History of the Steel Industry in the Port Talbot Area 1900-1988

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The candidate confirms that the work is his own and that appropriate credit has been given where reference has been made to the work of others.

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I would like to express my appreciation to Peter Knowles Photography for kind permission to reproduce the photograph on page 194, and the National Museum of Wales for all other photographs except pages 216 and 254 which are from my personal collection.

Abstract

This thesis examines the history of steelmaking at Port Talbot in South Wales from the start of modern steelmaking in 1902 to 1988. Although the British steel industry has been studied at national level, few studies have looked at company level and fewer on plant level studies. By studying this large and significant steelmaking site this thesis sheds light on the interaction between national constraints and local forces for change or inertia and on the interaction of plant management, industry leadership and national Government policies. A number of themes are examined including issues of locational inertia and change; technological innovation and choice; relationships to, and changes in markets; products and demand levels; the role of the state; and issues of decision making. The later includes managers, management structure, conflict among managers, corporate rivalries, relationships with banks and Government, and within nationalised industries.

The thesis covers the origins of modern steelmaking at Port Talbot in the 1900s, its expansion and integration with iron making during World War One. It looks at Port Talbot within the framework of heavy steel rationalisation in the 1920s and the inconclusive manoeuvrings to build a strip mill in the 1930s. After World Ward Two Port Talbot emerged as Britain's leading strip mill through a complex interplay of technological and locational choices including Government pressure and corporate rivalries. The boom years of the 1950s were followed by consolidation and modernisation in the 1960s through the Government inspired over expansion of the strip mill sector. After re-nationalisation in 1967 Port Talbot became involved in internal struggles with rival strip mills over investment. At each stage the thesis uses the detailed local adaptation and innovation within that context.

The thesis draws on extensive primary sources including the National Archives, Government Reports and documents, company records, Bank of England papers, trade papers, technical journals, trade union papers and local newspapers. The secondary literature on the steel industry is discussed and revised where appropriate and this study adds a full-scale plant level industrial history of one of the most important British steelworks to this literature.

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Abbreviations

ABP	Associated British Ports
ACAS	Advisory, Conciliation and Arbitration Service
AUEW	Amalgamated Union of Engineering Workers
BISF	British Iron and Steel Federation
BL	British Leyland
BOS	Basic Oxygen Steel
BS	British Steel
BSC	British Steel Corporation
BTDB	British Transport Docks Board
CSCNI	Commons Select Committee on Nationalised Industries
DTI	Department of Trade and Industry
DoI	Department of Industry
ECSC	European Coal and Steel Community
EEC	European Economic Community
ESC	English Steel Corporation
FCC	Flintshire County Council
FCI	Finance Corporation for Industry
GKB	Guest Keen Baldwins
GKN	Guest Keen Nettlefolds
GRCWC	Gloucester Railway Carriage and Wagon Company
GWR	Great Western Railway
IDAC	Import Duties Advisory Committee
ISB	Iron and Steel Board
ISC	Iron and Steel Corporation of Great Britain
ISHRA	Iron and Steel Holdings Realisation Agency
ISTC	Iron and Steel Trades Confederation
JSG	Joint Steering Group
LRQA	Lloyds Register Quality Assurance Ltd
MTPA	Million Tonnes Per Annum
NCB	National Coal Board
NUB	National Union of Blast Furnacemen
NUM	National Union of Mineworkers
OPEC	Organisation of Petroleum Exporting Countries

PDC	Public Dividend Capital
PTISC	Port Talbot Iron and Steel Company
PTR	Port Talbot Railway and Dock Company
PTSC	Port Talbot Steel Company
PTSDC	Port Talbot Steelworks Development Committee
RTB	Richard Thomas and Baldwins
SCNI	Select Committee on Nationalised Industries
SCoW	Steel Company of Wales
SIMA	Steel Industry Management Association
SOGAT	Society for Graphical and Allied Trades
T&G	Transport and General Workers Union
USS	United States Steel Corporation
VLN	Very Low Nitrogen
WWSDC	West Wales Steel Development Committee

Glossary

Acid Process	Any steelmaking process where the furnace lining and slag is chemically acidic.
Annealing	A heating process to remove stresses from rolled steel.
Bar	A finished steel product commonly in flat, square, round or hexagonal shape rolled from billets ½”-4” in diameter.
Basic Process	Any steelmaking process where the furnace lining and slag is chemically basic.
Basic Oxygen System/Steel	Method of steelmaking. A vessel is charged with scrap and molten iron before pure oxygen under pressure is blown onto it.
Battery	Group of coke ovens.
Bessemer Process	First commercial method of bulk steelmaking. Air and steam under pressure is blown through molten iron.
Billet	Rolled or forged steel 1½”-5” square or round in shape.
Blast Furnace	A furnace where air is blown through molten iron ore, coke and lime to produce molten pig iron.
Bloom	A semi-finished product mostly square in cross section and larger than 5” square. Used to produce girders, beams and other structural shapes.
Burden	The charge of raw materials into a blast furnace.
Campaign	The continuous long-term operation of a blast furnace.
Cogging Mill	Primarily rolling mill that produces blooms.
Coil	A finished steel product such as sheet or strip which has been wound or coiled after rolling.
Coke Ovens	High temperature ovens used to convert coal to coke by baking out volatile materials.
Cold Mill	Rolling mill used to roll hot rolled steel strip to produce thinner, smoother and stronger steel for commercial use e.g. sheet.
Continuous Casting	A process for solidifying liquid steel in the form of a continuous strand rather than individual ingots.
Continuous Rolling	Rolling mill where the steel goes through several consecutive rolls at the same time.
Cupola	Miniature blast furnace used to melt pig iron.

Electrolytic Tinning	Method of producing tinplate by means of electro-deposition.
Flat Products	Steel products including sheet, strip and plate that is made from slabs.
Four High Mill	A rolling mill with 4 rolls mounted horizontally but only 2 rolls do the rolling. The others are for back up.
Hand Mill	A rolling mill where iron or steel is manhandled through the rolls.
Hearth	Portion of a furnace that holds the metal being heated.
Heat	One steelmaking cycle.
High Top Pressure	High pressure used in a blast furnace to increase yield.
Hot Metal	Molten metal.
Hot Strip Mill	Rolling mill with a number of consecutive rolling stands used to produce thin steel strip.
Ingot	Steel block ready for rolling.
Integrated Steelmaking	Iron and steel is produced at the same site.
Melting Shop	Building where steel is made.
Mild Steel	Steel that contains between 0.15%-0.25% carbon.
Open-Hearth Process	Bulk steelmaking method using molten iron, scrap and limestone developed by Charles William Sieman. It was largely replaced by the BOS process.
Pickling	Removal of scale or oxides by hot acid solution from metal surfaces before processing in the cold mill.
Pig Iron	High carbon iron produced in a blast furnace.
Plate	A flat rolled product rolled from slabs of between 0.125”–3” in thickness.
Pulpit	An enclosed control area in a rolling mill.
Reversing Mill	A rolling mill where the steel is passed back and forth through the rolls.
Rimmed Steel	Low carbon steel where the rim of the ingot is almost pure iron.
Rolling Mill	The plant which reduces and transforms the shape of semi-finished steel by passing it through rolls.
Roughing Stand	Initial set of rolls for rolling slabs or ingots.

Semi-Finished Steel	Products such as slabs, billets and blooms which are further processed into saleable products.
Shear	Machine used to trim bars, plates and sheet.
Sintering	A process which combines ores too fine for efficient blast furnace use with flux and coke to form larger clumps.
Sheet	Flat rolled steel over 12” in width and less than 0.2” thick.
Slab	A wide semi-finished product made from ingots or continually cast commonly between 6”-9” thick and 24”-60” wide. Sheet, strip and plates are made from slab.
Slag	Hot waste drawn off the top of molten metal.
Steel	An alloy of iron and carbon containing between 0.15% and 1.4% carbon.
Strip	A flat rolled product less than 0.2” thick.
Stripper	Crane that removes ingots from their moulds.
Teeming	The flow of hot metal into ingot moulds.
Tilting Furnace	Steelmaking furnace that is tipped for pouring.
Torpedo	Specialist railway vehicle used to transport molten iron from the blast furnaces.
Universal Rolling	Rolling mill where the steel is rolled from top to bottom and side to side at the same time.
Wide Strip	More than 18” in width.

Introduction

This thesis looks at the history of steelmaking in the Port Talbot area of South Wales from the start of modern steelmaking in 1902 until British Steel's privatisation in 1988. It is a plant level study of one of Britain's most significant steelmaking sites. It fills an important gap in the understanding of an essential industry. Yet as a plant level study it does have consequences for the understanding of the wider industry.

There are a number of reasons for choosing Port Talbot. Atkinson and Baber[1] claim that the documentation of South Wales' economic past, unlike its social and political history, has failed to attract a commensurate share of academic interest. One of South Wales' main industries since the 1860s has been the steel industry. As late as the mid 1970s South Wales still possessed four integrated iron and steelworks. The largest and most successful of these was Port Talbot. The latter's significance goes beyond the local area as it has taken the British steel industry into new areas in terms of scale of production, technological change, company structure and profit levels. Port Talbot is one of Britain's three remaining integrated iron and steelmaking sites along with Scunthorpe and Redcar. What is surprising about steelmaking at Port Talbot is that it has not attracted more academic attention. It has certainly attracted academic interest but from the narrower perspectives of regional policy, the sociological perspective or even technical aspects and even then often over relatively short periods of time. What has been lacking is a study of its long-term steelmaking activities. This work fills that gap.

There are also personal reasons for choosing this particular site. I was born locally and grew up in Port Talbot. My father and other family members worked there as process workers or tradesmen. As I grew up the steelworks was often a subject of discussion. The success of the steelworks and the resulting improvements in the workforce's living standards gave my generation opportunities that my parent's generation lacked.

This thesis is a long-term history of a major British steelmaking site. Its contribution lies in drawing together a complex local history that sheds new light on broader and

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[1] M. Atkinson and C. Baber, *The Growth and Decline Of The South Wales Iron Industry 1760-1880* (Cardiff: University of Wales Press, 1987), p.1.

better known historical processes. The British steel industry is moderately well covered by broad overall historical accounts at industry level, notably by Duncan Burn[2], J.C. Carr and W. Taplin[3], John Vaizey[4] and B.S. Keeling and A.E.G. Wright[5] and for shorter periods by David Heal[6], G.F. Dudley and J.J. Richardson[7], R.A. Bryer et al[8] and Heidrun Abromeit[9]. Studies of sub-sectors (e.g. Kenneth Warren[10] or Paul Jenkins[11]) are rarer and there are only a few studies that go down to detailed corporate level (notably Peter Payne[12] and Steven Tolliday[13]). Hence, this thesis makes a contribution in analysing the development of a single large and nationally significant steelmaking site. This makes it possible to shed light on how change and development at plant level occurred within the framework of wider national constraints, highlights forces for change and inertia at plant level, and looks at the interaction of plant management, industry leadership and national Government policies. It is a work of industrial history and does not engage with the debates of economics or political scientists directly, though the material contained here throws some light on these matters.

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[2] Duncan Burn, *The Economic History of Steelmaking 1867-1939* (Cambridge: At The University Press, 1961), *The Steel Industry 1939-1959-A Study In Competition And Planning* (Cambridge: At The University Press, 1961).

[3] J.C. Carr and W. Taplin, *A History Of The British Steel Industry* (Oxford: Basil Blackwell, 1962).

[4] John Vaizey, *The History of British Steel* (London: Weidenfels and Nicolson, 1974).

[5] B.S. Keeling and A.E.G. Wright, *The Development Of The Modern British Steel Industry* (London: Longmans, Green and Co Ltd, 1964).

[6] David W. Heal, *Industrial Britain-The Steel Industry In Post War Britain* (Newton Abbot: David and Charles, 1974).

[7] G.F. Dudley and J.J. Richardson, *Politics and Steel in Britain 1967-1988, The Life and Times of the British Steel Corporation* (Aldershot: Dartmouth Publishing Company Limited, 1990).

[8] R.A. Bryer et al, *Accounting for British Steel-A Financial Analysis of the Future Of The British Steel Corporation 1967-1980* (Aldershot: Gower Publishing Company Limited, 1982).

[9] Heidrun Abromeit, *British Steel, An Industry between State and the Private Sector* (Leamington Spa/Heidelberg: Berg Publishers Ltd, 1986).

[10] Kenneth Warren, *The British Iron and Steel Sheet Industry Since 1840* (London: G Bell and Sons Ltd, 1970).

[11] Paul Jenkins, *Twenty By Fourteen-A History of the South Wales Tinplate Industry 1700-1961* (Llandysul Dyfed: Gomer Press, 1995).

[12] Peter L. Payne, *Colvilles and The Scottish Steel Industry* (Oxford: Clarendon Press, 1979).

[13] Steven Tolliday, *Business, Banking and Politics-The Case of British Steel 1918-1939* (Cambridge Massachusetts and London: Harvard University Press, 1987).

The account is a detailed historical and largely chronological one, but certain themes and issues recur over the course of the history that are worth flagging up.

i) *Locational advantage*: One of Port Talbot's great long-term strengths has been its location, a coastal site with relatively ample land for expansion. This made the location well placed to benefit from the shift from the use of indigenous raw materials to using richer overseas sourced raw materials. However, despite being a coastal location, limitations imposed by the dock put constraints on the full use of imported ores until 1970 when a purpose built harbour was built. This meant that low quality British ores had to be transported by rail from the Midlands to supplement imported ores. Locational advantage required both local locational features (site conditions, access, infrastructure etc) as well as broader locational advantages to take full effect, and legacies of past developments often stood in the way of new ones.

ii) *Technology:* Port Talbot was the site of major technological changes that helped transform the wider industry. The establishment of fully integrated iron and steelmaking through to rolling on a single site was established, rather painfully, in the first part of the twentieth century. The adoption of radical strip mill technology was a long and difficult struggle that spanned World War Two. Subsequently BOS technologies and continuous casting again transformed steelmaking. All of these were in some respects long and slow battles. Port Talbot did not pioneer these technologies but followed others often more slowly than corporate management would have liked and with an element of fear of the consequences. These technologies all involved big step changes, huge implications for products and product markets, interrelatedness with other existing or new technologies at plant level, and new questions about how these technologies fitted in with existing locational constraints. Arguably the most far reaching technological change was the building of the harbour that allowed Port Talbot to fully benefit from its coastal location and ensured survival into the twenty-first century.

iii) *Government*: Government policies throughout have been of enormous importance at Port Talbot. During the First World War, the Government largely financed and shaped the breakthrough into integrated steelmaking. In the 1920s, the Bank of England, acting as a sort of specialist agency on behalf of the Government, prodded industrialists into the rationalisation of South Wales' heavy steel industry and as is argued here had unfortunate longer-term consequences for the development of strip steel production at Port Talbot. The development of the Port Talbot strip mill and the subsequent development of rival strip mills from the late 1950s were all powerfully influenced and shaped by the Government. From nationalisation in 1967 issues of national planning or strategic calculations in the run up to privatisation in 1988 dominated the agenda. This thesis stresses the multiple roles of Government. Issues of regional policy and local interests were often very powerful. Steel was often seriously affected indirectly by policies primarily targeted at other goals, notably the protection of the British coal industry. As the scale of investment grew, Government became a crucial supplier of funds and guarantees for enormous investments. Under nationalisation, Government though often divided between different interests, became the dominant decision maker and allocator of resources within the industry. Port Talbot was at times a beneficiary and at times a victim of shifting Government policies.

iv) *Entrepreneurs and managers*: Port Talbot's origins lay in pools of local family wealth and regional business networks in the late nineteenth century, and families like the Gilbertsons, Wrights, Baldwins and Beales continued to play leading roles until the end of World War Two as owners and as managers. They were only slowly displaced by new generations of professional managers including accountants such as Julian Pode, engineers such as Fred Cartwright and professional managers including Brian Moffat. In contrast to other famous British companies there was perhaps a lack of charismatic managers and risk takers at the helm such as Firth at Richard Thomas, MacDiarmid at Stewarts and Lloyds or Craig at Colvilles. Instead, Port Talbot under private ownership was characterised by complex decision making processes including difficult tradeoffs between different stakeholders and partners within the firm and strong external pressures and constraints arising from the corporate networks and alliances that it was involved in. These had a profound effect in the crucial areas of heavy steel rationalisation and the entry to strip steel production, and after a brief period in which nationalisation seemed to have remedied this, they re-emerged in new forms after denationalisation in the 1950s. Under public ownership the emphasis shifted to the complex interactions between plant, regional and nation management within BSC.

v) *Demand and markets*: Port Talbot always had to deal with changes in demand and markets, both in terms of volume and product base. The shift from heavy to light steel production between the 1930s and the 1950s was an immense change and the move to new light steel products is a major theme of the story. Above all the situation was characterised by profound uncertainties over demand and difficulties of accurately forecasting future demand with such huge fixed investments which required several years to come on stream. The war and generous Government subsidies provided Baldwins with the integration that they aspired to only for it to fall into severe overcapacity problems during the 1920s. In the 1930s there was controversy about whether consumer demand would ever justify massive investments in integrated strip steel production. The pioneer firm, Richard Thomas, was a casualty of its own precocity. Port Talbot as a private enterprise was generally a cautious follower. After nationalisation in 1967 it was swept into BSC's national plans for expansion and its own future development often came to depend on national calculations on the balance of advantage between key rival locations. The interplant rivalry between Port Talbot, Llanwern and Ravenscraig within BSC becomes a central part of the story in the latter part of the thesis.

vi) *Economists versus geographers*: The thesis does not deal directly with economic theories relating to the industry. However, the historical approach tends to fit much more comfortably with the work of industrial geographers like David Heal and Kenneth Warren with their stress on the importance of historical legacies and constraints and the importance of conjunction and timing in key locational decisions. As a result, the thesis often takes issue with the work of the economist Duncan Burn who places his emphasis on the particular cost advantages of investment decisions at particular points of time. It shows that on several occasions, the solutions that seemed to make most sense in terms of narrow cost benefit analysis might well have proved disastrous in the longer run.

A brief synopsis indicates the scope and focus of the thesis :-

Chapter 1 briefly looks at local pre-twentieth century iron production. It discusses the rise and fall of iron production at the inland site of Cwmavon. It also looks at the shifting patterns of local business, the role of bankers and individual entrepreneurs, and the role of raw materials and transport cost in determining industrial location. Highlighted is the increasing pressure within South Wales to relocate iron and steel production from inland sites to coastal sites.

Chapter 2 examines why large scale steelmaking started at Port Talbot in the early years of the twentieth century and its development until the end of World War One. The stimulus involved market changes and the interaction with other expanding industries. Once opened the first Port Talbot steel company quickly failed. It is argued that cash flow problems was the main cause. Production restarted in 1907 under the new direction of Baldwins, a relatively new and aggressive steelmaker who widened the product range, targeted new markets and made strategic alliances with key customers. It was obtained for a very low price which allowed investment, expansion and movement into new profitable lines of production.

Chapter 3 covers the building of the neighbouring Margam Steelworks which was built to work in conjunction with Port Talbot Steelworks during World War One in response to Ministry of Munitions pressures to rapidly increase steel production. Yet pre-war Baldwins had contemplated the integration of iron making into the steelmaking process. It was financed through high wartime profits and generous Government subsidies. The scheme was unfinished at the end of the war and the lack of demand in the 1920s left Baldwins with severe overcapacity.

Chapter 4 looks at the 1920s. The depressed conditions of the 1920s meant that Baldwins could not fully exploit the Port Talbot/Margam complex and pushed the company towards failure necessitating radical financial reconstruction. Following this, Baldwins with the support of the Bank of England, merged its heavy steelmaking interests at Port Talbot with those of GKN in order to facilitate the rationalisation of all South Wales plate and rail production. Ironically, this probably made subsequent developments in South Wales more difficult particularly with regard to light steelmaking in the 1930s as Baldwins and GKN had created complex issues of control and decision making.

Chapter 5 examines steelmaking during the 1930s and World War Two. The partial merger between Baldwins and GKN resulted in all South Wales plate and rail manufacture being concentrated at Port Talbot. This resulted in the closure of Dowlais Steelworks and rebuilding of Cardiff East Moors Steelworks. It is argued that the Dowlais closure may have been premature. The rationalisation and the 1930s revival in markets resulted in a highly profitable company. Yet Richard Thomas' strip mill development left Baldwins' tinplate interests highly exposed. The differing interests of Baldwins and GKN prevented any strip mill development.

Chapter 6 covers the building of Port Talbot's hot strip mill in the late 1940s which was one of Britain's largest ever industrial projects. Its complex origins involved an interplay of technological and locational choices, Government industrial and regional policies, internal decision-making issues and corporate rivalries. The planning and debates are examined in depth from corporate and Government records and the thesis revises older views that the Government imposed locational compromise on the industry. Closely related to the strip mill project was the merger of Baldwins with Richard Thomas to form Richard Thomas and Baldwins and subsequently the Steel Company of Wales involving all the major South Wales light steelmakers.

Chapter 7 looks at the boom years of the 1950s with rising demand for sheet and tinplate, expanding output and increasing profits. Government support had been vital in building the strip mill but in South Wales denationalisation broke the close links between the steelmakers. The Government was instrumental in fostering rival strip mill developments by Colvilles (Ravenscraig) and RTB in Wales (Llanwern) that created damaging overcapacity and major liabilities for the companies that owned them. This chapter argues that building a second strip mill at Port Talbot would have been a more effective policy to work with Ebbw Vale and Shotton. This chapter also highlights the interplay of Government policy and corporate strategies and the difficulties of planning massive projects in the face of fluctuating and unpredictable patterns of demand.

Chapter 8 covers the period from 1961 to nationalisation in 1967. Rather than a period of expansion this was a period of consolidation, modernisation and financial decline as the Steel Company of Wales positioned itself to respond to the challenges of the two new strip mills. Again there was a failed attempt to build a second strip mill at Port Talbot. Despite this the decision to convert to BOS and building a purpose built harbour ensured the long-term viability of Port Talbot as a major steelmaking centre. The issue of manning levels is examined and it is argued that it was a far more complex issue than simply intransigence by the unions.

Chapter 9 examines the period from the second nationalisation in 1967 to 1978 which created a new environment for Port Talbot. BCS initiated plans for massive expansion based on hugely overoptimistic forecasts of growth in demand. The plan was exposed by the oil crisis of 1973-74 and subsequent intensification of competition which exposed British overcapacity and sub-optimal locations. Port Talbot should have been well placed to benefit from rationalisation in the strip mill sector in a congested market but BSC had linked Port Talbot’s expansion to the closure of Shotton. The result was political stalemate but expansion and modernisation of Llanwern and Ravenscraig.

Chapter 10 looks at the major changes in manning levels and working practices at Port Talbot that took place between 1979 and 1981 following the return of a Conservative Government in 1979. Port Talbot survived partly because of its latent strengths in technology and location and also because of rigorous internal rationalisation through its ‘Slimeline’ programme. It is argued that the latter was rushed but that it bought time for a more considered approach to future developments.

Chapter 11 examines the period from 1982 to privatisation in 1988. It is argued that continuing investment particularly at Port Talbot and limited expansion both here and at Llanwern led to the marginalisation and eventual closure of Ravenscraig. Port Talbot survived because of that investment and its long-term productive and locational advantages and because management exploited its new found strength over its workforce.

Chapter 12 briefly looks at the events since 1988 and at the overall conclusions and wider implications of the Port Talbot story.

To address the various issues raised a whole range of primary sources have been used. A new and highly detailed primary source used for the first time in a systematic way is the National Archives in Kew. Papers have been used from the Board of Trade 1901-09; Ministry of Munitions 1916-17; Iron and Steel Institute 1931; Ministry of Housing and Local Government 1945-48; British Iron and Steel Federation 1946; H.M.T. 1947-49 and 1969-72; Ministry of Supply 1951-54, Iron and Steel Board 1955-59; Department of Trade and Industry 1973-82; Department for Industry 1977-79; and Prime Ministers Papers 1961.

Other primary sources include various Government Reports; Acts of Parliament; Bank of England papers; Annual Reports and Accounts of the Steel Company of Wales, the British Steel Corporation, British Steel plc and Corus; trade association reports particularly the British Iron and Steel Federation; trade union papers; trade papers including the '*Iron and Coal Trades Review'*, '*Steel Times'* and '*Steel Times International'*; company newspapers including the Steel Company of Wales' '*The Dragon'* and the British Steel Corporation's '*Steel News'* and the local newspapers including the '*Port Talbot Guardian'*, '*South Wales Evening Post'* and the '*Western Mail'*.

The major secondary sources are the literature sources quoted earlier and also particularly Peter Jackson's '*The Letter-Books of W. Gilbertson and Co Ltd, Pontardawe, 1890-1929'*[14]*.* A work of significance on Port Talbot is Ralph Fevre's '*Wales is Closed*'[15]. It looks in detail at the outsourcing of functions at Port Talbot Steelworks in the early 1980s from the sociologist's viewpoint. C.W. Roberts' '*A Legacy From Victorian Enterprise – The Briton Ferry Ironworks and the daughter companies'*[16] looks at iron and steelmaking in an area close to Port Talbot. Although primarily written from a technical viewpoint contains useful information on the wider local industry. A work in the trade papers of note is David Brinn's BSC's '*Port Talbot Works*'[17]. It concentrates mainly on technical aspects of the steelworks but was later published separately by the steelworks as a stand alone paper.

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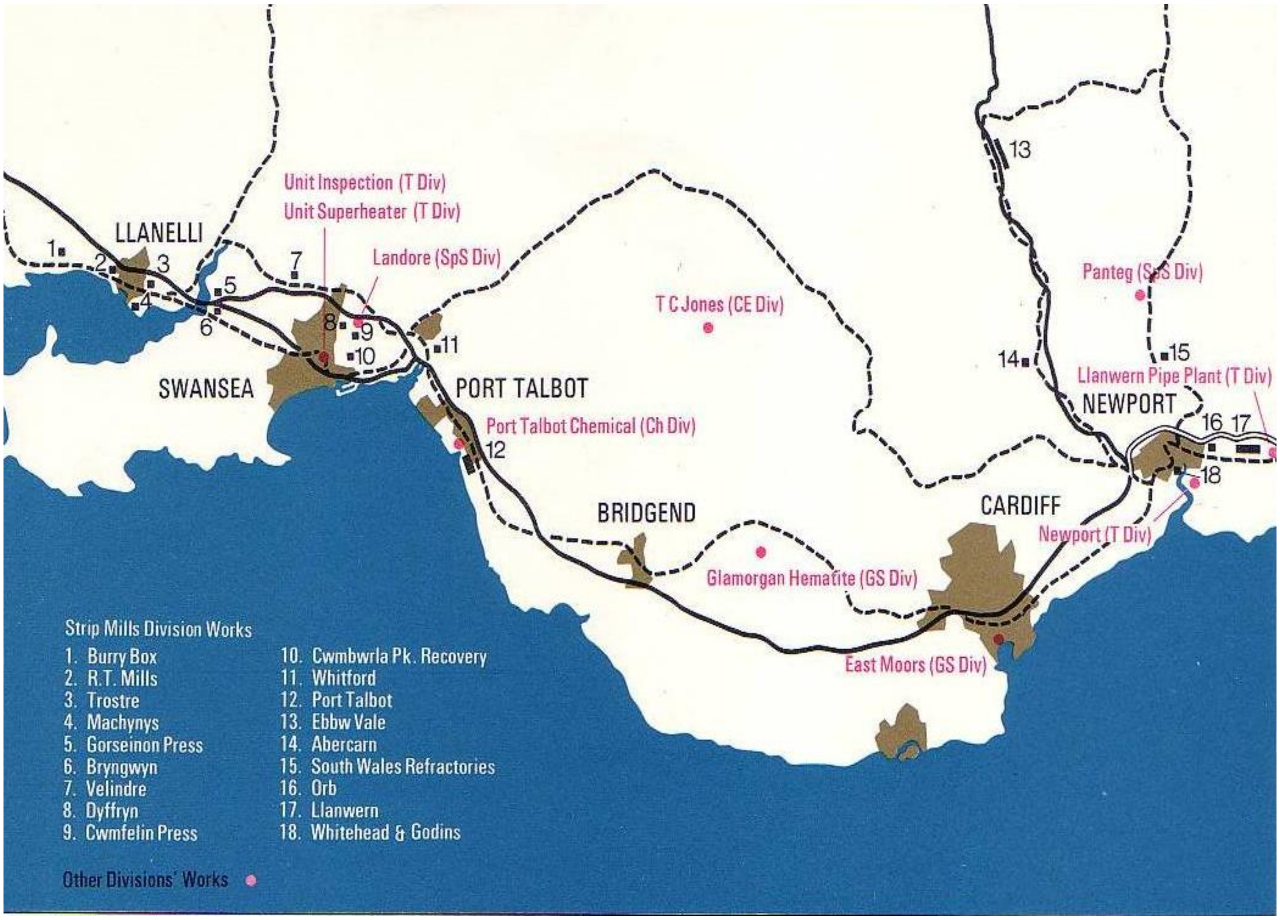
[14] P.W. Jackson, *The Letter-Books of W. Gilbertson & Co Ltd, Pontardawe 1890-1929* (Cardiff: South Wales Record Society, 2001).
[15] Ralph Fevre, *Wales is Closed* (Nottingham: Spokesman, 1989).
[16] C.W. Roberts, *A Legacy From Victorian Enterprise-The Briton Ferry Ironworks And The Daughter Companies* (Gloucester: Alan Sutton Publishing Ltd, 1983).
[17] David Brinn, 'BSC's Port Talbot Works', *Steel Times*, (1976, July).

This piece of work addresses a deficiency in the literature and adds considerably to the knowledge of the steel industry in South Wales and the wider industry. A map of South Wales showing the location of Port Talbot in relation to other local works in the early 1970s is shown below[18] :-



[18] British Steel Corporation (henceforth BSC), *Annual Report and Accounts 1970-71*, p.27.

Chapter 1: Pre-Twentieth Century: The Inland Iron and Steel Industry in the Port Talbot Area

Before the start of the twentieth century, the Port Talbot area saw numerous attempts at the development of iron and steel enterprises. Between the 1820s and 1890s a variety of small proprietors and entrepreneurs attempted to use local iron ore and coal to develop iron and copper enterprises. Locational advantages at this time drew them to Cwmavon and early success stimulated the creation of a dock at what is now Port Talbot to serve their needs in the 1830s. But the dock itself shifted the locational advantages by making richer imported iron ore available. Iron making in the area remained a fragile boom and bust business with several different entrepreneurs successively trying to make a success of Cwmavon's assets. In the end the demise of wrought iron and the rise of steel undercut all of these efforts and defeated the efforts of a string of proprietors to establish profitable iron making on what had become a marginal site with declining locational advantages. The experience of the area with iron and steel technologies and the presence of the dock at Port Talbot were important latent assets for the next phase of local steel development.

The history of iron making in the Port Talbot area extends back to at least 1253 when Walter Lovel, Lord of North Cornelly, granted the monks of Margam Abbey the privilege of extracting iron and lead ores from his lands. Similar concessions were also made by his neighbour Philip De Cornelly. The quantities of iron produced were small and were used for local domestic purposes. Production took place in small furnaces located at Graigafon using local ore and charcoal obtained from timber in the nearby Margam and Baglan Woods. Following the dissolution of the monasteries the local landowners, the Mansels and their lessees, continued to work the local iron and coal on a small scale. Until the mid eighteenth century iron making in South Wales was limited to a number of scattered charcoal fired furnaces. The limitations resulting from the dependence on timber ensured that the industry remained small, scattered and often migratory[19].

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[19] W.F. Cartwright, 'Preliminary Planning of Margam and Abbey Works' in A Technical Survey of the Abbey, Margam, Trostre and Newport Plants of The Steel Company of Wales Limited'. Special Issue of *The Iron and Coal Trades Review* (henceforth *I&CTR*), (1952), 9-12 (p.9). A.Leslie Evans, *The Story of Taibach and District* (Port Talbot: Private Publication,

In 1717 the first Lord Mansel of Margam set up the Afan or Avan Forge within the parish of Margam on the south bank of the River Avon for the purpose of refining local iron. The forge with a large attached pond fed from the waters of the River Avon, was run by the Mansels until 1726. It was then leased to Philip Jenkins, Rowland Pitt in 1747 and Coles and Lewis in 1760. By 1737 it may have been capable of smelting ores as well as refining iron. Coles and Lewis later erected a second forge alongside the original forge. The original forge became known as the Upper Forge and the newer forge the Lower Forge. The first local commercial mining of coal occurred at Waunlas, Cwmavon which is situated in the Avon Valley about 3-4 miles from what is now Port Talbot in 1748. By about 1750 coke ovens had been erected at the site to produce coke for the Afan Forge[20]. If iron was being smelted in 1737 it must have been by a charcoal fired furnace as commercial mining did not get underway for a further decade. Early industrialisation at Cwmavon was largely stimulated by demand for raw materials at the Afan Forge. It was not until the 1750s and 1760s that coke smelting became widespread in South Wales[21].

The two forges were acquired by John Miers in 1782. By 1803 there are indications that tinplate was being produced at the Afan Forge although it was not until 1822 that the industry became firmly established[22]. At the start of the nineteenth century Britain had 16 tinplate works of which 11 were located in Wales. The first Welsh tinplate was probably produced at Pontypool in 1720. The stimulus for the development of the tinplate industry was its increased use in storage containers for tea, coffee, confectionary etc during the first half of the nineteenth century[23].

In 1811 the Afan Forges passed to Samuel Fothergill Lettson who also leased land north of the river in Cwmavon for coal working. Lettson was impressed by the availability of iron ore in close proximity to the coal at Cwmavon. This led to the first

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1963), p.38. W. Rees and C. Rees, *Brief Historical Surveys of Taibach and Cwmavon* (Port Talbot: Private Publication, 1972), p.4. Brinn, p.4. Atkinson and Baber, p.4. Corus, *Port Talbot A Century In Stee*l (Port Talbot: Private Publication, 2002), p.2.

[20] A. Leslie Evans, *Taibach and District*, p.39. W. Rees and C. Rees, p.4. Brinn p.4. A. Rees, *The Port Talbot Railway & Dock Company* (Port Talbot: Private Publication, 1972). Ibid, 'Aberavon Forge', *Transactions of the Port Talbot Historical Society* Vol.1(IV), (1990), 80-82 (p.80). Corus, *Port Talbot A Century*, p.4.

[21] Atkinson and Baber, p.4.

[22] W. Rees and C. Rees, p.39. Brinn, p.4.

[23] Paul Jenkins, pp.24-27.

large scale development in iron making in the area when in 1819 Lettson built the first blast furnace in Cwmavon. To supply the water used at the furnace he constructed a weir, sluice gate and feeder canal from the River Avon as well as a water wheel. Low quality iron ore was also brought to the blast furnace from nearby Oakwood and Bryn. Before iron making started Lettson's enterprise failed in December 1819 when he ran short of capital. Following the failure he sold the enterprise to two Cornishmen, John Vigurs and Leonard Smith in 1820. It was these who, with the support of the Earl of Jersey, commissioned the blast furnace in 1820[24].

A second blast furnace was later added along with a foundry and rolling mill for the production of blackplate to be used in the manufacture of tinplate. The sheets produced at Cwmavon were taken to Vigurs and Smith's Ynysgerwn works in the Neath Valley by pack pony for tinning. In 1825 their tinning plant was transferred to Cwmavon[25]. By 1825 the Cwmavon plant consisted of a blast furnace, a forge with drop hammer, a mill to produce tinplate bar, a sheet mill, and a tin house[26]. The local iron industry moved up the Avon Valley and expanded to exploit Cwmavon's locational advantages.

Economic geography suggests that if the sources of raw materials are different from its market an industry will seek to locate to minimise transport costs[27]. As metal smelting is a bulk reducing process with raw materials being larger and heavier than the finished product transport costs are reduced by locating the industry near to the major raw materials. In the case of Cwmavon both coal and limited supplies of iron ore were available. Thus the site held locational advantages over the site of the Afan Forge. By 1830-31 the cost of raw materials in the production of pig iron accounted for between 80-85% of the production costs. In 1839 at Merthyr's Plymouth Ironworks it took 2¾ tons or ore and 2½ tons of coal to produce a ton of pig iron. There would be a gradual reduction in the amount of coal needed to

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24 A. Leslie Evans, *Taibach and District,* p.53, H.R. Jones, 'The Tinplate Industry in Port Talbot', *Transactions of the Port Talbot Historical Society*,Vol.II(2) (1971) 26-34 (p.28). Rees and Rees, pp.39-40. Brinn, pp.4-5. Jackson, p.34.

25 H.R. Jones, p.28. W. Rees and C. Rees, p.40.

26 Brinn, p.5.

27 John Sloman, *Economics* (Hemel Hempstead: Harvester Wheatsheaf, 1991), p.152.

produce a ton of iron in proportion to iron ore used[28]. Thus the locational pull was towards sources of iron ore. With copper production the position regarding raw materials was even more pronounced. In 1804 to produce one ton of copper it took 30 tons of coal and 12 tons of ore[29]. Thus it was important to locate the smelting near to coal sources. Unlike iron smelting there was no ore at Cwmavon but an established coal industry. Thus it made sense to co-locate iron and copper smelting. This took place in 1839 with the building of the Cwmavon Copper Works[30].

The growing industrial activities at Cwmavon created a need for a suitable dock facility to import raw materials and export coal and finished products. To satisfy this need a dock was constructed near Taibach between 1835 and 1837. It was built by C.R.M. Talbot, the head of the landowning Mansel family. It was after him that the new dock was named Port Talbot. The dock further stimulated the local iron industry[31]. This freed further developments from the restrictions of available local iron ore. It also spurred the development of the copper industry at Cwmavon with its dependency on non local ore. Between 1835 and 1836 local annual iron ore imports increased from 140 tons to over 2,800 tons[32]. All these developments have to be seen against a background of increasing demand for iron as industrialisation gathered pace during the first half of the nineteenth century. UK pig iron production increased from 68,300 tons in 1788 to 2,701,000 tons in 1852[33].

By 1838 two blast furnaces were in operation at Cwmavon using a 50% imported ore burden. Each of these blast furnaces had an output of about 2,000 tons/annum and used 3 tons of coal per ton of iron produced. The cost per ton of iron produced was £3-5s[34]. This was not a particularly large output by South Wales standards. By

[28] Atkinson and Baber, p.16.
[29] Ronald Rees, *King Copper-South Wales and The Copper Trade 1578-1895* (Cardiff: University of Wales, 2000), p.23.
[30] Ibid
[31] A. Leslie Evans, *Taibach and District*, pp.54-55. Brinn, p.5.
[32] Atkinson and Baber, p.39.
[33] Carr and Taplin, p.6.
[34] GKB, *Guest Keen Baldwins Iron and Steel Co Ltd* (Port Talbot: Private Publication, 1937), p.28. Brinn, p.5.

1808-12 the average output from the blast furnaces at Merthyr's Plymouth Ironworks was 2,035 tons and by 1827 the South Wales average was 3,022 tons per furnace[35].

On 29th May 1841 the whole of the Cwmavon industrial complex was taken over by the 'Governor and Company of Copper Miners in England' or 'The English Copper Company' along with the two blast furnaces at Pontrhydyfen Ironworks further up the Avon Valley. Over the next few years the new company prospered. During 1845, 36,412 boxes of tinplate, 2,389 tons of copper, and 134,506 tons of coal were produced at Cwmavon. By this time there were 7 blast furnaces, 68 puddling furnaces, 20 balling furnaces and 6 mills in operation. In 1844 steam power in the form of a steam engine was introduced. Cwmavon works now employed about 880 people[36].

During 1839 William Gilbertson moved from London to Cwmavon to take over as manager or partner. He remained at Cwmavon until April 1844 with the then partnership being dissolved in January 1846. It was his family who would build the original Port Talbot Steelworks in the early years of the twentieth century[37].

By the early 1820s South Wales accounted for about 40% of UK pig iron output. In the middle of the nineteenth century although output in terms of tonnage had increased the region's significance as a proportion of UK output had declined as new areas such as Cleveland, Cumbria, Lincolnshire and Northampton started production[38]. By 1828 rail manufacture had become an important activity for most South Wales iron works. This stimulated the construction of larger mills in order to roll the required larger masses of iron. There was also a need to add to the number of puddling and balling furnaces[39]. In 1846 a rail mill and an engineering workshop were built at Cwmavon[40]. By 1847 the Cwmavon complex employed 3,000[41].

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35 Atkinson and Baber, p.39.
36 GKB, p.28. R.O. Roberts, 'The Bank of England, the Company of Copper Miners and the Cwmavon Works 1847-52', *Welsh History Review*, Vol.4(3) (1969), 219-234 (p.222). W. Rees and C. Rees, p.42. Brinn, p.5. Jackson, p.4.
37 Jackson, p.4.
38 Atkinson and Baber, p.5.
39 Carr and Taplin, p.58. Atkinson and Baber, p.67.
40 Brinn, p.5.
41 Ibid. R.O. Roberts, p.224.

Financial difficulties resulted in a major restructuring of Cwmavon in 1847. The expansion of the 1840s had been largely financed by loans from the Bank of England. This resulted in a debt to the Bank of £270,000. When the Bank of England raised the Bank Rate early in 1847 it triggered the insolvency of the English Copper Company in the autumn of 1847. As a result the Bank took possession of the company's assets and operated the facilities at Cwmavon from April 1848 until May 1852[42].

The Bank of England returned the company to a group of former English Copper Company shareholders in May 1852. They re-appointed William Gilbertson as manager. Between 1852 and 1860 the net profits made by the company came to £215,527.2s.2d with a preference dividend of 7.5% paid regularly. The Cwmavon Works was now financially at its peak. In 1861 Gilbertson left to buy his own tinplate works in Pontardawe. During the next six to nine years Cwmavon endured net losses due to lower demand and prices for iron, coal, and copper[43].

The British iron industry experienced another short boom which peaked in 1871-72. This stimulated production and increases in capacity which by 1873 exceeded demand. When there was a general downturn in trade from the autumn of 1873 prices began to fall and remained low until 1879[44]. It was from this point in the early 1870s that the Cwmavon works went into a gradual and steady decline. The first closure was the rail mill that ceased production in 1874. This was caused by the substitution of steel for wrought iron in the manufacture of rails i.e. Cwmavon was unable to respond to the technological changes taking place. No doubt the years of losses caused problems in the ability of the company to raise sufficient capital to build a viable steelworks. During 1876 the company went into liquidation[45]. The closure of the rail mill reflected a wider trend within South Wales. Wrought iron rail production fell from 534,000 tons in 1869 to 100,000 in 1877[46]. Most of the old

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[42] Brinn, p.5. R.O. Roberts, pp.221-222. GCHT, *Glamorgan County History-Vol.5-Industrial Glamorgan from 1700-1970* (Cardiff: Private Publication, 1980), pp.383-384.
[43] W. Rees and C. Rees, pp.45-46. Brinn, p.5. Jackson, p.5, p.8.
[44] Carr and Taplin, p.95. Burn, *Economic History*, pp.19-27.
[45] W. Rees and C. Rees, pp.46-7.
[46] Atkinson and Baber, p.15.

established Welsh manufacturers withdrew from iron rail production by 1877[47]. Cwmavon was a casualty of that process.

In 1877 all the company's local assets were purchased by James Shaw, an engineer from Aberdeen. He immediately formed a limited company under the name of 'The Cwmavon Estates and Works Company Limited' and ran this as managing director until 1882. Production continued at the copper works, the blast furnaces, the western bar mills and the collieries. In 1878 the Coppee Company (Great Britain) Limited built a battery of 80 non by-product coke ovens at Cwmavon. Iron ore was imported from Spain and production in 1880 amounted to over 1,000 tons of iron/week[48].

By 1883 the iron and steel industries went into a 3 year long deep worldwide depression. This resulted in a fall in pig iron output. During 1883 only 12 Welsh puddling furnaces were working compared to 30 a few years earlier[49]. In 1882 the Cwmavon Estates and Works Company was hit by the trade depression and went into liquidation. The closure came very early as it was 1883 when the full downturn in trade took place. This suggests that other factors were at work. These factors include lack of modern plant and with imported ore locational disadvantages. This caused a further break up of the company into smaller units. The copper works remained idle until 1884 when it was purchased by the Rio Tinto Company. The remaining plant i.e. the blast furnaces, forges and collieries were taken over by a new company, the 'Cwmavon Works Proprietors' in 1884[50]. The works were probably idle between 1882 and 1884. A small steelworks, the Express Steelworks, was built near to the blast furnaces which worked for four years between 1889 and 1893 supplying steel bars to the Cwmavon tinplate works. It was the first steelworks in the Port Talbot area. In 1893 Wright, Butler and Company, to whom ownership had passed in 1892, closed it[51]. They only kept one blast furnace in operation with an output of approximately 500 tons/week and even this was soon taken out of

[47] Burn, *Economic History,* p.28.
[48] W. Rees and C. Rees, pp.46-47.
[49] Carr and Taplin, pp.104-106.
[50] W. Rees and C. Rees, pp.47-48. Brinn, p.6.
[51] Carr and Taplin, p.269. Robert Protheroe-Jones, *Welsh Steel* (Cardiff: National Museum of Wales, 1995), p.17.

operation although not demolished until 1928[52]. The coke ovens continued to operate until 1921 leaving only the tinplate works in production[53]. Unlike the other undertakings in Cwmavon this continued to flourish. In 1941 the tinplate works was acquired by the Government Ordinance Department and production ceased in 1944. It was dismantled in 1946 under the Tinplate Redundancy Scheme[54].

From the 1870s onwards two fundamental pressures worked against Cwmavon. Firstly the replacement of wrought iron by steel because of its lower production costs and superior physical properties meant that its output became technologically obsolete. No successful conversion to steelmaking took place largely because of the scale of investment required. Whether a larger company with greater access to capital could have achieved a transition at this site is open to question. The second factor was that once the local ore had to be supplemented, and the proportion of coal to ore required declined, the site lost its locational advantages. It then made more economic sense to produce iron and steel on the coast and eliminate the costly transport of iron ore to Cwmavon. This last factor meant that a successful conversion to steelmaking at this site would have been very unlikely.

The new owners, Wright, Butler and Company, were to play a crucial role in the subsequent history of steel at Port Talbot but in the 1880s and 1890s its primary attention was elsewhere. The company was formed in 1878 by Colonel Sir John Roper Wright to produce open-hearth steel tinplate bars at the Elba Steelworks, Gowerton near Swansea. Wright and Butler had been associated with the building of an open-hearth steelworks at Panteg in 1873 to make steel rails and fishplates. This had closed in 1879. Wright, Butler and Company acquired it in 1882 but converted it to produce tinplate bars. During 1885 Alfred Baldwin and Company opened the Panteg Tinplate Works. In 1892 Baldwin in association with Wright and Butler restarted the Pontymoila Tinplate Works. Both here and at Panteg they started to produce galvanised sheet in 1895[55]. This led on the 7th April 1902 to the

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[52] 'Blast Furnace Statistics', *I&CTR*, 11th February (1910), 224, and 25th April (1913), 665. Philip Riden and John Gilbert Owen, *British Blast Furnace Statistics 1790-1980* (Cardiff: Merton Priory Press, 1995), pp.10-11.
[53] W. Rees and C. Rees, p.48. Brinn, p.6. Jackson, p.404.
[54] H.R. Jones, p.28.
[55] Carr and Taplin, p.114, p.269. Warren, *British Iron and Steel*, pp.74-75.

amalgamation of Wright, Butler and Company with Alfred Baldwin & Company Limited, E.P.W. Baldwin Limited, the Blackwell Galvanised Iron Company Limited, and the Bryn Colliery Company to form Baldwins Limited[56]. Wright stated that the object of the merger was to more effectively meet competition[57]. An anonymous company official also stated that the merger would result in more economic working which would help fight foreign competition[58]. They were attempting to rationalise production and exploit the benefits of economy of scale.

