaven and Furness Junction Railway* (W.F.J. 1/3), 3 November 1863, 21 March 1864.

<sup>22</sup> H.R., *Letter Book*, no. 1, 24 June 1862.

been appointed in the principal iron-using districts, however, a pattern of business connections began to emerge. Most of the firm's trade was done with the Black Country, South Wales, and the coalfields of North Wales and Shropshire. Customers were also found in south Lancashire, central Scotland and in Cumberland, where the rapidly growing iron industry consumed an increasing quantity of ore.<sup>23</sup> After 1867, when the Millom works of the Cumberland Iron Mining and Smelting Company became a customer, Hodbarrow ore was also marketed within sight of the pits. This local connection was of mutual benefit, since by purchasing Hodbarrow ore the Millom company effected a considerable saving in transport costs, and the mining company in return received the benefit of regular and frequent orders.<sup>24</sup>

Iron ore was marketed by both rail and sea. Considerable amounts travelled over the Furness and west Cumberland routes to ironworks at Askam, Carnforth and Workington. An even larger quantity moved by sea from Crab Marsh Point to South Wales and the west of Scotland and to depôts along the estuaries of the Dee and Mersey. From here the ore was distributed by rail and canal to customers in the Midlands.<sup>25</sup> Bad weather and lack of vessels disrupted this traffic from time to time, and ore would then accumulate at the mine and customers grow impatient. Faced with these difficulties, the company soon adopted the practice of making more use of the railways in winter than in summer.<sup>26</sup> And after first separating their shipping department from other interests, the partners in 1871 agreed to establish a

<sup>23</sup> H.R., *Directors' Minute Book*, no. 1, *passim*.

<sup>24</sup> H.R., *Directors' Minute Book*, no. 1, 7 August 1865; letter, W. S. Caine to C. Vaughan, 23 July 1883.

<sup>25</sup> H.R., *Directors' Minute Book*, no. 1, *passim*; *Order Book A* (orders for iron ore, 1862).

<sup>26</sup> H.R., *Shipping Book (1868-1873)*, 93. In 1869, for example, when 131,449 tons of ore moved by sea and 67,256 by rail, seaborne cargoes were greatest in summer when rail deliveries were small.

shipping company to acquire and manage vessels for the ore traffic.<sup>27</sup> Vessels like the *Happy Harry* and the *Nellie Bywater*, a schooner of 200 tons, were soon busily engaged in carrying ore, coal and timber between the Duddon and ports in Lancashire, Northern Ireland, Wales and Scotland.<sup>28</sup>

Long before this time the increasing size and complexity of the company's business had led to administrative changes at the mines. In 1863 the partners appointed three of their number as directors, with power to "order all payments, control all appointments, and take the general supervision of all affairs of the Company".<sup>29</sup> John Barratt, Nathaniel Caine and Thomas Woodburne were the first directors, Barratt having special responsibility for the mine and Caine for the commercial side of the company's activities.

After 1863 an intensive search of the concession was put in hand, and in September 1864 William Barratt reported to the directors "that so far as operations have been extended we have discovered One Million Tons of ore".<sup>30</sup> By this time nearly 170 men were at work underground, three pits were in use and ore was being drawn at the rate of about 1,700 tons a week. Nine years of uncertainty were at last ended in November 1864, when a dividend of £50 a share was declared; a further £60,000 was paid in dividends during 1865 and 1866.<sup>31</sup>

In the early workings (the Old Mine) the ore occurred as "huge pockets and basins running out into veins in all directions".<sup>32</sup> The top of the ore body occurred

<sup>27</sup> H.R., *Directors' Minute Book*, no. 2 (partners' meeting, 22 May 1871).

<sup>28</sup> H.R., Miscellaneous papers, letters and correspondence relating to the shipping company. The *Nellie Bywater* was built on the Duddon and launched at Crab Marsh Point in 1873 (*Barrow Daily Times*, 22 December 1873).

<sup>29</sup> *Directors' Minute Book*, no. 1 (partners' meeting, 12 September 1863).

<sup>30</sup> H.R., *Directors' Minute Book*, no. 1, 30 September 1864.

<sup>31</sup> H.R., *Hodbarrow Mines, Private Ledger*.