This merger was part of a wider process that was underway within the British steel industry at the time. It was no coincidence that big groups began to emerge at this time including Dorman Long, Guest Keen and Nettlefold (GKN) and Stewarts and Lloyds. The stimulus for these mergers was the effect of foreign competition, growth of giant corporations overseas and the need to rationalise to meet this challenge[59]. Baldwins emerged as an integrated company with interests in coal and pig iron production through to a wide range of finished products, particularly sheet[60]. At formation Baldwins had a nominal capital of £1,000,000 with the distribution of shares :-

Table 1.1: Baldwins' Initial Shareholders[61]

	Shareholding
Alfred Baldwin MP	25,000
John Roper Wright	20,000
Isaac Butler	25,000
Roger Beck	20,000
Stanley Baldwin	5,000
Samuel L. Dore	5,000
H.A. Saunders	100
Total	**100,100**

[56] Anon. 'Great Steel Combine'. *South Wales Daily Post* (henceforth *SWDP*), 26th March 1902. Anon. 'Baldwins Limited'. *The Economist* (henceforth *Economist*), 19th October 1919, p.751. Anon. 'The New Margam Works of Baldwins Ltd', *I&CTR*, 17th September (1920), 354-359 (p.353). J. Horton, 'Baldwins Adds New Plant', *I&CTR*, 21st October (1920) 1133-1139 (p.1133). GKB, p.31. Carr and Taplin, p.268. Warren, *British Iron and Steel,* pp.106-107. Rees and Rees, p.48. Vaizey, p.9. Brinn, p.6. Jackson, p.404.
[57] John Roper Wright. Quoted in 'Great Steel Combine'. *SWDP*, 26th March 1902.
[58] Anon, 'Big Iron and Steel Combine'. *SWDP*, 9th April 1902.
[59] Carr and Taplin, p.183. Warren, *British Iron and Steel,* pp.106-107.
[60] Carr and Taplin, pp.268-269.
[61] Anon, 'Big Iron and Steel Combine'. *SWDP*, 9th April 1902.

It was proposed to only issue 4½% debentures and 5½% preference shares to the public.

At its formation in 1902 Baldwins had major South Wales interests in the production of tinplate and sheet. What they lacked was a significant interest in the heavy end of the steel industry producing plate, sections, rails etc. It was this that subsequently drew them into developments at Port Talbot.

Wright, Butler and Company were the last of a succession of proprietors, partners and limited liability companies (as well as an interlude of ownership by the Bank of England), who tried to make a success of iron production in the Port Talbot area during the nineteenth century. All of them struggled with the boom and bust of the industrial cycle, shortages of capital, shifts in technology and locational advantage. But Cwmavon and its neighbourhood gradually lost its early locational advantages and became a marginal production area. Considerable energy was expended by local entrepreneurs in attempting to resolve these problems but by the end of the nineteenth century iron and steelmaking had ceased in the Port Talbot area.

Chapter 2: Port Talbot Steelworks 1901-1921: From Failure to Success: A Tale of Two Companies

This chapter looks at the first two Port Talbot steel companies that were formed in the early years of the twentieth century. It explains their contrasting failure and success up to the early 1920s. Port Talbot Steelworks was built by the Port Talbot Iron and Steel Company (PTI&SC) in 1901-02 formed by the Gilbertsons, a steelmaking family based in Pontardawe who wanted to exploit market opportunities as the price of tinplate and tinplate bar rose from 1899 and Emily Talbot. It failed within a year of production starting. The existing literature[62] claims that the failure was due to technical and industrial relations problems but this chapter argues that the primary cause of the failure was a cash flow problem caused by an underestimation of building costs. The cash flow problem meant that the technical issues encountered could not be overcome. It also argues that the steelworks was too small to be viable and that the PTI&SC failed to meet customer demands.

The Port Talbot Steel Company (PTSC) was formed in 1906 to reopen the steelworks. Baldwins and the Gloucester Railway Carriage and Wagon Company (GRCWC) were joint owners. The latter became a joint owner to secure a reliable source of plate for their railway wagon building business. Ownership later broadened to include shipbuilders who were also trying to secure a source of plate. By doing this Baldwins were getting their customers to partly finance the required investment before they bought out their partners in 1915. This was triggered by their plans to build a nearby iron works. As Port Talbot Steelworks was obtained from Emily Talbot/Margam Estate for much less than it had cost to build it allowed the PTSC to raise the necessary capital for expansion and diversification into new and expanding product ranges. It is argued that diversification of the product base reduced the vulnerability of the company if demand for one product fell dramatically. The costs of expansion and the scope of Government assistance during the First World War are examined along with the financial performance of the company through to the early 1920s. It reveals a highly profitable company but that the seeds of future problems of industry overcapacity during the 1920s were sown during World War One.

[62] Brinn, p.6. Jackson, p.22.

To understand the rationale behind building Port Talbot Steelworks it is necessary to examine the wider local industrial scene at the turn of the twentieth century. Towards the end of the nineteenth century the mine owners of the Llynfi, Garw and Ogmore Valleys became concerned about the inadequacies of Porthcawl Harbour through which their coal exports were being shipped. It was owned by the Great Western Railway (GWR) who were unable, or unwilling, to expand the facilities due to the treacherous nature of the seaward approaches to the harbour[63]. To find a suitable outlet for their expanding coal exports they initially looked towards the new dock at Barry. Unfortunately it lacked an adequate rail connection as the construction of the connecting Vale of Glamorgan Railway was proceeding very slowly. Instead they looked westward towards Port Talbot.

In 1890 steps were taken to promote a public company to improve the existing Port Talbot Dock to handle larger modern vessels and to provide a railway connection with the neighbouring coalfield[64]. The resulting Port Talbot Railway and Dock Company (PTR) was incorporated on 31st July 1894. Its largest shareholder was the daughter of C.R.M. Talbot, Emily Talbot through her Margam Estate. The railway opened for freight in August 1897 and the dock in 1898 although it was not finally completed until 1901[65]. Despite steady growth the early years saw trade at the dock well below its full capacity. The PTR saw the Pontardawe steelmakers, the Gilbertsons, as a potential means of developing trade.

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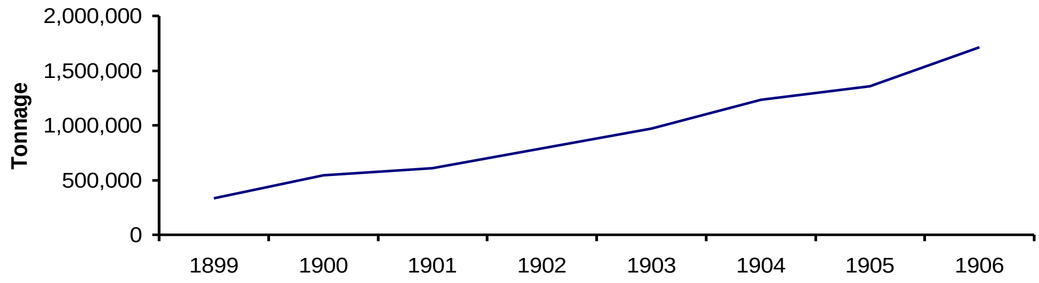
[63] James Page, *Forgotten Railways, South Wales* (Newton Abbot: David & Charles, 1976), p.113.

[64] E. de la Praudiere, *Port Talbot And Its Progress* (Port Talbot: Port Talbot Railway and Docks Company, 1919), p.10.

[65] J.V. Hughes, 'Emily Charlotte Talbot (1840-1918)', *Transactions of the Port Talbot Historical Society*, Vol II(3) (1974), 85-95 (p.91). D. Morgan Rees, *Industrial Archaeology of Wales* (Newton Abbot: David & Charles, 1975), p.210. Page, pp.113-114. D.S.M. Barrie, *A Regional History of the Railways of Great Britain, Volume 12, South Wales* (Newton Abbot: David & Charles, 1980), p.182. H. Morgan, *South Wales Branch Lines* (Shepperton: Ian Allan, 1984), pp.84-85. M. Hale 'From Port Talbot to the Garw', *The Welsh Railway Archives: The Journal of the Welsh Railway Research Circle*, Vol1(9) May (1994), 243-246 (p.244).

Figure 2.1: Total Tonnage Through Port Talbot Dock 1899-1906[66]



In 1861 William Gilbertson left Cwmavon and leased the Pontardawe Tinplate Works which he and his son Arthur developed. On William's death in 1882 leadership of W. Gilbertson & Co Ltd passed to Arthur. In 1890 he installed two open-hearth furnaces at Pontardawe and opened the Glynbeudy Tinplate Works at Brynamman[67].

Although South Wales had produced tinplate from at least 1720, from 1870 onwards tinplate production tended to be concentrated in the Swansea sub-region. The area had locational advantages in the form of available coal, navigable rivers to import raw tin and export finished tinplate, adequate water supplies, experienced workers readily available from the declining copper industry and sufficient sulphuric acid as a by-product from copper smelting[68].

In 1900 Gilbertson was looking to expand steelmaking capacity. His firm like other South Wales firms involved in the tinplate industry had been badly affected when the American Congress passed the McKinley Act. This imposed a tariff on all tinplate imported into the USA of 2.2 cents/pound from July 1891 in order to stimulate tinplate production in the USA. It raised the cost of Welsh tinplate imported into the USA by 70%[69].

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[66] PTR, *The Port Talbot Railway and Dock Co-Handbook of Rates, Dry Dock Accommodation and General Information* (Port Talbot: Private Publication, 1913), p.6. de la Praudiere, p.20.
[67] Jackson, p.12.
[68] Paul Jenkins, pp.23-30.
[69] Ibid, pp.40-41. Carr and Taplin, pp.116-117.

The impact initially was not as great as might have been expected as the American industry was not large enough to fully supply their canning industry. It really took effect from 1894. The result was that the price dropped from 18s 3d per box in 1891 to under 10s in 1894. There were 519 tinplate mills in South Wales in 1890 but only 308 in the whole of the UK by mid 1896[70]. During 1899 tinplate demand began to increase. As a consequence there was a rise of over 50% in the price of tinplate bars to £7-0-0d a ton. The number of working tinplate mills in South Wales increased from 319 in January 1899 to 416 in October 1899. This increase in demand was driven by the home market. British tinplate consumption increased from 2,300,000 boxes in 1896 to 4,400,000 in 1906 due to greater demand from the food canning industry[71].

The McKinley tariff cost the Gilbertsons virtually all their trade with the USA (225 tons/week). In response to this they converted their tinplate mills into sheet mills and began to galvanise from 1899 (they returned to the tinplate trade in 1911 with a new 6 mill works)[72]. During 1900 with home demand and prices for tinplate and sheet increasing the Gilbertsons decided to increase their steelmaking capacity to meet demand for tinplate bars. In 1900 Arthur Gilbertson agreed to build a new steelworks on a 12 acre site adjacent to Port Talbot Dock. The decision resulted from a convergence of interests of the Gilbertsons, Emily Talbot/Margam Estates and the PTR. Emily Talbot's cousin, and Clerk to Glamorgan County Council, Thomas Mansel Franklen aware of the benefits of a steelworks to local employment and to the PTR approached the Gilbertsons about the possibility of building a steelworks at Port Talbot[73]. The approach was encouraged by Emily Talbot/Margam Estate who agreed to lease the land[74]. She was also prepared to financially support the building of the steelworks through the use of a debenture/mortgage, the issue of shares to nominees and acting as guarantor for bank loans. A private joint stock company was established. The financial structure was such that in the event of

[70] Carr and Taplin, pp.116-117, p.144.
[71] Ibid, pp.186-187, p.190. Paul Jenkins, p.43.
[72] Warren, *British Iron and Steel*, p.75. Jackson, p.20.
[73] J.V. Hughes, 'Emily Charlotte Talbot (1840-1918)' p.91. Jackson, p.22.
[74] Jackson, ibid. Arthur Gilbertson, 'Letter to TM Franklen', 29th August 1902, in Jackson, p.94. Ibid, 'Letter to S.B. Barlow', 18th August 1902, pp.90-91.

company failure all the property went to Emily Talbot/Margam Estate[75]. As will be seen this would occur. This financial structure was typical of the pattern that Ranald Michie claims to be the main means of raising funding for industrial investment in the late nineteenth century where funding was raised through friends, relatives or business acquaintances[76].

The site held clear advantages for steelmaking. Firstly there was sufficient land available to build a steelworks and importantly enough for future expansion. The nearby dock allowed the import of raw materials and export of finished products. There was good railway access to coal over the PTR. The nearby GWR mainline allowed the easy movement of raw materials in and finished products out onto the national railway network[77]. Overall the location offered considerable advantages for steelmaking.

The new company, the PTI&SC, was incorporated on 21st August 1900 with a nominal capital of £10,000 divided into 200 ordinary shares of £50 each[78]. Initially only £2,500 of capital was called up split between the Gilbertson family and nominees of Emily Talbot/Margam Estate[79]. Over the next two years the capital was increased to £40,000. Most leading positions in the company were held by members of the Gilbertson family with Arthur Gilbertson acting as Managing Director[80].

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[75] Arthur Gilbertson, 'Letter to T.M. Franklen', 29th August 1902, pp.94-95. Ibid, 'Letter to Messers Barlow and Barlow', 27th August 1902, p.93.
[76] Ranald C. Michie, *The London and New York Stock Exchange 1850-1914* (London: Allen and Unwin, 1987), pp.105-106, and *The London Stock Exchange–A History* (Oxford: Oxford University Press, 1999), p.93.
[77] Jackson, p.22.
[78] Kew, National Archives (henceforth NA), Ref BT 31/9058/67018, Port Talbot Iron And Steel Company Limited, Memorandum and Articles of Association, 1900. Ibid, Port Talbot Iron And Steel Company Limited, Certificate of Incorporation, 24th August 1900.
[79] Ibid, Port Talbot Iron And Steel Company Limited, Summary Of Capital And Shares, 28th September 1900.
[80] Ibid, Port Talbot Iron And Steel Company Limited, Copy of the Register of Directors or Managers, 8th January 1901; Port Talbot Iron And Steel Company Limited, Special Resolutions, passed 11th December 1901 and confirmed 6th January 1902; Port Talbot Iron And Steel Company Limited, Statement of Increase of Nominal Capital, 21st January 1902; Port Talbot Iron and Steel Company Limited, Return of Allotments from 1st February 1902 to the 20th May 1902; Port Talbot Iron and Steel Company Limited, Summary Of Capital And Shares, 14th January 1903.

The building of the steelworks took place during 1901-02. Sir C. Furness originally estimated the cost to be £70,000. A subsequent estimate from Taylor and Farley increased this to £100,000. By early April 1902 the actual cost was already £110,000. They had accepted Furness' estimation which had underestimated the cost of installing the groundbreaking electrical and hydraulic power, the difficulty in getting suitable water supplies, and the cost of the foundations[81].

By August 1902 the company had mortgages/debentures of £130,000 and still needed £15,000 to pay off the contractors and interest on the mortgage[82]. Therefore building costs must have been approximately £145,000 (not the £250,000 quoted by Brinn[83]). Even before production had started the PTI&SC was in financial trouble through an underestimation of the building costs. As will be seen this miscalculation led to a cash flow problem which resulted in company failure even before the technical problems described in the literature fully emerged.

The plant included a battery of three cupolas with blowing plant to re-melt purchased pig iron to supply molten iron to the two 60 ton open-hearth furnaces for steel production[84]. These were relatively large furnaces for the time. During 1904 only 12% of all British open-hearth furnaces were of 50 tons capacity or more. The majority were between 20-30 tons capacity with the larger furnaces being concentrated in Scotland and the North East[85]. Although only two furnaces were initially built more furnaces were later added to the melting shop. Therefore it was built with the potential for future expansion. Even before completion in 1902 a German firm approached the Gilbertsons about adding blast furnaces[86]. These blast furnaces were never built.

To obtain pig iron for the steelmaking process the Gilbertsons approached a Canadian firm. They were already fully committed to supplying the American market

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[81] Arthur Gilbertson, 'Letter to T.M. Franklen', 4th April 1902, in Jackson, p.80. Ibid, 10th April 1902, pp.80-81; 'Letter to Charles Cheston', 16th April 1902, p.82.
[82] Ibid 'Letters to T.M. Franklen', 6th August 1902, pp.86-87 and 5th August 1902, p.86.
[83] Brinn, p.6.
[84] GKB, p.32. Brinn, p.6. Jackson, p.22, p.407.
[85] Carr and Taplin, p.195.
[86] Anon. Blast Furnaces For Port Talbot Big Anglo-German Enterprise. *SWDP*, 1st March 1902, p.3.

so they approached a German firm but their price was too high. In the end they bought 4,000 tons of pig iron from the Ukraine for delivery starting in May 1902[87].

Technical problems with the steelmaking process meant that the pig iron could not be used as quickly as anticipated. This only worsened the PTI&SC's already difficult cash flow problem[88]. Gilbertson claimed that they had bought 'abnormal' amounts of pig iron because Franklen, now a PTI&SC director, had told them *"not to miss a favourable chance of getting pig iron[89]"*. This is a surprising statement. As established steelmakers they were relying on a non steel man to determine raw material purchasing policy. This indicates slack control.

Steel was made by a modification of the Bertrand-Thiel process called the Pourcel method. The Bertrand-Thiel process had evolved during the 1890s at Kladno in Austria as an attempt to make open-hearth steelmaking using lower grade, highly phosphoric basic pig iron a continuous process. It involved two steel refining furnaces instead of one with the charge being partially refined in the first furnace before being tapped into the second for finishing. It was claimed to reduce costs by over 25% and increase output but it was rarely used in Britain or on the continent for technical reasons[90].

It was at the cupolas that the only recorded incidents of industrial action occurred. In July 1902 the workers asked for what Gilbertson claimed to be "*unreasonable wages for unskilled men*". They affected production for a week but were dismissed without a strike[91]. This can hardly have been responsible for the company failure[92], though it seems to have been used as an excuse to deflect responsibility for the company's failure from the Gilbertsons.

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[87] Arthur Gilbertson, 'Letter to Charles Cheston', 16th April 1902, p.82. Ibid, 'Letters to T.M. Franklen', 13th February 1902, p.79 and 14th April 1902, p.93. Anon. Russian Pig-Iron At Swansea-Another Consignment On The Way Here. *SWDP,* 29th April 1902, p.3.
[88] Arthur Gilbertson, 'Letters to T.M. Franklen', 29th August 1902, pp.94-95 and 5th August 1902, p.86.
[89] Ibid, 'Letters to T.M. Franklen', 9th August 1902, p.88 and 13th August 1902, p.88.
[90] Carr and Taplin, p.215, p.269.
[91] Arthur Gilbertson, 'Letter to Owen Davies', 19th July 1902, p.84. Ibid, 'Letters to T.M. Franklen', 21st July 1902, p.84 and 26th July 1902, p.84.
[92] Brinn, p.6.

Port Talbot Steelworks was built to initially produce between 650-700 tons of steel/week. The open-hearth furnaces were commissioned in the spring of 1902[93]. By late July 1902 Gilbertson stated that he hoped to increase weekly output to 1,000 tons/week once the technical problems were sorted and a third furnace added[94]. Actual output only reached 2,800 tons in July[95]. The projected output of 1,000 tons/week was certainly low compared to most Swansea area steelworks :-

Table 2.1: Swansea Area Steelworks Capacities[96]

Steelworks	Opened	Maximum Weekly Capacity	Closed
Landore-Swansea	1868	1,600tons (5 open-hearth furnaces)	1951
Elba-Gowerton	1870	2,450tons (6 open-hearth furnaces)	1967
Melyn-Neath	1883	200tons (2 open-hearth furnaces)	1903
Upper Forest-Swansea	1886	2,000tons (4 open-hearth furnaces)	1957
Briton Ferry Steel	1890	1,500tons (8 open-hearth furnaces)	1951
Pontardawe	1890	2,000tons (5 open-hearth furnaces)	1962
Albion Works-Briton Ferry	1893	5,000tons (8 open-hearth furnaces)	1978
Bryngwyn-Gorseinon	1897	1,600tons (5 open-hearth furnaces)	1951
Gravesend-Gorseinon	1900	2,000tons (5 open-hearth furnaces)	1961
Cwmfelin-Swansea	1905	2,000tons (5 open-hearth furnaces)	n/a

The technical problems had not been overcome by late August 1902. Output was just 600 tons/week and the PTI&SC was beginning to lay men off. Gilbertson was now complaining that they had been misled by the patentees as to what this method of steelmaking could achieve[97].

Port Talbot Steelworks' only rolling mill was a three stand 32" bar mill used for the production of steel sections, tinplate bars and billets[98]. It was probably the first mill in Britain to have electrically driven auxiliaries[99]. Problems were also encountered in the mill where the machinery was too powerful for the production of tinplate bars. During September 1902 a customer complained about the tinplate bars being

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[93] Jackson, p.22. Corus, *Port Talbot A Century*, p.1.
[94] Arthur Gilbertson, 'Letters to T.M. Franklen', 5th August 1902, p.86 and 26th July 1902, pp.84-85.
[95] GKB, p.32.
[96] C.W. Roberts, p.164.
[97] Arthur Gilbertson, 'Letter to Messers Barlow and Barlow', 27th August 1902, p.93. Ibid, 'Letter to Charles Chesterton', 22nd September 1902, p.95.
[98] Anon, 'The Port Talbot Steel Works', *I&CTR*, 17th September (1920), 362. GKB, p.32.
[99] Brinn, p.6.

underweight although the quality was described as excellent[100]. This again indicates a lack of managerial control. The Gilbertsons were fully occupied dealing with the steelmaking problems and trying to raise more capital. As a consequence they neglected rolling operations and customer requirements.

It is clear that the Gilbertsons put a great deal of effort into improving a technically difficult method of steelmaking. An additional problem was that the workforce was inexperienced with this method. It also became clear that a third furnace was needed but the lack of capital made this impractical. A further problem was that the price of tinplate fell just as the steelworks was starting up :-

Table 2.2: UK End of Year Prices of Bessemer Tinplate Steel[101]

	Tinplate Bars (per ton) £-s-d	Tinplate (per box) £-s-d
1899	£7-0-0	£0-15-9
1900	£5-5-0	£0-13-3
1901	£4-17-6	£0-13-0
1902	£4-12-6	£0-11-9
1903	£4-5-0	£0-11-3
1904	£4-6-6	£0-12-6
1905	£5-1-6	£0-13-0
1906	£6-0-0	£0-15-0

Gilbertson attributed this to under priced German tinplate bars coming into South Wales. The PTI&SC's response was to try to widen the product base to produce tram rails and sections but again the lack of capital prevented this[102]. In an attempt to raise more capital Gilbertson wrote on a number of occasions to Franklen asking him to intercede with Emily Talbot/Margam Estate but she was unwilling to invest further[103]. The Margam Estate accounts for the year ended 24th March 1906 showed a balance in the capital account of £948,970 but stated :-

[100] Arthur Gilbertson, 'Letter to Owen Roberts', 19th August 1902, p.91. Ibid, 'Letter to Charles Chesterton', 22nd September 1902, p.95.
[101] Carr and Taplin, p.190.
[102] Arthur Gilbertson, 'Letters to T.M. Franklen', 6th August 1902, pp.86-87; 26th July 1902, pp.84-85; 1st August 1902, p.85 and 17th July 1902, p.82.
[103] Ibid, 'Letters to T.M. Franklen', 4th April 1902' p.80; 10th April 1902, pp.80-81; 5th August 1902', p.86; 13th August 1902, pp.88-90; and 1st August 1902, pp.85-86. Ibid, 'Letter to Owen Davies', 19th July 1902, p.84.

"It should, however, be remembered that included in the above £948,970 is the Asset – Port Talbot Iron and Steel Co Limited Loan account £89,817-13s-9d (the ultimate realisation of which is very doubtful)….. [104]."

All production ceased at Port Talbot Steelworks in February 1903. Approximately 250 men were made redundant[105]. The PTI&SC was wound up in 1904[106]. After the closure the Gilbertsons concentrated on increasing steel production at their Pontardawe Steelworks. In 1933 they were taken over by Richard Thomas and Co for £350,000[107]. Under the terms of the debenture/mortgage Port Talbot Steelworks became the property of Emily Talbot/Margam Estate[108].

The main reason for the PTI&SC's failure was a cash flow problem and undercapitalisation. This emanated from a gross underestimation of the cost of building the steelworks. They accepted the lowest estimate even though others quoted much higher figures. Even these proved to be below the actual building cost. As a result insufficient capital was raised. The Gilbertsons then failed to raise the additional capital required to overcome the technical problems, increase production and to diversify the product base. The choice of a novel method of steelmaking was always going to be a risk. It was a failure which linked to a lack of capital meant that there was no scope for manoeuvre when things went wrong. A workforce inexperienced in this steelmaking method added to the problems. Other managerial failures included a lack of control over the production process resulting in under weight tinplate bars and over purchasing of raw materials. The fall in the price of tinplate bars exacerbated the problems.

Port Talbot Steelworks, now owned by Emily Talbot/Margam Estate, lay idle from 1903. Emily Talbot was the PTR's largest shareholder. The PTR's Chairman was Sir John Roper Wright, a major shareholder and director of Baldwins. He was in an excellent position to fully appreciate the potential of this site for a successful

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[104] Margam Estate, *Estate Accounts–Year Ending 24th March 1906*, Port Talbot Library Archives, pp.4-5.
[105] 'News Item', *I&CTR,* 6Th February (1903), p.379. GKB, p.33. Brinn, p.6. Jackson, pp.95-96.
[106] Kew, NA, Ref BT 31/9058/67018, Port Talbot Iron and Steel Company Limited, Letter from the Liquidator to the Registrar of Joint Stock Companies, 28th March 1904.
[107] Vaizey, p.78. Warren, p.176.
[108] Arthur Gilbertson, 'Letter to Messers Barlow and Barlow', 27th August 1902, p.93.

steelworks. In 1905 Emily Talbot approached and persuaded Wright to reopen Port Talbot steelworks under Baldwins[109].

Wright was to become the first major personality in the twentieth century history of steelmaking at Port Talbot. He was born near Chorley in Lancashire in March 1843. Wright undertook an engineering apprenticeship in Preston and assisted William Siemens in developing the open-hearth steelmaking process. Following this he became a prominent manager at the Landore-Siemens Steel Company. During 1873 he formed an association with Isaac Butler which led to the formation of Wright Butler and Co and was the driving force behind the formation of Baldwins. In 1908 he became Baldwins' chairman and led their expansion to make Baldwins a major player in both the steel and tinplate industries. He had practical knowledge of the steel industry as both an engineer and as a senior manager[110].

Why then did Baldwins want to reopen Port Talbot Steelworks? From 1901 onwards the overall trend in British steel ingot production was upwards (see Appendix 1). Between 1905 and 1914 British steelmakers found expanding markets in the Empire for such heavy products as plate, girders and rails. This was part of a worldwide increase in steel production from 36 million tons in 1904 to 75 million tons in 1913[111]. From 1903 steel prices, including tinplate bars, were rising again (see table 2.2). Rising output and prices made this an ideal time for Emily Talbot/Margam Estate to get Port Talbot Steelworks back into production and to recoup at least some of her investment.

In August 1906 a new company, 'The Port Talbot Steel Company Limited' was registered to take over Port Talbot Steelworks with a nominal capital of £100,000 divided into shares of £1 each[112]. There were six directors including the future Prime

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[109] Jackson, p.96.
[110] Graeme M. Holmes. *Wright, Sir John Roper*. *Dictionary of Business Biography*, Vol 5 S-Z (London: Butterworths, 1986), pp.897-901.
[111] Burn, *Economic History*, pp.332-335.
[112] Kew, NA, Ref BT 31/17841/8923, Port Talbot Steel Company Limited: Application for a Certificate of Incorporation, 8th August 1906. Ibid, Port Talbot Steel Company Limited, Declaration of Compliance with the requisition of the Companies Acts, 8th August 1906; Port Talbot Steel Company Limited, Memorandum of Association, 8th August 1906; Port Talbot

Minister, Stanley Baldwin, and John Roper Wright. The main shareholders in the new company were Baldwins and the Gloucester Railway Carriage and Wagon Company who each nominated 3 directors[113]. Duncan Burn is therefore incorrect when he states that Baldwins virtually absorbed the Port Talbot Company in 1906[114]. They only controlled a half of the PTSC shares. It was 1915 before Baldwins bought out the GRCWC.

The PTSC initially leased the site but purchased the plant. They later purchased the site[115]. Baldwins benefited from an increase in steelmaking capacity at a time of rising demand and prices for what was, and will be shown as, a very low price. Yet there were other substantial benefits to Baldwins. By going into partnership with the GRCWC, Baldwins were sharing the cost and getting a customer to partly finance the ensuing expansion. Thus Baldwins' risk was reduced. As the steelmaker Baldwins would be in charge of day to day operations. The product base was to be broadened to include plate and later rails and sections. Thus Port Talbot was moving into new markets. This allowed Baldwins to compete regionally with Guest Keen and their steelworks at Dowlais and Cardiff. It also reduced the risk from sudden market collapse in particular product lines as had happened with tinplate in the 1890s. By broadening their product base Baldwins could shift production into other products at times of difficulty with one product. Thus from Baldwins' perspective the formation of the PTSC can be seen as both aggressive in challenging the established heavy product steelmakers and defensive in that it reduced the chances of company failure by broadening the product base.

There were also advantages for the GRCWC in establishing a stake in a steel company. This period saw an increased use of steel in the construction of railway

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Steel Company Limited, Certificate of Incorporation, 13th August 1906. Brinn, p.6. Jackson, p.96.

[113] Kew, NA, Ref BT 31/1784/8923, Port Talbot Steel Company Limited, Copy of Register of Directors or Managers, 22nd August 1906. Ibid, Port Talbot Steel Company Limited, Return of Allotments, 16th August 1906. GKB, p.35. Carr and Taplin, p.269. Brinn, p.6. Corus, *Port Talbot A Century*, p.3.

[114] Burn, *Economic History*, p.335.

[115] Kew, NA, Ref BT 31/1784/8923, Port Talbot Steel Company Limited, Companies (Consolidated) Act 1908, Particulars Supplied to Registrar for an Issue of Debenture for Stock for £300,000, 27th March 1914.

wagons which stimulated demand for light plate[116]. To cater for this new market a light plate mill was built at Port Talbot and commissioned in September 1908 as the GRCWC had experienced difficulty in obtaining steel plate to construct railway wagons[117]. The building of the light plate mill guaranteed the GRCWC a source of raw materials[118]. They regularly placed substantial orders at Port Talbot[119]. The GRCWC were therefore involved in a process of vertical integration. Their financial stake in the PTSC ensured their loyalty as a customer.

As for the PTSC's financial structure the initial nominal capital of the company was £100,000. Only 50,007 shares were distributed in August 1906 with 25,000 each going to Baldwins and the GRCWC[120]. The 7 remaining shares were issued to the directors. These were fully paid with the remaining 50,000 shares only raising 6/- per share. Therefore only £15,007 was raised in capital. Also in August 1906 the PTSC issued a debenture of £40,000 to Emily Talbot/Margam Estate[121]. To the 5th October 1906 the receipts and payments of the company on its capital account were:-

Table 2.3: Capital Account Receipts and Payments to 5th October 1906[122]

Particulars of Receipts	£	Particulars of Payments	£
From Shareholders	15,007	Purchase-Contract 16-8-06	10,000
From Miss Talbot	40,000	Purchase of Plant	40,000
		Preliminary Expenses	700
		Purchase of New Plant	1,263
Total	**55,007**	**Total**	**51,963**

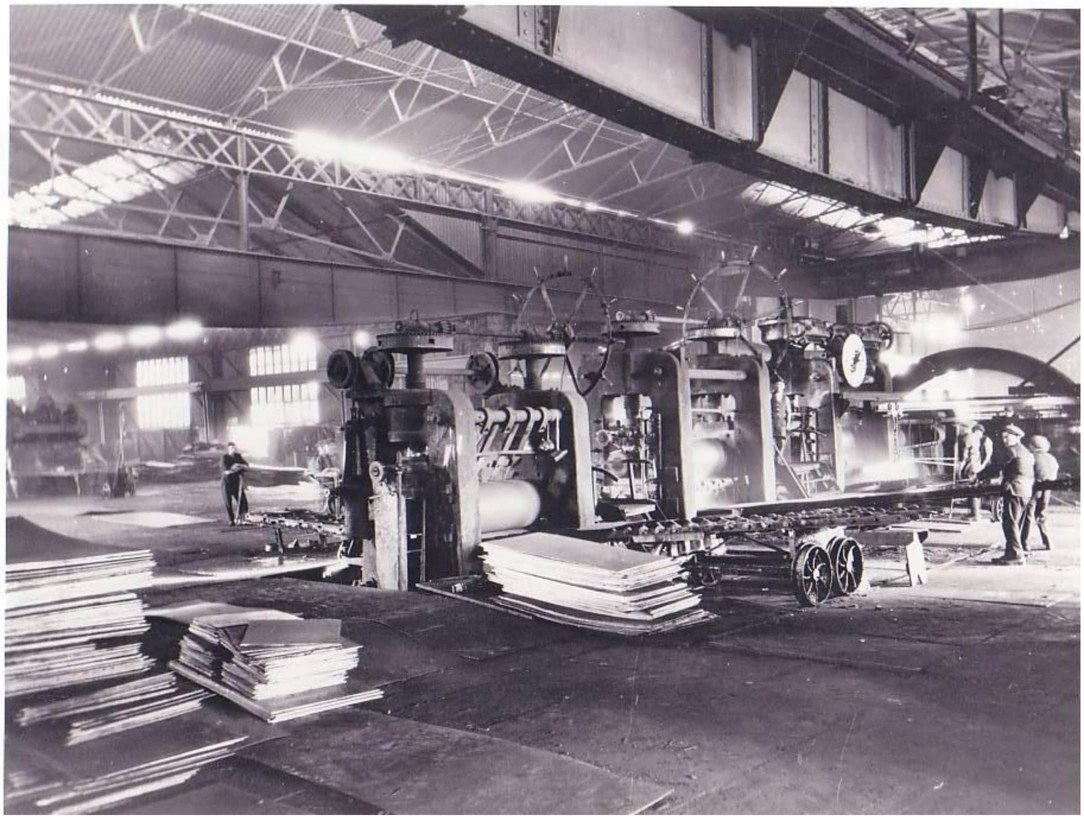
[116] Anon. 'Gloucester Railway Carriage and Wagon Company AGM', 26th August 1908. *Economist*, 29th August, 1908, p.413. GKB, pp.35-36. Brinn, p.6.
[117] Richard Vassar-Smith, 'Chairman's Address to the Gloucester Railway Carriage and Wagon Company AGM'. *Economist*, 29th August 1908, p.413.
[118] J. Hicks-Beach, 'Chairman's Address to the Gloucester Railway Carriage and Wagon AGM'. *Economist*, 28th August 1909, p.430.
[119] J. Ivor Hanson, *Profile Of A Welsh Town* (Port Talbot: Private Publication, 1969), p.92.
[120] Kew, NA, Ref BT 31/1784/8923, Port Talbot Steel Company Limited, Return of Allotments, 16th August 1906. Ibid, Port Talbot Steel Company Limited, Report pursuant to s.12 of the Companies Act 1900, 1906.
[121] Ibid, Port Talbot Steel Company Limited, Return of Allotments, 16th August 1906; Port Talbot Steel Company Limited, Report pursuant to s.12 of the Companies Act 1900 (63 and 64 Vict c.48), 1906; Port Talbot Steel Company Limited, Summary of Capital and Shares Made Up to 31st October 1906.
[122] Ibid, Port Talbot Steel Company Limited, Report pursuant to s.12 of the Companies Act 1900 (63 and 64 Vict c.48), 1906.

The PTSC acquired Port Talbot Steelworks and invested in new plant for just £40,000 raised by debenture and share capital of £15,007. The new plant related to the rebuilding of the open-hearth furnaces (see below). As the steelworks had cost £145,000 to build it was obtained for a very low price. What was even better for the PTSC was that Emily Talbot/Margam Estate provided the bulk of the capital to buy the steelworks off her. This was a paper transaction and the PTSC acquired the steelworks for virtually nothing. The method of acquisition allowed capital to be available to diversify into new profitable product lines.

What then did Emily Talbot/Margam Estate get from this arrangement? She effectively acted as a banker to the PTSC operating through loans secured by debentures. Interest would be paid and she was able to earn something on her original substantial investment in the steelworks. As mentioned earlier, she was the major shareholder in the PTR. A reopened steelworks would generate business for the local railway and dock. A similar financial relationship was put in place as with the PTI&SC where a debenture was issued. Company failure meant that ownership would again revert to her. The financial relationship differed in that she owned no shares in the PTSC even through nominees. The debenture was a means of reducing her financial risk.

The PTSC immediately started to modify the existing plant. The cupolas were dismantled and the furnaces rebuilt as normal cold charged open-hearth furnaces. This rebuilding reduced the capacity of the furnaces from 60 to 50 tons. One was acid and the other basic**.** The first steel was produced and rolled by the PTSC in January 1907. A third open-hearth furnace of 50 ton capacity came into operation in August 1907. In March and September 1908 two more 50 ton basic open-hearth furnaces were added. Also in September 1908 the light plate mill was installed[123]. The mill is shown below :-

[123] Anon, 'The Port Talbot Steel Works', *I&CTR,* 362. GKB, p.35. Brinn, p.6. Jackson, p.96.



To fund this a further £18,748 was raised by issuing the remaining shares to Baldwins and the GRCWC for 7/6d per share[124].

The PTSC began to make, and increase, its profits as shown below :-

Table 2.4: PTSC Profit and Loss 1909-1912[125]

Year Ending 31st March	Profit (Loss) (£)
1909	(4)
1910	8,089
1911	30,836
1912	45,159

Regrettably no information on turnover or on how the figures were made up is available. Throughout this period at yearly intervals £1,000 was paid off the original

[124] Kew, NA, Ref BT 31/1784/8923, Port Talbot Steel Company Limited, Return of Allotments, 21st February 1907. Ibid, Port Talbot Steel Company Limited, Resolution Passed At The Extraordinary General Meeting of the Shareholders at Port Talbot, 30th May 1907.

[125] Ibid, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 9th June 1909, and Balance Sheet at 31st March 1909. Ibid, to 13th June 1910, and at 31st March 1910; to 15th June 1911, and at 31st March 1911 and to 8th June 1912, and at 31st March 1912.

mortgage/debenture of £40,000[126]. The company was still raising capital. In 1907 an increase in nominal capital from £100,000 to £150,000 was authorised[127]. The call on this capital took place in the following years to finance further expansion :-

Table 2.5: Call on PTSC Shares 1909-1910[128]

Year Ending 31st March	No Fully Paid Up £1 Shares	No Shares Paid Up 10/- Each	No Shares Paid Up 15/- Each	Amount paid Up
1909	100,000	50,000	Nil	£125,000
1910	100,000	Nil	50,000	£138,500

Therefore between 1909 and 1910 the company raised an extra £13,500 capital from the shareholders. On 26th May 1909 a resolution was passed by the company authorising a second mortgage/debenture for £74,000[129]. Thus the company had raised £87,500 of extra capital. It is reasonable to assume that this capital was used to finance the continuing expansion. During 1912 there was a further increase in nominal capital from £150,000 to £500,000. This was done by the creation of 350,000, new £1 shares. Of this nominal increase of 350,000 only 189,000 new shares were actually allotted on 14th August 1912 with only an amount of 2/6d per share being paid[130]. This only raised £2,362-10s for the company. The distribution is shown below :-

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126 Ibid, Port Talbot Steel Company Limited, Notice of Satisfaction of Mortgage To The Extent of £1,000 To The Registrar of Joint Stock Companies Registered 5th July 1909; Port Talbot Steel Company Limited, Memorandum of Satisfaction of Mortgage or Charge for £1,000, 26th May 1909; 30th May 1910; 22nd May 1911 and 28th March 1912.

127 Ibid, Port Talbot Steel Company Limited, Resolution Passed At The Extraordinary General Meeting of the Shareholders at Port Talbot, 30th May 1907.

128 Ibid, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 9th June 1909 and Balance Sheet at 31st March 1909. Ibid, to 13th June 1910 and at 31st March 1910.

129 Ibid, Port Talbot Steel Company Limited, Particulars Relating To A Debenture Under The Companies (Consolidated) Act, 1908, 26th May 1909, for £74,000; Port Talbot Steel Company Limited, Certificate of the Registration of a Series of Debentures where there is no Trust deed, 2nd June 1909.

130 Ibid, Port Talbot Steel Company Limited, Special Resolutions passed 27th June 1912 and confirmed 15th July 1912; Port Talbot Steel Company Limited, Companies (Consolidation) Act 1908, Return of Allotments Made On 14th August 1912.

Table 2.6: Distribution of New PTSC Shares 1912[131]

Name	Description	Allotted Shares
GRCWC	Railway Carriage and Wagon Builders	50,000
Baldwins Ltd	Ironmasters	50,000
Workman Clark & Co Ltd	Ship Builders-Belfast	20,000
Kingston Clark & Company Ltd	Ship Builders-Port Glasgow	20,000
Louis Vandalle Fulton	Merchant-Greenock	6,000
Peter MacCallum Lang	Merchant-Greenock	7,000
James Fulton (Junior)	Shipowner-Greenock	4,000
John James Lang	Shipowner–Greenock	4,000
John Roper Wright	Ironmaster–Swansea	5,000
William Charles Wright	Ironmaster–Swansea	5,000
John Cecil Davies	Steel Manufacturer–Swansea	5,000
Stanley Baldwin	Ironmaster & MP-Stourport	5,000
Roger Beck	Ironmaster–Swansea	5,000
John Albert Matthews	Shipowner–Gloucester	1,000
Edward Lyons Evan-Thomas	Shipowner–London	1,000
Lilian Evan-Thomas	Widow-London	1,000
Total		**189,000**

Table 2.6 shows a broadening of ownership with shipbuilding and shipping companies buying stakes in the PTSC. It is possible to speculate that the shipbuilding companies were investing to guarantee a source of shipbuilding plate. As the heavy plate mill had yet to be built the customer was again helping to finance product development at Port Talbot and ensured customer loyalty. By 1910 the demand for heavy plate for shipbuilding had increased as the number of warships being built was unprecedented large[132]. What made the position difficult for shipbuilders was that price control associations had developed. This meant that certain associated firms insisted on selling only to certain shipbuilding firms[133]. Buying into the PTSC, who were moving into heavy plate production, was a means of circumventing these restrictions and gaining access to raw materials.

The market for sections had increased. To meet this demand a tandem 16”/12” three-high section mill was commissioned in January 1912. It was almost immediately modified to produce light rail sections (a market that the Gilbertsons had wanted to enter). Other products produced included light angles, tees, flats and

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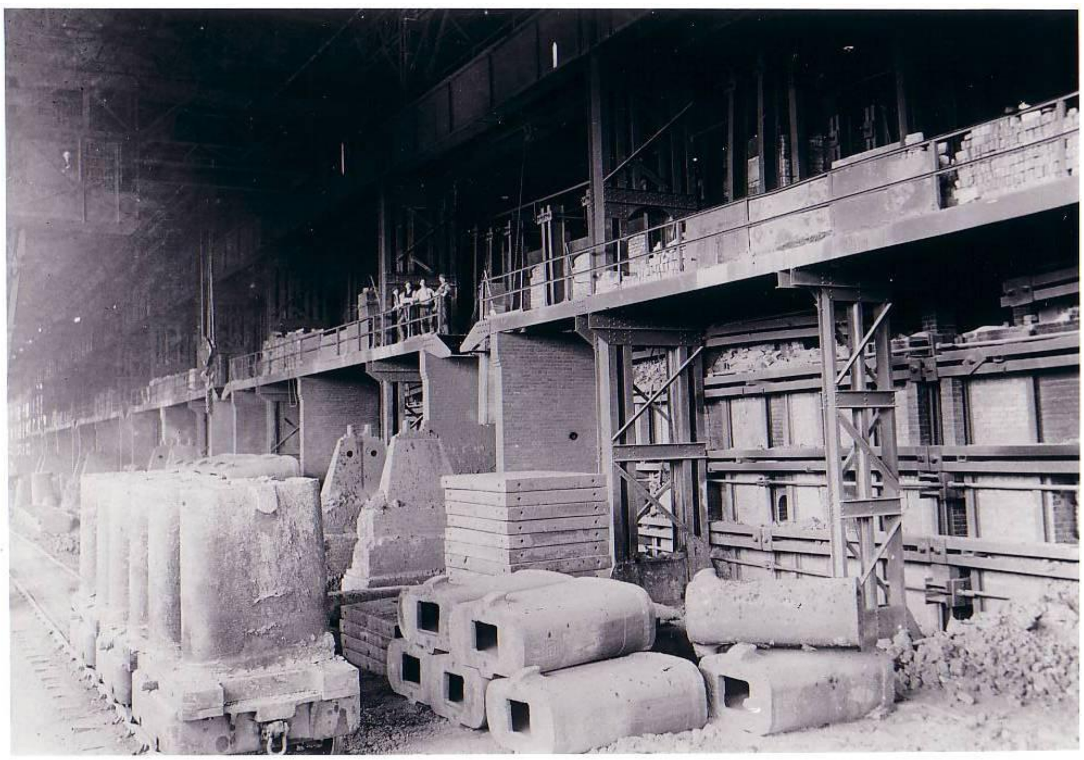
[131] Ibid, Port Talbot Steel Company Limited, Companies (Consolidation) Act 1908, Return of Allotments Made On 14th August 1912.
[132] Carr and Taplin, p.234.
[133] Burn, *Economic History*, pp.342-343.

other sections for constructional engineering. This became known as the light bar mill[134]. A heavy rail finishing department was also established (see Appendix 2 for a description of the plant).

To meet the growing demand for heavy plate from the shipbuilding industry and for heavy boiler manufacture a second melting shop and a 42" reversible heavy plate mill were built. A powerhouse was also built. These extensions necessitated the acquisition of more land[135]. The new melting shop was commissioned in May 1914. It consisted of four 60 ton capacity cold charged basic open-hearth furnaces[136]. As further furnaces were added later the melting shop was built with a view to further expansion. The interior of the melting shop is shown below in the early 1920s :-



This part of the steelworks became known as the 'New Side'[137]. Once completed the GRCWC Chairman, Vassar-Smith, described Port Talbot Steelworks as the best

[134] GKB, pp.36-37. Hanson, *Profile Of A Welsh Town,* p.92. Brinn, p.6.
[135] GKB, p.37. Hanson, *Profile Of A Welsh Town,* p.90. Brinn, p.6.
[136] Brinn, ibid.
[137] Anon, 'The New Margam Works of Baldwins, Ltd', *I&CTR*, 17th September (1920), 363.

equipped steelworks in Britain able to turn out both steel and plate considerably cheaper than its competitors[138]. It had modern plant and excellent access to raw materials and transport.

The PTSC allowed Baldwins to compete in new markets. They and regional rivals GKN were willing to compete with Scottish, North Eastern and Midland plate and section steelmakers even where district agreements existed to divide up their markets. They were prepared to ignore these agreements and to compete against these other producers with their established interests[139].

The PTSC's additional four furnaces had a capacity of 2,000 tons/week which brought the full capacity of the works up to 5,000 tons/week[140]. This, and the product base, now differentiated Port Talbot from the other Swansea area steelworks (see table 2.1). As well as supplying bar to the tinplate and sheet manufacturers it had expanded its steelmaking capacity and product base. Port Talbot was becoming a steelworks of national importance. In 1913 the biggest UK steelmaker was Dorman Long with output in three of its plants totalling over 700,000 ingot tons/year. No other firm had a capacity of over 500,000 tons (Colvilles had a capacity of 320,000). In terms of steelmaking capacity Port Talbot with a capacity of 260,000 tons/year was in the same category as Britain's largest steelmakers. The building of heavy mills was certainly not unique in Britain at this time. New heavy mills were built at Cargo Fleet (in the North-East), Skinningrove, Partington and Normanby Park Works (Scunthorpe). The latter was built by Lysaghts, a South Wales based firm. The Redbourn Hill blast furnace plant (also near Scunthorpe) was bought by Richard Thomas and Co, the South Wales based tinplate firm to supply pig iron to its South Wales plants[141]. Lysaghts are of particular interest as like Baldwins they moved into the heavy end of the steel industry. Both companies were exploiting new market opportunities particularly with regard to shipbuilding. As argued previously, by diversifying the product base they were protecting themselves from sudden falls in

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[138] Richard Vassar-Smith, 'Chairman's Address to the Gloucester Railway Carriage and Wagon Company AGM', 27th July 1914, *Economist*, 1st August 1914, pp.246-247.
[139] Burn, *Economic History*, p.342.
[140] C.W. Roberts, p.181. Corus, *Port Talbot A Century*, p.3.
[141] Burn, *Economic History*, p.338. Carr and Taplin, p.269.

demand for any particular product. As will be seen later this move into heavy steelmaking was to cause Baldwins particular problems in the 1920s.

Although Lysaghts only built four open-hearth furnaces of 45 tons capacity at Normanby Park they also built three blast furnaces to become a fully integrated iron and steelmaker. They thus ensured a source of raw materials in the form of pig iron that was lacking at Port Talbot. A difference between Lysaghts and the PTSC was that Lysaghts moved their steelmaking to the ore field whereas the PTSC, once blast furnaces were added, developed easier access to richer imported ore. Thus at Port Talbot energy costs per ton of iron produced would be less.

In 1912 there were a total of 536 open-hearth furnaces in Britain. By 1923 only 38 were larger than the 60 ton capacity furnaces built at Port Talbot[142]. Just as important as size was the technology used. Unlike those installed by the PTI&SC the rebuilt and new furnaces were of a tried and tested design. By doing this the PTSC were reducing risk to maximise the return on their investment. Both the size of the furnaces and efficiency of the design gave the PTSC an advantage over the established heavy steelmakers. The latter often used plant that was relatively inefficient[143]. By the start of World War One the PTSC had developed Port Talbot into a relatively large and modern steelmaker of national significance producing a wide range of products. The company was in an excellent position to exploit the market opportunities created by World War One.

After the outbreak of World War One the Ministry of Munitions requested a further expansion of steelmaking operations in Britain to support the war effort[144]. At Port Talbot this resulted in building the adjacent Margam Steelworks (see Chapter 3) and adding two open-hearth furnaces to the new Port Talbot Melting Shop (see table 2.7). The building of the two basic open-hearth furnaces was part of an evolving process producing shell steel. Pre-war only six British firms produced shell steel. The rapid wartime growth in demand for shells necessitated a lowering in the acceptable steel quality standards. In January 1915 the amount of acceptable

[142] NFISM, *Statistics of the Iron and Steel Industries 1923,* National Federation of the Iron and Steel Manufacturers, p.10.
[143] Burn, *Economic History,* p.335.
[144] GKB, p.37. Corus, *Port Talbot A Century,* p.3.

phosphorous in shell steel was raised, and raised again, in October 1915 and April 1916. This meant that producing shell steel by basic open-hearth furnaces was now acceptable. The additional furnaces at Port Talbot were part of this process of increasing shell steel production. Despite this the specifications for making shell steel remained far more exacting than those required to produce commercial mild steel[145]. In addition demand for Port Talbot's normal steel products was exceptionally high in order to support the war effort.

From early in World War One it was clear that steel production, particularly for shells, would play an important part in the war effort. To control steel production the Ministry of Munitions was set up on 9th June 1915[146] (see Chapter 3 for more details). Control of steelmaking naturally extended to Port Talbot Steelworks where priority was given to orders supporting the war effort. At Baldwins' 1915 AGM John Roper Wright stated that Baldwins were doing all they could to keep up the supply of steel for shell making and were laying down special plant to support this[147]. This included the building of the two additional open-hearth furnaces already mentioned. They were authorised in March 1916 when the Ministry of Munitions asked Baldwins to proceed with extensions at Port Talbot worth £96,000 alongside extensions at their Gowerton and Panteg steelworks[148].

These investments would produce an additional 100,000-110,000 tons/annum of steel ingots. This together with additional rolling plant and the rearrangement of the existing furnaces used to produce tin and sheet bar enabled about 200,000 extra tons of steel/annum of shell and Mannesman steel bars to be produced. It was anticipated that it would take approximately 6-9 months to complete the work. At completion an additional £10,500 had also been spent at Port Talbot (see table 2.7).

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[145] Burn, *Economic History*, p.369. Carr and Taplin, pp.300-301.
[146] Burn, ibid, p.357. Carr and Taplin, pp.301-302, p.305.
[147] John Roper Wright. 'Chairman's Address at Baldwins AGM', 28th October 1915, *Economist*, 30th October 1915, p.747.
[148] Kew, NA, Ref Mun 4/5226/231881, Ministry of Munitions of War correspondence with Baldwins Limited requesting extensions to be made at Port Talbot, Gowerton and Pantag, 1st March 1916.

As also shown below in table 2.7, 46% of the expenditure was written off by the Government under the Munitions of War Act 1915 and Finance (No2) Act of 1915[149].

Table 2.7: Port Talbot Extensions Agreed With the Ministry of Munitions[150]

Authorisation Date	Description	Estimated Cost	Written off
19th April 1917	No2 Melting Shop 2x60ton Basic Open-Hearth Furnaces	£96,770	46%
19th April 1917	Expenditure-Boiler & Roof	£10,500	46%
8th April 1918	Plate Flattening Machine	£6,197	Grant
4th May 1918	Finishing Machine & Motor*	£745	46%
Total		**£114,212**	

* The stimulus for this was the failure of the PTSC to meet rail quality standards on Government contracts[151].

The evidence suggests two authorisations in 1916 and 1917 by the Ministry of Munitions. It increased Port Talbot's capacity to 7,000 tons of ingot steel/week[152] (364,000 tons/annum).

Prior to World War One Port Talbot had experienced substantial increases in capacity and movement into new product lines. This was largely market driven and allowed Baldwins, through the PTSC, to challenge established steelmakers. The expansion during World War One was different. It was driven by Government requirements to support the war effort and in particular for munitions. Thus only a temporary steel market was created. Post war demand for munitions was bound to

149 Ibid, Correspondence from O.H. Smith at the Ministry of Munitions of War to Baldwins confirming completion of extensions to the steelworks at Port Talbot, Gowerton, and Pantag, 19th April 1917; Correspondence from the Secretary of Munitions Board of the Ministry of Munitions of War to the Port Talbot Steel Company on the installation of a Heavy Plate Mangle, 8th April 1918.

150 Ibid, List of Ministry of Munitions approved schemes for extensions to Baldwins Limited Steelworks and the new works at Port Talbot, undated 1918; C.W. Sparrow, Internal Ministry of Munitions of War minute to Sir John Hunter setting out estimated capital expenditure for Baldwins Limited, 13th October 1917; P.A Piercy, Ministry of Munitions Form MWB6–approving capital expenditure of £6,942 for the heavy plate mangle and starter, 19th October 1918; Correspondence from the Secretary of Munitions Board of the Ministry of Munitions of War to the Port Talbot Steel Company giving approval for a finishing machine to be installed, 4th May 1918.

151 Ibid, F. Syme, Correspondence with R.R.J. Turner of the Munitions Board of the Ministry of Munitions of War re problems with an order for rails at the Port Talbot Steelworks, undated 1918.

152 Anon, 'The Port Talbot Steel Works', *I&CTR*, 362. J. Ivor Hanson, *Outline Of A Welsh Town* (Port Talbot: Daffodil Publications, 1971), p.130.

fall dramatically leaving overcapacity throughout the industry. A further problem with this type of widespread subsidised investment was that it would be more difficult to concentrate production at the more modern and efficient steelworks like Port Talbot. Thus post war Port Talbot was prevented from reaching its full potential as a steelmaking site due to Government inspired and subsidised expansion even at unsuitable sites.

World War One also brought major changes in the structure of the PTSC. On 12th May 1915 Baldwins held an extraordinary shareholders meeting to get approval for the board to acquire all the PTSC shares. At this meeting the Chairman, John Roper Wright, presented Baldwins' plans for a blast furnace plant for the production of pig iron to be built near Port Talbot Steelworks. It would work in close association with Port Talbot and achieve full integration to maximise efficiency. It therefore made sense for Baldwins to gain full ownership of the PTSC. The Baldwins shareholders gave their approval[153]. The GRCWC exchanged 124,996 one pound shares in the PTSC for an equal number of fully paid shares in Baldwins[154]. Baldwins' takeover of the PTSC had been completed by 1916[155]. Surprisingly, the PTSC remained a subsidiary of Baldwins until 1930 when it was fully absorbed into the parent company whereas the new Margam Steelworks was to be directly owned by Baldwins.

By 1918 Port Talbot Steelworks employed 1,700 workers[156]. Under the impetus of war, profits increased dramatically :-

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[153] John Roper Wright. 'Baldwins Limited–Increase of Capital Sanctioned', *Economist*, 15th May 1915, p.950. PTSC, Advertisement for the *Port Talbot Steel Company Limited* in de la Praudiere, p.xiii. Brinn, p7. Paul Jenkins, p.46.
[154] Anon. 'Gloucester Railway Carriage and Wagon Company AGM', 26th July 1915. *Economist*, 31st July, 1915, p.190.
[155] John Roper Wright, *Economist*, 30th October 1915. Anon. 'Baldwins AGM', *Economist*, 30th October 1915, p747. PTSC in de la Praudiere pxiii. Carr and Taplin, p.329. Brinn, p.7.
[156] Anon. Port Talbot's Welcome To Prince of Wales–A Red Letter Day–Local Enthusiasm, *SWDP*, 20th February 1918. PTSC in de la Praudiere. Anon. The Firm Striking Details Of Industrial Scope. *SWDP*, 20th February 1918.

Table 2.8: PTSC Profits and Assets 1913-1920[157]

Year Ended 31st March	Profit (£)	Assets–Buildings Plant (£)	Stock On Hand (£)
1913	62,425	249,590	66,499
1914	41,601	505,868	71,751
1915	43,085	580,148	149,928
1916	50,311	574,703	240,508
1917	264,887	610,509	270,471
1918	211,790	559,608	335,677
1919	187,718	521,391	379,086
1920	177,101	494,124	460,207

The expansion of 1914 doubled the company assets. Also during 1914 the mortgage/debenture of 1906 for £40,000, and that of 1909 for £74,000 were both fully paid off[158]. The settlement of the 1906 mortgage/debenture finally ended Emily Talbot/Margam Estate's interest in Port Talbot Steelworks. The mortgage/debentures were replaced with a Lloyds Bank 'First Mortgage Debenture' of £300,000 which was taken out on 26th March 1914[159]. As can be seen from table 2.8 profits were given a major boost from the year ending 31st March 1916. With the economy geared to war production and high demand for shell steel and plate the PTSC was well placed to respond to these demands which was reflected in their profits.

The success of the PTSC can be attributed to a number of factors. They obtained the property cheaply and the Government subsidised their World War One expansion. The PTSC was more successful than the PTI&SC as it had greater access to capital, a wider product range and demand was higher. All these factors contributed to the success of the PTSC. However, for a long period the PTSC was

[157] Kew, NA, Ref BT 31/1784/8923, Port Talbot Steel Company Limited, Summary of Share Capital and Shares at 21st June 1913 and Balance Sheet at 31st March 1913. Ibid, to 12th July 1914, and at 31st March 1914; to 12th June 1915, and at 31st March 1915; to 10th August 1916, and at 31st March 1916; to 6th August 1917, and at 31st March 1917; to 12th August 1918 and at 31st March 1918; to 17th July 1919, and at 31st March 1919; to 23rd July 1920 and at 31st March 1920.

[158] Ibid, Port Talbot Steel Company Limited, Companies (Consolidated) Act 1908, Memorandum of Satisfaction of Mortgage or Charge of £40,000, 17th August 1906, Satisfied on 19th March 1914; Port Talbot Steel Company Limited, Companies (Consolidated) Act 1908, Memorandum of Satisfaction of Mortgage or Charge of £74,000, 26th May 1909, Satisfied on 18th March 1914.

[159] Ibid, Port Talbot Steel Company Limited, Certificate of the Registration of a Mortgage or Charge for £300,000, 8th April 1914.

operating under temporary boom conditions which hid deeper industry wide problems which only emerged during the 1920s.

By the end of World War One Port Talbot Steelworks had developed into a relatively large, highly profitable modern steelworks consisting of 11 open-hearth furnaces, a steelmaking capacity of about 364,000 tons, with heavy and light bar and plate mills at a favourable coastal location. Products included bars, billets, blooms, rails, sections and plate. The building of Margam Steelworks would ensure a source of pig iron. The problem for the industry was that the general industry wide expansion during World War One led to over capacity which only became apparent once the short post war boom ended.

Chapter 3: Building Margam Steelworks: An Integrated Iron and Steelworks To Support Port Talbot Steelworks

The building of Margam Steelworks during the First World War marked the integration of iron making into the steelmaking process and a major increase in steelmaking capacity. It was a major step in Baldwins' strategy of vertical integration. Prior to World War One plans had been produced to build blast furnaces to supply Port Talbot with pig iron so as to free the PTSC from uncertainty over pig iron supply. The start of World War One delayed these plans. However, during World War One the Ministry of Munitions encouraged a national increase in steel output. The building of Margam and its blast furnaces was part of this process and an important long-term development for steelmaking in the Port Talbot area. Wartime needs meant that a new melting shop and a rolling mill were also built alongside the blast furnaces. After the war this only added to Britain's interwar surplus of steelmaking capacity. In the 1920s Margam's underutilisation pushed Baldwins close to company failure. Nevertheless the developments were critical in allowing the Port Talbot area to be chosen as the location for Britain's third hot strip mill in the 1940s.

Between Port Talbot Steelworks' reopening and World War One there had been a large increase in capacity and diversification into new products. As previously shown other firms such as Lysaghts followed a similar strategy. Lysaghts had built a new integrated iron and steelworks at Normanby Park, near Scunthorpe. Also near Scunthorpe Richard Thomas and Co bought and had modernised the Redbourn Hill Ironworks[160]. Both rival steelmakers had established modern iron making plant as part of their steelmaking process yet Port Talbot lacked an integrated iron works. This put Port Talbot at a commercial disadvantage as the PTSC had to rely on the open market to obtain its raw materials in the form of pig iron.

From its formation in 1902 Baldwins had developed a strategy of making the business as self-contained as possible[161]. In pursuit of this they eventually acquired a number of collieries to ensure coal supplies and the Oxfordshire Ironstone

[160] Carr and Taplin, p.269.
[161] Anon, 'The New Margam Works of Baldwins, Ltd', p.353.

Company to guarantee iron ore supplies. They also acquired the North Wales Brymbo Steel Company in 1918[162]. This was not an innovative approach. As early as 1906 this was a recognised process within British industry. Shipbuilding and engineering companies had formed alliances with steelmakers to ensure access to steel supplies[163]. The interest of the GRCWC and later shipbuilding companies in the PTSC was part of this process.

The previous chapter noted that in 1902 a German firm considered building blast furnaces near Port Talbot Steelworks. In 1912 an unnamed company was formed that proposed to spend between £400,000 and £500,000 on new coke-ovens, blast furnaces and by-product works at Port Talbot Dock[164]. The location of the proposed plant was the site where Margam Steelworks was eventually built. As the site is only a half mile from Port Talbot Steelworks and lacked any steelmaking plant it must have been intended to support Port Talbot Steelworks. It would have given Port Talbot Steelworks the integration with iron making that it lacked. The two sites could have been linked with their own internal railway system allowing the easy movement of iron to Port Talbot's Melting Shops.

Therefore prior to 1914 proposals to integrate iron making into the steelmaking process had twice been considered at Port Talbot. There was also a report that negotiations had taken place in 1912 to build a new steelworks to produce bars[165]. Unfortunately, no information was given as to which firms were involved. Therefore the outbreak of World War One may have delayed the integration of iron making into the steelmaking process.

In parallel with these proposals was a plan to enlarge Port Talbot Dock. This involved extending the south breakwater by 1,800', the north breakwater by 500', a new 800' wharf at the proposed blast furnace site and a second 800' wharf at the site

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[162] Anon. 'Baldwins AGM'. *Economist*, 1st February 1919, p.162. Kew, NA, Ref Mun 4/5226/231881, C.W. Sparrow, internal Ministry of Munitions of War minute, 13th October 1917. J. Horton, p.1133.
[163] Anon. 'Steel Companies Results'. *Economist*, 24th March 1906, pp.491-492.
[164] 'News Item', *I&CTR*, 1st November (1912), 733.
[165] Ibid

of a by-product plant[166]. A second lock to the south of the existing lock 875' in length, 90' wide, deepening of the dock from 27'6" to 32' and the approach to the dock deepened to 45' on Spring tides was also proposed. It will be shown later that in the 1950s when the deepening of the approach channel was again being considered that it could only be deepened from 21' to 23'. The start of World War One prevented the dock development. Had it gone ahead and been successful it would have allowed larger ore carriers to enter Port Talbot Dock. This would have reduced the cost per ton of ore discharged and made the building of the harbour in the 1960s a much less financially attractive proposal. Without the harbour it is unlikely that steelmaking would have lasted into the current century. Therefore it had important long-term implications for steelmaking at Port Talbot.

After the start of World War One as demand for steel rose and labour shortages emerged it became apparent that the industry would struggle to fully support the war effort. As already mentioned in response to emerging shortages of steel, particularly for shells, the Government formed the Ministry of Munitions in June 1915[167]. William Charles Wright, the son of Baldwins' Chairman, John Roper Wright, and previously manager of Port Talbot Steelworks joined the new Ministry soon after it was formed in 1915. He is the second of the individuals who played a significant role in the history of Port Talbot steelmaking. In June 1915 he was appointed to supervise supply and distribution within the Ministry of Munitions. Part of this role involved fixing steel prices. By January 1916 Lloyd George's Parliamentary Secretary, and Deputy Head of the Ministry of Munitions, criticised Wright for coaching the steelmakers to demand higher prices for their products and greater tax relief in connection with steelworks extensions. In September 1917 he became the Ministry of Munitions' Controller of Iron and Steel production[168]. He introduced a high degree of planning and gained an invaluable insight into British steelmaking which he used during the rest of his career.

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[166] 'News Item', *I&CTR*, 14th November (1913) p.787.
[167] Anon, 'The New Margam Works of Baldwins, Ltd', *I&CTR*, p.353. Carr and Taplin, pp.301-303.
[168] Graeme M. Holmes. *Wright, Sir William Charles*. *Dictionary of Business Biography*, Vol 5 S-Z (London: Butterworths, 1986), pp.904-911. Carr and Taplin, p.307.

In 1925 he succeeded his father as Chairman of Baldwins. As Chairman he faced some major problems partly through industry overcapacity which he had helped create during World War One. His response to the problems was to look to mergers and alliances. He was at the forefront of the mergers to form Guest Keen Baldwins, Richard Thomas and Baldwins and the Steel Company of Wales. These mergers were aimed at modernising and rationalising the South Wales steel industry. At the formation of Guest Keen Baldwins in 1930 he became Deputy Chairman and Managing Director. In 1936 he became Chairman and spent most of his time on external relations with customers and other steelmakers. Throughout his career he developed a reputation for secretive dealing without telling his partners. Yet he understood the benefits of mergers and the need to modernise the sheet and tinplate industries. Unlike his father he was not particularly technically minded but he was good at recognising and promoting talented young managers. These included Julian Pode and Fred Cartwright who led the local industry in the 1950s and 1960s[169]. Despite his reputation he was the right man to be in charge at Port Talbot during a very difficult period.

One of the Ministry of Munitions' functions was to estimate future wartime steel demand. During November 1915 it was estimated that during 1916 the supply of steel would be approximately 9,360,000 tons but demand would be 12,051,000 tons[170]. It resulted in the Ministry of Munitions pressurising the steelmakers to increase production. During August 1916 the Ministry of Munitions formed its Iron and Steel Department under Sir John Hunter (he was succeeded by Charles Wright). This Department calculated the extra capacity needed to produce the additional steel using just home produced iron ore[171]. It authorised the following expansions :-

[169] Graeme M. Holmes, ibid.
[170] Carr and Taplin, p.305.
[171] Ibid

Table 3.1: UK Arranged Extensions 1916-1918[172]

District	New Blast Furnaces	New Basic Steel Furnaces	New Acid Steel Furnaces	Total New Steel Furnaces
Scotland	Nil	31	8	39
NE Coast	5	21	3	24
Lincolnshire	4	9	Nil	9
Midlands	5	38	10	48
South Wales	4	14	5	19
Cumberland & Lancashire	4	17	10	27
Total	**22**	**130**	**36**	**166**

The problem was that this expansion did little to alter the pre-war distribution of plant both within and between districts. Because of investment in modern plant at some badly located works rationalisation during the interwar period was made more difficult[173]. The Port Talbot area differed from the wider UK steel industry as Margam Steelworks was one of only two new integrated steelworks that was built during World War One. Duncan Burn is incorrect when he claims that Redcar was the only wholly new integrated plant to emerge from World War One. He claims that at Port Talbot blast furnaces and coke ovens were added to a steelworks[174]. In fact Margam was a fully integrated iron and steelworks with limited rolling plant of its own.

Following an approach from the Ministry of Munitions Baldwins made plans for a new iron and steelworks which became Margam Steelworks. Baldwins later claimed that Margam Steelworks was built at the Government's request to increase steel production[175]. This is true but as seen plans existed pre-war to build an iron works. It can be argued that the Government request simply coincided with Baldwins ongoing strategy of vertical integration. By producing their own pig iron they guaranteed a source of raw materials and brought them in line with their competitors. It gave Baldwins a more predictable price for its raw materials without resorting to the uncertainties of obtaining them on the open market.

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[172] F.H. Hatch, *The Iron and Steel Industry of the United Kingdom Under War Conditions* (London: Harrison and Sons, 1919).
[173] Burn, *Economic History*, p.356.
[174] Ibid, pp.360-361.
[175] R. Horne, 'Baldwins Annual Meeting', *I&CTR*, 28th December (1923), 984.

Baldwins also benefited from the fact that this investment was supported by a Government 46% write off of profits against taxation[176]. In effect, as with the purchase of Port Talbot Steelworks, the new works was obtained below full cost. It is certainly debatable, on a commercial basis, if post war Baldwins required a third melting shop but as seen pre-war there were plans to build a melting shop on this site. However, during World War One the national need for more steel justified this additional melting shop. There is no evidence at the time of any concerns expressed by Baldwins regarding capacity either here or nationally. Certainly during the early 1920s the PTSC closed their older Port Talbot Melting Shop. They may have always envisaged Margam Melting Shop replacing it. Later they would hold the Government responsible for building what they then considered to be an unneeded steelmaking plant. Yet after the 1920s slump Margam Melting Shop would prove an invaluable investment. It allowed the future Guest Keen Baldwins to concentrate their heavy steel production at the Port Talbot/Margam complex and in consequence to close Dowlais Steelworks and rebuild Cardiff Steelworks. In the later 1930s even with Margam Melting Shop, Port Talbot Steelworks was unable to meet the high demand generated by rearmament. The ability of Margam to produce iron was also an important factor in attracting the strip mill to Port Talbot after World War Two and in supporting the boom years of the 1950s. Although during the 1920s it was a major drain on Baldwins' finances in the longer term it was very important to steelmaking in the area.

The initial estimated cost of the Margam blast furnaces in 1915 was £300,000 but by mid 1916 the cost had risen to £500,000[177]. By 1917 the estimated cost of Margam Steelworks was £1.5 million :-

[176] Kew, NA, Ref Mun 4/5226/231881, Correspondence from O.H. Smith, 19th April 1917.
[177] Ibid, J. Mann, internal Ministry of Munitions minute seeking copy of costs for the extensions at Baldwins' Steelworks, 2nd October 1916. Ibid, Correspondence from O.H. Smith, 19th April 1917.

Table 3.2: Margam Works: Costings Agreed With the Ministry of Munitions[178]

Date of Ministry Sanction	Plant	Estimated Cost (£)
29th January 1917	Blast Furnaces	635,250
29th January 1917	Hutting For Blast Furnaces	10,000
13th July 1917	Coke Ovens	316,446
19th April 1917	Steelworks: 4 Open-Hearth Furnaces	250,000
19th April 1917	Rolling Mill	275,000
27th September 1917	Sintering Plant	35,000
Total		**1,521,696**

The site chosen for Margam Steelworks was about a half mile from Port Talbot Steelworks on land leased from Emily Talbot/Margam Estate [179]. The steelworks were linked by their own internal railway system. Thus pig iron or steel ingots could be moved quickly and cheaply to Port Talbot Steelworks. As with Port Talbot raw materials could be easily brought in by sea. It was particularly well situated for the import of iron ore to supply its blast furnaces which were built almost at the quayside. This gave Margam access to richer foreign ores without the additional cost of rail transport to inland steelworks. With richer foreign ores less energy was needed per ton of pig iron produced compared to iron works on Britain's ore fields. The linking of the blast furnaces to a dock made Port Talbot an even more attractive steelmaking site. As will be seen the ensuing cost advantages have allowed the growth and survival of steelmaking at Port Talbot.

Yet Baldwins had created a problem for themselves at Margam. As mentioned earlier Baldwins acquired the Oxfordshire Ironstone Company's quarries in 1918. In 1920 Baldwins Chairman, John Roper Wright, stated that the Oxfordshire quarries would supply their needs[180]. If that was the case building the iron making plant at Margam in South Wales was not an ideal choice as the iron ore had to be transported long distances by rail. It would have made more sense to have acquired an interest in an overseas ore field. A successful example of this was the Orconera Iron Company which was formed in Spain in 1873 by the Dowlais Iron Company,

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[178] Ibid. Ibid, C.W. Sparrow, internal Ministry of Munitions of War minute, 13th October 1917. Ibid, List of Ministry of Munitions approved schemes for extensions to Baldwins Limited Steelworks and the new works at Port Talbot, Undated 1918.

[179] B.S.S., *British Steel Smelters Reports 1916,* (Manchester, British Steel Smelters, Mill, Iron, and Tinplate Workers Union), p.625. Brinn, p.7.

[180] John Roper Wright 'Chairman's Address to Baldwins AGM', 30th June 1920, *I&CTR*, 9th July (1920).

Krupps and the Spanish Ybarra Company[181]. This meant that Dowlais and Cardiff East Moors had access to this richer ore (Oxford Ore had an iron content of 25% and Spanish ore 48%)[182]. Thus to access the richer foreign ores Baldwins had to compete on an uncertain open market. There is no evidence of Baldwins attempting to acquire any interest in any overseas ore field. By failing to do this they failed to fully exploit Margam's locational advantages. The eventual merger with GKN in 1930 subsequently gave them controlled access to richer Spanish ore.

At the time of planning Margam Steelworks, Port Talbot Steelworks was capable of producing about 5,000 tons/week. The intention was to produce a similar tonnage at Margam. The plant included a coal washery, coke ovens, blast furnaces, an open-hearth melting shop, and a reversing rolling mill to produce billets, bars, sections and rails. However, the emphasis was always intended to be on the production of pig iron and steel rather than rolling[183]. Port Talbot Steelworks would do the rolling (see Appendix 3 for plant details).

Duncan Burn states that none of the major wartime building schemes, including Margam, were approaching completion by the armistice[184]. The war created a labour shortage and with quicker gains to be made from ad hoc extensions to existing steelworks it is unsurprising that progress at Margam was relatively slow. Construction of Margam Melting Shop commenced in August 1916[185]. Much of the preliminary excavations and concrete work was provided by 430 German prisoners of war until 1919 when local labour took over[186].

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181 Edgar Jones, *A History of GKN: Volume 1: Integration and Enterprise, 1759-1918* (Basingstoke and London: McMillan Press, 1987), p.31. Carr and Taplin, p.83.
182 Horton, p.1156. BSC, *Statistical Handbook 1966, Volume 2, L-Z* (London: British Steel Corporation 1967), p.5.
183 Brinn, p.7. Corus, *Port Talbot A Century*, p.3.
184 Burn, *Economic History*, p.357.
185 John Roper Wright, 'Chairman's Address at Baldwins AGM', *Economist,* 28th October 1916, p.833. B.S.S., *British Steel Smelters Reports 1916,* p.625. GKB, pp.37-38. Cartwright, 'Preliminary Planning of Margam and Abbey Works' Special Issue of *I&CTR*, (1952), 9-12 (p.9). Carr and Taplin, p.329. Brinn, p.7.
186 Brinn, p.7.

Work on the foundations for three blast furnaces started in April 1917 although only two were actually completed[187]. Progress on these and the rest of the plant was slow with most of it not completed until after the armistice[188]. Baldwins' Chairman, John Roper Wright, attributed this to problems with the contractors[189]. Steelmaking on a limited scale started in September 1918 when two 70 ton open-hearth furnaces went into production. The ingots went to Port Talbot Steelworks for rolling[190].

By 1920 two more open-hearth furnaces were added to Margam Melting Shop to meet the demand created by the short post war boom. A fifth open-hearth furnace was added in 1922[191]. At Baldwins' 1920 AGM Wright reported that one of the blast furnaces was nearing completion and would be blown in during July 1920 with the second following a month later[192]. To support these blast furnaces approximately 2,000 tons/week of coke was needed. This required about 6,000 tons/week of coking coal which would come from Cribbwr Fawr Colliery which Baldwins had bought specifically to supply Margam. Any shortfall was to be supplied by Taylor's Navigation Colliery and the Cardiff Navigation Colliery which Baldwins already owned. This is a further example of Baldwins' drive for vertical integration.

The first blast furnace was actually blown in during February 1922. The second followed in April 1923[193]. Both had 12'6" hearth-diameters (see Appendix 3 for details). Each blast furnace was capable of producing approximately 2,000 tons/week of basic pig iron[194]. Both blast furnaces are shown below during 1923-24 :-

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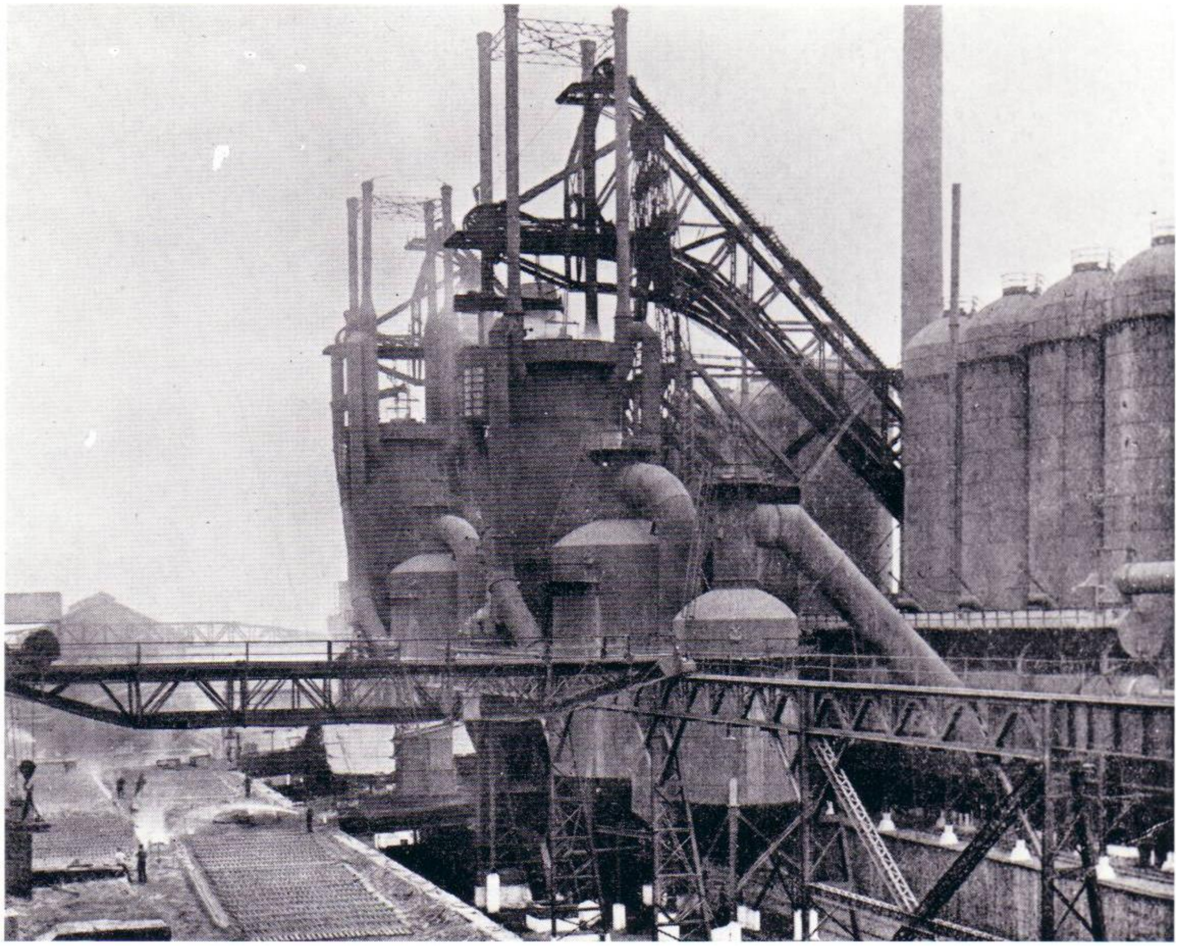
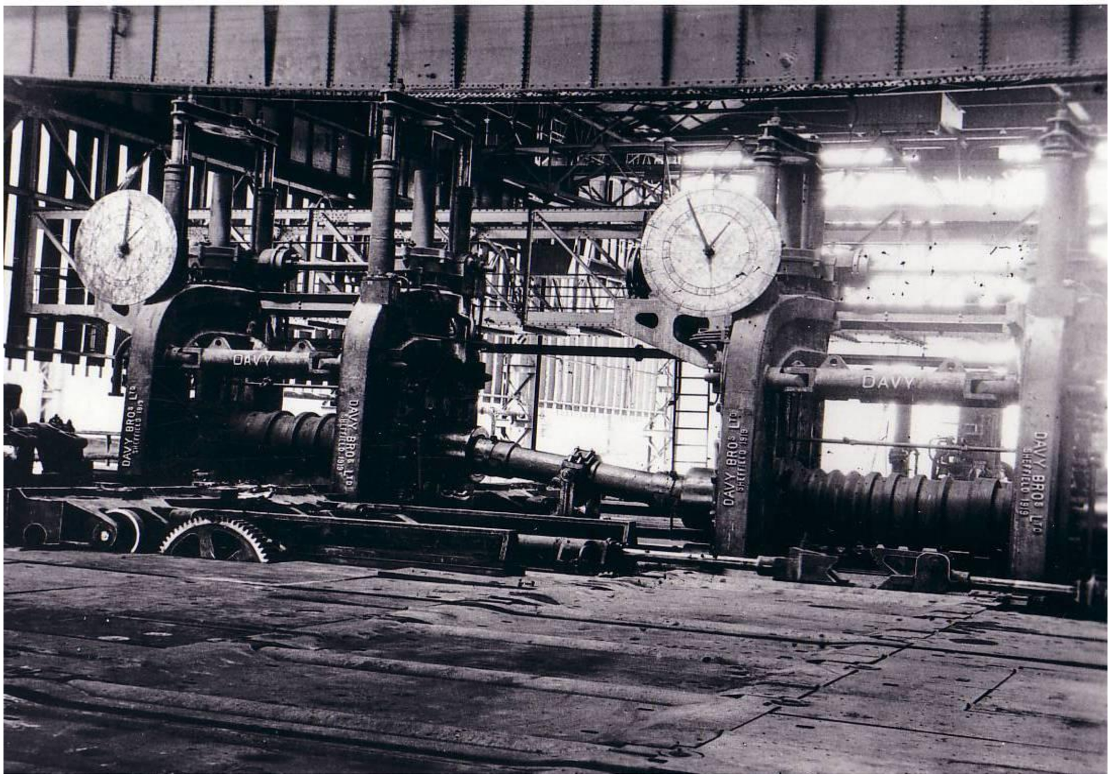
[187] GKB, pp.38-39.
[188] Carr and Taplin, p.329.
[189] John Roper Wright, 'Chairman's Address to Baldwins AGM', 30th June 1920.
[190] GKB, pp.40-41. Carr and Taplin, p.329. Brinn, p.7.
[191] Brinn, p.7. John Roper Wright, 'Chairman's Address to Baldwins AGM', 30th June 1920.
[192] Wright, ibid.
[193] 'News Item', *I&CTR*, 6th April (1923) 510. GKB, pp.39-42. Carr and Taplin, p.357. Brinn, p.7.
[194] Horton, pp.1133-1134. C.W. Roberts, p.145.



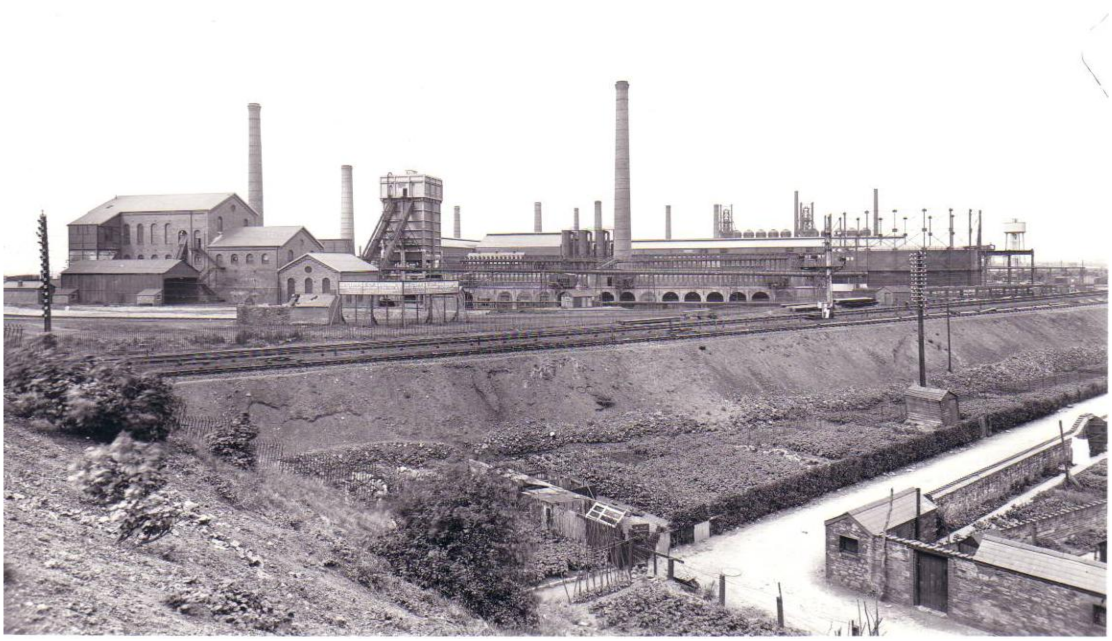
By British blast furnace standards these were relatively large but not exceptional. Those built at Cardiff in 1891 had hearth diameters of 10' which gave them a capacity of only 1,000 tons/week. By 1918 these blast furnaces had been enlarged from 75' to 85' in height and electric hoists added[195]. The two blast furnaces erected at Normanby Park had 11' hearth diameters and the third added in 1920 had a 13' hearth diameter[196]. Margam's open-hearth furnaces with their 70 ton capacity were relatively large by contemporary British standards.

Margam's one rolling mill consisted of 3 stands (cogging, roughing and finishing) with 36" diameter rolls. It was a reversing mill designed to produce billets, bars, sections and particularly rails[197]. The mill is shown below :-

[195] Edgar Jones, *A History of GKN: Volume 2: The Growth of a Business, 1918-1945* (Basingstoke and London: McMillan Academic and Professional Ltd, 1990), p.298, p.300.
[196] Ibid, p.114. Carr and Taplin, p.269.
[197] Brinn, p.7.



Margam Steelworks in 1921 is shown below :-



The delay in blowing in the blast furnaces was caused by a downturn in demand following the early post war boom. In 1920 the UK produced 9,067,300 tons of ingot steel but only 3,703,400 tons in 1921 (see Appendix 1 for full details). Therefore most of Margam Steelworks started production as the post war boom peaked or just after. A further problem within South Wales was a shift away from the use pig iron to scrap as a raw material in steelmaking. The stimulus for the change was a post war surplus of war material (this will be discussed later).

It was anticipated that Margam Steelworks would produce about 5,000 tons/week of steel and employ between 1,000 and 1,500[198]. In addition Port Talbot Steelworks was now capable of producing 6,000-7,000 tons/week. The combined output of these two steelworks was therefore about 11,000 tons/week. Because the older Port Talbot Melting Shop was taken out of use as Margam Melting Shop became operational in reality the actual capacity was lower. Yet Port Talbot/Margam was now a large steelworks by British standards.

The building of Margam Steelworks and other wartime acquisitions added £3,000,000 to Baldwins balance sheet of £7,000,000[199]. Port Talbot/Margam's importance to Baldwins can be judged from the 1920 proportion of production concentrated there (they owned 6 other sites that produced iron and/or steel) :-

Table 3.3: Port Talbot/Margam and Baldwins' 1920 Capacity (tons)[200]

	Baldwins Capacity 1920	Port Talbot/Margam Capacity	Port Talbot/Margam as a % of Baldwins Capacity
Pig Iron	300,000	220,000	73%
Steel ingots	1,000,000	520,000	52%

An oddity of ownership was that Port Talbot Steelworks was owned by the PTSC, a wholly owned subsidiary of Baldwins, while Margam Steelworks was owned directly.

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198 de la Praudiere, p.xv.

199 Anon. 'Baldwins Limited, Authorised Capital-£7,000,000, Offer of Purchase of 1,000,000 5% Cumulative 'B' preference Shares'. *Economist*, 18th October 1919, p.751. Horton, p.1134.

200 Baldwins. Company brochure for the visit of King George V to Swansea 20th October 1920, West Glamorgan Archives–Ref Z208.

This slightly different ownership would have an impact on operations during the 1920s.

In summary the building of an iron works to supply Port Talbot Steelworks with pig iron was considered at least twice before Margam Steelworks was built. The war may have even delayed its building. It fitted into Baldwins' strategy of vertical integration. In reality the blast furnaces at Margam were an extension of Port Talbot Steelworks but full integration would be delayed during the 1920s because of trading conditions and differences in ownership. The location at the dockside meant that the blast furnaces were ideally located to exploit richer imported iron ore. What emerges at this time is that the Government for the first time were playing a major role in the steel industry and determining overall strategy. Baldwins appeared to benefit as their expansion was heavily subsidised by the Government yet the resulting steelworks contributed little to the war effort as production started so late in the war. As demand for steel declined dramatically in the early 1920s Margam would become a drain on Baldwins' resources. Yet Margam from the early 1930s became a vital component of a steelmaking complex of national importance and an important factor in securing the building of the strip mill there.

Chapter 4: The 1920s: From Boom to Recession and Merger with GKN

Baldwins came out of World War One with progress well underway in building Margam Steelworks to support steelmaking at Port Talbot Steelworks. It would enable them to take iron ore and coal through to finished steel on a single site. However, instead of benefiting from these investments they were frustrated by the poor trading conditions during the 1920s brought about by overexpansion throughout the industry during World War One, lack of demand from the steel consuming industries, an adverse exchange rate and closure of export markets. Baldwins' production in the Port Talbot area during the 1920s, after the early 1920s boom, was never sufficient to justify their investment. The position was such that the future of Baldwins itself was put in doubt. Company failure was only averted by rationalisation and financial restructuring. The latter involved the shareholders exchanging a major share of ownership for long-term debt. Throughout the 1920s rumours persisted of a merger with GKN to rationalise South Wales heavy steelmaking and to gain access to funds to invest in modernisation and cost control. When it occurred at the end of the 1920s it was only a merger of their heavy steelmaking assets rather than a full company merger. It is argued that this was a missed opportunity for the South Wales tinplate and sheet sectors. Surprisingly, despite the adverse trading conditions limited investment continued throughout the 1920s although it was largely confined to improvements in efficiency and placing Baldwins in a better position to merge with GKN.

The 1920s were a difficult decade for the British steel industry. By the late 1920s British industry had lost about 20% of its pre-war 1913 export markets. It was the old staple industries such as coal, shipbuilding, engineering, textiles and steel that were the most affected[201].

Between 1913 and 1937 world steel production grew by 75%[202] yet the British steel industry was unable to exploit this growth. Prior to World War One most of Britain's exports went to semi-industrialised countries. During the war a number of non

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[201] Keith Laybourn, *Britain on the Breadline–A Social and Political History of Britain 1918-1939* (Stroud: Sutton Publishing Limited, paperback edition, 1998), p.7.
[202] Tolliday, p.19.

European countries either became producers for the first time or greatly expanded their capacity with the aim of becoming self sufficient in steel production e.g. Canada, Japan, India, Australia and South Africa[203]. Even within Europe this trend was apparent with iron and steelmaking starting in Holland between the wars[204]. It is probable that this process would have occurred without World War One but it speeded up that process. Prior to 1914 Britain was exporting 40% of its steel production[205]. But as a result of new production, tariffs, exclusions and an overvalued pound the British steel industry lost considerable parts of its export markets. To add further to the British steel industry's problems Britain's markets remained unprotected and open to foreign producers whose own markets were protected. Thus continental producers were able to target Britain's open market. An overvalued pound further exposed the British steel market to foreign competition[206]. These problems were increased by the wartime expansion in capacity of the steel industry. A combination of all these factors exposed the structural weaknesses of the industry which had been hidden by an expanding pre-war market.