<sup>32</sup> North of England Inst. of Mining Engineers, Newcastle, Forster MSS., Vol. 7, Shelf 51, *Report on Hodbarrow Mines* (1870).

at a depth of between 20 and 30 fathoms below the surface and was reached by shallow pits sunk through the overlying limestone. At the peak of its working life in the years before 1870, the Old Mine yielded between 3,000 and 4,000 tons of ore a week from about half a dozen shafts. These were "ladder pits", in which the men climbed to and from their work, and with the exception of Annie Lowther shaft, which was provided with a 48-h.p. engine, they were served by small winding engines with a capacity of 18 h.p. to 20 h.p.<sup>33</sup> These were set back from the pit mouth "so as to allow the Ore immediately around the shafts to be Taken out".<sup>34</sup> Horse gins were used for drawing dirt from new sinkings.<sup>35</sup> To an expert eye the surface installations appeared in 1874 to be "of a somewhat crude kind", a not unexpected remark since the working life of each pit was relatively short, and there was thus little incentive to lay out capital in expensive fixed works<sup>36</sup> (Plate III).

During 1867 and 1868 parts of a second and much larger ore body were discovered near Steel Green.<sup>37</sup> This was later found to be part of an enormous *flat* of ore, up to 100 ft. in thickness and bounded by limestone except on the south, where it continued seawards beyond the limit of the company's concession. The development of the New Mine, as this discovery was called, proved exceptionally difficult and costly owing to the presence of thick beds of waterlogged sand and gravel above the ore (Fig. 2). These hindered shaft sinking and for a time appeared likely to prevent

<sup>33</sup> *Ibid.*, Report on Hodbarrow Mines (1870); H.R., Report on Hodbarrow Mines by Messrs. Forster & Armstrong, 13 April 1872.

<sup>34</sup> Report on Hodbarrow Mines (1870).

<sup>35</sup> N. of Engl. Inst. of Mining Engineers, Forster MSS., letter, Barratt to Forster, 4 May 1870.

<sup>36</sup> *Engineering*, 11 September 1874, 200.

<sup>37</sup> Carlisle Record Office, Reports and papers relating to Lord Lonsdale's mines in Cumberland and Westmorland, 1866-1871 (D/Lons.); H. S. Bidwell, "The Outer Barrier, Hodbarrow Iron Mines, Millom, Cumberland", *Mins. of Proc. Inst. of Civil Engineers* CLXV, 1905-1906, Pt. III (1906), 157.

mining altogether. Eventually a shaft was sunk through limestone on the edge of the *flat*, thus avoiding the worst of the superficial deposits, and headings were driven into the nearby ore body. By this means, and with the assistance of powerful Cornish pumps in other shafts, the New Mine was at last brought into production in 1874. It was none too soon, for production had been falling as the Old Mine became exhausted.<sup>38</sup>

The partners were fortunate in that their difficulties with the New Mine partly coincided with a period of great prosperity. The selling price of Hodbarrow ore rose from 19/9d. a ton in 1871 to 32/- in 1873,<sup>39</sup> and despite an increase in working costs over the same period, vast profits were realized. Between 1864 and 1868 £135,000 was paid in dividends: between 1870 and 1874 dividends amounted to £435,000, more than half of which was paid in 1872 and 1873.<sup>40</sup> Even lean years failed to disturb the general prosperity of Hodbarrow. The directors noted with some concern in January 1880 that the previous three years had been "marked by a greater depression in trade than at any period since the Hodbarrow mines were started".<sup>41</sup> Yet shareholders received during these years nearly £165,000 in dividends and in 1877 two Hodbarrow shares changed hands for £5,500 each.<sup>42</sup> Some years later, in 1892-1893, a profit of £113,600 was made, despite the "great and ever deepening depression" which was then affecting the iron trade.<sup>43</sup> To less fortunate neighbours it appeared that Hodbarrow always "escaped the pinch of bad times".<sup>44</sup>

<sup>38</sup> These details are from the record of events in the period 1868-1875 contained in the Minute Books.

<sup>39</sup> H.R., "Statement of the average selling price of ore, January 1865 to October 1876".

<sup>40</sup> H.R., *Private Ledger 'A'*.