To illustrate the loss of markets for the British steel industry in a sector particularly relevant to steelmaking at Port Talbot, it is helpful to look at shipbuilding. In terms of tonnage, British interwar shipbuilding peaked during 1921 with an output of 2.1 million tons in an effort to replace war losses, but then averaged about 1 million tons/year during the rest of the 1920s and just 700,000 tons during the 1930s. Throughout the 1920s over a half of all shipbuilding berths remained empty but between 1930 and 1934 this figure increased to 80%. During World War One Britain had increased shipbuilding capacity by about 40% but European and other shipbuilders had increased their capacities by even more. This resulted in chronic world shipbuilding overcapacity. Much of Britain's pre-war export markets were lost as foreign tariffs and government policies denied access to their markets[207].

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[203] Ibid. Martin Daunton, *Wealth and Welfare–An Economic Social History of Britain 1851-1951* (Oxford: Oxford University Press, 2007), p.231.
[204] Hoogovens, *Steel At Sea* (Ijmuiden Steelworks, Hoogovens Groep, c1989).
[205] Tolliday, p.23.
[206] Ibid, p.21.
[207] Anthony Slaven, 'British Shipbuilders-Markets Trends and Order Patterns Between The Wars', *Journal Of Transport History,* Vol.3(2) (1982), 37-38. Peter Pagnamenta, and Richard Overy, *All Our Working Lives* (London: BBC, 1984), p.131. Geoffrey Owen, p.96.

This decline in shipbuilding caused serious problems for the steel industry. Before the early 1920s shipbuilding and repairing accounted for as much as 30% of Britain's steel output[208]. By 1924 this proportion of output had fallen to 19% and by 1935 to 8.3%[209]. This decline in such a major market was one of the reasons for the serious problems that the steel industry experienced between the wars. Of the rest of Britain's steel output, 30% went into producing tinplate and sheet and the remaining 40% went into producing railway material, motor vehicles, engineering, building and constructional work etc[210].

Both Port Talbot and Margam were geared towards heavy steel production. As a consequence they suffered particularly from depressed demand for plate, rails and structural steel. Nationally steel plate production fell from 1,654,700 tons in 1920 to less than 600,000 tons in 1923. Like plate, demand for structural steel and rails remained quite low throughout the 1920s. Unlike plate and structurals, rail demand did not share in the recovery of the 1930s[211]. These heavy steel products made up as much as 66% of national production in 1920 so the fall in demand had a disproportionate effect on the whole steel industry. In contrast demand for lighter steel products such as tinplate and sheet remained more stable during the 1920s[212]. In 1913 the UK produced 16,441 boxes of tinplate, 16,498 in 1924 and peaked at 17,597 in 1929[213].

As table 4.1 shows, British steel production plunged during 1921 into one of the worst recessions that it had ever experienced. Production was running at only 25½% of capacity. In South Wales there were 24 steelworks with 150 furnaces and converters but with just an average of 54.75 in operation[214]. In 1922 British steel production had recovered to about 45% of capacity[215]. Although by 1929 steel production was greater than in 1913 overall capacity had increased substantially

[208] Anon. 'The Iron and Steel Industry in 1922'. *Economist,* 3rd February 1923, p.201.
[209] Tolliday, p.24.
[210] Anon. 'The Iron and Steel Industry in 1922'. *Economist,* 3rd February 1923, p.201.
[211] Tolliday, pp.25-27.
[212] Ibid, pp.27-28.
[213] John Williams, *Digest of Welsh Historical Statistics–Volume 1* (Aberystwyth: University College of Wales, 1985), p.356.
[214] Anon, 'Iron and Steel Works in 1921', *I&CTR,* 20th October (1922), 566.
[215] H. Cole, 'British Iron and Steel and World Trade', *I&CTR*, 28th April (1922), p.602.

during World War One. The trigger for the downturn was the March to July 1921 national coal strike[216]. Steel production, because of the factors mentioned earlier struggled to recover.

Table 4.1: British Pig Iron and Steel Ingot/Casting Production (tons)[217]

Year	Pig Iron Production	Percentage Of 1913 Pig Iron Output	Steel Production	Percentage Of 1913 Steel Output
1913	10,260,300	100.0%	7,663,870	100.0%
1920	8,034,700	78.3%	9,067,300	118.3%
1921	2,611,400	25.5%	3,625,800	47.3%
1922	4,902,300	47.8%	5,880,600	76.7%
1923	7,440,500	72.5%	8,481,800	110.7%
1924	7,307,400	71.2%	8,201,200	107.0%
1925	6,261,700	61.0%	7,385,400	96.4%
1926	2,458,200	24.0%	3,596,100	46.9%
1927	7,292,900	71.1%	9,097,100	118.7%
1928	6,610,100	64.4%	8,519,700	111.2%
1929	7,589,300	74.0%	9,636,200	125.7%
1930	6,192,400	60.4%	7,325,700	95.6%

The percentage fall in iron production compared to 1913 was greater than for steel. In South Wales during 1921 there were seven iron works containing 33 blast furnaces. Yet only an average of 2.4 were in blast[218]. This was partly attributable to the replacement of pig iron as a raw material in the steelmaking process with scrap. During the early 1920s the general depression and availability of redundant war material saw scrap prices fall relative to pig iron. Throughout the 1920s between 40-50% of the steelmaking charge was scrap. It peaked at 60% in 1936 and remained about 50% after that. The problem was that for technical reasons scrap could be substituted most easily under cold metal practice. This favoured Britain's smaller non-integrated steelworks despite their poor fuel economy[219]. These were the very steelworks that were unsustainable in the longer term when the price of scrap rose. This helped hold back the modernisation of the industry.

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[216] Kenneth O. Morgan, *Rebirth of a Nation, Wales 1880-1980* (Oxford: Oxford University Press, 1982), p.194.
[217] Cole, p.602. Anon, 'Iron and Steel Works in 1921', *I&CTR,* 20th October (1922), 566. NFISM, p.8, p.11. Carr and Taplin, p.366, p.429, p.477.
[218] Anon, 'Iron and Steel Works in 1921', *I&CTR,* 20th October (1922), 566.
[219] Julian Greaves, 'British Steel in the 1930s, Adaptation Under Duress?', in *After the Slump,* ed C. Buckheim and W.R. Garside (London: Peter Long, 2000), pp.111-132 (pp.119-120).

Unsurprisingly a protectionist lobby emerged among the British steel companies from the early 1920s demanding tariff protection[220]. Although key figures in the Conservative administrations were sympathetic to some form of tariff protection strong opposition from the Treasury blocked any chance of their introduction. There is no evidence that Baldwins were part of this lobby. Part of the steel industry's response to the deteriorating situation was for some limited mergers to take place. This process quickened towards the end of the decade. Despite these mergers the fragmented structure of the steel industry persisted. There were still around twenty companies whose total output was equivalent to just one German Company, the Vereinigte Stahlwerke and only equivalent to approximately one third of the United States Steel Corporation[221].

Geoffrey Owen argues that the question of rationalisation to remove surplus capacity was closely bound up with protection[222]. The steelmakers argued that there was no incentive to modernise and re-equip as long as continental steelmakers were free to dump their surpluses below cost in Britain whilst their own markets were protected. These points were raised at Baldwins' 1922 AGM by John Roper Wright as affecting Baldwin's performance[223]. Yet rather than protection they saw the solution as cutting costs, particularly wages and a more favourable exchange rate.

The fundamental problem that the steel industry faced during the 1920s was a lack of demand from the steel consuming industries. In the immediate post-war period there were two sectors of the industry within South Wales supplying very different markets. During the interwar period the sectorial divisions became very apparent. The first of these was the traditional heavy iron and steel producing sector (including Port Talbot and Margam) mainly located in the eastern and central parts of Glamorgan on the northern rim of the coalfield. The second sector was located in South West Wales to the west of Port Talbot where virtually all the output of the 13

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[220] Tolliday, pp.294-295.
[221] Pagnamenta and Overy, p.80. Warren, *The British Iron and Steel*, p.102.
[222] Owen, pp.120-121.
[223] John Roper Wright, 'Chairman's Address to Baldwins AGM', 26th January 1922. *I&CTR,* 3rd February (1922), 186.

small steelworks was supplied to the local sheet and tinplate industries[224]. As Steven Tolliday states the tinplate sector performed relatively better than the rest of the steel industry during the 1920s[225]. Yet its share of world output fell from 45% in 1914 to 23% in 1930.

Table 4.2: South Wales Pig Iron and Steel Ingot/Casting Production (tons)[226]

Year	Pig Iron Production	Percentage Of 1913 Pig Iron Output	Steel Production	Percentage Of 1913 Steel Output
1913	889,200	100%	1,807,300	100%
1920	692,000	77%	1,884,300	104%
1921	120,500	14%	854,500	47%
1922	595,500	67%	1,873,900	104%
1923	807,600	90%	2,212,100	122%
1924	865,600	97%	2,254,600	125%
1925	788,900	88%	1,962,800	109%
1926	284,100	32%	902,100	50%
1927	739,100	83%	1,927,300	107%
1928	852,800	95%	2,158,600	119%
1929	926,500	104%	2,336,100	129%
1930	542,300	61%	1,503,200	83%

The relative fall in South Wales pig iron production during 1920-21 was more than for Britain as a whole (see table 4.1). This fall resulted from the greater use of scrap in the small cold charged steelworks in South West Wales where for technical reasons it was easier to substitute scrap for pig iron. As noted earlier the cause of the shift was a surplus in ex-war material scrap which undercut the price of pig iron. Yet after 1921 South Wales generally shows relatively more steel production compared to 1913. This was attributable to the high proportion of sheet and tinplate production in South Wales for which demand remained proportionally higher than for heavy products[227]. The two sectors of the steel industry in South Wales reacted quite differently to the economic downturn[228].

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[224] D. Gareth Evans, *A History Of Wales 1906-2000* (Cardiff: University Of Wales Press, 2000), p22.
[225] Tolliday, pp.125-126.
[226] John Williams, pp.352-355.
[227] Kenneth O. Morgan, p.217. Tolliday, pp.125-126. D. Gareth Evans, p.22.
[228] Anon. 'Review of the Iron and Steel Trades (South Wales)', *I&CTR*, 29th December (1922), 966-968.

It is unsurprising that the 1920s brought permanent closures to the older less efficient plants mainly producing heavy steel products located on the northern rim of the coalfield where ore transport costs from the docks to the steelworks finally brought closure. In 1921 Cyfarthfa steelworks near Merthyr, after returning to production in 1916 to support the war effort, finally closed leaving steelmaking in the Merthyr area confined to Dowlais. In Monmouthshire the steelworks at Blaenavon closed in 1922, its blast furnaces along with those at Tredegar closed in 1924 and steelmaking ceased at Ebbw Vale in 1929. The outcome was that the South Wales industry tended to become concentrated on the coast between Newport in the east and Llanelli in the west[229].

By the end of World War One Baldwins had become a highly successful steelmaker. Since their formation in 1902 they had taken full advantage of suitable opportunities to acquire other businesses to develop vertical integration and to move into new product lines. The development of the latter had been partly financed by their customers. They had acquired Port Talbot Steelworks on extremely advantageous terms and had been subsidised in building Margam Steelworks. Not only had Baldwins become highly profitable but they had challenged not just the established regional producers but even producers in other regions. By British standards their plant was both large and modern. Yet their success hid problems. Despite the high profits in the heavy steel product lines that they had diversified into they also became vulnerable to any dramatic downturn in demand for these products. This would occur in the early 1920s just as Margam Steelworks went into production. There is circumstantial evidence that Baldwins realised their vulnerability in the years immediately after World War One. They still owned substantial interests in tinplate and, as will be seen, they attempted to develop these further. At another level Baldwins were part of the wider British steel industry's structural problem of being too small compared to some continental and North American steelmakers to deal with the economic difficulties that they faced.

The early post-war years were highly profitable years for Baldwins (see table 4.3). This allowed them to continue expanding. Their most important long-term mistake at

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[229] Carr and Taplin, p.462. Kenneth O. Morgan, pp.216-217. Edgar Jones, *A History of GKN: Volume 2,* p.114. Paul Jenkins, p.367. D. Gareth Evans, p.22.

this time was their failure to acquire an overseas source of iron ore for Margam. Instead they concentrated on securing outlets for their steel. This was part of a wider process in South Wales where steelmakers were acquiring control of rolling businesses in the lighter end of steelmaking as outlets for their expanded wartime capacity[230]. It was an area of production where Baldwins were still able to make a profit in the late 1920s.

As part of this process Baldwins acquired the British Mannesmann Tube Company in January 1921. They paid 20 ordinary and 11 cumulative preference shares for every 40 ordinary shares in the latter company[231]. This allowed Baldwins to supply British Mannesmann with all their steel needs of about 1,000 tons/week[232]. Baldwins also acquired the Eagle Tinplate Works in Neath (1921), the Fairwood Tinplate Works in Gowerton (1923) and the Wern Tinplate Works in Briton Ferry (1921) gaining 15 tinplate mills in the process[233]. This was part of a wider process of concentration of tinplate production around three main South Wales groups. The other groups were Richard Thomas and the Briton Ferry Steel Company. Some tinplate works that were absorbed were obsolete and inefficient. They were bought partly for their goodwill, partly as a basis to claim quotas should they be introduced, and partly as an outlet for tinplate bars. During 1925, in conjunction with the Anglo-Asiatic Petroleum Company, Baldwins built a large tinplate works at Swansea adjoining their Kings Dock Tinplate Works near Llandarcy Oil Refinery which had opened in 1922[234]. Output from its 16 mills was destined primarily for the expanding oil can market. Initially it was registered as the Glamorgan Tinplate Company but was renamed the Elba Tinplate Works[235]. It was the last traditional British tinplate works to be built[236].

During 1920 Baldwins themselves were subject to a takeover bid. On 17th February 1920 Baldwins received a letter from Sperling and Co confirming an offer to

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[230] Tolliday, p.129.
[231] Anon. 'Baldwins and British Mannesmann Fusion'. *Economist*, 21st January 1921, p.150. Carr and Taplin, p.383. Burn, *The Economic History of Steelmaking 1867-1939,* p.384.
[232] Anon. 'Baldwins AGM', *Economist,* 29th January 1921, p.197.
[233] Carr and Taplin, pp.383-384. Tolliday, p.129. Paul Jenkins, p.46.
[234] D. Morgan Rees, p.229.
[235] Carr and Taplin, pp.383-384.
[236] Paul Jenkins, p.47.

purchase all or part of Baldwins' ordinary shares for £3 per share subject to acceptance of 51% of ordinary shares. Sperling were purchasing agents for the Northumberland Shipbuilding Company. Baldwins' board recommended acceptance and 97% of the shareholders accepted it. After an unexpected increase in Excess Profits Duty Tax from 40% to 60% the offer was withdrawn. As a consequence the Northumberland Shipbuilding Company paid compensation of £850,000 to Baldwins (or 5/- per share) rather than go ahead with the purchase[237]. This proved to be a sound decision for the Northumberland Shipbuilding Company. Sperling offered £3 per Baldwins share in 1921 but they were only worth 18/- in January 1922 and 5/- in May 1928[238].

During 1920 rumours circulated that Baldwins would merge with GKN[239]. There were further rumours in 1923 that this amalgamation was again being considered. They were denied at Baldwins' 1923 AGM[240] and in March 1924 Baldwins' directors again announced that rumours of a company reconstruction were groundless[241]. Arguably, both Baldwins and GKN were too small to deal with the problems that were emerging. A merger between Baldwins and GKN in the early 1920s would have helped the regional steel industry to deal with its problems. It could have allowed production to be concentrated at the more modern and efficient plants such as Port Talbot and Margam, allowed better access to raw materials, pooled resources and made it easier to raise funds. A delay of almost a decade before a merger of Baldwins and GKN's heavy steelmaking interests prevented any serious resolution of the issues and seriously weakened Baldwins.

By the end of World War One Port Talbot Steelworks consisted of 11 open-hearth furnaces (5x50tons and 6x60tons) with an annual steelmaking capacity of over 300,000 tons. Margam Steelworks had started limited steel production in September

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[237] Anon, The Offer to Baldwins Shareholders. *The Times*, 30th November 1920, p.20. 'John Roper Wright, Baldwins Limited–The Negotiations With Messrs Sperling and Co', *Economist*, 10th July 1920, p.69. Anon, 'Baldwins', *Journal of the Iron and Steel Confederation*, 1920. Burn, *The Economic History of Steelmaking 1867-1939*, p.390. Carr and Taplin, p.359.
[238] Anon, 'Share price quoted in *I&CTR*', 20th January (1922), 108. Carr and Taplin, p.446.
[239] Burn, *The Economic History of Steelmaking 1867-1939*, p.373.
[240] 'News Item', *I&CTR*, 27th April (1923), 619.
[241] Ibid, 21st March (1924), 492.

1918 and by 1922 had 5 open-hearth furnaces (5x60tons). Due to adverse market conditions its blast furnaces (completed by January 1921) were not blown in until February 1922 and April 1923. Both steelworks were intended to work as one unit but a complication emerged. Margam became a steelworks in its own right with limited rolling plant rather than focussing simply on iron production. In a sense it emerged as a semi competitor to Port Talbot, particularly as the ownership differed slightly. This might appear to be a legal technicality but as we will see it also ensured that complete integration in the wider sense could not be achieved. It created the potential for conflicts of interest and full integration only took place when the PTSC was fully absorbed into Baldwins shortly before the merger with GKN in 1930.

Baldwins' financial performance steadily improved from a profit of £108,354 in 1902-03 to £275,106 in 1912-13 (see Appendix 4). The period 1917 to 1920 saw a steep increase in trading profits which peaked at £683,405 during 1919-20 before declining. Dividends on ordinary shares ceased from 1920-21 although payments on preference shares continued until 1924-25. Although Baldwins made a trading profit of £410,758 and a net profit of over £325,000 in 1921 (see Appendix 4 for full details) it was a disastrous year for the PTSC. From 1921 Port Talbot and Margam faced a *"severe set back in trade*[242]*."* The 1921 coal strike brought Port Talbot and Margam to a standstill within days[243]. The increasingly adverse trading conditions were reflected in Baldwins' and the PTSC's results from 1918 to 1929 :-

[242] GKB, p.42.
[243] Hanson, *Profile Of A Welsh Town*, p.123.

Table 4.3: Baldwins and PTSC Financial Results 1918-1929[244]

Year Ended	Baldwins Trading Profit (£)	PTSC Profit/(Loss) (£)
1918	442,900	211,790
1919	554,997	187,718
1920	683,405	177,101
1921	410,758	(196,378)
1922	306,132	(157,578)
1923	484,760	19,063
1924	493,520	267
1925	214,078	1,032
1926	255,837	(53,910)
1927	120,009	(90,238)
1928	220,107*	(82,355)
1929	352,042*	-

* recorded as 'profit'

Baldwins' profits came from their tinplate and sheet interests as their heavy steel and colliery interests were losing money. The problem for Baldwins was that the heavy products that they had diversified into before the War, which had been highly profitable, were now the very products where demand fell most. It is unclear how Baldwins were accounting for the PTSC's results in their accounts but from table 4.3 the PTSC must have had a serious affect on Baldwins' financial results.

In the early 1920s Baldwins' Chairman, John Roper Wright, attributed the poor performance of the PTSC to a number of factors which he felt also affected the wider British steel industry including adverse exchange rates which meant that German, French and Belgium steelmakers could undercut prices in export markets and even

[244] Kew, NA, Ref BT 31/1784/8923, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 12th August 1918 and Balance Sheet at 31st March 1918. Ibid, to 17th July 1919 and Balance Sheet at 31st March 1919; to 23rd July 1920 and Balance Sheet at 31st March 1920; to 26th August 1921 and Balance Sheet at 31st March 1921; to 11th August 1922 and Balance Sheet at 31st March 1922; and to 13th July 1923 and Balance Sheet at 31st March 1923; to 2nd January 1925 and Balance Sheet at 30th June 1924. Ibid, to 24th November 1925 and Balance Sheet at 30th June 1925; to 24th November 1926 and Balance Sheet at 30th November 1926; to 8th November 1927 and Balance Sheet at 30th June 1927; and to 9th October 1928 and Balance Sheet at 30th June 1928. Anon. Baldwins Report for the year ended 30th June 1921. *Economist*, 21st January 1922, p.84. Ibid, Y/E 30th June 1924, 13th December 1924, p.959; Baldwins' Lean Year, 26th November 1927, p.927; Y/E 31st December 1930, 11th April 1931, pp.796-797.

in Britain. Other factors highlighted as contributory to the PTSC's losses were the price of coal and high taxation[245].

Wright frequently emphasised taxation, transport costs and coal prices, probably in an attempt to pressurise the Government and suppliers to reduce costs. He also blamed payments in connection with the housing of workmen, the general lack of demand for iron, steel and coal and continuing complaints about high railway and dock charges. He stated that charges on iron ore from ship to works were 130% above pre-war rates at Port Talbot and 140% at Swansea. Railway rates were said to have increased by between 70-90% over pre-war levels[246]. In 1924 Charles Wright stressed the effect of continental competition on the PTSC and in 1925 and 1926 he emphasised the effect of the high exchange rate on their financial performance[247].

A further problem for Baldwins and the PTSC is highlighted by Steven Tolliday. During the period 1920-1934 new integrated plant needed to operate at more than 80% of capacity to cover interest and depreciation charges. To realise the same profit existing plant only needed to operate at 40% of capacity[248]. Port Talbot was not a brand new steelworks but was relatively new with heavy recent investment and it operated at considerably less than 80% of capacity. Margam Steelworks was new and its capacity mainly came on stream only when demand for its pig iron and Port Talbot's heavy products had already peaked.

As production at Margam Melting Shop increased it was decided in 1920 to close the older of the two Port Talbot Steelworks' Melting Shops. It was demolished some years later. Margam Melting Shop was probably always intended to be a post-war replacement for the smaller of Port Talbot's Melting Shops which was closed before the end of the post-war boom. This rationalisation was intended to reduce costs by concentrating production on the more modern and efficient plant. It also brought

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[245] John Roper Wright, 'Chairman's Address to Baldwins AGM', *I&CTR*, 3rd February (1922), 186.
[246] Ibid, 'Chairman's Address to Baldwins AGM', *I&CTR*, 12th January (1923), 68.
[247] W. Charles Wright, 'Baldwins Limited AGM', *I&CTR*, 26th December (1924), 1061 and *Economist*, 20th December 1924, p.1102. Ibid, *Economist*, 27th November 1925, p.930. Ibid, 'Baldwins Limited AGM', *I&CTR*, 3rd December (1926), 878.
[248] Tolliday, p.41.

steelmaking capacity more inline with likely post-war demand. The closure left Port Talbot Steelworks with 6 open-hearth furnaces[249].

Despite low demand Margam proved itself to be an efficient and productive steelworks[250]. Although no exact utilisation rate is available, Wright stated that it was less than some of their other works which were given as 60%, well below the 80% utilisation rate needed to operate profitably. During the financial years ended 1922 and 1923 a lack of orders meant that Margam Steelworks only operated intermittently and made losses of £100,000 per annum[251]. In 1923 an order for 25,000 tons of rails was placed by the London Midland and Scottish Railway at Port Talbot Steelworks. The latter had been working well below capacity throughout much of 1922[252].

The extent that production was below capacity can be illustrated by the data on the use of Margam's blast furnaces (see table 4.4). From September 1924 to December 1930 only a maximum of one of the two blast furnaces was in blast. After the General Strike and the ensuing coal strike it was not until early 1927 that iron production restarted at Margam[253]. Despite the low utilisation rate of Margam's blast furnaces it was still higher than the overall South Wales rate. The problem for Baldwins was that based upon Tolliday's assertion that new plant needed to work at 80% to cover interest and depreciation charges then both furnaces needed to be in blast.

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[249] Brinn, p.7.
[250] John Roper Wright, 'Chairman's Address to Baldwins AGM', 12th January (1923), 68.
[251] R. Horne, 984.
[252] Ibid. 'News Item', *I&CTR*, 3rd February (1922), 178.
[253] Journal of the Iron and Steel Confederation, (1927), 53.

Table 4.4: Blast Furnace Operations September 1922-December 1930[254]

Quarter Ended	Margam Blast Furnaces in Blast	South Wales Blast Furnaces in Blast	South Wales Blast Furnaces	South Wales Utilisation Rate
30th September 1922	Nil	6	33	18%
31st March 1923	1	n/a	n/a	-
30th June 1923	2	11	36	31%
30th September 1923	2	9	36	25%
31st March 1924	2	11	36	31%
30th September 1924	2	7	31	23%
31st December 1924	Nil	7	31	23%
31st March 1925	1	8	31	26%
30th June 1925	1	8	31	26%
31st December 1926	Nil	1	30	3%
30th September 1927	1	8	26	31%
31st December 1927	1	4	24	17%
31st March 1928	1	7	24	29%
30th September 1928	1	8	24	33%
30th June 1929	1	10	22	45%
31st December 1930	1	2	22	9%

Baldwins trading performance put the company under financial pressure. Until 1921 Baldwins had an issued capital of almost £6,000,000 and £500,000 in 4½% first mortgage debenture. During the post war boom they issued a further £2,250,000 of 7½ % mortgage debenture stock. They considered raising these already high levels of debt to a total of £4,000,000 and issuing further shares, but the onset of the downturn meant that, fortunately in retrospect, they did not do this[255].

Despite a deteriorating situation Baldwins returned a trading profit throughout the 1920s never falling below £120,000. However, this was far below the £683,000 returned during 1919-20. In 1924-25 the net profit disappeared and became a net

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254 'British Blast Furnaces For The Quarter Ended September 30th 1922', *I&CTR*, 20th October (1922), 580. Ibid, The Quarter Ended 30th June 1923, 3rd August (1923), 177; The Quarter Ended 30th September 1923, 26th October (1923), 641; The Quarter Ended 31st March 1924, 9th May (1924), 804; For The Quarters Ended 30th September 1924 and 31st December 1924, 30th January (1925), 190, For The Quarter Ended 31st March 1925, 24th April (1925), 668; For The Quarter Ended 30th June 1925, 24th July (1925), 149; For The Quarter Ended 31st December 1926, 21st January (1927), 109; For The Quarter Ended 30th September 1927, 28th October (1927), 630; For The Quarter Ended 31st December 1927, 20th January (1928), 88; For The Quarter Ended 31st March 1928, 11th May (1928), 721; For The Quarter Ended 30th September 1928,19th October (1928), 582; For The Quarter Ended 30th June 1929,19th July (1929), 94; For the Quarter Ended December 31, 1930, 23rd January (1931), 184. Anon. 'Neath Assessment Committee–Tin, Iron and Steel Works Dealt With–1677 Appeals'. *Port Talbot Guardian* (henceforth PTG), 8th March 1929, p.3.

255 Anon. 'Baldwins Limited', *Economist*, 11th June 1921, p.1284.

loss of just under £44,000 and by 1926-27 this had increased to a loss of almost £130,000 (for full details see Appendix 4). The main problem area for Baldwins was their interests in heavy steel. Port Talbot barely broke even after 1923 and made heavy losses from 1926 (see table 4.3). By 1926 Baldwins were unable to even pay a dividend on their preference shares (see Appendix 4). With regard to Port Talbot, in 1926 Wright stated :-

"…..the Port Talbot Steel Company had been practically at a standstill, with the exception of the light plate mill and light bar mill, which had worked intermittently. The heavy bar mill and heavy plate mill had been closed down since September of last year owing to keen competition in foreign heavy plates and sectional materials, and unless some legislation was introduced to counter the dumping of heavy steel goods, there seemed small prospects for the future of the heavy steel trade [256]."

During 1926 Baldwins' financial position deteriorated to such an extent that they approached the Government for financial help. This was refused on the advice of the Governor of the Bank of England, Montagu Norman[257]. As a response in June 1926 the company appointed an Advisory Committee to look at their financial structures. This reported in 1928 that £3,786,431 of capital had been lost and should be written off their £6,000,000 share capital[258]. The 5% 'B' preference shares were written down by 6/- and the ordinary shares by 16/-[259]. A new class of 6% first mortgage debentures to the value of £1,000,000 was created to provide badly needed capital taking precedence over all other debenture stock. When this issue was made at 96½ in October 1928 it was over subscribed. By April 1929 it was trading at 99½. When Baldwins emerged from reconstruction their shares only represented 36½% of their capital as opposed to 66% before reconstruction. Share capital had fallen from £6 million to £2.25 million while debenture capital had risen from £2.75 million to £3.75 million. Thus the financial structure of the company was fundamentally changed from one dominated by shareholders to one dominated by debenture holders and debt. In order to survive Baldwins' shareholders lost part

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[256] W. Charles Wright, 'Baldwins Limited AGM', *I&CTR*, 3rd December (1926), 878.
[257] Carr and Taplin, p.446.
[258] W. Charles Wright, 'Baldwins Limited AGM', *I&CTR*, 23rd December (1927), 956. Anon. 'Baldwins Limited–Reorganisation Scheme–Extraordinary General Meeting' 26th June 1928. *Economist*, 30th June 1928, p.1348.
[259] Carr and Taplin, p.446.

ownership of the company in exchange for larger company debt. This restructuring as well as a survival strategy was also a prerequisite to a potential merger with GKN.

In parallel with their financial reconstruction Baldwins sold their Netherton blast furnaces and their shares in the Canadian Steel Corporation and closed all collieries except for Cribbwr Fawr which supplied Margam with coking coal. They also intended to sell the Briton Ferry Iron Works, the Wern Tinplate Works, the Brymbo Steel Company, and interests in Australia and South Africa[260]. Brymbo Steelworks closed and was sold back to its previous owner, Sir Henry Robertson, for £25,000. After the introduction of tariffs it went back into production[261]. Their interest in the Mannesmann Tube Company was exchanged for shares in the Mannesmannrohen Werke of Dusseldorf[262]. Thus Baldwins underwent a fundamental reconstruction. The company was slimmed down to its core interests in tinplate and heavy steel production.

For most of 1927 Port Talbot Steelworks remained virtually idle. The heavy bar mill worked intermittently[263]. By 1929 Charles Wright stated that at Port Talbot :-

"With regard to the heavy side of their steel business, the Margam Works and Port Talbot were now worked as one unit under one control. At these works they are fairly well off for orders in rails and sections, but with light and heavy plates there was a scarcity of orders, and prices in all cases are low. At these works they are making steel for the British Mannesmann Tube Company [264]*."*

The comment about Margam and Port Talbot working as one unit suggests that they had not previously been worked as one unit. Margam had been built to supply Port Talbot with raw materials but Wright suggests that integration and overall control had come about slowly. If this is correct it indicates a lack of managerial control by Baldwins. This tightening of control was a precursor of the forthcoming absorption of the PTSC fully into Baldwins. By 1929 only one of Margam's blast furnaces was in blast (see table 4.4) and only 2 of its 5 open-hearth furnaces were in production.

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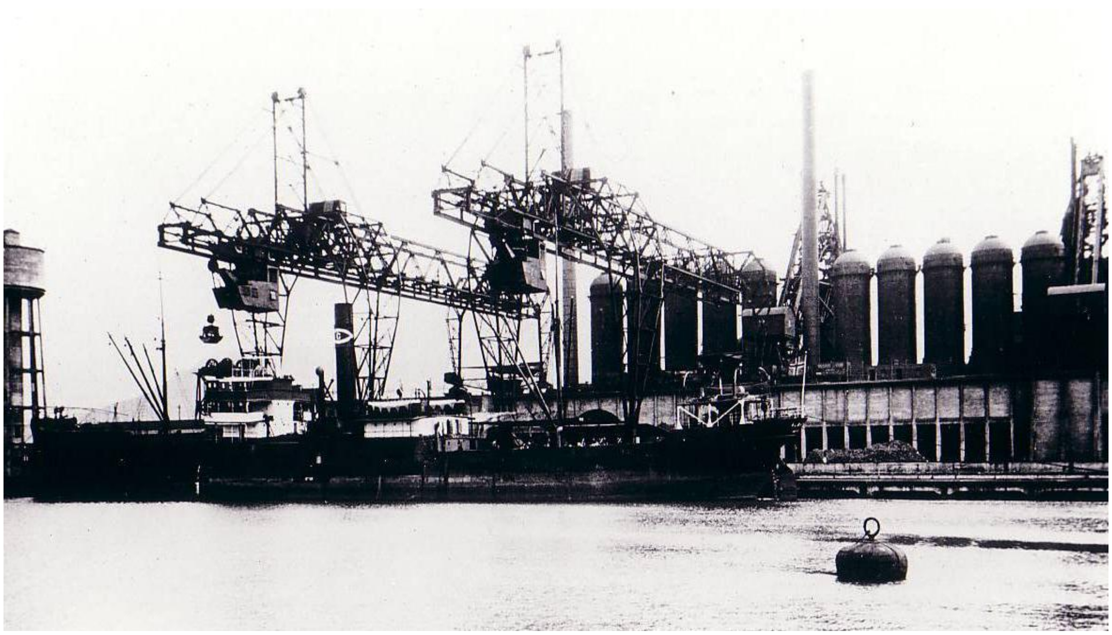
[260] W. Charles Wright, 'Baldwins Limited AGM', *I&CTR*, 3rd May 1929. 700.
[261] London, Bank of England Archives (hereafter BoE), Ref BID 1/14, Bankers Industrial Development Trust, Memo on Brymbo Steel (Successors) Ltd, 26th June 1935.
[262] Carr and Taplin, pp.446-447.
[263] W. Charles Wright, 23rd December (1927), 956.
[264] Ibid, 3rd May (1929), 700.

Unsurprisingly, Margam was losing money although no figure is available[265]. From the opening of Margam Steelworks until 1932 the maximum combined annual output of Port Talbot and Margam was 250,000 ingot tons/annum[266] at a time when their combined annual steel ingot capacity was about 400,000 ingot tons[267]. Hence during this period the maximum combined output was 62.5% of capacity which was well below the 80% needed to fully cover costs.

Despite the poor trading position modest investment continued to take place. The investment was mainly confined to incremental improvements to the efficiency of the existing plant. In 1927 two transporter unloaders were erected at Margam Wharf, each capable of discharging 150 tons/hour of ore[268]. These are shown below :-



[265] Turnock, quoted in, 'Neath Assessment Committee–Tin, Iron and Steel Works Dealt With–1677 Appeals'. *PTG*, 8th March 1929, p.3.
[266] London, BoE, Bruce Gardner Papers, Ref SMT 3/168, Notes on Cardiff Works Scheme No4, 1933.
[267] Ibid, Ref SMT 3/168, Hewitson-Hall, Memo on development of Cardiff Works, June 1933.
[268] Anon, BOS Plant 'Swallows' Wharf Cranes, *Steel News*, 19th April 1973, p.3.

By 1931, after the merger with GKN had given them access to their Spanish ore, these unloaders discharged ore from Spain, Sweden, North Africa, and France[269] (see Appendix 5 for iron ore imported through Port Talbot Dock). The investment in the transporters allowed quicker and more efficient discharge of the richer foreign ores. This could suggest that Baldwins had been anticipating the merger with GKN and access to their Spanish ore.

By 1927 both of Margam's blast furnaces had been relined and their hearth diameters increased from 12'6" to 14'[270]. The result was an increase in furnace capacity. At the time of completion Margam's two blast furnaces were capable of producing a total of 4,000 tons of basic pig iron/week[271]. By 1931 it was claimed that each furnace could now produce between 2,500 and 2,800 tons/week of pig iron[272]. At first glance with such a low blast furnace utilisation rate this is an odd investment. Yet faced with fluctuations in demand an enlarged blast furnace made it possible to supply demand using just one blast furnace rather than two. During 1931 the single operating Margam blast furnace was producing 2,450 tons/week of pig iron[273]. Thus the blast furnace was operating near to maximum capacity. With just one blast furnace in blast rather than two production costs were reduced in terms of fuel consumption and wages. To maximise profit, or to reduce losses, it was better to drive one furnace as hard as possible in order to reduce costs per ton of iron to a minimum even if this meant not using the other blast furnace.

During 1928 a new medium plate mill was installed at Port Talbot[274]. This mill was located alongside the heavy plate mill and was designed to work in conjunction with it. The mill itself was the Lauth type single 3-high stand of rolls which was capable of producing plate from ¼" to ¾" and up to 76" wide[275]. Again, this seems a surprising

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[269] London, BoE, Bruce Gardner Papers, Ref SMT 3/168, Memorandum setting out the position of GKB's South Wales Scheme, 24th April 1931. Anon, 'Works Visited By Members Of The Iron and Steel Institute–The Port Talbot Branch of the British (Guest Keen Baldwins) Iron and Steel Company Limited', *I&CTR,* 2nd October (1931), 497-501.
[270] Brinn, p.7, p.23.
[271] Horton, pp.1133-1134.
[272] Anon, 'Works Visited By Members Of The Iron and Steel Institute', (1931), 497.
[273] E.C. Evans, 'Blast-Furnace Data And Their Correlation–Part II', *Iron and Steel Institute,* 1931, p.122.
[274] Brinn, p.7.
[275] Anon, 'Works Visited By Members Of The Iron and Steel Institute', (1931), 500.

investment at a time when demand for plate was so low, but it allowed Port Talbot to provide a wider range of plate at a time when pressure was growing on steel firms to merge. The obvious firm for Baldwins to merge with was GKN and the installation of this new mill strengthened Baldwins hand prior to a merger. It created more modern plant and a full range of plate production compared to GKN's Cardiff plate mill. It put Baldwins in a stronger position in relation to GKN with the inevitable rationalisation. If the merger unravelled after GKN closed its Cardiff plate mill, Baldwins would have a monopoly of South Wales plate production.

During the 1920s the market for rails and sections stagnated. As a result the 36" reversing rolling mill at Margam became surplus. It was shipped to a steelworks at Port Kembla in Australia during the late 1920s[276]. This meant that Margam had no rolling mill and now simply produced pig iron or steel ingots, further rationalising its relationship with Port Talbot.

Between 1926 and 1928 there were a number of approaches from the City with regard to amalgamations within the steel industry. In 1927 F.A. Szarvasy put forward a proposal to form a giant holding company to take in Colvilles, Richard Thomas, United Steel, South Durham, Cargo Fleet, Baldwins, Bolckow Vaughan and Dorman Long. The idea was that the holding company could evolve into an amalgamation. Within months the idea had petered out[277].

In 1929 with the finances of the steel industry in a precarious state the Bank of England's Montagu Norman, anxious to avoid a call for the steel industry to be nationalised, decided to push for the reorganisation of the industry. He asked Charles Bruce-Gardner to draw up a national plan which developed into the Bruce-Gardner Plan. The plan called for a regional rationalisation of production through mergers and the setting up of a central organisation to co-ordinate sales.

As already described, Baldwins had already undergone a financial and structural reconstruction that put them into a better position to take part in a merger. The

[276] Anon. 'Neath Assessment Committee–Tin, Iron and Steel Works Dealt With–1677 Appeals'. *PTG*, 8th March 1929, p.3. Anon, 'Baldwins Limited AGM', *I&CTR*, 8th April (1932), 614. GKB, p.42. Brinn, p.7.
[277] Vaizey, p.40. Tolliday, pp.99-100.

outstanding balance of £180,000 on the PTSC's 5% Debenture Stock was paid off from the 6% first mortgage debenture of £1,000,000 that Baldwins had taken out as part of its financial restructuring[278]. The assets of the PTSC were then absorbed into Baldwins removing a complication to a potential merger. The formal winding up of the PTSC began in 1928 and was completed by April 1930[279].

The obvious regional merger partner for Baldwins was GKN as both companies produced heavy steel products. GKN's origins date back to 1759 when an iron works was established at Dowlais. In 1767 John Guest became manager and it was he and his family who controlled the Dowlais Iron Company for the next century[280]. In 1865 Dowlais started to make steel but because of locational disadvantages began to plan for a steelworks in Cardiff from 1887[281] (both works will be discussed in the next chapter). The actual formation of GKN was part of a trend between 1900 and 1914 for steelmaking companies to merge. It was part of a process related to technical innovations which required large capital investment which was easier for bigger companies to raise, and also to deal with foreign competition under free trade[282]. GKN was formed in 1902 with the merger of the Guest's interests at Dowlais and Cardiff with two Black Country firms, the Patent Nut and Bolt Company and Nettlefolds[283]. In 1902 GKN absorbed the interests of Crawshay Brothers at Cyfarthfa. Thus a large part of their business was based in South Wales producing plate and rail in competition with the PTSC. In 1920 GKN absorbed the South Wales sheet manufacturer Lysaghts to diversify their product range[284]. Between 1918 and 1930 GKN returned a profit each year which never fell below £417,141 in 1919 and peaked at £968,698 in 1930[285] a striking contrast to Dowlais and Cardiff which both lost money throughout this period :-

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278 Kew, NA, Ref BT 31/1784/8923, Port Talbot Steel Company Limited, The Companies Acts 1908 to 1917, Memorandum of Satisfaction of Mortgage or Change, 6th February 1929. Anon, 'Baldwins Limited–Reorganisation Scheme', *I&CTR*, 15th June (1928), 923.
279 Kew, NA, Ref BT 31/1784/8923, Port Talbot Steel Company Limited, The Companies Acts 1908 to 1917, Memorandum of Satisfaction of Mortgage or Change, 6th February 1929. Ibid, The Return of Final Winding-Up Meeting, 22nd April 1930.
280 Atkinson and Baber, p.6.
281 Edgar Jones, *A History of GKN: Volume 1,* p.297.
282 Carr and Taplin, p.263.
283 Ibid, pp.267-268.
284 Ibid, p.386.
285 Edgar Jones, *A History of GKN: Volume 2,* p.7.

Table 4.5: Profit (Loss) at Dowlais and Cardiff Steelworks 1924-1929 (£)[286]

Year	Dowlais	Cardiff
1924	(77,538)	(24,807)
1925	(69,268)	(18,737)
1926	(67,210)	(40,748)
1927	(102,559)	(64,788)
1928	14,383	(17,507)
1929	(14,399)	(27,749)
Total Loss	**(316,591)**	**(194,336)**

During the equivalent period Baldwins also always returned a trading profit but lower than GKN (see table 4.3 and Appendix 4) although the PTSC lost £225,204 between 1924-1928 (see table 4.3). However, in comparing Dowlais and Cardiff figures with the PTSC figures it needs to be remembered that the PTSC figures relate to the entire company and may not be fully comparable.

The resulting merger of the heavy steelmaking interests of Baldwins and GKN was followed by the closure of Dowlais Steelworks and the end of plate making at Cardiff with production of rails and plate being concentrated at Port Talbot. In return the Bank of England ensured that the merged company got support and access to resources through the 'Bankers Industrial Development Trust' to rebuild Cardiff to produce bars, billets and light bars[287].

It was Charles Wright who approached GKN's John Field Beale on 20th December 1929 suggesting the merger of the two companies' heavy steel interests. Within 3 days GKN had provisionally agreed to the scheme and on 2nd January 1930 the GKN Board ratified the plan. In February 1930 it was agreed that the merged company would be called 'The British (Guest, Keen, Baldwins) Iron and Steel Company Ltd' (GKB)[288]. GKB was fully incorporated on 24th March 1930[289]. It comprised GKN's Dowlais and Cardiff East Moors Steelworks and Baldwins' Port Talbot/Margam Steelworks and Briton Ferry Iron Works. Raw material supplies were assured through the parent companies i.e. Baldwins' colliery, limestone and Oxfordshire

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[286] London, BoE, Bruce Gardner Papers, Ref SMT 3/168, W. Simon, Special Report on Cardiff and Dowlais Works, 28th September 1929.
[287] Edgar Jones, *A History of GKN: Volume 2,* p.132.
[288] Ibid, p.129.
[289] London, BoE, Bruce Gardner Papers, Ref SMT 3/168, Rintoul, P., Report on proposals to reorganise plants of British (GKB) Iron and Steel Company, 13th March 1931.

phosphoric ore interests and GKN's interest in Spanish Orconera hematite iron ore mines[290].

The actual issued capital of GKB was £4,849,166 divided into 1,174,166, 5% redeemable cumulative preference shares and 3,675,000 ordinary shares. Additionally there was £500,000 of 5% income notes[291]. The shares were divided as shown :-

Table 4.6: GKB Capital Structure[292]

	Baldwins	GKN
5% Income Notes	180,000	320,000
5% Preference Shares	502,403	671,763
Ordinary Shares	1,575,000	2,100,000

All other activities of both companies, namely light sheet, sheet and tinplate remained in the hands of Baldwins and GKN who continued as independent companies[293]. Baldwins viewed the merger as an opportunity to reduce capacity by closing the less economic steelworks and loading up and modernising the remaining steelworks[294]. This would ensure a return to profitability. The merger was a lost opportunity as it was not a full merger. Essentially Baldwins and GKN retained ownership of what they considered to be the profitable parts of their companies and disposed of their loss making heavy steel interests aided by funding from the Bank of England. In the following decade through rationalisation, reduced foreign competition and increased demand these heavy steelmaking interests returned to high profitability. In contrast Baldwins' tinplate and sheet interests which had been profitable in the 1920s experienced difficulties in the late 1930s when the heavy

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290 Anon. 'Baldwins and Guest Keen'. *Economist*, 11th January 1930, p.80. Anon, 'Guest Keen-Baldwins Fusion–Financial Details', *I&CTR*, 11th April (1930), 624. Ibid, 'Developments in the Steel Industry of South Wales and Northamptonshire', 24th June (1938), 1094. Anon. 'Brighter Industrial Outlook–Local Significance of Welsh Steel Merger'. *PTG*, 10th January 1930, p.2. Ibid, 'Port Talbot Piers-£300,000 Scheme of Dock Extension'. 14th March 1930, p.1. GKB, p.14. E.L. Chappell, *History of the Port of Cardiff* (Cardiff: The Priory Press Ltd, 1939), p126. L. Griffiths, 'Margam Reconstruction in A Technical Survey of the Abbey, Margam, Trostre and Newport Plants of The Steel Company of Wales Limited', *I&CTR Special Issue* (1952). Carr and Taplin, p.447. Brinn, pp.7-8.

291 Anon, 'Guest Keen-Baldwins Fusion–Financial Details', 11th April (1930), 624.

292 Ibid

293 Carr and Taplin, p.447. Brinn, p.8. C.W. Roberts, p.152.

294 Anon, 'Baldwins Limited AGM', *I&CTR*, 11th April (1930), 626.

sector was highly profitable. A merger of the whole of Baldwins and GKN in 1930 would have offered greater opportunities for rationalisation and investment.

In summary the 1920s were a very difficult period for the British steel industry. The sector that suffered most was heavy steel following overexpansion during World War One, an overvalued pound, a decline in the steel consuming industries and loss of export markets. Despite its modern plant production in the Port Talbot area was affected as much as any other region. Because of the depressed trading conditions and failings in managerial control, Baldwins were not in a position to fully exploit the integration brought about by the building of Margam Steelworks and its blast furnaces. Nevertheless there was a surprising amount of local investment by Baldwins during the 1920s which improved efficiency and put Baldwins in a better position for a potential merger.

As the 1920s progressed the problems with their heavy steelmaking interests brought Baldwins to the point of company failure. Their reconstruction involved disposing of non core activities, amalgamating subsidiaries into Baldwins, and a reduction of shareholders' ownership and its replacement with long-term debt. Once restructuring was complete a merger of their heavy steelmaking interests with those of GKN was possible. The fact that it was only a partial merger shows that both companies wanted to retain full control of their more profitable interests. This was probably a short-term view. A full merger would have allowed a modernisation of Baldwins' tinplate interests and more balanced development of light and heavy steel interests. As will be seen, the restructuring of the companies in 1930 left a legacy of problems in the years that followed.

Chapter 5: The 1930s and World War Two: From Depression To Full Capacity

The 1930s were a period of revival in the Port Talbot steel industry's fortunes. Yet there was a price to pay for that. After the formation of GKB in 1930 all the company's heavy steelmaking was concentrated at Port Talbot. The result was the end of iron and steelmaking at Dowlais and the closure of the plate mill at Cardiff East Moors. Port Talbot became the sole South Wales plate and rail producer. This rationalisation allied to an import tariff, a general economic revival, the joining of the European steel cartel and rearmament led to much higher demand from 1933. From the mid 1930s Port Talbot/Margam operated at or near full capacity which was reflected in GKB's growing profits and a major contribution to Britain's war effort during World War Two. Yet problems and tensions were to emerge within GKB. The building of tinplate manufacturer Richard Thomas' hot strip mill at Ebbw Vale exposed Baldwins' extensive tinplate interests on both cost and quality grounds. Baldwins needed access to their own mill which needed to be attached to iron and steelmaking plant. The problem was that Baldwins had lost control of their own steelmaking plant with the formation of GKB and their partners GKN were less keen on building a hot strip mill.

Despite a modest increase in trade by the end of the 1920s the British steel industry was in a serious financial situation. Only between one to two million pounds (1-2% of the valuation of steel industry capital) was being invested annually in capital expenditure. It was estimated that capital investment of £15 million a year was needed to restore full technical efficiency to the industry[295]. Yet this was beyond the resources of the industry. One possible method of increasing investment was the introduction of a tariff on steel imports. This would have allowed the steel companies to increase production and to generate sufficient funds for the necessary investment. The investment would have reduced steelmaking costs, allowing them to compete with the continental producers. The Bank of England's fear was that such a policy would allow the less efficient firms to continue in production. As already seen their response to the steel industry's problems was to promote regional mergers which through rationalisation would concentrate production at the more modern and

[295] Burn, *Economic History*, pp.436-437.

efficient plants. The Bank of England would then assist the merged companies to obtain funds for further investment[296]. It feared that the Government would step in to prevent bankrupt companies from closing works on employment grounds.

In parallel with the Bank of England the Labour Government set up the Iron and Steel Committee of the Economic Advisory Council chaired by Lord Sankey. It reported in May 1930. Its recommendations were similar to those of the Bank of England recommending regional amalgamations and rationalisation of uneconomic units. It recommended rationalisation before a tariff was introduced. However, after the 1931 general election the pound was devalued and tariffs were introduced in June 1932. A general duty of 10% was applied to most goods but for most steel products a tariff of 33⅓% was applied and 20% on the rest[297]. The aim was to produce a more stable environment and to allow the steel industry to reorganise itself. A committee of civil servants, the Import Duties Advisory Committee (IDAC), was set up in March 1932 to supervise the steel and other industries to ensure that rationalisation took place. The steel companies estimated that the tariff would allow an extra 2 million tons of steel to be produced in Britain. This would allow a 10 shillings/ton or approximately a 10% cost reduction[298]. The effects of the tariff are shown below :-

Table 5.1: British Steel Production and Consumption 1929-1937 ('000 tons)[299]

Year	Steel Production	Plus Imports	Less Exports	Steel Consumption	Imports as % of Consumption
1929	9,636.2	2,669.3	3,834.4	**8,471.1**	31.5%
1930	7,325.7	2,600.0	2843.0	**7,082.7**	36.7%
1931	5,202.6	2,538.0	1,777.0	**5,963.6**	42.6%
1932	5,261.4	1,441.0	1,759.0	**4,943.4**	29.1%
1933	7,024.0	850.0	1,810.0	**6,064.0**	14.0%
1934	8,849.7	1,203.0	2,117.0	**7,935.7**	15.2%
1935	9,858.7	1,024.0	2,212.0	**8,670.7**	11.8%
1936	11,784.6	1,172.4	2,122.8	**10,834.2**	10.8%
1937	12,984.0	1,317.4	2,440.1	**11,861.3**	11.1%

[296] Ibid. Carr and Taplin, pp.439-441.
[297] John Simon, 'Speech by Chancellor of the Exchequer to the British Iron and Steel Federation', *I&CTR*, 17th February (1939), 325-328 (p.325). Carr and Taplin, p.440, pp.478-79, p.485. Vaizey, p.29, pp.66-68. Owen, p.121.
[298] Tolliday, p.295.
[299] 'Output of Pig Iron and Steel in Great Britain', *I&CTR*, 30th September (1938), 509. S. Summers, 'Iron and Steel Imports and Exports in 1939–Review of the Principle Factors Operating During the Year', *I&CTR*, 20th January (1939), 102-104 (pp.103-104). Carr and Taplin, pp.429-430, pp.486-487.

As table 5.1 shows production increased from a low of 5.2 million tons in 1931 and 1932 to almost 13 million tons in 1937. Not only did imports fall in absolute terms but also as a proportion of consumption. The steel industry's recovery was driven by domestic consumption not exports[300]. Despite a rise in British steel prices they were now lower than all the main steel producing countries with the exception of Germany where prices were artificially held down. As a consequence in March 1937 the import duty on pig iron was removed. It was reduced on steel imports from cartel countries in July 1937 to 2½% and on others to 12½% to meet the developing steel shortage[301]. The recovery in the steel consuming industries was uneven. Output of cars rose from 1932, merchant shipbuilding revived in 1933-34 and factory building from 1934. Other uses for steel, such as for furniture, office equipment, domestic pit props and colliery arches recovered by 1934[302].

Table 5.2: British Iron Production and Consumption 1929-1937 ('000 tons)[303]

Year	Iron Production	Plus Imports	Less Exports	Iron Consumption	Imports as % of Consumption
1929	7,589.3	153	545	**7,197.3**	2.1%
1930	6,192.4	312	317	**6,187.4**	5.0%
1931	3,772.6	307	202	**3,877.6**	7.9%
1932	3,574.0	153	128	**3,599.0**	4.3%
1933	4,136.0	121	112	**4,145.0**	2.9%
1934	5,969.1	163	133	**5,999.1**	2.7%
1935	6,424.1	128	157	**6,395.1**	2.0%
1936	7,721.4	311	112	**7,920.4**	4.0%
1937	8,493.1	716	167	**9,042.1**	7.9%

As seen in table 5.2 iron production unsurprisingly fell in the early 1930s but by 1936 had surpassed 1929's output (also see Appendix 7). Unlike steel, as a proportion of consumption, imports returned to their pre-tariff levels. This reflects inadequate production facilities following rationalisation. Average British blast furnace output increased from 48,000 tons/annum in 1929 to 67,000 tons/annum in 1937 (the equivalent South Wales figures were 101,100 and 137,400 tons/annum)[304]. The rationalisation process had reduced the number of British blast furnaces from 394 in

[300] Tolliday, p.24.
[301] Carr and Taplin, p.490.
[302] Burn, *Economic History*, p.450.
[303] Carr and Taplin, pp.429-430, pp.484-488.
[304] E.J. Fox, 'The British Pig-Iron Industry–A Review of Progress From 1929-1937', *I&CTR*, 21st January (1938), 103-104 (p.103).

1929 to 204 in 1937. High demand improved efficiency in the production process as plant was being operated more consistently and harder. Other factors included closer attention to the preparation of the burden (particularly iron ore), improvements in coke use and in charging. The result was a reduction in coke consumption from 23.74 cwt/ton of pig iron in 1929 to 22.23 cwt in 1936[305].

The outcome of increased steel production during 1936 and 1937 was an increase in pig iron imports to make up for the deficiency in British production. Although the rationalisation process undertaken during the interwar period may be classed as a financial success for the steel companies it left British iron making unable to supply sufficient raw material at a time of high demand. It will be argued later that some of the iron works that were closed during rationalisation in the 1920s/1930s might have been profitable at this time.

The introduction of the tariff in 1932, a depreciation of the pound, and a recovery in the steel consuming industries gave the necessary boost to British steelmakers. The recovery came against a backdrop of a fall in global demand with world steel ingot output down from 68 million tons in 1931 to 49 million tons in 1932[306] while British steel output even marginally increased in 1932 (see table 5.1).

During 1934 the British Iron and Steel Federation (BISF) was established to represent the views of the steel firms and to provide a greater measure of co-operation between them to the benefit of the whole industry[307]. In 1935 the Government encouraged the BISF to join the International Steel Cartel which had been formed during February 1933 by the leading steelmakers in Germany, Belgium, France and Luxemburg. The cartel's function was to regulate export markets by apportioning tonnages. After Britain had joined the cartel British firms were able to raise their domestic prices to the German and French levels. The cartel's pricing policy was designed to prevent further expansion of national steel industries outside their own domestic markets by dual pricing systems and 'penetration agreements'[308].

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[305] Ibid
[306] Burn, *Economic History*, p.450.
[307] Ibid, pp.452-453. Carr and Taplin, p.498.
[308] Tolliday, p.23, p.309.

As shown previously GKB was formed in 1930 with the merger of Baldwins' and GKN's heavy steelmaking interests in South Wales. Crucially both companies kept their light steel interests separate, including tinplate and sheet production. The merger occurred at a time when British shipbuilding had almost ceased, the railways had little money to spend, and there was little chance of export markets for steel products[309]. It was a merger to consolidate business interests, ensure better access to financial resources and to undertake rationalisation[310]. By removing regional competition it provided an opportunity to rationalise and modernise through investment organised by the Bank of England. The consequences would be the closure of at least one steelworks[311]. These implications were noted at the time by the local press :-

"The main object of the scheme writes our Industrial Correspondent is to put the industry on a more economic basis. Underlying the scheme is the idea of concentrating the present work of the two companies in one place. It is understood that this will necessarily entail the closing down of certain sections of the present works [312]*."*

The formation of GKB brought together within the same firm Port Talbot/Margam, Dowlais and Cardiff East Moors Steelworks. As demand was so low only the most efficient could survive[313]. Of the three steelworks Dowlais was the oldest. Its origins go back to 1759 when an ironworks was established, and the first steel was made there in 1865[314]. By 1919 Dowlais concentrated on rail and associated production[315]. The downturn in demand during the 1920s exposed its weaknesses. Over such a long period of operation developments had been piecemeal. That, and the age of some of the plant, ensured that production costs were high. That is not to say that there had not been investment at Dowlais. In 1923 a new railway sleeper plant had been installed[316]. Rail production was hampered by its inability to store the longer

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[309] GKB, p.43.
[310] Edgar Jones, *A History of GKN, Volume 2,* p.129.
[311] Ibid
[312] Anon. 'Brighter Industrial Outlook–Local Significance of Welsh Steel Merger'. *PTG,* 10th January 1930, p.2.
[313] D.G. Watts, 'Changes in Location of the South Wales Iron and Steel Industry 1860-1930', *Geography,* Vol.53(3) (1968) 294-307 (pp.295-296).
[314] Atkinson and Baber, p6, p13. Edgar Jones, *A History of GKN, Volume 2,* p.113.
[315] Edgar Jones, ibid, p.114.
[316] Ibid, p.117.

rails now demanded by customers. Plans to extend its rail bank were abandoned in 1925[317]. By July 1928, for the first time in 50 years, Dowlais failed to secure any orders from any British railway company. Problems increased when a batch of rails for the Egyptian Government was of such poor quality that they had to be replaced[318]. By the late 1920s Dowlais was unable to compete on quality grounds. Its other problem was its location. Once the local economic ore was exhausted Dowlais had to absorb the additional costs of transporting ore from Cardiff Docks. This put steelmaking at Dowlais at a severe economic disadvantage to the extent that between 1924-1928 it lost in total £316,591[319].

In early 1930, shortly after the formation of GKB, it was announced that once current orders were completed Dowlais would close permanently. On 4th October 1930 Dowlais closed. Any plant and machinery of value was taken to Cardiff or Port Talbot[320]. The four blast furnaces were demolished in 1937[321]. Ironically this was the time when Britain was importing large amounts of pig iron to maintain steelmaking. Under these conditions it is possible that Dowlais could have traded profitably as an iron works supplying the British steel industry with pig iron as between 1931 and 1937 the price of scrap in South Wales had increased by over 50%[322]. During World War Two there would have been a ready market for both Dowlais' iron and steel. The Bank of England's rationalisation policy made financial sense for the companies in 1930 but it missed opportunities in the late 1930s and during World War Two and the social costs of the closure of Dowlais had to be borne by the Government. An example of the possibilities for Dowlais was the case of the Briton Ferry Ironworks which was owned by Baldwins. During the late 1920s it made a small profit of about 6p per ton of pig iron yet by May 1930 it was making 26p per ton. Despite this Briton Ferry Ironworks closed during the summer of 1930 but

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[317] Ibid, p.120.
[318] Ibid, pp.122-123.
[319] Bruce Gardner Papers, Ref SMT 3/168, Simon, W., Special Report on Cardiff and Dowlais Works.
[320] Edgar Jones, *A History of GKN: Volume 2,* p.124.
[321] Ibid, p.137. Anon. 'More Orders–How Closing of Dowlais Works Affects Margam–Prospects 'Reasonably Fair''. *PTG*, 10th October 1930, p.1. GKB, p.55. Anon, 'Developments in the Steel Industry of South Wales and Northamptonshire', *I&CTR* , 24th June (1938), 1094. Carr and Taplin, p.447.
[322] Anon, 'A Comparison of Cast Iron Scrap Prices–Average Monthly Prices of Cast Iron Scrap in the Principle Districts in the Years 1931-38', *I&CTR*, 21st January (1938), 105.

reopened in 1932 and operated continuously until 1941 when, because of difficulties in obtaining Spanish ore, it closed. It restarted again in 1947 and closed permanently in 1958[323].

GKN's other main steelworks was Cardiff East Moors built to offset the locational disadvantages of Dowlais. The first of its four blast furnaces was blown in 1891 and the first steel was made there in 1895. It also possessed a 36" slabbing mill and a 32" plate mill[324]. Before World War One its main product was plate for boilers and shipbuilding, the very products most affected by the downturn in trade during the 1920s. By August 1928 only one blast furnace was in blast and the steel plant was operating at about 50% of capacity[325]. During the period 1924-1928 Cardiff lost in total £194,336 with losses incurred every year[326]. After the formation of GKB in 1930 the melting shop and rolling mill closed. All plate orders were transferred to Port Talbot[327]. Yet GKN did not give up on the idea of continuing plate production in Cardiff. They came up with proposals to rebuild Cardiff to produce plate, sections and rails, closing Port Talbot instead[328]. The Bankers Industrial Development Company wanted GKN and Baldwins to provide guarantees for the required capital. As the formation of GKB was partly to divorce GKN and Baldwins from direct responsibility for their steelworks the scheme was dropped[329]. This highlights a fundamental problem with the formation of GKB. GKN were pursuing their own interests and trying to avoid the concentration of all plate production at Baldwins' former Port Talbot site. They were aware that this would place Baldwins in an advantageous position if GKB unravelled back into its component companies as Baldwins would have a monopoly on South Wales plate production. Hence they pushed for investment to be focused on their Cardiff Steelworks despite its inadequacies.

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[323] C.W. Roberts, pp.151-152.
[324] Edgar Jones, *A History of GKN: Volume 1,* pp.299-300.
[325] Ibid, *A History of GKN: Volume 2,* p.125, p.129.
[326] Bruce Gardner Papers, Ref SMT 3/168, Simon, W., Special Report on Cardiff and Dowlais Works.
[327] Edgar Jones, *A History of GKN: Volume 2,* p.125, p.129.
[328] Bruce Gardner Papers, Ref SMT 3/168, Hewitson-Hall, Memo on development of Cardiff Works.
[329] Bruce Gardner Papers, Ref SMT 3/168, Memorandum setting out the position of GKB's South Wales Scheme. Edgar Jones, *A History of GKN: Volume 2,* p.130.

GKB kept one Cardiff blast furnace in operation but eventually rebuilt the steelworks to include two other rebuilt blast furnaces, new coke ovens, a new melting shop with two open-hearth furnaces and two 250 ton tilting furnaces, a cogging mill, a continuous sheet bar and billet mill and a Lamberton 21" light bar mill. Production started in January 1936 at a cost of £3,000,000[330]. Two of its blast furnaces supplied molten iron to the melting shop and a third sold pig iron to other steelworks. The Lamberton mill produced colliery arches, pit props and light sections. Port Talbot was left as the sole producer of plate and heavy rails in South Wales. GKN's proposal to rebuild Cardiff to produce plate and heavy rails to replace modern plant at Port Talbot/Margam under the early 1930s trading conditions was never realistic. It also emphasises the benefit to Port Talbot of Baldwins' investment in the late 1920s to broaden the range of plate production. However, a new Cardiff plate mill, or indeed the old unmodernised plate mill, could still have found a ready market for its products in the late 1930s when Britain rearmed and during World War Two. During 1938 a fourth blast furnace and two more 250 ton tilting furnaces were added to Cardiff's melting shop[331].

Port Talbot/Margam was the obvious site to concentrate GKB's steelmaking. It was more modern than either Dowlais or Cardiff, could produce a wider range of products and produce higher quality products. In addition all products could be produced at one site rather than two thereby achieving economies of scale. The dockside location of Port Talbot, and particularly Margam's blast furnaces, meant that imported ore did not need further rail transport thus reducing operating costs. With production concentrated at just one works capacity utilisation would rise to a level to cover both operational and investment costs. Only at Port Talbot/Margam could this be attained. However, within five years demand had recovered for at least some products that Dowlais and Cardiff had produced. They may well have been able to operate profitably in the late 1930s and during World War Two.

For most of the 1930s local production at Port Talbot/Margam mirrored national trends. At the time of GKB's formation in 1930 Port Talbot/Margam was working well below capacity (approximately 4,000 tons/week at Port Talbot and 5,000 tons/week

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330 Edgar Jones, ibid, p.132.
331 Carr and Taplin, p.542.

at Margam[332]). The mill most affected by lack of demand was the heavy plate mill. Both the light plate mill and the bar mill were working to a higher capacity but still working below full capacity. Steelmaking was restricted to about 4,650 tons/week whereas by 1937 it was running at 8,500 tons/week[333]. Actual production costs in 1931 were :-

Table 5.3: Pig Iron Production Costs/Ton 1931[334]

	Margam	Cardiff
Burden	62s 3d	54s 2d
Conversion	18s 5d	15s 3d
Credits	9s 5d	3s 10d
Total Net Costs	**71s 3d**	**65s 8d**

Table 5.4: Melting Shop Costs/Ton 1931[335]

	Margam	Port Talbot
Charge	65s 4d	66s 1d
Conversion	23s 7d	26s 5d
Total Net Costs	**89s 0d**	**92s 3d**

Table 5.5: Port Talbot Heavy Bar Mill Cost/Ton 1931[336]

	Cost
Charge	93s 6d
Conversion	32s 3d
Total Net Costs	**125s 9d**

Interestingly the cost of pig iron production at Cardiff was less than Margam. During 1931 both Margam and Cardiff only operated one blast furnace. It is unclear if the cost differential relates to the cost of ore from different sources. Certainly GKN used Spanish ore from the Orconera Company which by 1933 was 2/- a ton cheaper than some other sources[337]. Yet by 1931 Margam should have had access to this source. It is also unclear whether these figures include interest payments or depreciation.

[332] Bruce Gardner Papers, Ref SMT 3/168, Rintoul, P., 'Report on proposals to reorganise plants of British (GKB) Iron and Steel Company', 13th March 1931.
[333] Anon. 'Hopeful Prospects–Steady Progress at Port Talbot–Industrial Review for April'. *PTG,* 9th May 1930, p.1. GKB, p.53.
[334] Bruce Gardner Papers, Ref SMT 3/168, Comparison of actual cost with estimated cost of new plant at Cardiff 1931.
[335] Ibid
[336] Ibid
[337] Bruce Gardner Papers, Ref SMT 3/168, Hewitson-Hall, 'Memo on development of Cardiff Works'.

With Margam's newer furnaces it is likely that both would be higher. The cost per ton will also depend upon how much iron is produced. No definitive figures are available on this. The 'credits' relate to energy savings in the steelmaking process. The comparison between the Margam and Port Talbot Melting Shops is also interesting. Costs are very similar but Port Talbot would have had to incur extra costs in transporting iron from Margam's blast furnaces. However, extra costs would be incurred transporting steel ingots from Margam to Port Talbot's rolling mills.

During 1929 both Baldwins and GKN lost money on their heavy steelmaking. By 1931 GKB through rationalisation and concentrating production at Port Talbot/Margam with its more modern and efficient plant returned a profit of £9,891 (see table 5.6)[338]. The process of concentrating production at Port Talbot/Margam was completed in 1932[339]. As demand revived during 1933 Port Talbot/Margam's production increased by over 50% resulting in most departments working full time[340]. From 1933 onwards Port Talbot/Margam operated at or near full capacity[341]. GKB's rationalisation and concentration of production at Port Talbot/Margam allied with a revival in demand allowed a utilisation rate sufficient to return a profit which by 1933 was over £222,000. In the following years substantial profits were recorded :-

Table 5.6: GKB's Financial Results 1931-1937[342]

Year Ending	GKB Profit (£)
1931	9,891
1932	38,110
1933	222,101
1934	n/a
1935	258,890
1936	609,201
1937	806,018

338 Anon, 'Baldwins Limited AGM', *I&CTR*, 17th April (1931), 644.
339 Ibid, 'Guest, Keen and Nettlefolds Limited', 1st July (1932), 26; 16th June (1933), 958.
340 Ibid, 29th June (1934), 1078. Ibid, 'Baldwins Limited AGM', 6th April (1934), 592. Anon. 'Port Talbot Trade Boom–Advisory Committee's Encouraging Report'. *PTG*, 16th March 1934, p1. Ibid, 'Unemployment Figures Drop – Development Committee and Improved Trade'. 13th April 1934, p.1.
341 Anon, 'Baldwins Limited AGM', *I&CTR*, 5th April (1935), 607-608 (p.608). Ibid, 3rd April (1936), 656. Anon. 'Port Talbot Unemployment Figures'. *PTG*, 18th April 1935. Ibid, 'More Men at Work at Port Talbot', 16th August 1935; 'Trade Improvement Continues–Good Prospects For The Future', 27th September 1935.
342 Anon. 'Baldwins Report', *Economist*, 1st April 1933, p.669. Ibid, 24th March 1934, p.642. Ibid, 'Baldwins Progressive Report', 27th March 1937, pp.710-711. Ibid, Baldwins Accounts, 26th March 1938, pp.698-699.

By 1937 the demand for Port Talbot's heavy steel products was such that it outstripped supply. This continued throughout 1938[343]. Port Talbot/Margam's annual steel ingot output was in excess of 400,000 tons. The general revival in steelmaking between 1931 and 1937 pushed up the price of heavy scrap by over 50%[344]. This stimulated demand for pig iron and forced prices up. It was at this time of high demand that Dowlais' blast furnaces might have been able to operate profitably.

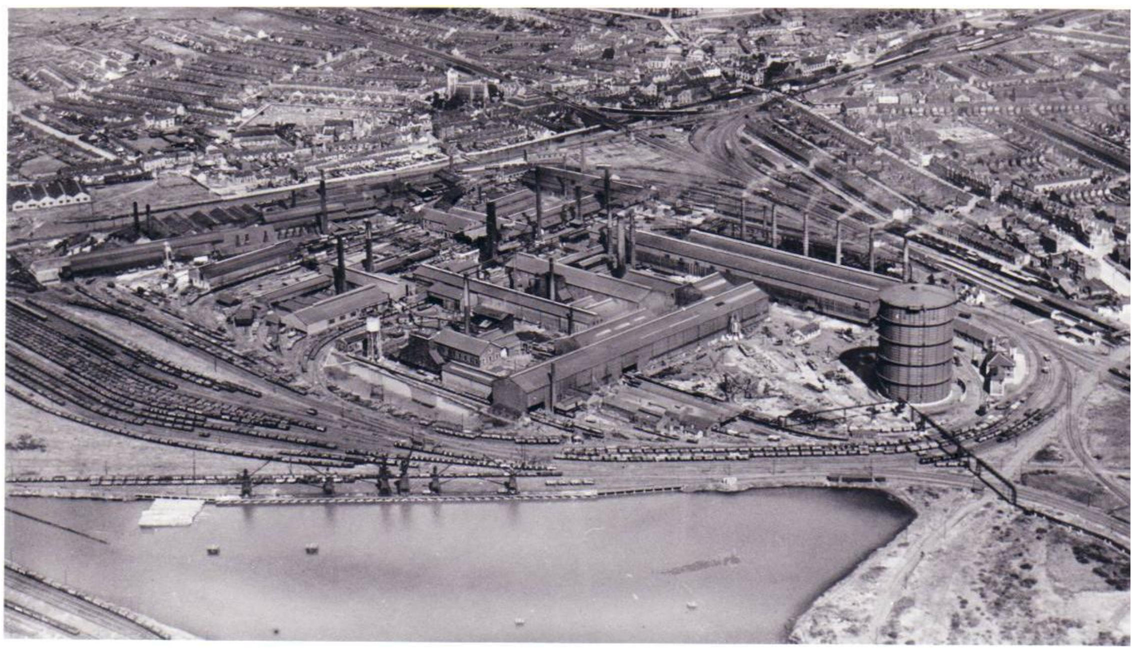
Although Port Talbot/Margam's revival was largely due to GKB's rationalisation and a general increase in demand other factors were at work. Tariffs, a devalued pound, a general economic recovery and rearmament all stimulated demand. During the 1930s both the railway construction and shipbuilding industries recovered which stimulated demand for plate. The recovery in merchant shipbuilding from 1935 was partly due to the introduction of a 'scrap and build' scheme. By the end of 1936, 60 orders approaching 200,000 gross tons had been secured via the scheme[345]. As for naval construction between 1930 and 1935 the only major warships ordered were 3 cruisers each year (during 1934 an aircraft carrier was also ordered). As rearmament began from 1936 to 1939 inclusive, either 2 or 3 battleships were ordered each year along with at least one aircraft carrier (in 1939 it was 6) and at least 7 cruisers[346]. A further stimulus to demand was agreement with the European cartel on prices and marketing of heavy plate for shipbuilding and sections. It was agreed that for the first 6 months of 1934, 25% of international trade was allocated to British steelmakers[347].

By 1937-38 the rationalised steel industry lacked the capacity to fully meet heavy steel product demand. Despite increases in furnace capacities (see later) this was insufficient to meet demand. The flexibilities of the system had been removed and

[343] Anon, 'District Iron and Steel Trade Reports–South Wales', *I&CTR*, 12th March (1937), 505. Ibid, 19th March (1937), 549; 12th November (1937), 819; 7th January (1938), 21.
[344] Ibid, 'A Comparison of Cast Iron Scrap Prices–Average Monthly Prices of Cast Iron Scrap in the Principle Districts in the Years 1931-38', 105.
[345] William Gray, 'The Shipbuilding Industry in 1936', *I&CTR*, 15th January (1937), 125-126 (p.125).
[346] Lenton, H.T. and J.J. College, *Warships of World War 2-Part 1–Capital Ships* (London: Ian Allan Limited, 1962), p.6.
[347]Anon. 'Ship Steel Agreement', *Economist*, 13th January 1934, p.63.

large upsurges in demand could not be met. By 1937-38 the rationale for ending steelmaking at Dowlais and closing the Cardiff plate mill was no longer so clear.

An aim of the Bank of England's merger strategy was to allow greater investment either through pooled resources or by making it easier to raise capital. Through this investment the more efficient British firms and steelworks were expected to compete with the continental steelmakers. GKB's first major investment at Port Talbot/Margam was to reduce fuel costs. They installed waste heat boilers in both melting shops. During 1933-34 a Klonne waterless gasholder was built at Port Talbot to store and use blast furnace and coke oven gas at a cost of £90,000[348]. The gasholder is on the right hand side of the photograph c1935 :-



The gas was used as a fuel source at the ingot preheating furnace at the heavy bar mill, at the normalising furnace for plates, steam raising and for miscellaneous purposes. Although no figures are available on cost savings, a gasholder of similar capacity was built at Normanby Park Steelworks in Scunthorpe[349]. Based upon an output of 250,000 tons per annum an estimated 10% of extra product could be rolled

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[348] GKB, p.53. Brinn, p.8. Edgar Jones, *A History of GKN: Volume 2*, p.130.
[349] W.J. Brooke, 'Co-Ordinated Heat Conservation At The Normanby Park Steel Works, Scunthorpe', *The Journal of the Iron and Steel Institute*, Vol.CXXVIII-1933(2), 46.

for the same energy costs. Similar savings were likely to have been made at Port Talbot.

During 1934 the Wellman mixer for molten pig iron at Margam Melting Shop was converted into a 140 ton tilting steel furnace using coke oven gas as a fuel[350]. A tilting furnace works on the principle of a continuous charging and tapping process[351]. The result of this low cost adaptation was that Margam Melting Shop's furnaces increased to six. Until the end of 1934 modernisation focused on reducing fuel costs and achieving low cost capacity increases in response to rising demand[352]. Despite the short-term benefits in converting the mixer into a tilting furnace at relative low cost it introduced a non standard furnace into Margam Melting Shop which may have resulted in slightly higher operating costs. Yet at a time of rising demand this was not a problem. Margam Steelworks is shown below c1935 :-

During 1935 the English Steel Corporation (ESC) acquired a 5% shareholding in GKB[353]. The ESC was formed in January 1929 from the steelmaking interests of the

[350] Brinn, p.8.
[351] Carr and Taplin, p.216.
[352] Anon, 'Guest, Keen and Nettlefolds Limited AGM', *I&CTR*, 28th June (1935), 1120.
[353] Ibid, 'Baldwins Limited AGM', 3rd April (1936), 656.

armament firms of Vickers, Vickers-Armstrong and Cammell Laird[354]. This merger was similar to the formation of GKB in that only parts of the parent companies were merged and rationalised[355]. The split in the shareholding of GKB became GKN 54.1%, Baldwins 40.5% and the English Steel Corporation 5.4%. The aim of the ESC's parent companies was to guarantee a source of steel for their operations. The deal made funding available to GKB for new investment. Once more the customer was funding modernisation. During 1936 the name of the company was formally changed to Guest Keen Baldwins Iron and Steel Company Ltd[356].

In the late 1930s, with Port Talbot/Margam working at full capacity, investment continued with the emphasis moving from cost reduction to capacity expansion. In 1938 plans were drawn up for the building of a third blast furnace. The foundations for a third blast furnace had been laid down when the other blast furnaces were built[357]. Even so, Number 3 blast furnace was only completed in 1941 with a hearth diameter of 16' along with a rebuilding of the heating stoves[358]. Plans were also made to rebuild Numbers 1 and 2 blast furnaces to increase iron making capacity. Number 2 was the first to be rebuilt, and was completed in 1943 to the same diameter as Number 3[359]. In addition the ore bunkers were enlarged by about 30% to a 140,000 ton capacity and additional blowers were installed. At the same time new gas cleaning and water pumping systems were installed. This left Number 1 unrebuilt. In 1944 it was decided to rebuild Number 1 blast furnace to a hearth diameter of 21'6" from the previous 14'. The new blast furnace was blown in on 8th August 1946. This blast furnace was designed to produce 5,000 tons/week of pig iron. In August 1948 it produced a British record of 5,410 tons/week of pig iron[360].

Other than the tilting furnace no additional steelmaking furnaces were added during the 1930s but there were gradual improvements and enlargements to the existing

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354 Carr and Taplin, p.443.
355 Ibid, and p.462.
356 Brinn, pp.7-8.
357 Brinn, p.8.
358 Anon, 'British Pig-Iron Production During The War–A Brief Statistical Record', *I&CTR*, 9th November (1945), 719-720 (p.719). Griffiths, p.13. Carr and Taplin, p.542. Brinn, p.8, p.23. Corus, *Port Talbot A Century*, p.4.
359 Griffiths, ibid. Brinn, ibid.
360 Anon, 'No 1 Blast-Furnace at the Margam 1 Works', *Journal of the Iron and Steel Institute*, Vol.1(1947), 289-290 (p.289). Griffiths, p.13. Brinn, p.8.

furnaces[361]. By 1938 these improvements had resulted in 6x75 ton gas fired open-hearth furnaces at Port Talbot, 5x75 ton mixed gas fired open-hearth furnaces at Margam and 1x150 ton coke oven gas fired tilting furnace at Margam[362]. During the late 1930s a new rail and section mill was built at Port Talbot. It was a fully mechanised continental type unique to Great Britain including a machine for straightening rails followed by a machine to cut the rail to the required length. Simultaneously it drilled the holes for the fish plates[363].

Investment during the second half of the 1930s and during World War Two was fundamentally different from that of the early 1930s. The investment in the early 1930s was limited to improving the efficiency of the existing plant and mainly directed towards fuel economy. The later investment was to increase capacity and modernise the plant. The stimulus was the high demand for Port Talbot's existing products and the growing possibility of building a hot strip mill.

The prospect of a hot strip mill came out of fundamental changes in the American steel markets during the 1920s. Similarly, in the UK during the 1920s there was growing demand for thin strip steel for the motor industry and for household appliances[364]. Yet by as late as 1937 this accounted for only 7% of total UK steel demand[365]. The only method of producing this type of steel was by hand rolling which produced sheet of indifferent and variable quality. In the United States during the 1920s the American Rolling Mill Company at Ashland in Kentucky and the Columbia Steel Company at Butler in Pennsylvania developed the first hot strip mill to produce wide strip steel on the continuous rolling principle. This allowed the production of long lengths of wide strip steel both to higher quality standards and at lower cost than hand mills. By 1938 there were 27 continuous wide strip mills in the United States[366]. The new mills rendered the hand rolling techniques obsolete and it

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[361] Anon, 'Wages and Work', *I&CTR*, 7th April (1939), 648. Brinn, p.8.
[362] Brinn, ibid.
[363] Ibid. GKB, p.54. Carr and Taplin, p.542. Corus, *Port Talbot A Century*, p.4.
[364] Owen, p.123.
[365] Tolliday, p.24.
[366] D. Eppelsheimer, 'Development of Continuous Strip Mills', *I&CTR*, 28th October (1938), 683-684 (p.683). D.A. Fisher, *The Epic Of Steel* (New York, Evanston and London: Harper and Row, 1963). ARMCO, *ARMCO Today–Seventy-Fifth Anniversary Issue* (Middleton–

was clear that the new technology would eventually need to be introduced into Britain. As early as 1930 GKB, when exploring the possibilities of rebuilding Cardiff, considered the possibility of building a strip mill at Margam[367]. Nothing came of this.

Internal discussions about the feasibility of a strip mill continued at Baldwins under Charles Wright. In 1935 Wright considered the idea of a wide strip mill which would link up with Lysaghts' cold reduction mill at their Orb Works in Newport. However, the combined Baldwins and GKN requirements for strip steel, even including some light plate production, was not reckoned to be sufficient to support a strip mill. Contemporary estimates were that between half a million and one million tons were the minimum requirements for a modern plant. Between them Baldwins and GKN required c250,000 tons of strip per annum and 125,000 tons of light plate in the late 1930s. It was clear that some form of amalgamation was required to achieve adequate scale to support a new strip mill. These issues were set aside by the building of the Ebbw Vale strip mill[368].

It was Richard Thomas who built Britain's first strip mill. Initially, in 1935, they considered locating it at Redbourn in Lincolnshire. This was close to both cheap ore and the motor industry that the mill was intended to serve[369]. Due to political pressure the mill was built on the site of the old steelworks at Ebbw Vale largely to relieve local unemployment. It had an initial capacity of 300,000 tons, a maximum width of 54" and was built between 1935 and 1938. Production started in September 1938[370]. It was clear that for long-term operating efficiency Ebbw Vale was the wrong location as its iron ore had to be hauled up from Newport Dock. In effect it suffered from the same locational disadvantages as Dowlais. At the time of the

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Ohio, The American Rolling Mill Corporation, 1975), p.12. C.W. Roberts, p.188. Paul Jenkins, p.218.

[367] London, BoE, Bankers Industrial Development Co Papers, Correspondence from Beale, J.F., GKB's Chairman, to Bruce Gardiner, 1st August 1930, Ref BID 1/69.

[368] Burn, The Steel Industry, pp.80-81. Warren, *British Iron and Steel*, pp.205-209.

[369] Warren, *British Iron and Steel*, p.178. Kenneth O. Morgan, p.227. Paul Jenkins, pp.53-54.

[370] Anon, 'Developments in the Steel Industry of South Wales and Northamptonshire', 1095. BSC, *British Steel Corporation Welcomes You To Ebbw Vale–Strip Mills Division–Tinplate Group*, Brochure produced by the BSC, c1972. Kenneth O. Morgan, p.228. C.W. Roberts, p.189. D. Gareth Evans, p.22.

building it caused concern in South West Wales in regard to its effect on employment in the tinplate industry[371].

Richard Thomas, as major tinplate producers, introduced the technology into Britain rather than Baldwins for a number of reasons. William Firth, Richard Thomas' Chairman, even tried, and failed, to secure co-operation from other tinplate producers including Baldwins[372]. The problem was that Baldwins, through GKB, were fully committed to rebuilding Cardiff East Moors and modernising Port Talbot which prevented participation.

With Ebbw Vale's hot strip mill starting production and a second strip mill being built at John Summers' Shotton Steelworks[373] Baldwins' large tinplate interests were at a severe commercial disadvantage on quality and cost grounds. During 1937 Charles Wright claimed that GKB needed a strip mill to supply the coil to Baldwins, GKN and their subsidiaries. Their Cardiff site lacked sufficient space to accommodate a strip mill. Attention then fell onto Port Talbot. By early 1938 GKB had produced tentative plans for a new mill at Port Talbot[374]. The problem for Baldwins was that by setting up GKB they had lost direct control over their steelmaking plant and needed approval from GKN. As will be seen the latter were less enthusiastic about a strip mill. This was a factor in the merger of Baldwins tinplate interests with Richard Thomas in the 1940s. Certainly by 1938 a strip mill at Port Talbot was a possibility.

From 1938 Port Talbot/Margam rode the tide of the emergency war economy. During 1938 the South Wales tinplate industry and supporting steelmaking was badly hit by a downturn in trade but Port Talbot/Margam was almost untouched by the

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[371] Anon. 'Strip Mill A Revolution in Industry–Mr Bert Sutcliffe's Views on Serious Problem'. *PTG,* 30th May 1938, p.1. Ibid, 'Strip Mill Causes Crisis in Tinplate Industry–Heavy Sacrifice Needed To Solve Serious Problem', 3rd June 1938, p.1; 'Labour's Co-operation Urgent–Room For Second Strip Mill', 17th June 1938, p.1; 'Mass Meeting to Discuss Strip Mill Menace–Iron and Steel Trades and Mechanisation Fears', 1st July 1938, p.1; 'Worker's Campaign to Combat Strip Mill Menace', 8th July 1938, p.1.
[372] Warren, *British Iron and Steel*, pp.173-174.
[373] Jonathan Aylen, 'Construction of the Shotton Wide Strip Mill', *Transactions–Newcomen Society,* Number 78 (2008), 57-85 (p.73).
[374] Carr and Taplin, p.542. Warren, *British Iron and Steel*, p.191. Brinn, p.8. Paul Jenkins, p.54. Protheroe-Jones, pp.39-40. Gordon Smith, *A Century of Shotton Steel* (Shotton: British Steel, 1996), p.31.

downturn[375]. Overall utilisation of steelmaking capacity in South Wales fell from 61.4% in January 1938 to just 41% in May but by October it had risen to 65%[376]. Full production was maintained at Port Talbot/Margam with both blast furnaces being kept in blast during the first half of 1938[377]. By 1938 demand from rearmament was so high that Port Talbot/Margam had become largely immune to other market changes.

The increase in overall South Wales capacity utilisation rates from mid 1938 continued into 1939 due to demand stimulated by the approaching war. By May 1939, 94% of South Wales steelmaking capacity was being used[378]. By July it was 97% by which time most steelmakers were inundated with so many orders that they were unable to cope[379].

At the start of World War Two in 1939 the steel industry had an annual capacity of about 14.5 million ingot tons[380]. Throughout the 6 years of World War Two Britain produced approximately 76 million tons of steel[381]. Only in two years during World War Two did production exceed the pre-war peak set in 1937 of 12,984,000 tons :-

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375 Carr and Taplin, p.494.

376 Anon, '*District Iron and Steel Trades Review–South Wales', I&CTR*, 7th January (1938), 21. Ibid, 21st January 1938, 130; 4th February 1938, 247; 11th February 1938, 287; 18th February 1938, 338; 25th February 1938, 379; 11th March 1938 457; 26th August 1938, 333; and 28th October 1938, 715.

377 'British Blast Furnaces in Quarter Ended 30th June 1938', *I&CTR*, 15th July (1938), 103.

378 Anon, 'District Review of the Iron and Steel Trade–South Wales', *I&CTR*, 26th May (1939), 1054.

379 Ibid, 7th July (1939), 27; 14th July (1939), 64.

380 Greenwood, 'The British Iron And Steel Industry 1938–A Year Of Recession But Brighter Prospects', *I&CTR*, 20th January (1939), 101-102 (p.101).

381 BISF, *The Battle of Steel* (London, British Iron and Steel Federation, 1946), p.1.

Table 5.7: Iron & Steel Production in Britain & South Wales 1939-1945 (tons)[382]

Year	British Pig Iron and Ferro Alloys Production	South Wales Pig Iron Production	British Steel Production	South Wales Steel Production
1939	7,979,800	1,100,700	13,221,300	2,887,200
1940	8,204,600	962,200	12,975,300	2,816,400
1941	7,392,500	805,300	12,312,200	2,564,500
1942	7,725,600	828,900	12,941,700	2,625,800
1943	7,186,900	804,300	13,031,200	2,609,500
1944	6,736,500	777,600	12,142,200	2,417,900
1945	7,107,400	864,000	11,824,400	2,380,000

Production on this scale was a major achievement as the industry was cut off from about 80% of its overseas iron ore sources. This necessitated the greater use of low quality home produced ores and developing new overseas sources[383]. As can be seen from Appendix 5 imports of ore into Port Talbot were particularly low during 1941 to 1944. To maintain high levels of production Margam relied on low quality British ore. This reversed the economic logic of locating steelworks on the coast. However, it was production levels rather than economic logic that drove the industry. Even a sub-optimal plant like Dowlais could have made a valuable contribution to the war effort if it had been retained. The wider steel industry encountered problems with the needs of the blackout, coal shortages and the loss of its younger more productive workers to the armed services[384].

The Government took control of the steel industry from 1st September 1939. The initial Iron and Steel Order was issued by the Ministry of Supply. Even before this the British Iron and Steel Corporation had been established as a centralised buying and selling organisation of the BISF. The result was that every aspect of the steel industry was controlled to such an extent that by 1942 only 7% of British steel production was going to civilian use[385].

[382] Anon, 'Steel Production Since 1939–High Annual Average', *I&CTR*, 28th September (1945), 489. Carr and Taplin, p.596. John Williams, p.355.
[383] *I&CTR* ibid and 'Iron And Steel Trade', 8th December (1944), 887. BISF, *The Battle of Steel*, p.5, p.8.
[384] Anon, 'British Iron and Steel Industry in 1944 Production', *I&CTR* , 12th January (1945), 83-86 (p.83). BISF, ibid, p.5.
[385] BISF, ibid, pp.5-7.

Both Port Talbot and Cardiff made notable contributions to the war effort through maximising production[386]. In 1938 GKB built 102 shelters into the foundations of buildings, in tunnels and in open spaces using the colliery arch-cum corrugated sheet form of construction that they manufactured. Each shelter had a capacity of about 40. At both sites a total of 6,000 could be accommodated although only 4,000 were expected to be on site at the same time. Other precautions included training 84 men specifically to fight fires and establishing 10 ambulance stations of which 7 were underground[387]. Although there was no specific air raid on Port Talbot a number of isolated bombs fell in the vicinity of Port Talbot/Margam Steelworks during the summer of 1940[388]. One bomb hit Margam's fitting shop but failed to explode. More serious was a stick of 9 bombs that fell outside Port Talbot's General Offices on 29th June 1940 which smashed windows, dislodged slates and damaged some rails. The objective was probably Port Talbot's gasholder which GKB had emptied earlier in the war[389]. No information is available on the effects on production although it would appear to be minimal. On 30th March 1944 King George VI, Queen Elizabeth and Princess Elizabeth visited Port Talbot and were escorted in their tour by Charles Wright[390].

Modernisation and expansion continued during the first half of the war and was largely completed by 1943[391]. David Brinn argues that by this time although Port Talbot/Margam was not the biggest British steelworks it was the most efficient. By early 1944 with a workforce of 3,600 production was :-

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386 D. Gareth Evans, p.22.
387 Anon, 'ARP at Steelworks–Guest Keen Baldwins' Scheme', *I&CTR*, 3rd November (1938), 733.
388 Anon. 'Luftwaffe Attacks On South Wales and Surrounding Bridgend Area', w.w.w.islandfarm.fsnet.co.uk.
389 Hanson, *Profile Of A Welsh Town*, pp.132-133, and *Outline Of A Welsh Town*, p.160.
390 A. Leslie Evans, *Royal Visitors to the Afan District* in *Royalty and Afan* (Port Talbot: Afan Borough Council, 1977), p.7.
391 Brinn, p.8.

Table 5.8: Port Talbot/Margam Production Early 1944 (tons)[392]

	Weekly Production	Annualised Production
Coke	5,600	291,200
Pig Iron	7,000	364,000
Steel Ingots	7,500	390,000
Rails	1,500	78,000
Sections	1,000	52,000
Plates	2,300	119,600

Port Talbot/Margam's plant at this time is shown below :-

Table 5.9: Plant at Port Talbot Steelworks 1944[393]

Plant	Date Completed/Installed
6x75 ton Open-Hearth Furnaces (producer gas fired)	Completed 1914
1 Slabbing Mill	Completed 1914
1 Heavy Plate Mill	Completed 1914
1 Medium Plate Mill	Installed 1928
1 Light Plate Mill	Installed 1908
1x3 Stand Rail and Section Mill	Installed 1939

Table 5.10: Plant at Margam Steelworks 1944[394]

Plant	Date Completed/Rebuilt
1 Blast Furnace (hearth diameter 16ft 0ins)	Rebuilt 1941
1 Blast Furnace (hearth diameter 16ft 0ins)	Rebuilt 1943
1 Blast Furnace (hearth diameter 21ft 6ins)	Being Rebuilt 1944
1x400 ton Mixer	Rebuilt 1935
1x150 ton Open-Hearth Tilting Furnace (coke oven gas fired)	Rebuilt 1934
5x75 ton Open-Hearth Furnaces (mixed gas fired)	Completed From 1918

The war years were the peak of Port Talbot/Margam operating as a plant focused on heavy steel production. Steelmaking in the Port Talbot area was about to shift in a different direction. As will be seen planning continued throughout the war on building a hot strip mill at Port Talbot. After the war production moved away from heavy steel products to strip steel production to help fuel the post war consumer boom.