<sup>41</sup> H.R., *Directors' Minute Book, no. 4*, 16 January 1880.

<sup>42</sup> H.R., "Shares sold to Mr Arnold and Mr W. Barratt, August 1877".

<sup>43</sup> H.R., *Directors' Annual Report* for the year ended 31 March 1893.

<sup>44</sup> H.R., *Letters Received* (27 May-11 July 1892), Ainsley to Vaughan, 31 May 1892.

# Section of HODBARROW MINES

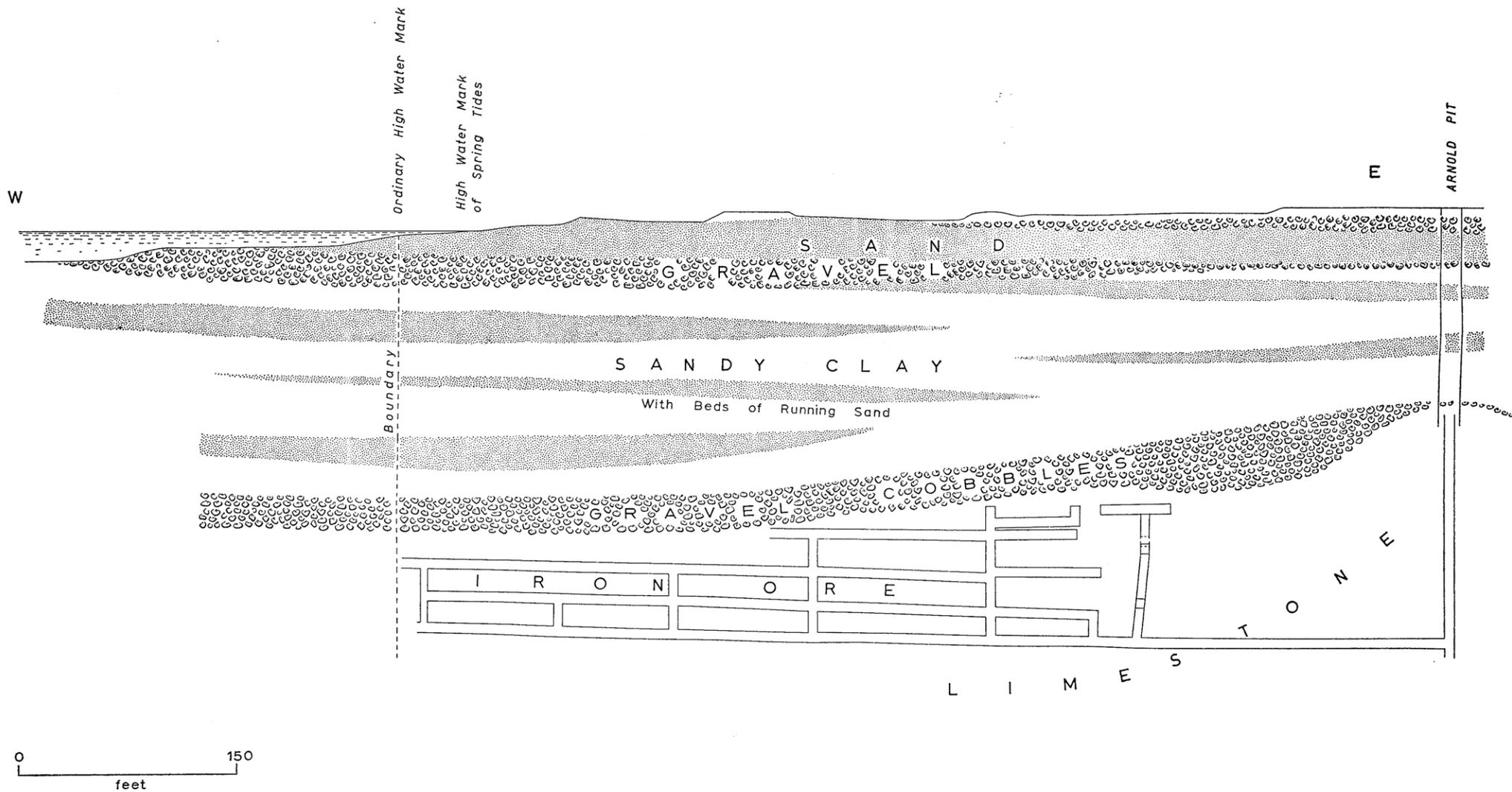


FIG. 2.—Geological section through Hodbarrow Mines, from a plan in the Hodbarrow records dated 1877.

The company owed its extraordinary success to a combination of circumstances. Its ores were rich,<sup>45</sup> scrupulously prepared before sale and normally in great demand; they were also available in vast quantities. The company was fortunate, too, in having men like Nathaniel Caine and Cedric Vaughan in charge of its affairs.<sup>46</sup> Both skilfully cultivated the widest possible range of customers, with the result that even when trade was slack it was possible to claim that "what one district does not require, another district takes".<sup>47</sup>

The minute books, which provide a wealth of information on many aspects of the firm's activities, are more reticent about the miners themselves. Yet by the 'eighties more than 1,000 men and boys were employed at Hodbarrow,<sup>48</sup> and they and their families formed the largest single occupational group both in Millom and in several of the nearby villages.<sup>49</sup> Many of the miners were of Cornish and Irish origin.<sup>50</sup> The migration of a few Cornishmen to Hodbarrow in the early years of the mine had been followed by a more substantial movement in the 'sixties and 'seventies, occasioned by the increased scale of activity at the mine itself and by the decline of tin and copper mining in the South West. By the 1870s many of the underground bargains at the mine were in the hands of Cornishmen.<sup>51</sup> Others were held by Irish miners, of

<sup>45</sup> H.R., *Analyses of Iron Ore* (1885). The analyses show a metallic iron content of between 55% and 63%.

<sup>46</sup> Cedric Vaughan (1841-1911) joined the company in 1872 as Deputy Manager from the Midland Railway's workshops at Derby, where he had been Locomotive Superintendent. He subsequently became Managing Director and Chairman of the Hodbarrow company (*Engineering*, 24 February 1911 and Hodbarrow records). Some notes on Caine appear in the *Millom Advertiser*, 6 October 1877.

<sup>47</sup> H.R., *Directors' Minute Book*, no. 3, 22 April 1892.

<sup>48</sup> H.R., *Pay Book* (1887-1889). In September 1887 910 persons were employed below ground and 304 on the surface.

<sup>49</sup> *Barrow, Furness and North-Western Daily Times*, 2 October 1871; *Millom Advertiser*, 1 January 1876; *Millom Gazette*, 29 December 1894.

<sup>50</sup> *Millom Advertiser*, 5 March 1881; *Liverpool Mercury*, 24 August 1885.

<sup>51</sup> One such bargain was taken in May 1879 by Henry Richards, Henry Richards, Thomas Tresidder, Thomas Tresidder, William Tresidder and William John Richards (H.R., *Underground Bargains* 1879).

whom there were perhaps 70 or 80 on the company's books at any one time.<sup>52</sup> Although the presence of these strangers excited particular comment amongst contemporary observers, the bargain and wage books contain many names which are not immediately recognizable as belonging to either group. The company in fact appears to have recruited its men wherever they might be found; by the end of the century at least, many were miners' sons from Millom itself.<sup>53</sup>

Dressed in "a skull cap of linen, surmounted by a felt hat stiff with drippings from the mineral, moleskin trousers and vest, flannel shirt, monkey jacket, and hob-nailed boots",<sup>54</sup> the local miner earned his wages according to a system which had long been familiar in Cornwall. Though some were on ordinary shift-work and were paid a daily wage, most underground workers were "bargain men". Underground bargains were let to the lowest bidder who, together with his partners, assumed responsibility for working a section of the mine. Before pay day the cost of powder, candles, fuses and tools was deducted from the "bargain money". Although wages fluctuated with the selling price of ore, the general prosperity of the mine ensured for its employees a degree of stability that was denied to miners at less fortunate concerns. During the late 'seventies, when conditions in the iron trade were particularly difficult, the directors claimed that their men had "enjoyed full work and better wages than at any other mine in the district", and that they themselves "over and over again, [had] sacrificed their own interest to those of the men".<sup>55</sup> It is impossible to test the truth of the second

<sup>52</sup> H.R., authorization to deduct money from wages on behalf of Rev. W. Perrin (28 July 1883). The figure quoted is at best a rough approximation and may well be too low.