The formation of GKB became a financial success during the 1930s as production of plate and rails was concentrated at Port Talbot/Margam. The introduction of an

[392] Ibid
[393] Kew, NA, Ref HLG 79/583–223474, Guest Keen Baldwins Iron and Steel Company Limited, Port Talbot, Proposed 80" Strip Mill, May 1944.
[394] Ibid

import tariff, a recovery in the steel consuming industries and rearmament all helped to stimulate demand for steel. Yet even as the financial performance improved it is possible to see tension emerging within GKB between Baldwins and GKN over the future developments at Port Talbot. The problem was that Baldwins retained large tinplate interests and needed access to a hot strip mill. GKN had less need of a strip mill and were less keen to build one. This would become a major problem for Baldwins who would eventually decide to merge with their rivals Richard Thomas. Actual investment at Port Talbot/Margam during the 1930s falls into two categories. Initially investment was largely directed towards fuel economy to make production more efficient. Later investment was directed towards increasing output and modernisation of the plant. By the late 1930s investment was taking place with one eye on the growing possibility of building a hot strip mill.

Chapter 6: Planning And Building Of The Abbey Works: The Move To Strip Mill Production

This chapter looks at the planning and building of the hot strip mill at Port Talbot in the immediate post-war years. It examines the reasons why this site was chosen for one of Britain's largest ever industrial projects which has been discussed by economists, geographers and historians. The requirement to build the mill at a site where iron and steelmaking were already integrated alongside a suitable dock to import iron ore meant that this was the obvious South Wales location. In addition there was a large amount of cheap land of little agricultural value available. The role of Hugh Dalton is examined stressing his deep commitment to prevent the return of mass unemployment. He did not choose the site but he ensured that it was in this area. It is argued that the requirements of the tinplate industry stimulated the need for this mill but it was the requirements for sheet from the motor industry that largely determined the design. Although incorporated into the BISF's plan for the post-war steel industry this development was made independently. Despite the eventual technological and commercial success of the project a number of long-term mistakes were made. These included the grafting of the mill onto the older steelworks and the failure to locate a tinplate works at the site. It shows that the formation of the Steel Company of Wales (SCoW) resulted from the sheer scale of the development which was beyond the resources of its constituent companies. Without the pooling of the resources and the new mill these companies would have been driven from the market.

As previously noted GKB began to make tentative plans to build a strip mill in 1938[395]. That planning process was complicated by the differing views of Baldwins and GKN as to their requirements[396]. Charles Wright was the driving force to build the new mill as Baldwins had extensive tinplate interests. That need became greater once their main competitor in tinplate production, Richard Thomas, opened their Ebbw Vale strip mill. The latter and its tinplate works were largely responsible for Baldwins losing 26.5% of the tinplate market between 1937-1944[397]. The problem for Baldwins was that with the formation of GKB in 1930 they had lost full control

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[395] Brinn, p.8. Fevre, *Wales Is Closed*, p.17. Gordon Smith, p.31.
[396] Warren, *The British Iron and Steel*, p.190.
[397] Ibid, p.219.

over their former steelmaking plant at Port Talbot which was essential for the strip mill. The steelworks had even been expanded and modernised. They now needed GKN's support to build the mill. GKN owned the sheet manufacturer Lysaghts, which also required access to a strip mill but most of GKN's other interests were mainly concentrated in engineering. As a result they were less enthusiastic about the strip mill. The irony was that the Bank of England's policy of encouraging regional mergers to help stimulate investment was now actually preventing investment.

As the strip mill needed to be attached to an integrated iron and steelworks there were only two possible South Wales sites. The first was Cardiff which was too cramped to accommodate a strip mill[398]. This left Port Talbot/Margam. By March 1938 GKB had produced plans for a combined plate and sheet operation here[399]. It included a 4 high reversing plate mill with room at the end for a 4 stand hot strip mill to be added later. The reversing mill would have acted as a roughing section and would have had a 300,000 ton capacity[400]. World War Two prevented any development but planning continued[401].

At this time, Briton Ferry Steel, Lysaghts and The Llanelly Associated Tinplate Company all produced tentative plans for hot strip mills. Of more significance was Richard Thomas' plan to build a second South Wales strip mill to support their West Wales operations. The problem was that none of their West Wales steelworks included iron making plant nor were located near a suitable dock[402]. Richard Thomas commissioned two experts, Latham and James, to recommend the most suitable South Wales site for a strip mill. Their 1943 memorandum, '*The Future of the Tinplate Trade',* recommended that the best site was adjacent to Margam steelworks. It envisaged a melting shop, slabbing mill and hot strip mill[403].

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[398] Ibid, p.191.
[399] Ibid
[400] Brinn, p.8.
[401] Ibid. Warren, *The British Iron and Steel*, p.191.
[402] Brinn ibid. C.W. Roberts, pp.188-189.
[403] Warren, *The British Iron and Steel*, p.191, pp.212-213.

Latham and James tried to reconcile efficient centralised hot rolled coil production at an integrated coastal steelworks with dispersal of output to different firms for finishing. Their solution involved the existing tinplate firms jointly owning the hot strip mill and allocating output in proportion to their tinplate production at a uniform price. In many ways this was the significance of the memorandum. It recognised that the only viable way forward was a regrouping of companies to make use of Port Talbot's large and valuable existing plant at a coastal site using imported ore. Although there is no direct evidence to support this it must have been clear to Baldwins and Richard Thomas that they would need to collaborate on this. It also proposed that there should be 5 new cold mills each with an average output of 70,000 tons/annum located near existing tinplate works[404]. They unrealistically estimated that the whole scheme would cost just £7,000,000 :-

Table 6.1: Estimated Cost of the Latham-James Reorganisation Scheme[405]

Facilities	**Cost (£m)**
Melting Shop & Strip Mill (516,000 ton ingot capacity)	3.5
5 Cold Reduction Mills (c390,000 ton capacity)	1.4
Electrolytic Tinning Lines	c1.25
Annealing Plant	0.35
Working Capital & Starting Expenses	0.50
Total	**7.00**

For a second time a steelmaker had recognised that Port Talbot was the best site in South Wales to locate another hot strip mill and for the first time it envisaged the need for joint ownership. Yet it failed to fully appreciate the structural changes needed within the tinplate industry. These included the replacement of the old hand mills with electrolytic tinning and the concentration of production at fewer sites. To remain internationally competitive concentration of tinplate and sheet production was essential. This required some form of collaboration between the producers. During 1941 the Board of Trade set up a committee chaired by Lord Essenden to review the tinplate industry. His report delivered in October 1941 recognised the need for some sort of collaboration to develop hot strip mills and cold mills to support tinplate production[406]. It recommended that up to 30% of existing tinplate capacity should be

[404] Ibid, pp.213-214.
[405] Ibid, p.215.
[406] Kew, NA, Ref BE1/335-254647, Correspondence between SCoW/RTB Chairman, Sir Ernest Lever and the ISB's Sir Archibald Forbes, 25th February 1955, pp.1-2.

closed and that Ebbw Vale would only be able to deal with a fifth of post war demand. As a result it recommended immediate planning for more strip mills[407]. It was this report that initiated Richard Thomas commissioning Latham and James to determine the best South Wales site for the strip mill in January 1943. By World War Two maintaining the existing structure of the South Wales tinplate and sheet industries was not an option. Technological change was rendering current production obsolete and the scale of necessary change required joint action.

In May 1944 GKB's Chairman, Charles Wright, presented the board with Development Scheme 'J' a minutely detailed plan for the construction of a strip mill and steelworks called 'Margam 2' near the existing Margam Steelworks. Both steelworks were envisaged as working in conjunction with each other. This was the same site identified by Richard Thomas[408]. Scheme J recognised that if Britain was to remain internationally competitive in tinplate and sheet production this strip mill was essential. It envisaged a strip mill 72" wide to meet the motor industry's requirements. This was considerably wider than the existing mills at Ebbw Vale and Shotton. Output was to be about 13/14,000 tons/week of which 3,000 tons would be sold to non GKN and Baldwins South Wales firms[409]. By September 1944 the proposed plant included :-

Table 6.2: Proposed Scheme J Plant[410]

1,000 ton Mixer (coke oven gas-fired)
9x200 ton Fixed Open-Hearth Furnaces (producer gas-fired)
Stripping and Soaking Pit Plant (100% blast furnace gas-fired)
2 High Universal Slabbing Mill
4 Mixed Gas Fired Slab Furnaces
Roughing Scale Breaker
1x4 High 80" Reversing Universal Roughing Mill
Finishing Scale Breaker
6x4 High 80" Continuous Strip Mill
Plate Handling Department, with Cooling Tables, Levellers and Shears
Flying Shears for Sheets in Multiple Lengths
Coilers for Strip Coils

[407] Warren, *The British Iron and Steel*, p.211.
[408] Kew, NA, Ref BE1/335-254647, Internal minute from the Chief Regional Planning Officer at the Ministry of Town and Country Planning to Mr Pepler, 16th July 1945. Brinn, p.8. Corus, *Port Talbot A Century*, p.6.
[409] Kew, NA, Ref HLG 79/583-223474, W. Charles Wright in the forward to *Guest Keen Baldwins Iron and Steel Company Limited–Port Talbot, Proposed 80" Strip and Plate Mill,* May 1944.
[410] Ibid, main document.

It was estimated to take 2 years to build and would cost £12 million. The mill width had now been increased to 80” to meet the future likely needs of the motor industry[411]. Interestingly, Warren claims that it was March 1945 that a United Engineering report to Lever concluded in favour of an 80” strip mill. Certainly by September 1944 Scheme J included an 80” strip mill. Warren also claims that the 80” strip mill was suggested by the ‘Iron and Steel Control’ as early as 1943[412]. Despite some consideration of a 100” wide mill it was recognised that demand would not support this[413].

There is evidence of a change in priority here. The strip mill had initially been conceived primarily to meet the needs of the tinplate industry but the design was being dictated by the needs of the motor industry for sheet. There is an inherent problem here. A wider mill requires more capital investment yet a substantial proportion of its output was destined for the tinplate industry with a narrower strip requirement. Thus a substantial proportion of its production could have been produced on a mill requiring less investment. An element of inefficiency was built into the mill from the start. As will be seen several unsuccessful attempts were made to build a second narrower strip mill at Port Talbot primarily to supply the tinplate industry. No British steelworks ever had a second strip mill. Thus the capital investment could never be utilised to optimum efficiency.

Towards the end of World War Two Baldwins still felt very exposed with regard to their tinplate interests. With rivals Richard Thomas having access to a strip mill and GKN still being lukewarm about building one at Port Talbot they felt that GKB could not be fully relied upon. As such Baldwins began an informal dialogue with Richard Thomas on a merger to gain access to Ebbw Vales’ strip mill and to build the strip mill at Port Talbot if GKB decided against the new mill[414]. The negotiations between Wright and Richard Thomas’ Chairman, Ernest Lever, produced an agreement whereby Baldwins would receive an apparently advantageous share of a merged company based upon 1937 output levels rather than their reduced 1943 output[415].

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[411] Warren, *The British Iron and Steel*, p.218.
[412] Ibid, p.224.
[413] Ibid, p.209.
[414] Ibid, p.218.
[415] Burn, *The Steel Industry*, p.80.

During November 1944 Richard Thomas' directors agreed to merge from 1st January 1945 despite opposition from the former Chairman and Managing Director, William Firth. Lever understood that the merger would link Richard Thomas with the all important steelmaking plant at Port Talbot[416]. It also brought 340 of the 500 South Wales tinplate mills under the control of one company[417]. Baldwins transferred all their assets, including those of their subsidiaries (including GKB) and £300,000 in cash to Richard Thomas[418]. In exchange Richard Thomas allotted Baldwins 8,500,002 ordinary shares credited as fully paid. The name of the company was changed to Richard Thomas and Baldwins Limited (RTB) and Baldwins became Baldwins (Holdings) Limited[419]. An earlier merger along these lines might have allowed an earlier rationalisation of the tinplate industry, greater access to capital and possibly even avoided the financial problems that engulfed Richard Thomas with the building of the Ebbw Vale hot strip mill. Richard Thomas recognised that to maintain post war tinplate markets another strip mill was essential. They also recognised that this was beyond the resources of any one company and that pooling of resources was essential[420].

The newly merged RTB sent two experts, Fred Cartwright from GKB and S.E. Graeff from Richard Thomas to the United States to examine the latest American strip mill practices. They reported back to the RTB board on 30th April 1945 making a number of recommendations which were built into Scheme J[421] :-

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[416] Warren, *The British Iron and Steel*, pp.218-219.
[417] Kenneth O. Morgan, p.314. Paul Jenkins, p.55.
[418] Anon, 'Richard Thomas & Baldwins Fusion–Modernisation of Sheet and Tinplate Trades', *I&CTR*, 8th December 1944, 889-890 (p.889).
[419] Ibid, and 'Richard Thomas and Baldwins–Fusion Proposed', 17th November (1944), 775. Brinn, p.8.
[420] Anon, 'Richard Thomas & Baldwins Fusion' (p.890). Ernest H.Lever, Chairman Of Richard Thomas and Company Limited in 'Richard Thomas & Baldwins Fusion–Modernisation of Sheet and Tinplate Trades' (p.890).
[421] Brinn, p.8.

Table 6.3: Recommended Plant[422]

2x800 ton Mixers
10x200 ton oil fired Open-Hearth furnaces
Stripping and Soaking Pit plant
High lift Slabbing Mill
4 Slab Reheating Furnaces
Fully Continuous 10 Stand 80" Hot Strip Mill

They recommended that the new 18,000 tons/week capacity mill should be operated in conjunction with Ebbw Vale's strip mill to ensure optimum utilisation of both plants. The minimum economic output was now considered to be 1,000,000 tons/annum[423]. These recommendations formed the basis of the strip mill and steelmaking plant that was built[424].

GKB and Richard Thomas had independently identified Port Talbot as the best South Wales location to build a new hot strip mill. The location held many advantages. Firstly South Wales had the largest reserves of UK coking coal[425]. In addition limestone, dolomite, silica bricks and abundant water were all available locally[426]. The only raw material absent was iron ore but Port Talbot had a developed iron ore wharf capable of handling large amounts of imported low phosphorous ores thought necessary to produce higher grade strip steel[427]. Adjacent to Margam Steelworks were 1,700 acres of cheap and flat land unencumbered by any buildings and of little agricultural value[428]. The location also had direct access to the national rail network, a nucleus of trained personnel, available support services and fuel oil available from the nearby Llandarcy Oil

[422] Ibid, pp.8-9.
[423] Cartwright, 'Preliminary Planning of Margam and Abbey Works'. Special Issue of *I&CTR*, (1952), 9-12, (p.10).
[424] Brinn, p.9.
[425] Cartwright, 'Preliminary Planning of Margam and Abbey Works'. Special Issue of *I&CTR*, (1952), 9-12, (p.9).
[426] Kew, NA, Guest Keen Baldwins Iron and Steel Company Limited, Port Talbot, Proposed 80" Strip Mill.
[427] Cartwright, 'Preliminary Planning of Margam and Abbey Works'. Special Issue of *I&CTR*, (1952), 9-12, (p.9).
[428] Ibid. Kew, NA, Ref HLG 79/583-223474, D.J. Young, GKB Company Secretary, in 'Record of Interview' 6th June 1945 with Representatives of Messrs Guest Keen and Baldwins Ltd regarding the proposed Strip and Plate Mill at Margam, Ministry of Town and Country Planning. Heal, p.48.

Refinery[429]. Finally, and of significance Port Talbot/Margam already possessed integrated and modernised iron and steelmaking plant. There were also good reasons to build the strip mill here on employment grounds. The tinplate industry was heavily concentrated in West Wales and would inevitably create large numbers of redundant workers which could be absorbed at the new steelworks[430]. Kenneth Warren claims that a location to the west of Newport held similar advantages to Port Talbot but lacked crucial iron and steelmaking plant. It would also not alleviate the resulting West Wales unemployment resulting from the inevitable closures of the local small steelworks and tinplate works. As a result the Newport site offered nothing to Government regional development concerns[431]. Thus for both political and industrial/financial reasons the site was never realistic.

Cartwright identified two fundamental problems with Port Talbot namely the limitations imposed by the dock on the size of ore carriers and that the coke ovens were close to a residential area[432]. The problem with the dock was two fold. Firstly the lock was just 450' in length and 60' wide[433]. This restricted the deadweight of ships to around 9,500 tons. It could have been enlarged but the approach channel could not have been sufficiently deepened to allow larger ore carriers. The restriction on the size of ore carriers meant that it was uneconomic to transport ore from the richer southern hemisphere ore fields. Despite this a fleet of 24 small specialist ore carriers was built during the 1950s to supply ore to Port Talbot[434].

In January 1946 GKB had approached Port Talbot Dock's owner, the GWR, as to how to increase imported iron ore tonnages. The GWR proposed importing all ore through Swansea's Kings Dock. As Swansea could handle larger ore carriers they estimated reduced costs of 6/- per ton discharged and rail transport costs to Port Talbot of 2/4d a ton. GKB rejected these figures and estimated a saving of 2/1d a

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[429] Cartwright, 'Preliminary Planning of Margam and Abbey Works'. Special Issue of *I&CTR*, (1952), 9-12, (p.9). Burn, *The Steel Industry*, p.82.
[430] Warren, *The British Iron and Steel*, pp.221-222.
[431] Ibid
[432] W.F. Cartwright, quoted in Pagnamenta and Overy, pp.90-91.
[433] PTR, p.8.
[434] Harrison, John, 'The Iron Ladies – Part 1', *Ships in Focus–Record 23* (2003), 154-167; Part 2', *Ships in Focus–Record 24* (2003), 205-215; Part 3', *Ships in Focus–Record 25* (2003), 24-36.

ton by importing all ore through Port Talbot Dock. During 1947 the GWR agreed to spend £900,000 improving Port Talbot Dock[435]. Thus by using Port Talbot Dock, and accepting its limitations, steelmaking was freed from additional rail transport costs.
In reality the new strip mill was being grafted onto the old Port Talbot/Margam Steelworks. This was not ideal[436]. If sufficient funds had been available all existing plant would have demolished and new plant built but the funds were not available[437]. It is this that is the vital factor as to the location of the new strip mill. If the strip mill had been built at another location the limited funds would need to have covered the building of plant already existing at Port Talbot. Thus the scale of the remaining plant would have been less which would have reduced profits.

Duncan Burn argues that Port Talbot was not an ideal site as an immense amount of pile driving was necessary even though there was some suitable existing plant[438]. Yet Burn acknowledges that Richard Thomas' board concluded that Port Talbot was the right site for the strip mill[439]. He claims that an alternative site near Barry was strongly, though not publicly advocated, where the largest envisaged ore carriers of up to 20,000 tons could be docked. Unfortunately Burn does not state who advocated this site. In producing this work no evidence has been found of any suggestion to use Barry as an alternative site. Warren argues that the Barry site might have been flat and had good rail facilities but was not large and had no existing steel plant[440]. It appears that it was never a realistic alternative. Burn also raises the possibility of locating the mill on Humberside to use Yorkshire coking coal near to home ore and deep water for imported ore[441]. This reveals a certain prejudice towards home produced ore. Burn was writing during 1960-61. Apart from any technical requirements to use higher quality foreign ore by this time it must have been clear that the cost of foreign ore was falling as it peaked at 123 shillings/ton in 1957 and by 1960 had fallen to 98 shillings/ton as the price of home ore increased

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[435] Cartwright, 'Preliminary Planning of Margam and Abbey Works'. Special Issue of *I&CTR*, (1952), 9-12, (p.9).
[436] Cartwright, quoted in Pagnamenta, and Overy, p.90. Heal, p.48.
[437] Cartwright, ibid.
[438] Burn, *The Steel Industry*, p.81.
[439] Ibid, pp.81-82.
[440] Warren, *The British Iron and Steel*, p.220.
[441] Burn, *The Steel Industry*, p.103.

by 20% between 1957 and 1962[442]. Yet even Burn begrudgingly accepts that home ores were difficult to use for high grade steel as the Americans had never succeeded in making strip from low grade ore[443]. Port Talbot may not have been a perfect location but it was through a combination of factors the most suitable site. However compromised, Port Talbot took British steelmaking to a new level in terms of scale and technology.

Employment factors were also important in deciding to locate the strip mill at Port Talbot. In particular they influenced the drive and determination of Hugh Dalton, the wartime President of the Board of Trade. He had a deep commitment to avoid a return to pre-war unemployment levels[444]. In the first Welsh Affairs debate on 17th October 1944 he stated that the Welsh tinplate industry needed new strip mills and cold reduction plants but he had not received any information from the tinplate manufacturers nor the BISF as to where the plants would be built. He added that he would not participate in the dislocation of the Welsh tinplate industry[445].

Dalton resisted any opposition to locating the strip mill in South Wales. He publicly stated that the Government would not support locating the mill on Humberside[446]. In February 1944 he refused a request by the Tinplate Association to pay compensation of £500,000 to shareholders in closed tinplate works to ensure that they never re-opened. This was of course an essential element of the requirement for tinplate rationalisation. Once he received assurances that Port Talbot would be the location of the strip mill he gave approval and announced its location in a speech to Swansea Chambers of Commerce on 23rd April 1945[447]. Yet John Vaizey states that it was October 1945 before RTB and GKB agreed to build the strip mill at Port Talbot[448]. Even some Whitehall Ministries were unaware of the decision[449]. In an

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442 Heal, p.127.
443 Burn, *The Steel Industry,* p.106.
444 Hugh Dalton, *The Fateful Years–Memoirs 1931-1945* (London: Frederick Muller Ltd, 1957), p.434.
445 *Hansard* (Commons). 17th October 1944, columns 2319-2324.
446 Ibid
447 Dalton, *The Fateful Years,* pp.444-446.
448 Vaizey, p.137.

internal Ministry of Town and Country Planning memo Herbert Morrison stated that Dalton was determined to build the mill at Port Talbot and that his own ministry was unaware of the precise site[450]. Although the steel companies had identified Port Talbot as the most suitable South Wales location it was Dalton's drive and determination that added the political impetus to avoid the large scale unemployment resulting from the inevitable closure of the now obsolete South Wales hand mills. Burn argues that in some respects the steelmakers and politicians could do no more than to come to compromises within frustrating constraints and broadly speaking he accepted that Port Talbot did this[451]. Heal, an industrial geographer, starts from the assumption that all location and investment decisions are historical compromises made at one time and imposing a weighty legacy on those who inherit them[452]. He views Port Talbot as *"the best compromise solution for the existing set of problems[453]".* That problem he accepts was the modernisation of the tinplate industry but the impetus for continued growth was sheet[454]. As will be seem the growth in tinplate demand was also to be an important factor in future developments. Warren also views that the location of the strip mill as a compromise[455]. Yet the evidence suggests something different. Two steelmakers had independently determined this as the best South Wales site for another strip mill. That coincided with the political need to locate the mill in the area on employment grounds. Rather than being a compromise it was a meeting of interests between the steelmakers and politicians.

During World War Two the BISF were asked to forecast Britain's post-war steel requirements and plan on how to meet them. The Iron and Steel Control Board and the BISF were very clear that a third strip mill would be an essential part of post war modernisation and they had no doubt that its large capacity would necessitate an amalgamation of companies and the elimination of much old capacity. An Iron and

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[449] Kew, NA, Ref HLG 79/583 223474, Internal Ministry of Town and Country Planning minute from A.M. Jenkins to R.D. Jones, 4th May 1945. Ibid, minute from R.D. Jones to A.M. Jenkins, 10th May 1945.
[450] Ibid, minute from Herbert Morrison to 'Smith' at the Board of Trade, 6th June 1945.
[451] Burn, *The Steel Industry,* p.106.
[452] Heal, pp.50-51.
[453] Ibid, p.50.
[454] Ibid, p.48.
[455] Warren, *The British Iron and Steel,* pp.219-224.

Steel Control Board technical study in 1943 defined the desirable parameters as wider than the 56” mill at Ebbw Vale and 60” at Shotton[456]. In May 1946 the Ministry of Supply published the BISF’s 5 year modernisation plan[457] a year after Dalton had announced that Port Talbot would be the site of Britain’s third hot strip mill. Therefore it had very little influence on the Port Talbot development. It did not even specifically mention Port Talbot. Its significance was that it put the development within the wider plan for the British steel industry.

The report estimated that between 1950 and 1955 the UK needed a steel capacity of approximately 16,000,000 ingot tons/annum. With a 94% utilisation rate Britain was capable of producing 15,000,000 ingot tons[458]. To raise capacity to the required level and to modernise the following expenditure was needed :-

Table 6.4: Summary of District Expenditure[459]

District	**Proposed Expenditure (£)**
South Wales	41,000,000
North East Coast	35,000,000
Scotland	29,000,000
North West Coast	1,300,000
Sheffield	5,500,000
Lancashire, Flintshire, Staffordshire etc	17,000,000
Lincolnshire	19,200,000
Northamptonshire	20,000,000
Total	**168,000,000**

The report for South Wales concentrated on the modernisation of the predominating tinplate and sheet sectors[460]. Although not mentioning Port Talbot the report incorporated the planning already undertaken by stating that South Wales’ hot rolled strip capacity would increase by 1,000,000 tons/annum. It envisaged annual output of 1,650,000 tons/annum including 100,000 tons of plate up to 0.75” in thickness. Production of thicker plate would move out of South Wales altogether. This meant the end of heavy plate production in Port Talbot. To support this level of South

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456 Ibid, p.202, p.218.
457 Great Britain. Ministry of Suppy. *Iron and Steel Industry-Reports By The British Iron And Steel Federation And The Joint Iron Council* (Cmnd 6811). London: HMSO, 1946.
458 Ibid, p.10.
459 Ibid, p.13.
460 Ibid, p.14.

Wales steelmaking large quantities of imported low phosphorous iron ore were required[461]. To keep production costs down the mill needed to be located at a dockside location. Port Talbot was such a location. It stated that nationally the new hot strip mill should be given top priority. It would substantially lower tinplate and sheet production costs and improve the quality essential for export markets[462]. Despite adding little that was new the BISF report was important as it incorporated the existing planning and political decision within the national plan.

As noted earlier, RTB had concluded that no single steelmaker could independently fund the new mill. They took the lead in lengthy and detailed discussions with GKB, Llanelly Associated Tinplate and John Lysaght Ltd to pool resources to build the strip mill[463]. This reduced the financial risk to any one company. The Briton Ferry Steel Company was involved in the initial discussions but later withdrew. Between 1946 and 1952 it was involved with rebuilding Briton Ferry Steelworks and decided to concentrate on billet production which did not require a strip mill as a result of the large billet mills mentioned in the 1946 report not being built[464].

Agreement between the remaining companies was reached and in March 1947 the formation of the SCoW was announced. It was registered as a public company on 1st May 1947 with Ernest Lever, the Chairman of RTB, as Chairman. Each company was represented on the board[465].

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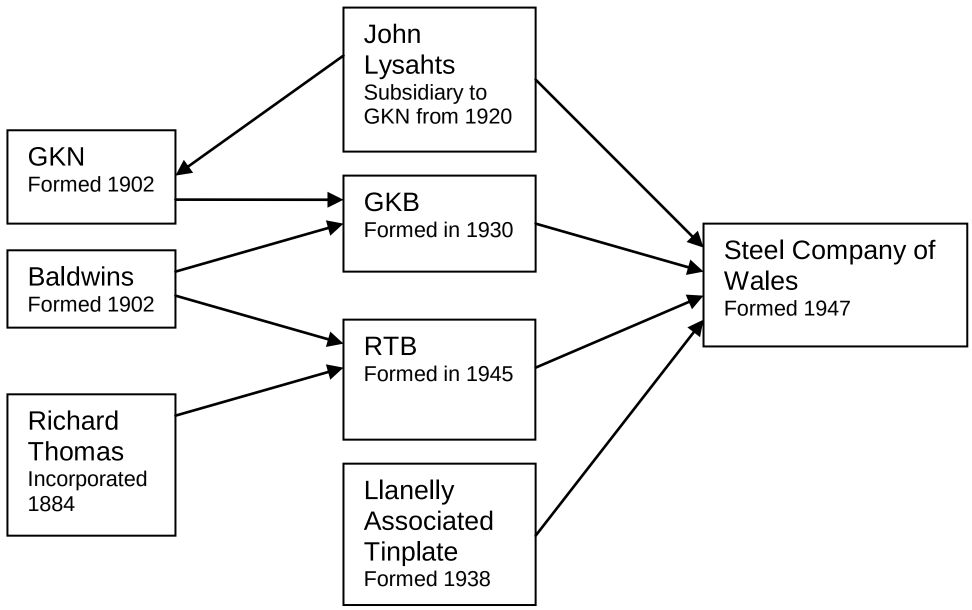
[461] Ibid, pp.13-14.
[462] Ibid, p.33.
[463] Brinn, p.9. Paul Jenkins, p.55. Carr and Taplin, p.597. Keeling and Wright, pp.135-136. Kenneth O. Morgan, p.314. C.W. Roberts, p.193. Protheroe-Jones, p.41. Corus, *Port Talbot A Century,* p.6.
[464] Burn, *The Steel Industry,* p.246. Heal, p.71.
[465] Kew, NA, Ref T228/147–250657, The Steel Company of Wales Limited, Offer for sale, 1947. Brinn, p.9. Paul Jenkins, p.55.

Figure 6.1: Constituent Companies of the SCoW 1947[466]



Also in March 1947 Lever officially announced that the SCoW would build the new strip mill adjoining Margam Steelworks[467]. On 27th September 1947 the SCoW officially took over the running of Port Talbot/Margam[468]. Fig 6.1 shows that the various takeovers had resulted in complex relationships between the firms. Fundamentally the SCoW was owned by GKN, Baldwins, Richard Thomas and Llanelly Associated Tinplate through various subsidiaries. The complex inter company relationships that had emerged during the 1930s and 1940s actually helped with the formation of the SCoW. Once mergers started to take place it made sense to look beyond the parent companies to spread the financial risk. As the size of the mill increased this approach became essential. The reality was that to stay in tinplate and sheet manufacture the scale of investment was beyond any of these companies. They had little option but to merge.

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[466] Jenkins, ibid. Brinn, p.3. Kew, NA, Ref HLG 79/583–223474, Outline of Developments at Port Talbot By The Steel Company of Wales Limited, 6th June 1947. Ibid, Ref T228/147–250657, The Steel Company of Wales Limited, Offer for sale, 1947. Burn, *The Economic History*, p.384. Warren, *The British Iron and Steel,* p.195.
[467] Cartwright, 'Preliminary Planning of Margam and Abbey Works'. Special Issue of *I&CTR*, (1952), 9-12, (p.9).
[468] M. Potts and G.W. Green, *Industrial Locomotives of West Glamorgan* (Oakham: Industrial Railway Society, 1996), p.47.

The proposed funding for the development was agreed by the Treasury's Capital Issues Committee in 1947 :-

a) *"£15 million 3% First Mortgage Debenture Stock (5-10 years) – to be issued at 98½ to a group of 7 merchant banks, who will offer the debentures for sale to the public at par.*

b) *£5 million of Ordinary Shares to be subscribed in cash at par by the promoting companies or their nominees. A further amount of Ordinary Shares of not less than £10 million to be issued to the promoting companies in exchange for assets which they will transfer to the new company.*

c) *Up to £35 million will be borrowed over the next five years from the Finance Corporation for Industry, to whom an equivalent amount of 3½% Convertible Mortgage Debenture Stock (repayable in 20 years) will be issued as collateral. The F.C.I. will have the rights (1) (before 16th July 1947) to convert 30% into 4½% Cumulative Preference Shares and 30% into Ordinary Shares; and (2) to market the collateral at any time at not less than par and to use the proceeds to repay the loan. The loan will carry 3¾% interest until the Debenture under (a) are repaid, and 3½% thereafter[469]."*

The £15 million 3% Debenture stock was issued on 16th July 1947 but was not a successful issue despite being kept as short-term and at a high rate of 3%. Applications totalled £10,573,625, of which only £4,073,225 was raised from the public with £6,500,400 being covered by the underwriters. This failure was attributed to uncertainty about the future course of interest rates, the prospect of nationalisation and the number of other recent issues[470].

At registration the SCoW had an authorised nominal share capital of £40,000,000 in £1 shares. Exactly 5,000,000 shares (1/- paid) were subscribed by the 4 founding companies (RTB, GKB, John Lysaghts and the Llanelly Associated Tinplate Companies Limited) and 1,400 shares (fully paid) went to the directors. The 4 founding companies also received £10,000,000 worth of shares, credited as being

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[469] Kew, NA, Ref T228/147–250657, The Steel Company of Wales Limited, anonymous Ministry of Supply minute to the Treasury's Sir Herbert Brittain, 20th June 1947. Ibid, Ref HLG 79/583–223474, The Steel Company of Wales Limited, Offer for sale, 1947.

[470] Anon. 'Welsh Steel Under Subscription', *Economist*, 19th July 1947, pp.118-119. Kew, NA, Ref T228/147–250657, Internal Treasury Minute to Sir Herbert Brittain, 8th November 1948.

fully paid, in proportion to the amounts of assets and working capital transferred to the SCoW[471]. The assets transferred to the SCoW were[472] :-

- *RTB:* 14 tinplate and blackplate works (114 mills), land and house property in South Wales and Gloucestershire.
- *GKB:* a limestone quarry, coke ovens, blast furnaces, melting shops, rolling and finishing plant for rails, sleepers, sections and plates, land and house property in Port Talbot.
- *John Lysaghts:* sheet works in Newport consisting of a 3 stand cold reduction mill, hand and mechanised mills, land and house property.
- *Llanelly Associated Tinplate Companies Ltd:* 4 tinplate works (28 mills), land and house property in South Wales, and 11,167 shares of £1 each in Galbraith, Campbell and Co Ltd, a merchandising company with an issued share capital of 21,500 ordinary shares of £1 each, all fully paid.

A Finance Corporation for Industry (FCI) loan was also made available to be drawn upon up to 16th July 1952[473]. The FCI was heavily involved in financing the post-war development of the steel industry. It consisted of insurance companies, investment trusts and the Bank of England[474].

As the detailed planning proceeded Scheme J evolved into Development Scheme 'K'. It was this that was actually built. The new steelworks was renamed the 'Abbey Works' in recognition of the nearby Cistercian Margam Abbey[475]. Planning started from the assumption that a certain tonnage needed to be produced[476]. This determined the tonnage of ingots, scrap and pig iron needed which determined the amount of ore, coke, and coking coal required. As noted earlier the minimum economic output was calculated to be 1,000,000 tons/annum of steel product. It was

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[471] Kew, NA, Ref HLG 79/583–223474, Outline of Developments at Port Talbot 6th June 1947. Ibid, Ref T228/147–250657, The Steel Company of Wales Limited, Offer for sale, 1947.
[472] Ibid, Ref T228/147–250657, letter from the Chairman of The Steel Company of Wales, Ernest H. Lever, to the Issuing House, 10th October 1947.
[473] Ibid, The Steel Company of Wales Limited, Offer for sale, 1947.
[474] Keeling and Wright, p.131.
[475] Brinn, p.9.
[476] Cartwright, 'Preliminary Planning of Margam and Abbey Works'. Special Issue of *I&CTR*, (1952), 9-12, (p.9).

built with a 1,500,000 tons/annum capacity but with planning already underway to increase capacity to 2,000,000 tons/annum because of rising demand. As previously noted there was a tension between producing strip for the sheet and tinplate markets as although mill requirements were similar they were not identical. That tension manifested itself in strip mill width. The mill produced strip up to 80" in width. A narrower and less costly mill could have satisfied tinplate requirements but the wider mill gave the SCoW a number of commercial advantages including the widest strip mill in Europe[477]. However, as a sizeable proportion of output could have been produced on a narrower less costly mill the capital investment was not being utilised in the most efficient manner. In addition Warren claims that an increase in mill width from 54" to 72" increases the cost of strip by 12½%[478]. The mill design followed standard American practice of a conventional 10 stand strip mill[479]. This was a cautious and safe approach but considering the scale of investment undoubtedly the correct one.

A cold mill was not part of the original proposal, but was added following wider consideration of modernising the existing cold reduction plant at Lysaght's Orb Works in Newport or building it at Llanelli on employment grounds. The Iron and Steel Board (ISB) rejected both sites on cost grounds[480]. Building the cold mill at Margam instead of Newport saved 11/- a ton on sheet production[481]. The decision to locate the cold mill at Margam was made by the 'Cabinet Distribution of Industry Committee' on 12th December 1947[482]. The problem related to both employment issues regarding the site of the new tinplate works and GKN's attempt to protect their subsidiary, Lysaght's, Orb Works in Newport. They initially resisted incorporating this into the SCoW and according to Vaizey even contemplated buying out the RTB's

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477 Ibid

478 Warren, *The British Iron and Steel*,p.224.

479 Cartwright, 'Preliminary Planning of Margam and Abbey Works'. Special Issue of *I&CTR*, (1952), 9-12, (p.9).

480 Kew, NA, Ref HLG 79/583–223474, Presentation to 'Panel A' by W.F. Cartwright on the Proposal for the Modernisation and Development of Sheet and Tinplate in South Wales, 6th May 1947, Ministry of Town and Country Planning papers.

481 Ibid, Scheme For The Modernisation And Development Of Sheet And Tinplate Production In South Wales, The Ministry Of Supply Parliamentary Secretary notes and Paymaster General letter, 1st December 1947.

482 Ibid, internal minute to Regional Controller, Ministry of Town and Country Planning, 5th May 1947 and internal Ministry minute, 20th December 1947.

shares in GKB and building the strip mill themselves. In the end their lack of experience with strip mills forced them to abandon the idea and GKN merged Lysaghts into the SCoW[483]. The Orb Works became an integral part of the SCoW producing electrical sheet[484].

The existing ore wharf, Margam Wharf, was extended with 3 transporter cranes being installed in 1950, 1952 and 1953 to bring the number up to 5. Each was capable of lifting 12½ tons and had a discharge rate of 500 tons/hour[485]. New railway sidings and tipplers to discharge coal were built at Margam in 1949. At the same time a new coal washery was built capable of handling 20,000-22,000 tons/week of coal[486]. Two new batteries of coke ovens consisting of 90 coke ovens and a by-product plant were built during 1950-51. This brought total coke making capacity to 14,000 tons/week. These batteries went into production in March 1951 and October 1951[487].

It was originally planned that the open-hearth furnaces would use a charge of 50% scrap and 50% pig iron[488]. Numbers 2 and 3 blast furnaces would have been rebuilt like Number 1 blast furnace with hearth diameters of 21'6" but were rebuilt with hearth diameters of 25'9" because of difficulties in obtaining scrap which meant that more pig iron was needed. They were completed in November 1950 and June 1952 and were each capable of producing 1,000 tons/day of iron[489]. To support the planned output of 16,250 tons/week of iron the following materials were needed :-

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483 Vaizey, p.138.
484 Warren, *The British Iron and Steel*, p.250.
485 Kew, NA, Ref HLG 79/583–223474, Outline of Developments at Port Talbot By The Steel Company of Wales Limited, 6th June 1947, p.6. Anon. 'Steel Works in the Making', *Economist*, 15th November 1947, p.811. Brinn, p.10.
486 Kew, NA, ibid, p.5. Brinn ibid.
487 Kew, NA, ibid. Brinn, ibid and p.37.
488 Cartwright, 'Preliminary Planning of Margam and Abbey Works'. Special Issue of *I&CTR*, (1952), 9-12, (p.10).
489 Brinn, p.10, p.23.

Table 6.5: Required Blast Furnace Raw Materials[490]

Raw Material	Tonnage
Limestone	3,000
Coke	14,000
Home Ore	7,000
Imported Ore	28,000

The limestone came from the nearby Cornelly Quarry. A sinter plant was completed in 1954[491].

Both Port Talbot and Margam Melting Shops' 75 ton open-hearth furnaces were rebuilt as 100 tons furnaces[492]. Production in each melting shop was planned to be 4,000 tons/week[493]. A new open-hearth melting shop, the Abbey Melting Shop, was built during 1951-52. It contained 8x200 ton fixed American designed but British built open-hearth furnaces and two 800 ton mixers which would produce 16,000 tons/week of Scheme K's planned 24,000 ingot tons/week[494]. The plan to use 3 melting shops, each with different requirements, added to production costs and was far from ideal. A lack of funding prevented the closure and replacement of the older melting shops[495].

Twenty soaking pits were built to handle up to 25,000 tons/week[496]. In conjunction with these a 45" slabbing mill was built capable of handling ingots weighing up to 55,000 lbs which along with three reheating furnaces was completed in 1950. This slabbing mill was built with too small a capacity and had to be replaced in the late 1950s in order to handle the greater tonnages then needed.

The main feature of Scheme K was the 10 stand continuous 80" wide hot strip mill with two downcomers (see Appendix 8 for details). Part of the mill is shown below :-

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490 Kew, NA, Ref HLG 79/583–223474, Outline of Developments at Port Talbot By The Steel Company of Wales Limited, 6th June 1947, p.5.
491 Ibid, p.1. Brinn, p.10.
492 Cartwright, 'Preliminary Planning of Margam and Abbey Works'. Special Issue of *I&CTR*, (1952), 9-12, (p.10). Brinn, ibid and p.24.
493 Kew, NA, Outline of Developments at Port Talbot, p.6.
494 Kew, NA, Outline of Developments at Port Talbot, p.2. Anon. *Economist*, 15th November 1947, p.811. Cartwright, 'Preliminary Planning of Margam and Abbey Works'. Special Issue of *I&CTR*, (1952), 9-12, (p.10). Brinn, p.10, p.24.
495 Pagnamenta and Overy, p.90.
496 Ibid

The mill was supplied from the USA by United Engineering under the terms of the Marshall Aid Scheme (the SCoW received $27 million in total, the equivalent of £9.5 millions of Marshall Aid funding). It was completed during 1950-51[497]. Strip mill output was planned to be :-

Table 6.6: Planned Weekly Strip Mill Production[498]

	Weekly Production (tons)
Hot Rolled Coil	7,000
To Cold Mill	7,000
Hot Finished Shoots	3,000
Plates	2,500
Total	**19,500**

Finally during 1951 the continuous pickling line, the 3 stand cold reduction mill, the annealing bay with 12 furnaces, and 2 temper mills were completed[499]. It was planned to produce approximately 6,200 tons/week of sheet in the cold mill[500]. An improved power plant was also completed in 1951[501].

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497 Brinn, pp.9-10.
498 Ibid. Kew, NA, Outline of Developments at Port Talbot By The Steel Company of Wales Limited, 6th June 1947, p.3.
499 Brinn, p.10.
500 Kew, NA, Outline of Developments at Port Talbot, By The Steel Company of Wales Limited, 6th June 1947, p.4.
501 Brinn, p.10.

To support production internal road and railway systems were built[502]. The Abbey Works railway system was worked exclusively by diesel locomotives with 43 eventually being purchased[503]. Diesel power gave a 5/- hourly saving over steam power and more economical maintenance[504].

The plant installed under Scheme K at the Abbey Works was unquestionably of a high standard which meant buying American plant. Despite the high standard of the plant the layout was not ideal. The blast furnaces, the Abbey Melting Shop and the strip mill were not ideally located relative to each other. The additional internal transport added to production costs. Margam and Port Talbot Melting Shops were located even further away from the strip mill. Partly because of the extra transport costs involved and their small size furnaces both melting shops were vulnerable if the market ever tightened. As will be seen this happened.

The planning application to build the Abbey Works was made on 6th June 1945[505]. Building work started in 1947. The main contractor was George Wimpey and Co Ltd[506]. Approximately 500 acres of land were leased for the steelworks itself from Margam Estate with an additional 1,200 acres to the seaward side of the works[507]. The building process required raising the whole site by 10’ and this involved adding over 5 million tons of material[508].

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[502] C. Wordsworth, ‘Locomotives for Heavy Industry’, *Journal of the Institution of Locomotive Engineers*, Vol.45 (1955), 609-672, (p.613).
[503] Ibid. Kew, NA, Outline of Developments at Port Talbot By The Steel Company of Wales Limited, 6th June 1947, p.4. E.S. Tonks, *Industrial Locomotives of South Wales and Monmouthshire* (Birmingham: The Birmingham Locomotive Club, 1951), p.304. R.T. Ribbon, ‘Recent Developments In Locomotives Used By A Heavy Industry’, *Journal of the Institution of Locomotive Engineers*, Vol.54(5) (1964-65), 406-464 (p.411). Potts and Green, pp.47-48.
[504] Wordsworth, pp.626-627.
[505] Kew, NA, Ref HLG 79/583-223474, internal Board of Trade minute, 13th June 1945.
[506] Ibid, minute from the Iron and Steel Board’s N. Iles to T.H. Williams, Ministry of Town and Country Planning,13th May 1947. Keeling and Wright, p.109. Ribbons, p.411. Brinn, p.9. Fevre, *Wales Is Closed*, pp.17-18.
[507] Kew, NA, Outline of Developments at Port Talbot By The Steel Company of Wales Limited, 6th June 1947, p.4. Brinn, p.9.
[508] A. Leslie Evans, *Taibach and District*, p.84. Corus, *Port Talbot A Century*, p.8.

During May 1945 the Ministry of Town and Country Planning anticipated difficulty in supplying sufficient numbers of skilled builders[509]. The ISB estimated 2,500 builders would be needed during 1947-48 but later rising to 5,400[510]. The workforce peaked at 7,700[511]. They were housed at the former RAF base at nearby Stormy Down[512].

The first part of Scheme K to be completed was the slabbing mill. It first produced slabs on 27th November 1950. In March 1951 the Abbey Melting Shop produced its first steel and in June 1951 the hot strip mill produced its first commercial strip steel[513]. The Abbey Works by its sheer size was a milestone in British steelmaking. At completion it was twice the size of Britain's largest steelworks in 1945. The Abbey Works' official opening ceremony was performed by the Chancellor of the Exchequer, Hugh Gaitskill, on 17th July 1951. King George VI was due to perform the ceremony but deteriorating health prevented him from attending[514].

By the middle of 1952 the majority of Scheme K projects were completed and commissioning difficulties overcome. Only two major problems were encountered. The first was the national problem of a scrap shortage. Construction of enlarged blast furnaces partly overcame this problem. The second was the poor quality of pig iron produced due to low quality iron ore[515]. With experience production figures exceeded expectations :-

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509 Kew, NA, Ref HLG 79/583-223474, Minutes of 12th RDJ Committee Meeting 23rd May 1945, Ministry of Town and Country Planning.
510 Ibid, N. Iles, 13th May 1947; N. Iles, to T. H. Williams, 3rd June 1947.
511 A. Leslie Evans, *Taibach and District*, p.84.
512 Kew, NA, Ref HLG 79/583-223474, Julian Pode to the Ministry of Town and Country Planning's D.T. Williams, 17th May 1947. Ibid, Outline of Developments at Port Talbot.
513 A. Leslie Evans, *Taibach and District*, p.84. Brinn, p.10. Corus, *Port Talbot A Century*.
514 Evans, ibid. Brinn ibid. Corus, ibid. P. Fisher, Town Bites Dust, *South Wales Evening Post* (henceforth *SWEP*), 21st July 2000, p.1. David Roberts, *Reflections of Neath and Port Talbot* (Derby: The Breedon Books Publishing Company Ltd, 2002), p.107.
515 Brinn, p.10. D. Gareth Evans, p.151.

Table 6.7: Weekly Production After Scheme K Completion[516]

	Planned Production (tons/week)	Actual Production (tons/week)
Coke	14,400	13,440
Pig Iron	19,000	19,300
Crude Steel	30,000	32,360
Coiled Strip/Plate	25,500	28,230

In the early 1950s the SCoW introduced a 3 divisional structure :-

Table 6.8: Early 1950s SCoW Divisional Structure[517]

Division	General Manager
Steel (Port Talbot/Margam/Abbey Complex)	Fred Cartwright (and director)
Newport	R.P. Perry
Tinplate	Leighton Davies

In parallel with building the Abbey Works the SCoW built a cold mill and an electrolytic tinplate works at Trostre near Llanelli. The ISB favoured a site near Swansea which was nearer the strip mill and the main tinplate markets in the Midlands. The new strip mill was also likely to cause 10,000 redundancies in the area. Llanelli was chosen as it was felt that it would be easier to bring new industries to the Swansea area[518]. The cost of transporting coil the 21½ miles to Trostre from Port Talbot and finished product to Swansea Dock for export was estimated in 1953 to add 5/- a ton or £60,000/annum on production of 250,000 tons[519]. On economic grounds building the tinplate works at any location other than Port Talbot was a mistake as it added to the cost of production.

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[516] Brinn, ibid.
[517] Ibid.
[518] Kew, NA, Ref HLG 79/583 223474, internal minute to Regional Controller, Ministry of Town and Country Planning, 5th May 1947. Ibid, internal minute from D.I. Williams to S.W.C. Phillips, 13th May 1947; minute from the Board of Trade to the Cabinet–Lord President's Committee–Distribution of Industry Sub-Committee, May 1947.
[519] Warren, *The British Iron and Steel*, p.234.

Various different amounts were quoted for the cost of building the Abbey Works (shown above). The Ministry of Town and Country Planning estimated that the cost of building the Abbey Works without the cold mill would be £29 million and that the latter would cost an additional £5,228,000[520]. By 2nd October 1948 £45 million of expenditure had already been put in hand of which £9,168,845 had been spent[521]. The SCoW Chairman, Ernest Lever stated that the full cost of Scheme K would be about £60 million[522]. This figure included Trostre and 3 cold mills of which 2 were finally built. David Brinn quotes the actual cost of Scheme K as £73 million[523]. Corus claimed that the full cost of building the Abbey Works was £56 million[524]. As already noted the SCoW received $27 million of Marshall Aid funding in relation to Scheme K[525]. A figure of £60-70 million seems most likely for Scheme K.

[520] Kew, NA, Ref HLG 79/583-223474, internal Ministry of Town and Country Planning minute from A.E Gibb to 'Prosser', 24th December 1947.
[521] Ernest Lever, The Steel Company of Wales Limited: Statement by the Chairman, *Economist*, 12th March 1949, p.493.
[522] Kew, NA, Ref T228/147–250657, Ernest H. Lever, SCOW Chairman to the Issuing House, 10th October 1947.
[523] Brinn, p.9.
[524] Corus, *Port Talbot A Century*, p.8.
[525] Brinn, p.9.

In parallel with Scheme K came the political debate over ownership of the steel industry. The Labour Party's 1945 manifesto included a commitment to nationalise the steel industry but it was not until October 1948 that the Labour Government introduced a bill to nationalise the steel industry[526]. The Minister of Supply, George Strauss who introduced the Bill, stated that the reason it was introduced was that it was felt that the industry was disorganised and consisted of independent warring units who made no effort to ensure that work was done in the most efficient plants. It was an effort to introduce efficiency into steelmaking to meet national needs[527].

As a result the Iron and Steel Corporation of Great Britain (ISC) under the chairmanship of Steven Hardie was formed in October 1950 and the shares of 96 nationalised steel companies were vested on 14th February 1951[528]. The SCoW was one of the companies nationalised. Compensation was related to Stock Exchange values taken during the month of October 1948 or six mid-monthly dates before the 1945 General Election[529]. The Government kept the company structures and the individual companies continued to trade under their old names. This made de-nationalisation much easier, a mistake that was not repeated at the second nationalisation.

The stimulus to build the hot strip mill at Port Talbot was technological change which rendered the older methods of making tinplate and sheet uneconomic. Tinplate demand stimulated the building but sheet requirements determined the final design. The location was not perfect for a strip mill but no other site in South Wales offered such favourable factors as this site. The sheer scale of what was being attempted necessitated the merger of those firms with interests in producing tinplate and sheet products in order to gain access to a strip mill. Without this they faced the prospect of being driven from the market. Thus the drive for the merger came from the firms themselves to reduce their financial risk and to remain in the market.

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526 Kathleen Burk, *The First Privatisation–The Politicians, The City, And The Denationalisation Of Steel* (London: The Historian's Press, 1988), pp.17-20.
527 George Strauss quoted in Pagnamenta and Overy, p.87.
528 Great Britain. *Iron and Steel Act,* Third Schedule, 1949. Brinn, p.10. Owen, p.26.
529 Anon, The Steel Bill Examined, *Economist*, 6th November 1948, p.757.

Two major mistakes were made during this period. Firstly the lack of funds meant that some old steelmaking plant was retained giving a far from ideal plant layout and secondly locating the tinplate works away from Port Talbot added to tinplate production costs. Despite these shortcomings a large and technologically advanced steelworks was built at Port Talbot just as the demand for its products was taking off.

Chapter 7: Expansion and Challenges 1951-1960

The 1950s was a period of expansion and rising profits for Port Talbot which was well placed with its new strip mill to service a rising demand for strip steel to satisfy the European wide post war consumer boom. The partial merger of the SCoW and RTB that occurred after nationalisation was reversed in order to facilitate resale to the private sector recreating the old rivalries and overlapping and incompatible strategies in South Wales. Political choices continued to dominate issues of industrial location in the strip mill sector and strategic decisions on major investments were compromised. Port Talbot was one of Britain's biggest industrial projects, it flourished in this period, despite becoming the sector leader it never became the dominant player in the industry. The SCoW concentrated on boosting output and profits and for most of this period was a technological and innovative leader. By the 1960s the failure to deliver its full development strategy and the development of more complex technical issues had came to the fore. In the late 1940s Government policies had assisted Port Talbot in becoming the leading strip mill in Britain and Europe but in the late 1950s the tide of policy moved against them. Prevention of further development at Port Talbot and the Government inspired, and partly financed, building of two new strip mills by Colvilles and RTB prevented the SCoW from taking full commercial advantage of its position. As it transpired Government support for the new mills proved to be a poisoned chalice for both Colvilles and RTB but also severely constrained and impeded the further development of Port Talbot. By re-nationalisation in 1967 Port Talbot was facing serious problems.

This chapter sets out the contextual background of British and European steel production and demand over the period between 1945 and 1967. It then discusses the period of prosperity and rather rudderless developments of the 1950s. Chapter 8 looks at how patterns of drift and decline began to come to the fore in the 1960s.

(i) Key features of production and profits in British steel 1950-1967

UK steel production increased between 1950 and 1966 but both West Germany and France increased output much faster but starting from a much lower base as they recovered from World War Two :-

Table 7.1: UK, French and West German Steel Production 1945-1966 (million tons)[530]

	UK	France	W.Germany
1945	11.82	1.63	1.52*
1946	12.70	4.34	2.71*
1947	12.72	5.64	3.12*
1948	14.88	7.12	5.47
1949	15.55	9.01	9.01
1950	16.29	8.52	11.93
1951	15.64	9.68	13.29
1952	16.42	10.70	15.56
1953	17.61	9.84	15.18
1954	18.52	10.46	17.16
1955	19.79	12.39	21.00
1956	20.66	13.19	22.82
1957	21.70	13.87	24.12
1958	19.57	14.39	22.43
1959	20.19	14.98	28.97
1960	24.31	17.01	33.56
1961	22.09	17.29	32.93
1962	20.49	16.97	32.05
1963	22.52	17.28	31.10
1964	26.23	19.47	36.75
1965	27.01	19.29	36.24
1966	24.32	19.28	34.76

* Includes East Germany

In 1946 the Allies restricted German output to 5.8 million tons and a capacity of 7.5 million tons. Their only strip mill at Dinslaken was shipped to the USSR as war reparations. Only in 1955 did Thyssen start Germany's second wide strip mill. In 1956 a cold mill was added. Thus the German car industry was initially forced to import large amounts of French sheet[531]. This allowed France to fully exploit the two post war strip mills built at Denain and Seremanges[532]. Neither was as large as Port Talbot nor integrated with a cold mill. Geoffrey Owen argues that the establishment of the European Coal and Steel Community after 1950 was to break down the parochialism of the French steel industry and forced it to plan for a wider European market[533]. It allowed France to take advantage of Germany's defeat and in the

[530] BSC, *Statistical Handbook 1966*, p.5
[531] Burn, *The Steel Industry 1939-1959*, pp.399-400, p.419, p.457.
[532] Ibid pp.418-419.
[533] Owen, p.130.

process to build up its own industrial strength[534]. The British steel industry did not have the same stimulus to break down its own parochialism although it continued to export substantial amounts but not to what would become the Common Market.

Despite this parochialism between 1945 and 1966 UK liquid steel output increased from 11.82 to 24.32 million tons (see table 7.1). UK iron output increased from 7.1 to 15.7 million tons in 1966. The average number of blast furnaces in blast fell from 99 in 1945 to 60 in 1966 but output per furnace increased from 71,700 to 260,400 tons/annum (see Appendix 10).

Between 1954 and 1964 UK sheet consumption increased from 1.8 to 2.8 million tons/annum. This increase was attributable to a growth in consumer goods manufacture and an increase in car production. By 1963 the latter accounted for 45% of UK sheet consumption[535]. In 1946 the UK produced 18,300 cars/month which by 1964 had increased to 155,600 (commercial vehicle production increased from 12,200 vehicles/month to 38,700)[536]. Tinplate consumption increased from 552,000 tons in 1954 to 765,000 tons during 1963-64 despite an annual 1% decrease in the amount of steel per container after 1958. Most of the tinplate was used in various forms of containers[537]. Additionally large amounts of sheet and tinplate were produced for export. Between 1954 and 1956 on average 391,000 tons of sheet and 307,000 tons of tinplate were exported. During 1963, 1,051,000 tons of sheet and 459,000 tons of tinplate were exported[538]. This demand for strip mill products increased throughout the 1950s but that growth slowed in the 1960s just as a surge of new capacity came online.

The post war profits of the leading steel companies rose steadily to peak at £141 million in 1960 before declining to £23 million in 1967[539]. That decline was steady particularly when expressed as a percentage of capital employed :-

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[534] Ibid, p.43.
[535] Iron and Steel Board (henceforth ISB), 'Development In the Iron and Steel Industry– Special Report' (London: HMSO 18th November 1964), p.54.
[536] *Economic Trends–Annual Supplement* (London: HMSO, 2006), p.213.
[537] ISB, p.57.
[538] Ibid, p.29.
[539] Heal, pp.102-107.

Table 7.2: Combined Results of 14 Largest Steel Companies 1958-1967 (£ million)[540]

	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Profits Before Depreciation	138	143	181	148	115	114	148	145	115	93
Profits After Depreciation	108	109	141	104	67	59	87	80	47	23
Capital Employed	624	696	750	840	1010	1238	1189	1194	1230	1228
% Ratio Profits After Depreciation To Capital	17.2	15.7	18.8	12.4	6.6	4.8	7.3	6.7	3.8	1.9

By nationalisation in 1967 the leading British steel companies were in serious financial decline. At the root of this lay a lack of economy of scale in the British industry. In 1945 the British steel industry consisted of 9 major firms with works on more than one site and 14 single works companies accounting for 95% of output. Britain's largest steelworks at Appleby-Frodingham (Scunthorpe) had a capacity of 700,000 tons/annum[541] (Port Talbot/Margam's capacity was 400,000-500,000 tons/annum). US Steel had 12 steelworks with capacities of over one million tons[542]. This highlights the relatively small size of British steelworks at this time. Even by 1966, the last full year under private ownership, the four Welsh strip mill steelworks only produced an average of 1.67 million tons[543]. Warren, quoting Cartwright, argues that in 1970 the entire British strip mill tonnage should have been produced at two steelworks not four (this ignores Ravenscraig as it produced steel for other sectors)[544].

The problem for the British steel industry was that the steel companies were too small to raise sufficient capital needed to concentrate production at larger, better located sites using newer technology. One solution was for firms to merge but with the exception of the formation of the SCoW and a brief period of nationalisation this did not occur. The failure to restructure and the inability to relocate and concentrate production at larger more modern plants in itself would lead to financial decline.

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[540] BSC, *Annual Report and Accounts 1967-68*, p.7.
[541] Heal, p.12.
[542] Kenneth Warren, *Big Steel–The First Century of the United States Steel Corporation* (Pittsburgh: University of Pittsburgh Press, 2001), p.364.
[543] Warren, *British Iron and Steel*, p.6.
[544] Ibid, pp.6-7.

Several other factors put the steel companies under financial pressure. The ISB, re-established under the Iron and Steel Act of 1953, determined steel product maximum prices. Prices were determined based upon production costs plus a standard margin for depreciation and interest[545]. The BISF repeatedly complained that prices were too low[546]. After 1954 UK prices were generally lower than continental prices[547]. At a time of technological change fewer funds were generated to reinvest in the industry.

The cost of raw materials also became a problem for British steelmakers. Traditionally British steelmakers had cheaper coal than continental steelmakers. Between 1950 and 1957 this cost advantage was gradually eroded[548]. This was partly offset between 1953 and 1957 by lower blast furnace coke consumption per ton of iron smelted[549] but crucially, the industry was prevented by the Government from importing cheaper, better quality foreign coal to protect the British coal industry.

Until 1958 British domestic ore was cheaper than ore produced in France, Belgium and Luxembourg. From 1957 the price of foreign ore began to fall[550]. By 1964 the British steel industry used more foreign than home produced ore[551]. The problem was that to fully benefit from cheaper foreign raw materials the steelworks needed to be located on the coast to reduce transport costs inland[552]. The 1966 Benson Report recognised this and recommended a relocation of the industry. However, this was beyond the resources of most steel companies.

A further problem for the steel companies was a fundamental change in steelmaking technology. A new steelmaking technique known as the Linz-Donawitz or Basic Oxygen System/Steel process (BOS) was developed in Austria. It consisted of basic oxygen top blown converters which eventually displaced the open-hearth method of steelmaking. By 1956 BOS steel cost just 55% of the cost of open-hearth steel. It

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[545] British Iron and Steel Federation (henceforth BISF), *Annual Report 1954,* p.19.
[546] Ibid, and *1957*, pp.24-26; *1959,* p.20; *1960*, p.23; *1962*, p.30; *1963*, p.46.
[547] Ibid, *1957,* p.26. Burn, *The Steel Industry 1939-1959,* p.567.
[548] Burn, ibid, p.568. Bryer et al, p.200.
[549] Burn, ibid, p.572.
[550] Ibid, p.573.
[551] Heal, p.108, p.127.
[552] Bryer et al, pp.21-23.

needed less fuel, labour and capital investment[553]. By 1965 the cost differential was between $2-$10/ton in favour of BOS steelmaking[554]. Yet it was 1964 before British commercial BOS production really got underway. By 1966 26.1% of British steel production was by the BOS process. Britain had caught up with the USA and most continental producers but remained someway behind Japan[555]. Britain's first BOS plant was commissioned at Ebbw Vale in 1960 followed by Llanwern (1962), Ravenscraig (1964), Consett (1964) and Scunthorpe (1964)[556]. At a time of declining profits the steel companies continued to invest in new steelmaking technology but most of this investment was made at inland sites. Investing at these sites reinforced the steel industry's locational problems.

Another significant technological change was the introduction of continuous casting (concast). This is the process of pouring molten steel into a casting machine where it is cooled and emerges as a continuously moving slab or billet. It eliminates the need for primary rolling and reduces energy, labour and capital costs, saves space and increases yield. The British steel industry, like most Western countries, but unlike Japan, was slow to widely adopt continuous casting. Other technological changes such as screened sinter, fuel oil and oxygen injection in the iron making process and using oxygen in the steelmaking process were all introduced.

The British steel industry was faced with growing foreign competition as continental producers recovered from the war, depressed prices, relatively more expensive raw materials which favoured new sites, the need to invest in new technology and a levelling off in demand. With companies too small to undertake the necessary structural changes a fall in profits was inevitable.

(ii) Expansion under nationalisation, 1950-1954

During the early 1950s planners at both the SCoW and RTB forecast further growth in tinplate demand. The table below is a combination of their forecasts throughout the 1950s along with actual tinplate production.

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[553] Heal, p.91.
[554] Owen, p.124.
[555] BSC, *Statistical Handbook 1966,* p.6.
[556] Heal, p.114.

Table 7.3: Forecast and Actual UK Tinplate Production (tons)

	1951 Actual[557]	1952 Forecast[558]	1952 Actual[559]	1955 Forecast[560]	1955 Actual[561]	1960 Forecast[562]	1960 Actual[563]
Home	500,000	700,000	605,000	675,000	570,000	700,000	-
Exports	250,000	400,000	303,000	440,000*	322,000	328,000**	-
Totals	**750,000**	**1,100,000**	**908,000**	**1,115,000**	**892,000**	**1,028,000**	**1,234,000**

* excludes Australia

** based upon reduced exports due to increased foreign production

In 1952 James Steele of the ISC recommended that a second tinplate works linked to the new Port Talbot strip mill, should be built to meet the likely growth in demand and to replace the remaining hand mills :-

Table 7.4: 1951 Tinplate Production and 1958 Forecasts (tons)

	1951 Production[564]	1958 Forecasts[565]	1958 Production[566]
Continuous Mills			
Ebbw Vale	202,813	311,500	
Trostre	5,322	390,000	
New Mill	Nil	345,000	
Total	**208,135**	**1,046,500**	
Hand Mills			
RTB	47,464	Nil	
SCoW	264,864	Nil	
Others	236,423	53,500	
Totals	**548,751**	**53,500**	
Grand Total	**756,886**	**1,100,000**	**1,043,000**

Steele estimated that Ebbw Vale's Tinplate Work produced tinplate that was 5/11d per box cheaper than the old hand mills[567]. He also claimed that a third modern tinplate works (alongside Ebbw Vale and Trostre) was essential to retain the

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[557] Kew, NA, Ref BE2/328–261086, James Steele, Steel Company of Wales Ltd–Richard Thomas Baldwins Ltd–Proposals For Development In Tinplate Production, internal ISC note, 5th May 1952, p.1.
[558] Ibid
[559] Ibid, Ref BE1/335-254647, 'Report by Mr E Julian Pode and Mr W.F. Cartwright On The Proposals Which Have Been Made For The Building Of A Fourth UK Wide Strip Mill', 19th May 1958, p.9.
[560] Steele, appendix p.1.
[561] Pode and Cartwright, p.9.
[562] Steele, appendix p.1.
[563] John Williams, p.356.
[564] Steele, p.4.
[565] Ibid
[566] John Williams, p.356.
[567] Steele, appendix p.1.

overseas markets. As the hand mills were largely located in West Wales there was pressure to build the new tinplate works there. The SCoW chose Llangyfelach for its second tinplate works. It was 7 miles from Swansea and 13 miles from Port Talbot and was named Velindre Tinplate Works. This site was originally favoured by the SCoW over Trostre. King's Dock Swansea, Trostre and the Abbey Works were alternative sites considered and rejected[568]. The Ministry of Supply and the SCoW concluded that Port Talbot was the most economic site for the tinplate works. There would be a 5% saving on construction costs and a ¾% production cost advantage[569]. Nevertheless the location was rejected by the SCoW and that decision approved by the ISC because[570] :-

a) The workforce would need a substantial number of new houses.
b) The SCoW's operations in the Port Talbot area were as large as could be managed efficiently.
c) Labour relations at the Abbey Works would be too complex.
d) Dirtier operations at Port Talbot could adversely affect tinplate production.
e) It would interfere with other Port Talbot construction.
f) The site at Llangyfelach was partly prepared.
g) Separating the tinplate works and strip mill would be advantageous for defence purposes.

These reasons do not appear to be particularly convincing. There were certainly employment reasons to site the tinplate works near Swansea. Land available at the Abbey Works may have been earmarked for other uses. As will be shown later several unsuccessful attempts were made to build a second strip mill at the Abbey Works and even as early as 1951 the SCoW may have wanted to keep the available land for this. The outcome was that for the second time a strategic mistake was made in not integrating the strip mill with a tinplate works at Port Talbot.

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[568] Kew, NA, Ref BE2/328–261086, 'Considerations leading to the choice of Llangyfelach as a site for the proposed new 5 stand Continuous Tinplate Mill', note from SCoW Chairman, Ernest Lever to the ISC's James Steele, 11th March 1952. Ibid, Ministry of Supply note on Development of the Tinplate Industry in South Wales, 1952.
[569] Lever, ibid.
[570] Ibid.

To supply the new tinplate works additional steel was needed. The planning for this was set out in Development Scheme 'L' in 1952 (see table 7.5). The strip mill was producing 23,000 tons/week but with sufficient slabs available was capable of producing 37,000 tons/week. This required the production of 44,000 tons/week of ingots.

Table 7.5: Scheme L: Planned Weekly Output & 1957 Actual Output (tons)[571]

Product	Planned Weekly Capacity	Average 1957 Weekly Output
Coke	23,400	22,350
Pig Iron	29,000	30,000
Ingot Steel	44,000	48,000
Coil/Strip/Plate	37,000	40,000

The Abbey Melting Shop would increase production to 30,000 tons/week of ingots with Port Talbot and Margam Melting Shops each providing 7,000 tons/week. To release 3,500 extra tons/week of ingots for the strip mill Port Talbot's bar mill closed in June 1952[572]. As Port Talbot's plate mill had already closed the scheme reduced Port Talbot to exclusively producing ingots for the strip mill. To raise production in the Abbey Melting Shop 4x200 ton open-hearth furnaces were added to the existing eight[573]. This increased level of steelmaking required an estimated 2 million tons of imported ore, 0.75 million tons of home ore and 0.4 million tons of purchased scrap annually. The imported ore would come largely from Sydvaranger via Narvik and Sierra Leone in the form of concentrates.

Scheme L included a new large Number 4 blast furnace with a hearth diameter of 29'9" and a capacity of 10,000 tons/week[574]. The existing blast furnace site was too restricted, so a new site was developed to the south. It was a similar design to Numbers 2 and 3 but larger. By mid 1956 it was operating above planned capacity[575]. It is shown below in the 1950s together with its relationship to the future Number 5 blast furnace :-

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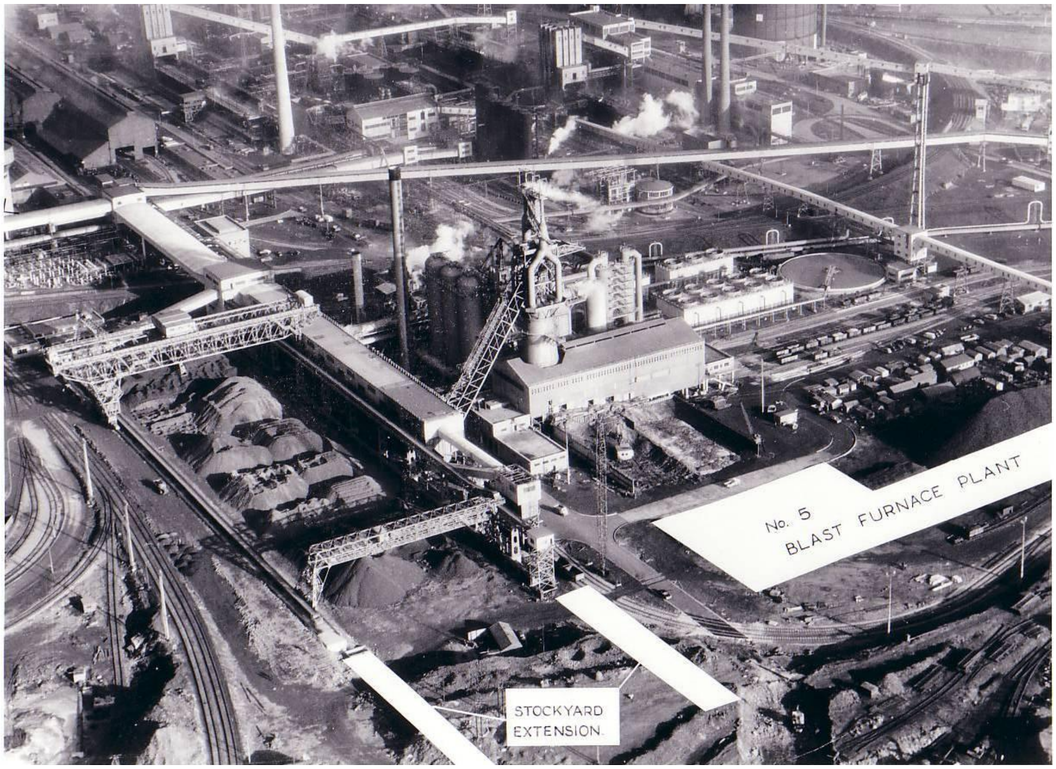
[571] Brinn, pp.10-12.
[572] Kew, NA, Steele, 1952, pp.2-3. H. Fancott, 'Port Talbot Steelworks Has Now Been Working For Half A Century'. *The Dragon,* No 14, January 1957, p.3.
[573] Brinn, p.11.
[574] Ibid, pp.10-11.
[575] Ibid. Anon. 'Europe's Biggest Blast Furnace Ready For Production-£40 Million Scheme Gets Under Way'. *The Dragon,* No2, January 1956, p.1. Ibid, 'Margam's Giant New Blast Furnace Blown In'. No3, February 1956, p.1.



Scheme L was approved by the Ministry of Supply and the ISC on 29th November 1952[576]. Construction took place during 1953-1956 (see Appendix 11 for details). It increased ingot output from 37,000 tons/week in 1952 to approximately 48,000 tons/week and strip mill output to 40,000 tons/week in 1957[577]. In 1952 the initial cost of the expansion was estimated to be £32.97 million (see Appendix 12). The final cost of Scheme L was £54 million[578].

In parallel with Scheme L the British Oxygen Company built Britain's first bulk oxygen production plant at Margam producing 100 tons/day. It was used in the Abbey Melting Shop's open-hearth furnaces to speed up and increase output and for removing surface scale on the slabs in the slabbing mill. The SCoW estimated that after Scheme L the use of oxygen would increase the Abbey Melting Shop's output by 160,000 tons/year. Oxygen was then introduced into the Margam and later into

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[576] Ibid. Kew, NA, Ref BE2/328–261086, SCoW Press Statement Announcing Approval of Development Scheme L, 29th November 1952.
[577] Brinn, pp.10-12.
[578] Ibid, p.10.

Port Talbot Melting Shops. Margam Melting Shop could now produce high silicon steel for sheet used in the electrical industry and special quality deep drawing sheets for the motor industry[579].

Scheme L was a logical extension of Scheme K and primarily designed to meet increased tinplate demand. The decision not to build the second tinplate works at Port Talbot perpetuated the lack of integration. The new steelmaking plant built at the Abbey Works was generally just an extension of existing plant but it was successful in allowing ingot production to increase from 1.3 million tons in 1953 to 2.1 million tons in 1957 (see Appendix 13). In practical terms by 1957 production had reached full capacity.

(iii) Break up of SCoW/RTB and denationalisation

The Conservative Government of 1951 was committed to returning the steel industry to the private sector. The Iron and Steel Act of May 1953 introduced two new organisations. '*The Iron and Steel Holding Realisation Agency'* (ISHRA) assumed ownership of the companies and had responsibility for their resale. '*The Iron and Steel Board'* (ISB) had the power to fix maximum prices and to prevent (but not compel) proposed developments. It was hoped, incorrectly, that this would maintain a level of public control sufficient to prevent further nationalisation[580].

The equity sale of several large formally publicly quoted companies started in October 1953 with the sale of United Steel. By January 1955 Stewarts and Lloyds, John Summers, Colvilles, Dorman Long and Lancashire Steel had been sold. United Steel, John Summers, Consett and Dorman Long reappeared in their pre-nationalisation form[581]. In 1952 just before denationalisation, the state owned ISC had eliminated the crossholdings of shares between RTB, SCoW and GKN. The SCoW and RTB were now administered as one company (the RTSC) with identical boards (except for one member each) although both the SCoW and RTB retained

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[579] Anon. 100 Tons Of Oxygen Daily For Abbey. No10, September 1956, p.1; Oxygen Now Helps Margam To Speed Up Output–Special Gun Designed By Steel Division Staff. No18, May 1957, p.1.

[580] Burk, pp.4-8.

[581] Ibid, pp.96-97.

separate identities[582]. During the sell-off GKN repurchased Cardiff East Moors steelworks through a private sale[583]. The ISB unsuccessfully argued against splitting the RTSC back into the SCoW and RTB on economic and financial grounds[584]. In October 1955 the ISHRA announced that as a preliminary step to sell off RTB and the SCoW, the RTSC would be split and separate Boards re-established[585]. The SCoW's Chairman, Ernest Lever, left to remain with RTB. Despite the split the 'RTSC Sales' company, which sold the products of both companies, remained in place[586].

There were a number of reasons for the split. Firstly it was apparent that the markets could handle the sale of the individual companies more easily than as a single entity[587]. Secondly, as will be seen, RTB was about to embark on building a new strip mill. A sale involving a company with so much debt would be difficult. In fact, RTB was never sold. In the context of denationalisation the decision to sell the SCoW separately was realistic. It is unlikely that the RTSC could have been sold as an entity. Yet the decision helped to prolong the fragmented nature of the steel industry which could not be sustained in the long-term. An important opportunity for long-term reconstruction of the steel industry was missed.

On 14th March 1957 the public were offered 40 million SCoW £1 ordinary shares. The offer was over subscribed with applications for 45.7 million shares so larger applications were scaled down. Metal Box bought one million shares and GKN two million shares[588]. The SCoW was now totally separate from RTB. Thus denationalisation further fragmented the South Wales steel industry. This made restructuring more difficult particularly once profits started to decline. The 1966

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582 Kew, NA, Ref BE1/335-254647, Ernest Lever to Archibald Forbes, 25th February 1955, pp.7-8.
583 Heal, p.9.
584 Kew, NA, Ref BE1/335-254647, Notes on devesting of the RTSC Group, Iron and Steel Board, 19th January 1955, p.3.
585 Ibid, Iron And Steel Holding Realisation Agency Announcement: Richard Thomas And Baldwins Ltd and The Steel Company of Wales Ltd, 19th October 1955. Anon. 'Company Strengthens Its Ties With South Wales'. *The Dragon*, No1, December 1955, p.1.
586 Kew, NA, Ref BE1/335-254647, Correspondence between SCoW/RTB, 25th February 1955, pp.6-7.
587 Ibid, Notes on divesting of the RTSC Group, 19th January 1955, pp.10-11.
588 Anon. 'Steel of Wales Offer', *Economist*, 9th March 1957, p.834.

Benson Report recognised the steel industry's flawed structure and tried to promote mergers but within the private sector. At the time of the SCoW sale an 8% yield was forecast. This was higher than other companies at denationalisation :-

Table 7.6: Steel Share Prices and Yields[589]

	Issue Price	Forecast % Yield	1957 Price	1957 % Yield
Colvilles	26s 0d	6.9	30s 7½d	7.2
Dorman Long	22s 6d	7.1	24s 6d	6.5
Lancashire Steel	22s 0d	7.3	29s 3d	7.5
Stewarts & Lloyds	17s 6d	7.1	28s 9d	6.1
John Summers	24s 6d	7.3	32s 3d	7.4
United Steel	25s 0d	7.2	30s 9d	8.1
SCoW	20s 0d	8.0	-	-

The SCoW offer was the largest amount raised to date in a single day by the City of London in an issue of one class of shares[590]. It produced 29,000 SCoW shareholders. This included one in twelve employees as a result of the company setting up an employee share purchase scheme[591]. The share price peaked at an average price of £1-4s-1½d in 1963. By early 1964 it had fallen to £1-0s-9d due to declining profits and concerns over a new Labour Government's probable renationalisation[592].

The SCoW's denationalisation came relatively late in the process. The disentangling of the SCoW from RTSC caused some delay and, unlike many steel companies, the financial structure of the SCoW that emerged from denationalisation was different to that at nationalised. It was no longer fundamentally a holding company for other steelmakers. In that sense denationalisation created a company with a different financial structure but it retained ownership of the same works. What denationalisation failed to do was to address the problem of the British steel industry's fragmented ownership. In South Wales it even fragmented it further.

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[589] Ibid
[590] Brinn, p.12.
[591] Harald Peake, 'The Chairman Talks To 'Dragon' Readers'. *The Dragon,* No26, January 1958, p.1.
[592] Anon, 'Steel Share Prospect', *Steel Times*, 3rd January (1964), 11.

(iv) The Coming of the 4th and 5th strip mills, 1957-1960

The late 1950s saw the Government make a major mistake that handicapped flat steel product production for three decades and would prevent Port Talbot from reaching its full potential. In 1957 the ISB published the third post war development plan which envisaged a demand for 29 million ingot tons by 1962 including 5 million tons of exports[593]. Actual steel production in 1962 was 20.49 million tons (including 4 million tons of exports) (see table 7.1)[594]. Although a year of relatively low production it highlighted the gap between the forecast and actual production. The problem was that the underpinning assumption was that wider industrial output would increase by 3¾% per annum[595]. Burn, writing in 1961 was correctly sceptical about the assumptions behind the plan of growth in the working labour force from ½% to 1% a year and a yearly rise in productivity of 3% underpinning the forecasts[596]. The plan called for the building of a fourth strip mill, but many within the industry were sceptical about the need for it[597]. The logic behind this was that there would be an increase of 88.8% in steel consumption in car production for the home market from 430,000 to 812,000 tons between 1954 and 1962[598]. Total car production increased from 64,100 units/month in 1954 to 104,100 in 1962[599] i.e. a 62% increase. Although 1962 was a year of low car production, and it would increase above this, growth was not as strong as forecast.

RTB was the first to put forward a proposal to build the fourth strip mill which they proposed to locate near Newport in South Wales. Burn attributes this to the termination of the joint administration of RTB and the SCoW in 1955 prior to privatisation of the SCoW. He argues that it undid the benefits of the merger of Richard Thomas with Baldwins in 1945 as it left RTB with much of the obsolete capacity and in need of modernisation. Their initial plan was for a slab making

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[593] Burn, *The Steel Industry*, p.624. Keeling and Wright, p.107.
[594] BISF, *1962*, p.10.
[595] Burn, *The Steel Industry*, p.621.
[596] Ibid, p.626.
[597] Keeling and Wright, p.107.
[598] Burn, *The Steel Industry*, p.622.
[599] *Economic Trend*, p.213.

steelworks at Newport to be fully integrated later[600]. This would alleviate the need for RTB to bring slabs in at Ebbw Vale from Redbourn and West Wales[601].

However, strong pressure was also exerted to locate the mill in Scotland. In May 1957 Sir Robert MacLean, a Scottish industrialist, spoke at a meeting of MPs arguing for the strip mill to be located in Scotland. He argued that the new mill was needed as Scotland's proportion of Britain's steel output was falling and that it would relieve the area's high unemployment. MacLean even argued that it was not just a question of the economics of the strip mill but a question of attaining a balanced economy throughout Britain[602]. If built in Scotland the mill would be built by Colvilles. Colvilles' Chairman, Sir Andrew McCance, argued that the scheme was not viable[603]. As Heal argues, of the parties directly involved, Colvilles were the last to be persuaded as to the merits of the project. They were persuaded largely by a £50 million Government loan[604]. As for location Grangemouth was proposed. Burn argues that this site would give access to relatively cheaply imported Swedish ore but had no access to cheap home ore[605]. Although suffering from the same paucity of suitable coking coal as the rest of Scotland the ore argument is spurious as the economics were shifting to foreign sourced ores. Grangemouth was a coastal site that would have made more economic sense than the site chosen. The site chosen was Ravenscraig, an inland site which already had some iron and steelmaking plant. Heal describes Ravenscraig as an example of a major development whose causative factors lay in economic and social factors of the community as a whole rather than in the economic forces of the industry[606].

On 18th November 1958 the Prime Minister, Harold Macmillan, announced, largely to maintain Conservative support in Scotland, that there would be not one but two new strip mills. One was to be built in Scotland and the other in South Wales. Almost all the industry including the ISB and BISF were opposed to building a fifth strip mill. They recognised that demand did not exist to support it but were overruled by the

[600] Burn, *The Steel Industry*, p.640.
[601] Heal, p.102.
[602] Payne, p.374.
[603] Ibid
[604] Heal, pp.101-102.
[605] Burn, *The Steel Industry*, p.642.
[606] Heal, p.101.

Government. The minimum economic steelmaking capacity for a new plant was 3 million tons but steelmaking plants of only half this capacity were built attached to larger capacity strip mills.

Llanwern was built by RTB near Newport and Colvilles built Ravenscraig near Motherwell. The Government agreed to loan £60 million to RTB for a project estimated to cost £100 million in 1959 and £50 million to Colvilles[607]. By 1961 Llanwern's estimated cost had risen to £134 million, RTB was returning a loss and unlikely to make a profit[608]. As for Ravenscraig, because of adverse trading conditions during 1961-62, Colvilles had to turn to the Government and the banks for an additional £23 million of funding[609]. Payne argues that, without nationalisation, the building of the strip mill cast doubts over Colvilles' long-term prospects[610]. Vaizey states that Colvilles were virtually bankrupt by 1961[611]. Therefore of Britain's five strip mills only Port Talbot's did not cause the parent company serious financial problems. That was attributable to a pooling of resources at Port Talbot. Llanwern's hot strip mill went into production in August 1962 and Ravenscraig's in December 1962 just as the rate of growth in demand slipped below forecast[612].

Ravenscraig stimulated some investment with car and vehicle plants being built at Linwood and Bathgate but less than anticipated. Both Llanwern and Ravenscraig lacked the locational advantages of Port Talbot as steelmaking sites i.e. they lacked an attached ore port. The fact that they were built with uneconomic steelmaking capacities meant that there would be pressure to increase capacity to an economic level. This would prevent Port Talbot from reaching its full economic steelmaking potential and exerted downward pressure on the SCoW's profits. Their very existence and the need to expand their steelmaking capacity marginalised and exposed Ebbw Vale's locational disadvantages and Shotton's obsolete plant. By nationalisation in 1967 the British steel industry faced severe problems. The strip

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607 Warren, *British Iron and Steel*, p.277.
608 Vaizey, p.171.
609 Payne, pp.396-401.
610 Ibid, p.424.
611 Vaizey, p.175.
612 Warren, *British Iron and Steel*, pp.280-281.

mill sector was particularly exposed to unexpected downturns because of its overcapacity.

(v) Compromises in expansion and modernisation

On 1st May 1956 the SCoW announced its third development scheme, Development Scheme 'M'[613]. It was intended to increase output and modernise all the Steel Division's departments. Planning had started in September 1954 primarily as a response to increasing forecasts for strip steel and particularly sheet[614]. Between 1953 and 1954 steel exports had increased from 2.75 to 2.89 million tons/annum even though exports of sheet were restricted to meet home demand[615].

To satisfy this increased demand for sheet at the Abbey Works the key was to increase hot strip mill output. Building the slabbing mill and hot strip mill with different capacities was a mistake in the initial planning of the strip mill which needed to be addressed. With modifications the slabbing mill could handle a maximum of about 60,000 tons/week of ingots which was equivalent to about 50,000 tons/week of slab but the strip mill could produce about 60,000 tons/week of coil[616].

An increase of approximately 10,000 tons/week of hot rolled coil from 40,000 tons/week after the completion of Scheme L required 14,000 extra tons/week of steel ingots and 9,300 tons/week of extra pig iron. This required a new blast furnace which in turn required an additional 4,400 tons/week of coke[617]. This was achieved by building the Grange Coke Ovens. To increase sheet production it was proposed to install a 56" 4-stand cold mill in addition to the existing 3-stand mill. These mills alone needed up to 24,000 tons/week of hot rolled strip[618]. Therefore Scheme M would raise output to:-

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[613] Anon. 'Development Scheme Is Taking Shape'. *The Dragon,* No11, October 1956, p.3. Ibid, 'Scheme 'M' In Progress'. No25, December 1957, p.4.

[614] Kew, NA, Ref BE1/335–254647, 'Development Scheme 'M'–Proposals To Increase Ingot Output From 48,000 Tons To 60,000 Tons Weekly In Order To Increase Output Of Flat Rolled Products', SCoW paper, 29th January 1955.

[615] BISF, *1954*, p.10.

[616] Kew, NA, Ref BE1/335–254647, 'Development Scheme 'M' –Proposals To Increase Ingot Output From 48,000 Tons To 60,000 Tons Weekly In Order To Increase Output Of Flat Rolled Products', SCoW paper, 29th January 1955.

[617] Ibid

[618] Ibid, Internal Iron and Steel Board minute re Scheme 'M', 8th March 1955, p.3.

Table 7.7: Scheme M: Planned Weekly Output[619]

Product	Weekly Capacity (tons)
Coke	30,000
Pig Iron	40,000
Crude Steel	
Open Hearth Ingots	*48,000*
Bessemer	*12,000*
Total	60,000
Coil/Sheet/Plate	50,000

The SCoW and the ISB met on 22nd July 1955 to discuss the development scheme. The ISB's main concern was whether Port Talbot Dock could handle the required 120,000 tons/week of imported iron ore and whether sufficient shipping was available[620]. They went to considerable lengths to confirm this. On 2nd December 1955 BISC (Ore) Ltd confirmed that the existing ore carriers plus 9 new vessels on order would be sufficient to support the higher level of production envisaged. However, the limitations of Port Talbot Dock's small lock and difficult approach channel were beginning to be felt. The cost per ton of iron ore discharged at Port Talbot using 8,000 ton ships was 30/- per ton whereas for 15,000 ton ships at other ports it was only 25/- per ton. Port Talbot's Harbour Master reassured the ISB that with adequate ore carriers available Margam Wharf could discharge about 115,000 tons/week[621]. It was also confirmed that Swansea was not a realistic alternative[622]. In January 1956 the ISB met senior management of the Dock Section of the British Transport Commission. They confirmed that 3.5 million tons/year of ore could be imported through Port Talbot Dock. They also confirmed that a new lock could be built to dock 15,000 ton vessels and that the entrance channel widened at a cost of £14 million but it could only be deepened from 21' to 23'. This would restrict the docking of 15,000 ton vessels to only a third of the tides which was not cost effective[623]. Even the 8,000 ton ore carriers when fully loaded were unable to enter

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[619] Kew, NA, Ref BE1/335–254647, 'Development Scheme 'M'–Proposals', 29th January 1955, appendix 2. Anon. 'Development Scheme Is Taking Shape'. *The Dragon*, No11, October 1956, p.3. Ibid, 'This Is Scheme 4'. No7, June 1956, p.4; 'Scheme 'M' In Progress'. No25, December 1957, p.4.

[620] Kew, ibid, Notes of a meeting between the ISB and SCoW, Norfolk House, 22nd July 1955, p.2; 'Development Scheme 'M'', p.3.

[621] Ibid, Notes on ISB visit to the SCoW, 8th December 1955.

[622] Ibid, Notes on ISB meeting with BISC (Ore) Ltd on the shipping problems associated with Development Scheme 'M', 2nd December 1955.

[623] Ibid, 'Port Talbot Dock', internal ISB minute, 20th January 1956, re meeting with the Dock section of the British Transport Commission, 18th January 1956.

the dock on all tides. The result was that the old lock continued to be used and the SCoW had to rely on the smaller ore carriers. A direct cost disadvantage of 5/- per ton on imported ore meant that based on imports of 3.5 million tons/year there was an additional production cost of £875,000 a year.

The ISB evaluated the financial aspects of Scheme M through a report by Thompson McLintock. This confirmed the SCoW figures of £47.3 million for fixed assets and £4.6 million for current assets in Scheme M[624]. The report estimated that the additional profit generated by Scheme M would be £7.75 million before depreciation i.e. a 15% return on their investment of £51.9 million. This was the same as overall investment by the SCoW to date :-

Table 7.8: SCoW Return on Capital Employed[625]

Scheme	% Profit On Capital
Scheme ‘K’	17% on £95,700,000
Additional Profit on Scheme ‘L’	12% on £52,600,000
Total Profit At End of Scheme ‘L’	15% on £148,300,000
Additional Profit On Scheme ‘M’	15% on £51,900,000
Total Profit At End Of Scheme ‘M’	15% on £200,200,000

There were several important developments within Scheme M. Firstly, a new larger blast furnace, Number 5, similar to Number 4 but with a larger 31’ hearth diameter[626]. Blown in during May 1959 by September it was producing over 11,800 tons of iron/week and by 1960 14,000 tons/week[627]. Alongside this the Very Low Nitrogen (VLN) Melting Shop was built. The VLN was designed to produce an extra 12,000 tons/week of steel[628]. It consisted of 3 bottom blown converters charged with lime, scrap, and molten iron blown by a mixture of oxygen-steam through the charge for 10 minutes. Unlike a Bessemer system where air is blown through the charge there was little nitrogen contamination of the steel. The improved steel quality allowed

[624] Ibid, ‘Thomson Mclintock Report–‘M’ Scheme’, produced for the ISB, 1956. Ibid, internal ISB minute re Thomson McLintock Report on Scheme M, 1956. Corus, *Port Talbot A Century In Steel*, p.8.
[625] Ibid, re Thomson McLintock Report.
[626] Anon. ‘This Is Scheme 4’. *The Dragon*, No7, June 1956, p.4. Brinn, p.14.
[627] Brinn, p.12. Kew, NA, Ref BE1/335-254647, internal ISB minute re Thomson McLintock Report, 1956.
[628] Anon, ‘100 Tons Of Oxygen Daily For Abbey’. *The Dragon*, No10, September 1956, p.1; ‘Abbey Process Gets A New Name’. No59, December 1960, p.1. R.W. Evans, ‘Bessemers Will Produce 12,000 Tons Each Week’. *The Dragon*, No12, November 1956, p.2.

strip steel to be produced. 'Demag' in Germany designed and built the three 50 ton capacity converters[629].