<sup>53</sup> H.R., *Directors' Minute Book*, no. 9, 7 September 1894.

<sup>54</sup> *Liverpool Mercury*. 24 August 1885.

<sup>55</sup> H.R., *Directors' Minute Book*, no. 4, 16 January 1880.

assertion, though the general record of the company provides no grounds for doubting its essential accuracy. The wage books certainly suggest that the remuneration of Hodbarrow miners compared favourably with that of iron miners elsewhere in Cumberland.<sup>56</sup>

The influx of newcomers into Millom caused a rapid increase in the size of the old villages of Haverigg and Holborn Hill, close to the mines, and led to the creation of Millom new town in 1866. The company assisted this expansion by building houses both in Millom and the villages,<sup>57</sup> but most of its employees found accommodation as best they could, and in the early days at least this frequently meant that houses were occupied by two or more families and were grossly overcrowded.<sup>58</sup> The *Barrow Daily Times* reported in March 1874 that members of the working class in Millom were "pretty certain to be found in a small and very much overcrowded house, built on marshy ground, and surrounded with reeking puddle holes and loathsome nuisances". In such a house "every small room . . . [was] crowded, and used not simply as a sleeping apartment, but as sitting-room, dining-room, and general clutter, smudging, and washing-up room".

Most of the miners were either Nonconformist or Roman Catholic and both Millom and the industrialized villages nearby were soon provided with new churches and chapels which served Baptists, Methodists, Welsh Presbyterians, Catholics or Bible Christians. The old parish church of Millom lay remote from the centre of activity about the mines and the ironworks, and in

<sup>56</sup> This statement is based on the evidence of the books at Hodbarrow and Oliver Wood, *The Development of the Coal, Iron and Shipbuilding Industries of West Cumberland, 1750-1914*, unpublished Ph.D. thesis, Univ. of London (1952), 260.

<sup>57</sup> H.R., Miscellaneous papers relating to the company's houses at Haverigg, Steel Green and Millom (c. 1870-1890); A. Harris, *Millom: a Victorian new town*. CW2 lxvi 449-467.

<sup>58</sup> *Barrow Times*, 1 September 1866; *Barrow Daily Times*, 6 October 1873; *Barrow Herald*, 24 July 1875.

1877 a new ecclesiastical parish was created for the convenience of the Church of England congregation in this part of Millom.<sup>59</sup>

The company contributed towards the cost of all the new churches and chapels and also made an annual subscription towards their upkeep.<sup>60</sup> But this was only one of the ways in which, almost imperceptibly, the company became so deeply involved in local affairs that eventually few matters of importance, from the siting of a new post office to the creation of a Local Board of Health, failed to be referred to the directors and partners for an opinion. And through their representatives on the Local Board, the mining company and the smelting company together largely governed Millom for more than a quarter of a century.<sup>61</sup>

During the last two decades of the 19th century, the company was faced with a crisis that for a time threatened its very existence.<sup>62</sup> The threat arose from the fact that as ore was removed in great quantities from the New Mine, surface subsidence developed and extended in sympathy with the underground workings. Since these were intended eventually to approach the shore, there was a great risk that seawater might find its way into the mine, either by flooding the broken ground inland or by percolation along the seaward face of the mine (Fig.2). After much discussion between the directors and the Earl of Lonsdale's advisers, it was agreed to leave a substantial barrier of ore along

<sup>59</sup> *Barrow Daily Times*, 14 July 1874; *Millom Advertiser*, 26 May 1877.

<sup>60</sup> These contributions are recorded in the Minute Books. Thus in August 1878, the partners agreed to give the Bible Christians "the same as the Company allows to other denominations, viz. £20 p. Ann" (*Book 3*, 30 August 1878).

<sup>61</sup> Company participation in the affairs of Millom would make an interesting study. The Minute Books of the company and the Local Board throw a good deal of light on the subject and there are also many references to it in the local newspapers of the period. The archives of the Local Board of Health are held by the Millom Rural District Council.

<sup>62</sup> The crisis can be traced in the Minute Books from 1880 onwards and in numerous reports and letters in the Hodbarrow archives. The Forster MSS. in the library of the North of England Institution of Mining Engineers, Newcastle upon Tyne, are also useful in this context.

the seaward edge of the concession. By 1883 some of the workings had reached the agreed limit and had been left standing in solid metal.<sup>63</sup> Meanwhile, with every month that passed, working conditions in the mine became more circumscribed and difficult. In June 1887 Vaughan reported to the directors that "we are getting to the end of our tether"; readily accessible ore had been practically exhausted and runs of sand and saltwater had begun to appear in the mine with ominous regularity.<sup>64</sup> After prolonged negotiations with the Earl of Lonsdale, the partners in 1888 secured a new lease of the mine and work was begun at once on the construction of a sea wall (the Inner Barrier), which was intended by Sir John Coode, its designer, both to protect the workings and allow the extraction of between four and five million tons of ore along the seaward edge of the concession (Plate IV). In the same year, the partners turned themselves into a private limited company.<sup>65</sup>

With the completion of the wall in 1890, the underground workings were quickly extended seawards, and between March 1892 and March 1893 nearly 540,000 tons of ore were raised.<sup>66</sup> It was the largest annual output since the opening of the mine, and as John Bewley remarked, "would rather have astonished old John Barratt could he have known [of] it".<sup>67</sup>

Although the Inner Barrier gave the mine a new lease of life, it soon became apparent that further protective works would be required. As the ore-bearing ground behind the new wall was gradually worked,

<sup>63</sup> H.R., *Report on the Mine* by T. Forster Brown and Augustus H. Strongitharm (26 January 1883).

<sup>64</sup> H.R., *Directors' Minute Book*, no. 7, 24 June 1887; no. 8, 7 November 1890.

<sup>65</sup> H.R., papers and correspondence relating to the formation of a limited company (c. 1887-1888); Companies Registration Office, Board of Trade Files of Dissolved Companies (Hodbarrow Mining Co.), no. 26568 (1888), Vol. 1.

<sup>66</sup> H.R., *Directors' Annual Report* for the year 31 March 1893.

<sup>67</sup> H.R., letter, Bewley to Vaughan, 29 September 1892. The iron mines of Cumberland were producing 1,350,000 tons of haematite at this period.

this area, too, was affected by surface subsidence. On 17 May 1898 a small run of wet sand into the mine "suddenly assumed alarming proportions and when the tide receded about 1 a.m. on the 18th a funnel-shaped depression was discovered on the shore . . . 100 yards from the face of the Wall. The inrush abated as the tide receded, clearly showing that the water had come from the sea and down the funnel. The depression was 40 yards in diameter at the top and about 15 feet deep in the middle".<sup>68</sup> The depression was "filled . . . with furze and clay, well rammed down, before the tide returned at 7 a.m.". But on 21 May part of the wall subsided into the cavity formed beneath it by the water some days earlier.<sup>69</sup> Though this plugged the gap and stopped any further incursion of water, it emphasized the need for speedy remedial action if the mine was to be saved. The result was a decision to press ahead with the construction of a second wall (the Outer Barrier), which would release yet another area of ground for mining purposes, as well as protecting the existing workings.<sup>70</sup> The Outer Barrier, a massive structure of rubble limestone and clay protected by concrete blocks and iron slag, was completed in 1905 at a cost of almost £600,000.<sup>71</sup> By this time, the surface of some parts of the New Mine had slumped by as much as 60 feet.

The first decade of the 20th century can be seen in retrospect to mark the end of an era at Hodbarrow: it brings to a close an age of optimism and vigorous expansion and initiates a period of slow but persistent decline.

For a time, however, all seemed well. By means

<sup>68</sup> H.R., *Directors' Minute Book*, no. 10, 19 May 1898.

<sup>69</sup> *Ibid.*, 27 May 1898.

<sup>70</sup> H.R., *Directors' Minute Book*, no. 9, 30 April 1897.

<sup>71</sup> H.R., *Directors' Reports* for the year ended 31 March 1905 and 1906. There is a full technical account of the building of the wall in *Engineering*, 7 April 1905. Its cost was met largely from profits, but money was raised also by the sale of stock, which had been purchased earlier out of the Reserve Fund. The Reserve Fund had been created in 1880.

of New Annie Lowther shaft, sunk between 1897 and 1900, hitherto unworked deposits of ore in the eastern part of the mine were opened up,<sup>72</sup> and the construction of the Outer Barrier held a promise of further riches to come. The directors could confidently expect the mine to earn a net income of at least £100,000 a year between 1900 and 1910.<sup>73</sup> They were not disappointed when, in 1900 and 1901, the net profit was £400,000.<sup>74</sup> Despite competition from imported ore, the company had retained a foothold in most of its old markets and there was a good trade in railborne ore with ironworks at Ulverston, Carnforth, Barrow and Millom and, by sea, with Scotland, South Wales and the Dee and Mersey estuaries.<sup>75</sup>

The completion of the Outer Barrier enabled the company to extend its operations seawards once more and to halt the decline in output which had been occasioned by a restricted working area behind the old seawall and by the threat of inundation. Between 1905 and 1908 ore production was consistently above 500,000 tons a year, but thereafter it declined and by 1913 had fallen below 400,000 tons. About 13 million tons of haematite had been won from the mine by 1900, and by 1919 some 20 million tons had been removed:<sup>76</sup> it was at last becoming apparent that even Hodbarrow's exceptionally generous physical endowment was not unlimited. There were other problems, too. A heavy burden of drainage charges had to be met irrespective of output. Furthermore, as acid steel lost ground to basic steel in the country at large, the balance of advantages gradually moved against Hod-

<sup>72</sup> H.R., *Directors' Minute Book*, no. 10, 23 November 1900.

<sup>73</sup> H.R., *Ibid.*, 15 December 1899.

<sup>74</sup> H.R., *Directors' Annual Reports* for 1900 and 1901.

<sup>75</sup> H.R., particularly the summaries of *Deliveries by Rail and Deliveries by Sea*. References to competition from Spanish ore occur frequently in the Minute Books after about 1880.

<sup>76</sup> VCH *Cumberland II* (1905), 396; Bernard Smith, *Special Reports on the Mineral Resources of Great Britain: Haematites of West Cumberland, Lancashire and the Lake District* (1919), 129.

barrow and in favour of the more easily worked phosphoric ores of eastern England.<sup>77</sup> There was much hand-to-mouth working and stock-piling between the wars. The search for new ore bodies was not abandoned, however, and in January 1925 a borehole at Moorbank, near Haverigg, passed through workable ore.<sup>78</sup> Three years later a shaft was sunk on the site and the present Moorbank mine developed. Mining activity in other parts of the concession was gradually curtailed and, except for pumping, has now ceased entirely. Hodbarrow's eventful history as an independent concern came to an end in 1958 when the mine was purchased by the Millom Haematite Ore and Iron Co. Ltd., who also acquired the Millom ironworks. By this time the production of iron ore had fallen to about 40,000 tons a year and mining had ceased to play a decisive part in the local employment structure.<sup>79</sup>

Hodbarrow today is a strangely empty place, yet no one viewing it from the Outer Barrier, across a great expanse of broken ground, could fail to be moved by the signs of former prosperity. Under these circumstances the verdict of Sir Henry Cunynghame, Chairman of the Royal Commission on Metalliferous Mines in 1910, comes to mind: Hodbarrow was indeed "a very remarkable mine".<sup>80</sup>

Since this article was written it has been announced that Hodbarrow mine will be closed not later than March 1968.

<sup>77</sup> J. C. Carr and W. Taplin, *A History of the British Steel Industry* (1962), 127-128; Duncan Burn, *The Economic History of Steelmaking, 1867-1939*, especially Chapter XI.

<sup>78</sup> H.R., *Directors' Minute Book*, no. 15.

<sup>79</sup> Companies Registration Office, Board of Trade Files of Dissolved Companies (Hodbarrow Mining Co.), no. 26568, vol. III, Chairman's report for the year ended 28 September 1957. As early as 1937 the underground labour force had fallen to 155 (Home Office *List of Mines*, 1937, 95).

<sup>80</sup> *Royal Commission on Metalliferous Mines and Quarries*, Mins. of Evidence (Cd. 6390, 1912), Q. 5827.