The VLN process was introduced mainly because it met quality requirements and required a lower capital investment than open-hearth furnaces[630]. It was a quick and cheap solution to met urgent demand pressures but it added to the complexity and hence cost of steelmaking. By this time it was apparent that oxygen would play a bigger role in steelmaking yet it was unclear whether VLN, BOS or the Kaldo system would become the dominant system. The SCoW did not choose the system that was to prove the most successful and become dominant in the industry, but it was not too damaging a decision as the capacity was relatively low in relation to works capacity. With the addition of the VLN Melting Shop steelmaking now took place in 4 melting shops each with separate requirements. The VLN process required pig iron with between 1.0% and 1.6% phosphorus content. As a result Number 1 blast furnace was used exclusively to supply the VLN plant[631]. The plant remained in production for only 10 years before being replaced by a BOS plant.

The third critical development was the replacement of the slabbing mill with a new Davy-United universal mill with greater capacity to bring it in line with strip mill capacity and remedy the shortage of slabbing capacity that was now hampering production. Installation of the new slabbing mill caused a major interruption to production. Starting in August 1958 the SCoW had purchased and stockpiled 58,000 tons of slabs from Consett, RTB and Shotton to supply the strip mill during the changeover. The changeover took place in November 1958 and cost £1¾ million[632]. The new slabbing mill is shown below :-

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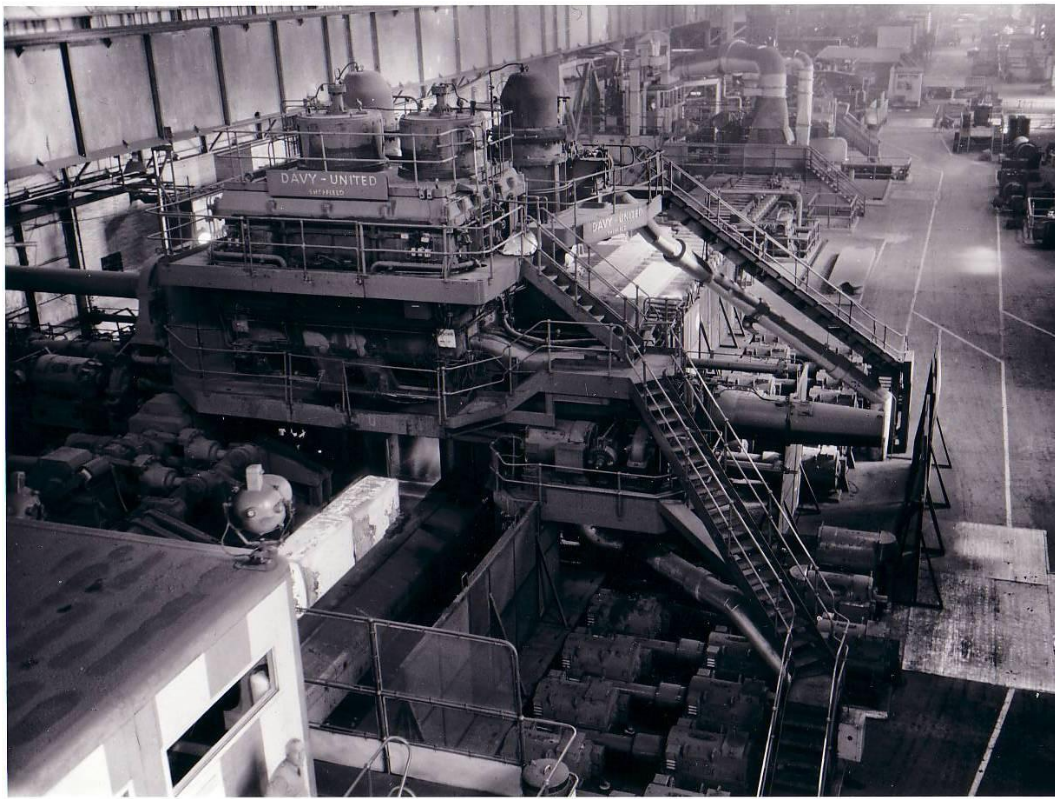
[629] Brinn, p.12.
[630] Ibid, 100 Tons Of Oxygen Daily For Abbey. No10, September 1956, p.1. Brinn, p.12.
[631] Kew, NA, Ref BE1/335–254647, 'Development Scheme 'M'–Proposals To Increase Ingot Output, 29th January 1955, p.5. Anon. 'This Is Scheme 4'. *The Dragon*, No7, June 1956, p.4.
[632] Ibid, 'Universal Mill Changeover–12½ Day Feat'. *The Dragon,* No37, December 1958, p.1. Brinn, pp.12-13.



Finally a Davy-United 4 stand cold mill was added to the existing 3 stand cold mill to increase cold mill capacity[633] (see Appendix 15 for details of Scheme M).

If Scheme L was a logical extension of Scheme K, Scheme M was the result of pressure to expand output as quickly and cheaply as possible to meet increasing demand. The new slabbing mill rectified the shortage of slab capacity in Scheme K. Building the VLN plant was a mistake. It was a poor choice of technology and needed to be replaced within ten years. It also further complicated an already complex steelmaking and control operation. The Abbey Melting Shop contained its maximum number of open-hearth furnaces and no others could be added. The SCoW had to find new solutions but it stored up problems for future efficiency of production by pursuing short-term solutions.

Some of the improvements within Scheme M, as will be seen, were essentially short-term compromises. There were other compromises at this time. When the capacity of Number 1 blast furnace was increased in 1959 by relining its hearth diameter to

[633] Brinn, p13.

23’9”, a ¼ mile long 60” wide conveyor belt was installed at Margam Wharf to take ore away for crushing and screening[634]. This improvement to burden preparation was advantageous but taking the ore away from Margam Wharf, processing it and returning it to the blast furnaces there was inefficient. It was a price that the SCoW paid for its cramped inherited plant at Margam Wharf. The cramped site can be seen in the photograph of the site below. The building of Numbers 4 and 5 blast furnaces meant that there were 4 different sizes of blast furnaces. Number 5 needed a higher percentage of sinter and tapped into a difficult type of ladle which further complicated iron making.

Until 1960 the SCoW’s production process was relatively inefficient. This was due in part to the inherited plant, restrictions imposed by the size of the dock, lack of access to the best overseas coking coals and errors in the 1950s expansion programmes. Control within such a large and complex steelworks was difficult. The method adopted was known as the ‘ingot controller’ (it was a function rather than an

[634] Anon. ‘No 1 Furnace to be relined’. *The Dragon*, No40, March 1959, p.1. Ibid, ‘Speeding-up on vital ore delivery’. No41, April 1959, p.4.

individual) (similarly, iron supply was coordinated by the 'hot metal controller'). The ingot controller coordinated all melting shops, soaking pits, ingot stripper bay and all movements by radio. By 1960 there were 27 furnaces of varying size and 18 different sizes of ingot mould all needing control and coordination[635]. Control was made more difficult with dispersed production units as shown below (taken c1956). Port Talbot Steelworks is at the bottom, Margam at the quayside and the Abbey Works in the distance. The distance involved considerable internal movements which increased production costs.

One of the biggest control problems related to raw material stocks. During the first half of 1959 the SCoW received 105 different grades of South Wales coal[636]. All attempts to reduce the number of different coal grades from the NCB failed. In 1961 the SCoW applied to the Government to import 250,000 tons of American coking

[635] W.F. Cartwright, 'Production control in an integrated iron and steelworks', *Journal of The Iron and Steel Institute,* June (1960), 137-144 (p.138).
[636] Ibid, p.140.

coal[637]. The President of the Board of Trade, Reginald Maudling, wanted to give approval but was overruled by the Cabinet in order to maintain UK mining jobs[638]. Yet the SCoW still made considerable improvements in coke consumption. Between 1952 and 1966 coke consumption per ton of pig iron produced fell by almost a half as coal prices rose (see Appendix 22). This was attributable to a number of factors such as new and larger blast furnaces, richer ores, better burden preparation and oil injection. Between 1953 and 1957 average UK coke consumption fell from 21.2 cwt/ton of pig iron to 18.9 (the equivalent German figures were 20.2 to 19.2 cwt/ton)[639]. Port Talbot's figures were 22.0 to 18.0 cwt/ton[640]. This indicates a greater increase in efficiency at Port Talbot than the wider UK industry. By 1963 the average UK figure was 14.4 cwt/ton of iron[641] but Port Talbot was 13.9 cwt/ton (see Appendix 22).

A similar problem existed with iron ore. During 1959 the SCoW received 24 different types of ore. Each had to be stocked and treated separately. The sheer number of different ore types reduced steelmaking efficiency[642].

Yet with high demand these complexities were not critical issues. The crucial factor was maximising production as cheaply as possible. By 1960 Scheme M had substantially increased production of coke, iron, ingots and rolled products[643] (see Appendices 13 and 16 for details). The SCoW accounted for a quarter of the increase in British ingot production between 1957 and 1960. It enabled the strip mill to meet rapidly expanding demand for sheet and coil :-

[637] Anon. Coal Imports Requested By Steel Firm. *The Times*, 8th May 1961. Kew, NA, Ref Prem 11/4135, minute from Ministry of Power's R.Wood to Prime Minister re importing American Coal, 8th May 1961. Lord Robens, *Ten Year Stint* (London: Cassell, 1972), pp.82-83.
[638] Kew, NA, Ref Prem 11/4135, minute from the Prime Minister, Harold MacMillan to the Minister of Power, 10th May 1961. *Hansard* (Commons). 3rd August 1961, columns 16-17, Vol.644.
[639] Burn, *The Steel Industry 1939-1959*, p.572.
[640] Brinn, pp.11-12.
[641] ISB, p.83.
[642] Cartwright, 'Production control' (p.142).
[643] Brinn, p.13.

Table 7.9: Strip Mill Output Distribution in Schemes L and M (tons/week)[644]

	January 1955	Post Scheme L	Post Scheme M
Trostre	8,500	8,500	9,500
Velindre	-	8,500	9,500
Newport (Orb)	1,200	2,000	1,394
Cold Mill	9,000	13,000	22,406
HR Sheets & Plates	7,000	6,200	5,300
Sale of Coils	1,800	1,800	2,000
Total	**27,500**	**40,000**	**50,100**

Until 1960 little appears in the SCoW literature relating to product quality. The emphasis was on increasing output, often resulting in indifferent quality. After 1960 as competition increased quality started to become an issue. With surplus capacity emerging customers demanded better quality which increased the cost of production[645]. Within the SCoW demands for greater product quality was seen as an inconvenience in the production process[646]. The required shift in mindset from maximising output of an indifferent quality to basing production around quality of product was slow to develop.

The period 1951-1960 was one of expansion and increasing profits (see next chapter). This was primarily driven by growing demand for tinplate and sheet fuelled by increasing demand for consumer goods and particularly sheet from the car industry at a time when the European steel industry was still being rebuilt. These factors hid the structural problems of the British steel industry i.e. too many companies and steelworks of suboptimal size. High demand also delayed the full impact of the shift in the relative cost advantage of raw materials from domestic to overseas sources. Port Talbot was particularly well suited to benefit from this change. As will be seen later the SCoW undoubtedly exploited the commercial opportunities of the 1950s but this in itself caused problems. The pressure to generate profits led to investment in plant that was inappropriate, overmanning and a failure to address poor working practices. In the 1960s it also became clear that the biggest blow to the SCoW in the 1950s had been the decision to build the two new strip mills.

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[644] Kew, NA, Ref BE1/335–254647, Development Scheme 'M' appendix 2.
[645] E. Julian Pode, 'Statement by the Chairman of The Steel Company of Wales', *Steel Times,* 15th January (1965), 75.
[646] Ibid

Chapter 8: Strategy, Technology and Corporate Performance 1961-1967

The Government decision to build the two new strip mills at Llanwern and Ravenscraig shifted the competitive ground around Port Talbot and challenged its role as the leading strip mill. It introduced large amounts of new capacity that, as many had feared, exceeded demand and it brought new competitors with modern plants into the strip mill sector. At first, the SCoW attempted to get their own scheme for strip mill expansion at Port Talbot approved, even though this meant proposing a sixth strip mill not long after having questioned the need for even a fourth strip mill. When this failed, the emphasis shifted from running a plant with few competitors that could focus on the maximisation of output to improving the efficiency and cost of the existing plant to take on the new competitors in a more difficult market. The result was significant technical progress including the resolution of Port Talbot's serious limitations imposed by the dock and a transition to best practice BOS steelmaking technology. These changes provided the platform for the long-term survival of steelmaking at Port Talbot into the twenty-first century. The corporate performance of the SCoW and Port Talbot was broadly in line with that of the wider industry in the 1960s. The high levels of profits of the 1950s were gradually eroded during the 1960s. Consolidation and modernisation replaced expansion.

(i) The SCoW's Proposal for a 6th Strip Mill, 1958

The continuous expansion of Port Talbot's strip and coil capacity in the successive development schemes of the 1950s was fuelled by the booming demand for sheet steel in the car industry which was reaching its peak at this time. The approval of the two new strip mills at Llanwern and Ravenscraig in November 1958 was followed by an expansion of Llanwern's planned capacity in 1959 from 1 million to 1.4 million tons[647]. The SCoW fully realised that RTB's new strip mill at Llanwern would shortly become a highly modern best practice competitor. During 1957, the SCoW, along with many other steelmakers had been sceptical about the need for a fourth strip mill. In 1957 the SCoW had argued that hot strip mill expansion would be unwise as Australia, which took between 120,000-130,000 tons/annum of British tinplate, was

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[647] Warren, *British Iron and Steel*, p.280.

developing its own productions facilities[648]. In May 1958 the SCoW argued that three strip mills would be quite adequate to meet likely demand levels in 1965[649]. But as their competitors stole a march on them and demand from the car industry remained high they made a belated attempt to persuade the ISB of their own case to build a second strip mill at Port Talbot which would have been Britain's sixth strip mill.

During the debates on the fourth strip mill in 1958, the SCoW had proposed a 'half-size' semi continuous strip mill (together with a new steelworks) at Swansea. This would be a narrow 48" wide mill concentrating on strip production for tinplate which would free the 80" mill at the Abbey Works to concentrate on long runs of wide strip for the car industry[650]. It would produce 10,000-12,000 tons/week of coil (approximately 500,000 tons/annum) with potential to be expanded to a million tons plus in the future. This was rejected by the ISB in July 1958 during the negotiations over Llanwern and Ravenscraig[651], but the SCoW brought back the proposal in an alternative form in 1959.

Scheme M had added a 4-stand cold mill to the existing 3-stand mill and given the existing constraints imposed by the capacity of Port Talbot Dock and the capacity of the strip mill, this would fully load the existing strip mill. However, Cartwright argued that the Abbey Works could accommodate a further 5-stand cold mill that could roll an initial 12,000-13,000 tons/week of hot strip, with a capacity to increase sheet production to 35,000 tons/week within 5-10 years[652]. The steel coil for this mill could either be supplied from a new SCoW steelworks at Swansea or the RTB's new strip mill at Llanwern, though the SCoW disliked the latter option because *"it would not be very desirable to have the hot strip mill in one ownership and the cold mill in another[653]."*

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[648] Kew, NA, Ref BE1/335–254647, letter from E.J. Pode to Archibald Forbe of the ISB, 16th May 1957.
[649] Ibid, Report by Pode and Cartwright on Fourth UK Wide Strip Mill, 19th May 1958, p.5.
[650] Ibid, W.F. Cartwright, Future Expansion of the SCoW, 9th September 1958.
[651] Ibid, ISB and SCoW meeting notes re plans for a Swansea hot strip mill, 16th September 1958.
[652] Ibid, W.F. Cartwright, Future Expansion of the SCoW, 9th September 1958.
[653] Ibid

Cartwright and the SCoW continued to press proposals for a Swansea scheme in 1958-59. This developed into the unrealistic Development Schemes ‘S’ and ‘T’. Under Scheme S ore unloading and crushing plant would be built at Swansea Dock (which would ease the ore bottleneck at Port Talbot Dock). The ore would then be moved by rail to Port Talbot and the resulting liquid steel would be cast into slabs in a continuous casting plant operating alongside the slabbing mill which would produce 4,000-5,000 tons/week. The slabs would then be returned to Swansea for rolling in a new strip mill in Swansea before being sent to Trostre and Velindre Tinplate Works[654]. The practicality of this scheme with its elaborate cross-freighting is open to question and would have had much higher costs than rolling the strip in a second Abbey Works strip mill at Port Talbot, and there is a suspicion that the plan might have been advanced in order to be rejected while increasing the chances of approval for a second narrower strip mill at Port Talbot. Scheme S was expected to cost £40 million. Scheme T was larger and would cost £60 million but was more robust and more ambitious. In addition to the ore dock at Swansea a blast furnace, electric arc steelmaking and a cold mill would also be built at Swansea to enable it to make some of its own slabs while sourcing the remainder through Port Talbot. The SCoW claimed that it could fund Scheme S from its own resources if it was guaranteed against renationalisation but would need Government investment for the larger project[655]. In November 1958 the SCoW asked the ISB for permission to buy land in Swansea for the project[656]. Thereafter the project dropped out of sight.

Instead, in 1959 the SCoW’s emphasis shifted to what was probably their preferred project, to build a second narrower 48” hot strip mill to the south of the Abbey Works[657]. To support this mill, it was proposed to expand steel production by enlarging the Abbey and VLN Melting Shops and to replace Port Talbot and possibly Margam Melting Shops with BOS and electric furnaces. A sixth blast furnace would be built to increase pig iron production to 55,000-60,000 tons/week[658]. The plan did

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[654] Ibid, ISB and the SCoW meeting notes, 11th November 1958, pp.1-2.
[655] Ibid
[656] Ibid, letter from SCoW Chairman, Harald Peake to Chairman of the ISB, 20th November 1958.
[657] Ibid, W.F. Cartwright, Future Expansion of the SCoW, 9th September 1958.
[658] Ibid

not include an explanation as to how the additional ore required would be obtained, given that Port Talbot Dock was already stretched to capacity.

The hot strip mill was part of Development Scheme 'V' submitted to the ISB by the SCoW. It was costed at £33.1 million[659] (see Appendix 17). The SCoW's Pode and Peake met with the ISB in October 1959. The mill would initially produce 8,000 tons/week (400,000 tons/annum) but would have a potential capacity of up to 1.2 million tons/annum. This would bring overall strip mill output levels at Port Talbot to 57,000 ton/week or close to 3 million tons/annum, comparable to major plants in the USA[660] :-

Table 8.1: Scheme V: Weekly Output and Allocation (tons)[661]

Facility	Maximum Output Scheme M	Maximum Output Scheme V
Blast Furnace Coke	30,000	30,000
Pig Iron	40,000	44,600
Open-Hearth Furnaces	47,000	54,200
Bessemer	12,000	14,000
Total Steel Production	**59,000**	**68,200**
Hot Strip Mills	**49,000**	**57,000**
Allocation		
Tinplate	23,000	23,000
Newport	2,400	2,400
Cold Reduced Sheet	18,600	26,000
Hot Rolled Sheets & Plates	5,000	5,600
Total Allocated	**49,000**	**57,000**

The narrower mill would concentrate on strip for tinplate leaving the 80" mill free to focus on wide strip for the car and domestic appliance industries. Despite their optimistic forecasts, the ISB could not be persuaded that there was sufficient demand to justify the construction of a sixth strip mill at the same time as Llanwern and Ravenscraig. The Port Talbot scheme would require the cancellation of at least one of the two mills already commissioned and that was out of the question in view of Government commitments to those schemes. If all three went ahead the Port

[659] Ibid, Ref BE1/337, ISB and SCoW meeting notes, 20th October 1959, p.1.
[660] Ibid , internal ISB memo from W.L. Hewlett to ISB Secretary, 5th December 1959. Ibid, ISB and SCoW meeting notes, 20th October 1959, p.3.
[661] Ibid, Ref BE1/335–254647, Scheme For Increasing Production Of Cold Sheet By 350,000 Tons Per Annum, 1959, p.2.

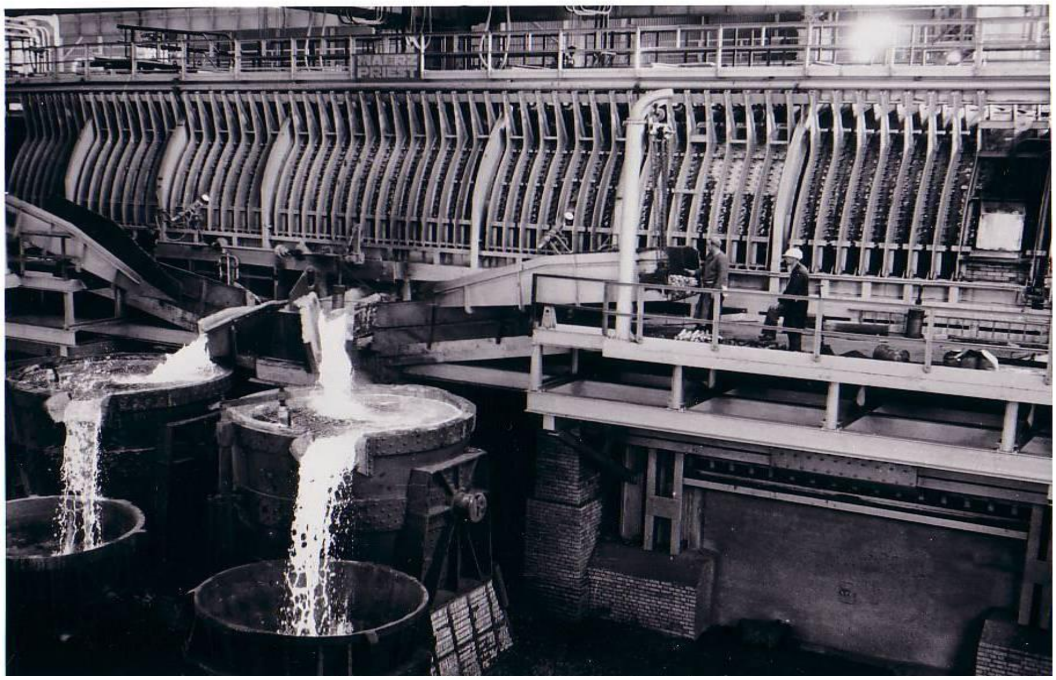
Talbot plant would simply serve to undermine the RTB mill at Llanwern[662]. Instead, as already noted, Llanwern was permitted to further increase its planned capacity during 1959[663].

(ii) Strategic Shifts from Expansion to Efficiency, 1960-1967

The ISB did approve most of Scheme V's proposals apart from the strip mill in February 1960[664] (see Appendix 18 for details). The omission of the strip mill reduced costs to £20 million. Annual ingot capacity was to increase by 650,000 tons to 3,650,000 tons[665]. Without the new strip mill steelmaking capacity now exceeded rolling capacity. This put the future of the older less efficient Port Talbot and Margam Melting Shops in doubt.

Under Scheme V, 4x200 ton open-hearth furnaces in the Abbey Melting Shop were replaced, not with BOS furnaces, but with 4x400 ton Maerz Boelens open-hearth furnaces while a fourth VLN converter was added to the VLN Melting Shop[666]. One of the Maerz Boelens furnaces is shown below :-

[662] Ibid, Ref BE1/337, 'S.C.W.–Scheme 'V', internal ISB minute from J.R.C. Boys to the ISB Chairman, 15th January 1959. Ibid, ISB and SCoW meeting notes, 11th November 1959.
[663] Warren, *British Iron and Steel*, p.280.
[664] Brinn, p.13.
[665] Anon. 'Another Strip Mill Proposed For Abbey'. *The Dragon*, No48, January 1960, p.1, p.8. Ibid, 'Continuous Casting–One of world's biggest plants for Abbey'. No50, March 1960, p.1.
[666] Ibid, '400-Ton Furnace Lift–Big conversion feat at Abbey Works'. No61–February 1961, p.1; 'Development Scheme 'W' Is Approved'. No59, December 1960, p.1; 'New Converter Will Step Up Output'. No80, October 1962, p.8. W.F. Cartwright, 'Aim For Prosperity–keep costs down and increase productivity'. *The Dragon*, No77–July 1962, p.1. Brinn, p.13.



Thus the Abbey Works continued to use two different steelmaking methods, each with separate requirements, and neither of which was the cutting edge technology (BOS) of the time. Their more ambitious scheme to introduce a continuous casting machine to produce 4,000 tons/week of slabs was unfortunately premature. Technical problems with casting rimmed steel could not be overcome and the caster was abandoned after five years development[667].

Steelmaking in the Port Talbot Melting Shop had become uneconomic and the SCoW decided to concentrate production at the more efficient and enlarged Abbey and VLN Melting Shops[668]. Port Talbot Melting Shop closed in June 1961. Its 600 workforce was absorbed into the rest of the works[669]. Margam Melting Shop was closed in March 1963 resulting in a reduction in steelmaking capacity from 3,650,000 to 3,250,000 tons/annum[670]. These measures marked a fundamental shift in the

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[667] Ibid, 'Continuous Casting–One of world's biggest plants for Abbey'. No50, March 1960; '82½ ft pit for Continuous Casting Plant'. No61, February 1961, p.1. Brinn, p.13.
[668] Anon. 'SCoW statement on Port Talbot Melting Shop closure in, The Final Days Of A Once Thriving Works', *PTG*, 12th May 1961, p.1.
[669] Anon. 'Development Scheme 'W' Is Approved'. *The Dragon,* No59, December 1960, p.1. Ibid, 'New Converter Will Step Up Output'. No80, October 1962, p.8.
[670] Ibid, 'Margam Melting Shop'. No73, March 1962, p.1; 'Employee's Interests Safeguarded–Margam Melting Shop Closes On March 30'. No84, February 1963, p.1.

SCoW's operating strategy. Until this point rising demand had required maximising steel production as cheaply as possible, but the new strip mills shifted the balance between supply and demand for hot rolled strip products towards a surplus in supply. To maintain market share and profits the SCoW was forced to improve efficiency and reduce production costs. The closure of the two melting shops was part of that process. But while Llanwern was about to start production using the newer and more efficient BOS process, the SCoW's approach to technological modernisation was confused.

The change in operating strategy meant that between 1961 and 1967 investment tended to be directed towards improving efficiency and in particular improvements in iron making. Between 1961 and 1964 the SCoW introduced fuel oil injection into its blast furnaces. It reduced coke consumption by 15% and removed the need for additional investment in coking capacity[671]. In 1961 automatically operated pneumatic drills were installed to tap Numbers 4 and 5 blast furnaces. This improved the quality of iron, minimised delays in preparing the casting house between casts and increased output[672]. During 1960 experiments were undertaken at Number 2 blast furnace with oxygen injection. Regarded as a success it resulted in the building of a second oxygen plant in 1962. Oxygen enrichment of between 21% and 25% was then introduced operationally at Numbers 1, 2 and 3 blast furnaces. Numbers 4 and 5 were similarly modified during 1964[673]. These and other incremental changes resulted in lower coke consumption per ton of iron produced (see Appendix 22) at a time of increasing coal costs. These changes were incremental in nature and paralleled the main development schemes. Most investment tended to focus on iron and steelmaking and improvements at the rolling end were delayed until the late 1960s.

During 1961 the SCoW instigated a feasibility study to improve strip mill efficiency and quality. It revealed that major mechanical and electrical modifications were required before modern sophisticated controls could be installed. In late August

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[671] Ibid, 'Iron Production Research–Oil injection trials at No1 Blast Furnace'. No62, March 1961, p.8. Brinn, p.14.
[672] Brinn, ibid. Anon. 'Automatic Drills To Tap Blast Furnaces'. *The Dragon*, No69, October 1961, p.1.
[673] Brinn, ibid.

1965 improvements to the roughing stand, finishing stands and exiter were made along with installation of new instrumentation at a cost of £3 million. During November 1965 automatic gauge control in the form of a GE Model 412 computer was brought into use to improve quality consistency. It was highly successfully in producing strip within +/- 0.002” of requirement[674]. This was a year after a similar model was installed at Llanwern’s hot strip mill[675].

Early in 1962 investigations took place into applying automatic gauge control to the 4 stand cold reduction mill. In mid 1962 an order was placed for a TRW 330 computer to satisfy growing customer demand for greater uniformity of gauge and temper and to increase yield by reducing breakages. Installation began early in 1963 with commissioning in early 1964. Considerable difficulties were encountered particularly with light-gauges[676]. The system was modified in 1967 when the mill was converted to 5 stand with the result that light-gauge performance was improved. In late 1966 the SCoW began to investigate the possibility of applying computer control to the blast furnaces. By June 1967 a specification was drawn up and early in 1968 Number 5 became the first British blast furnace to be computerised[677].

(iii) Technology Catch-Up and Problem Solving: the New Harbour and BOS

In 1965 the SCoW once again put forward a proposal to the ISB for a second strip mill at the Abbey Works in Development Scheme ‘A’[678]. However, the other main elements of Scheme A had profound effects on the future of Port Talbot. They resolved the long-running weakness of Port Talbot Dock and instigated the transition to BOS steelmaking[679]. The successful accomplishments of these changes in the period before re-nationalisation ensured the long-term survival of steelmaking at Port Talbot.

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[674] Ibid. Anon. ‘Hot Strip Mill Automation’. *The Dragon*, No95, April 1964, p.1.
[675] Jonathan Aylen. ‘Natural experiments in innovation: radical adoption of computers and changes to ‘physical’ and ‘social technologies’ at Llanwern steelworks, South Wales’. Manchester Institute of Innovation Research, 2010.
[676] Brinn, p.15.
[677] Ibid, p.14
[678] Anon. ‘Company’s £60m Plans–Proposed development for 1965-70 include a new strip mill’. *The Dragon,* No107, April 1965, p.1.
[679] Ibid. Brinn, p.16.

As noted earlier, the limitations of Port Talbot Dock had caused problems with the development plans in the 1950s. Restrictions on the size of ore carriers made it uneconomic to use the richer more distant ores. During 1963 the SCoW and the British Transport Docks Board (BTDB) established a joint working party to consider building a new harbour at Port Talbot. Agreement was reached in the spring of 1964 and approval was received from the ISB in March 1966. The cost was estimated to be approximately £17 million[680]. At the same time the ISB rejected the SCoW's second proposal to build a second strip mill but gave approval to construct a BOS plant to replace the Abbey and VLN Melting Shops[681].

Despite the second rejection of a second strip mill, this development scheme, Development Scheme 'A', was of immense importance. It eliminated the bottleneck of the inadequacies of the dock and replaced it with modern harbour facilities that gave Port Talbot a huge commercial advantage, and changed the steelmaking method to the more modern BOS process. The overall cost of Scheme A was estimated to be £50.75 million (see Appendices 19 and 20). Because of their significance it is appropriate to look at them in some detail.

The first attempt to improve the efficiency of importing ore was for British steelmakers to operate their own fleet of purpose built ore carriers. Eventually there would be 73 such ore carriers of which 24 were specifically built to use Port Talbot Dock[682]. The small size of these ore carriers put the SCoW at a cost disadvantage per ton of ore discharged compared to other steel companies. Of the other ports that discharged iron ore 13 could handle larger ore carriers. Despite this during 1963 Port Talbot Dock discharged more ore than any other UK port (3,058,000 tons)[683]. In the 1960s a proposal was put forward to import all of Port Talbot and Llanwern's ore through an enlarged lock at Cardiff Dock, but the Ministry of Transport rejected the scheme as uneconomic[684]. An alternative proposal was to use Milford Haven to import all of Port Talbot and Llanwern's ore. As Milford Haven is 80 miles from Port

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[680] Anon, 'Green light for Red Dragon', *Steel Times,* 19th August (1966) 237-238 (p.237). Brinn, p.16.
[681] Brinn, ibid.
[682] Anon. 'Steel Trade To Have Its Own Shipping Fleet'. *The Dragon,* No12, November 1956, p.3. Harrison, '*The Iron Ladies–Part 1'*, 154-156.
[683] ISB, p.88.
[684] Anon, 'South Wales Ore Port Development', *Steel Times*, 9th July (1965), 37-39 (p.39).

Talbot and 130 miles from Llanwern the cost of rail transport made the idea uneconomic[685]. Surprisingly, the SCoW and the Guest Keen Iron and Steel Co jointly formed the Angle Ore and Transport Company and even acquired a site at Milford Haven before abandoning the idea[686].

During 1965 the Government published a White Paper on South Wales iron ore imports. It recommended two terminals with a total capacity of 10 million tons/annum capable of handling ships of up to 65,000 tons. One was a harbour at Port Talbot and the other a 4½ mile jetty into the Bristol Channel near Llanwern. Costs were estimated to be £17.7 million for Port Talbot and £16.4 million for the Llanwern jetty. Ore costs at both steelworks were expected to be reduced by about 10s/ton. RTB rejected the idea of a jetty on cost grounds and because of political opposition from Portishead in Somerset[687]. It appeared to be a less crucial decision for Llanwern as Newport Dock could handle larger ore carriers than Port Talbot Dock but the harbour was later to give Port Talbot a production cost advantage over Llanwern which ultimately led to the end of steelmaking at Llanwern.

By 1966 the planned size of ore carrier capable of using Port Talbot Harbour had increased to 88,000 tons with the possibility of further increases up to 100,000 tons[688]. The SCoW and the BTDB reached and signed an agreement in August 1966. Construction of the harbour was the responsibility of the BTDB with the SCoW responsible for the unloading equipment. The latter cost was now estimated to be £4 million. At the signing Cartwright stated that the harbour was the keystone to the success of the local steel industry[689]. A problem that they encountered was the requirement to pay an additional £800,000/annum in rates, which could have made

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[685] Ibid, p.38.

[686] Anon. 'Milford Haven'. *The Dragon*, No15, February 1957, p.1. Ibid, 'Milford Could Be Europe's Greatest Ore Port'. No29, April 1958, p.2; 'Self-discharging ore carrier in Milford Margam experiment'. No91, September 1963, p.1; 'No hitch in 'Ore Convoy' experiment'. No92, October 1963, p.5.

[687] Ibid, 'Port Talbot's £17,000,000 harbour gets 'go ahead''. No124, September 1966, p.1. Anon, 'Green light for Red Dragon', *Steel Times*, 19th August (1966) 237-238 (p.237). Brinn, p.16.

[688] Ibid, *Steel Times.*

[689] Ibid

the scheme unviable. After negotiations with the Government this figure was halved to guarantee the development[690].

Construction of Port Talbot Harbour began in September 1966[691]. It consisted of a 2¾ mile approach channel leading to a 400 acres area protected by two breakwaters. Within this a jetty was located with a dredged basin alongside. On the 2,500' long jetty were located two Arrol built, Dravo designed, transporter unloaders which were each rated at 2,000 tons/hour. Fully laden vessels of up to 100,000 tons could be berthed compared to ore carriers of less than 10,000 tons using Port Talbot Dock[692]. The actual cost of building the harbour was £20 million[693]. The harbour changed the whole economics of making strip steel in Britain in Port Talbot's favour. Not only were costs per ton of ore discharged at Port Talbot reduced but unlike Llanwern and Ravenscraig the ore required no rail haulage to the steelworks. Richer ores which reduced the cost per ton of iron produced from Australia and Brazil were now within economic reach.

Building the BOS plant was the other main feature of Scheme A. Cartwright had visited Japan in 1963 and was impressed by their BOS steelmaking plants. Although their converters were only 150 tons they were well laid out and efficiently operated giving a 6-10% cost advantage over open-hearth steel[694]. He became convinced of the need to convert to BOS steelmaking[695]. In 1965 it was proposed to convert the VLN plant to 2x90 ton BOS converters. The Abbey Melting Shop was to be retained with the remaining 200 ton open-hearth furnaces converted to 400 tons[696]. In the

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[690] Ibid. Anon. 'Government Gives Port Talbot The Go-Ahead For–New £17m Ore Terminal'. *The Dragon,* No110, July 1965, p.1. Ibid, 'Heavy Rate Burden–position so serious that the new deep water harbour may be delayed'. No120, May 1966, p.1, p.8.
[691] *Steel Times*, ibid. Anon. 'Port Talbot's £17,000,000 harbour gets 'go ahead''. *The Dragon,* No124, September 1966, p.1. Brinn, p.16.
[692] Anon, 'New Harbour and Steel Facilities at Port Talbot', *Steel Times,* August 1969 539-542 (pp.541-542).
[693] ABP, *The History and Development of Port Facilities at Swansea and Port Talbot* (ABP, c1985), p.8.
[694] Anon. 'Japanese Attitude To Research-'Dynamic'–And their 1970 steel target is 48,000,000 tons'. *The Dragon,* No85, May 1963, p.2.
[695] Hugo Kindersley, Ex-SCoW Non Executive Director 1960-1967. *Conversation with Stephen Parry*, February 2006.
[696] Anon. 'Company's £60m Plans'. *The Dragon,* No107, April 1965, p.1.

light of Cartwright's arguments, this proposal was considered to be unviable and it was decided to fully convert to BOS steelmaking.

The initial proposal was for 3x270 ton vessels. This would allow steel output of between 60,000 to 75,000 tons/week in 1970. If the second strip mill had been permitted output could have increased to 90,000 tons/week in 1972[697]. The BOS plant that was built was designed to contain two BOS converters but with the potential to add a third converter later. Each had a nominal capacity of 300 tons. Construction began in November 1966[698]. The rated capacity of the BOS plant, as built, was the same as the existing steelmaking capacity of 65,000 tons/week (3,250,000 tons/year)[699].

The conversion to the BOS process was significant at a number of levels. It reflected the fact that Port Talbot which had led in strip mill technology in the 1940s was now having to catch up with the best international steelmaking practice and technology in the 1960s. The SCoW now built on others' experiences. The BOS converters at Port Talbot were bigger and fewer than at Llanwern and Ravenscraig. Port Talbot avoided others' mistakes. In doing so, it wrote off large amounts of relatively new plant in the form of 400 ton open-hearth furnaces in the Abbey Melting Shop and the VLN plant. With growing competition it were left with little option. Failure to convert to the BOS process would have led to decline and uncompetitiveness. It was in effect a survival strategy.

In summary Scheme A was immensely important. It totally modernised the steelmaking process allowing production costs to be reduced at a time of growing competition and falling profits. Building the harbour gave the SCoW steelmaking cost advantages over their British rivals and meant that the SCoW could more than compete with the new strip mills on cost. Although some improvements in the strip

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[697] Anon. 'Company Switching To L.D.–New steel pant will boost our capacity to 75,000 tons a week'. *The Dragon*, No119, April 1966, p.1. Ibid, 'Statement by C.E.H. Morris, General Manager, Iron and Steel Division', Works Council Meeting, 22nd March 1966, No119, April 1966, p.2.

[698] Anon, 'New Harbour and Steel Facilities at Port Talbot', *Steel Times,* August 1969, 539-542 (p.541). Brinn, p.16.

[699] Statement by C.E.H. Morris. Anon, 'Green light for Red Dragon', *Steel Times,* 19th August (1966), 237-238.

mill and cold mill were made in Scheme A, much more investment was needed in rolling to satisfy growing quality demands. This was soon to develop into a critical issue.

(iv) Corporate Performance and the Question of Overmanning

Port Talbot was the leading steelworks in terms of output in the British steel industry in the 1950s and 1960s. In 1948 the SCoW produced 416,000 ingot tons in Port Talbot and Margam Melting Shops. Port Talbot's steel production peaked at 2,777,000 ingot tons (2,814,000 tons of liquid steel) in 1960[700], greater than at any other UK steelworks, and with the exception of United Steel, the SCoW's output was greater than any UK steel company[701]. Between 1960 and 1967 production remained within the range 2,419,000 to 2,736,000 ingot tons/annum (see Appendix 13), running close to full capacity. Port Talbot's share of national steel ingot output steadily increased throughout the 1950s to peak at 12.3% in 1962 (see Appendix 21). When Llanwern and Ravenscraig went into production Port Talbot's share fell below 12%.

The SCoW's sales increased from £22,167,000 in 1948 to peak at £143,096,000 in 1960. After 1960, with the exception of the strike affected year of 1964, it remained within the range £133,040,000 to £141,015,000 (see Appendices 14 and 23). Between 1962 and 1966 the proportion of sales revenue from exports fell from 26% to 21%. The main fall was in the Tinplate Division largely because of growing foreign production[702]. During 1965 the SCoW exported to 75 countries. The top three countries were South Africa (£5,308,000), Argentina (£3,974,000) and Spain (£2,032,000). The main export was tinplate[703].

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700 ISB, p.136.

701 Ibid, table 63.

702 Anon. 'Our aim market development and big sales effort'. *The Dragon*, No84, March 1963 p.4. Ibid, 'Review Of Accounts For The Year To September 1964', No104, January 1965, pp.4-5; 'Heavy Rate Burden', No120, May 1966, p.1, p.8; 'Review Of Account For The Year To September 1966–Chairman's statement to shareholders'. No130, March 1967, p.4.

703 Ibid, 'Review Of Accounts For The Year To September 1965–Extract From The Chairman's Statement'. No117, February 1966, p.4.

In 1960, the SCoW returned the highest gross profit of any British steel company[704]. The SCoW followed the same pattern as the wider steel industry with profits peaking in 1960 before entering a steady but serious decline, though at a slower rate of decline than the wider industry. Its trading profit grew from £1,514,000 in 1948 to peak at £30,479,000 in 1960 before steadily falling to £17,646,000 in 1966 (see Appendix 14). Trading profits as a percentage of turnover fell from 21.3% in 1960 to 10.7% in 1967. Similarly trading profit compared to the value of the company fell from 16.5% in 1960 to 8.2% in 1967 (see Appendix 23). If trading profit is adjusted for depreciation and interest, the adjusted profit as a percentage of turnover fell from 12.2% in 1960 to 2.2% in 1966 (see Appendix 24).

The broader reasons for the decline in profitability of the wider UK steel industry certainly applied to the SCoW, though the SCoW faced certain sector specific factors such as increased domestic competition in strip steel and slowing of growth of demand for flat products. Export opportunities declined as overseas strip mill production increased. When the SCoW's financial performance is compared to the wider industry it reveals that once depreciation is stripped from the trading profit and compared to employed capital between 1958 and 1960 the SCoW was returning a lower figure than the wider industry. After 1960 the position is reversed (see Appendix 25 for details). Before 1960 high demand ensured that older steelworks paying less interest on older capital investments could still make profits. After 1960 when the gap between demand and supply narrowed quality considerations became more important and older steelworks had more difficulty in meeting these quality requirements. By nationalisation the SCoW was in financial decline. Despite the steady fall in trading profits dividend payments remained constant. By 1966 dividend payments exceeded the balance left from trading profits after other deductions (see Appendix 14). How long this could have continued is open to question.

As quality and productivity started to become more important issues after 1960, manning levels at Port Talbot became an increasingly controversial issue. To understand the SCoW's manning levels at Port Talbot it is necessary to return to the

[704] Heal, pp.103-104.

planning stage. In 1945 it was expected that Port Talbot would employ 5,050[705]. By 1947 this figure had increased to 5,427 (including 1,196 for the hot strip mill) plus 700 for the cold mill[706]. In January 1948 the SCoW revised the manning requirement to 6,900 including 2,000 for the strip mill[707]. The increase was due to a reduction in working hours, provision of welfare services and higher production[708].

It was anticipated that the growing workforce would be drawn from redundant tinplate workers and the construction force[709]. By December 1952 actual manning was 9,071 and it peaked at 18,352 in 1960 (see Appendix 26). By 1960 there was considerable overmanning at Port Talbot[710]. Every craftsman had a mate to undertake each job which doubled the number of workers required to do a job[711]. At Port Talbot Steelworks the locomotive drivers did their own minor repairs. At the Abbey Works the fitters removed the spanners from the locomotives claiming that repairs were their job[712]. This type of demarcation spread throughout the works. In Port Talbot Steelworks the personnel department had only 6 staff. Each Abbey Works section had its own personnel department which numbered over a hundred staff[713]. Overmanning was more significant in the auxiliary functions than in the production process[714]. This view was expressed in a SCoW 1955 internal report comparing Port Talbot to a similar steelworks in the Chicago area of the USA[715].

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[705] Kew, NA, Ref HLG 79/583-223474, RDJ Committee Meeting minutes, 23rd May 1945, Ministry of Town and Country Planning. Ibid, Regional Distribution of Industry Committee minutes, Cardiff 23rd May 1945, Ministry of Production–Wales Regional Board.
[706] Ibid, 'Sociological Implications Arising From The Siting Of The Hot Strip Mill At Port Talbot'. Internal Ministry of Town and Country Planning minutes from D.I. Williams to S.W.C. Phillips, 10th June 1947 and 24th June 1947.
[707] Ibid, Internal Ministry of Town and Country Planning Minute from A.E Gibb to 'Prosser', 24th December 1947.
[708] Ibid, Letter from SCoW Secretary, David J. Young, to D.I. Williams of the Ministry of Town and Country Planning notifying an increase in labour requirements, 28th January 1948; 'Margam Steel Works–Labour Requirements', internal Ministry of Town and Country Planning minute from D.S. Prosser, to the Regional Controller, 6th January 1948.
[709] Ibid, minutes Ministry of Labour Office and Ministry of Town and Country Planning meeting, 28th January 1948.
[710] Cartwright quoted in Pagnamenta and Overy, p.90.
[711] Pagnamenta and Overy, pp.90-91.
[712] Ibid
[713] Ibid
[714] Ex-I.S.T.C Divisional Official and strip mill worker. *Conversation with Stephen Parry*, November 2008.
[715] Pagnamenta and Overy, p.92.

Why did this overmanning arise and why was it not tackled? It has to be realised that everyone at one time or another benefited from it. The Government had helped the SCoW build the Abbey Works and they expected the SCoW to absorb the unemployment resulting from the inevitable steelworks and tinplate closures. The SCoW's management freely admitted that they were overmanned in the early 1960s. They attributed this to the need to produce sheet as quickly as possible during the early years[716]. But there were also more complex managerial reasons for it. Throughout the 1950s the Abbey Works was rapidly expanding to meet growing demand. That expansion was reliant upon gaining approval from the various ministries and the ISB. They inevitably asked whether the necessary extra workforce was available. In a tight labour market there was pressure on the SCoW to hoard labour. With overmanning mainly built up in the ancillary functions it was a pool of labour that could be moved into the production process. Thus management were in effect strategically utilising the overmanning that they had created.

The unions resisted any reduction in the workforce. Whether they were instrumental in causing the overmanning is less clear. They certainly brought some outdated labour practices to the Abbey Works from Port Talbot and Margam Steelworks[717]. Yet it is unfair to hold them fully responsible for the overmanning. Evidence exists that union wage claims were rejected in order to increase the workforce[718]. Even the demarcation that occurred, which management tolerated, can be interpreted as a means of utilising and occupying the overmanning. The unions certainly abetted in the overmanning but in certain respects management and unions collaborated in it. Both sides had endured the difficult interwar years and it was felt that both sides should benefit from a boom market. Overmanning also served management's interests in that they could demonstrate the advantages of the private sector to the workforce at a time of political debate about whether the industry should be nationalised or not.

The most important factor regarding manning is not the number of employees but the cost. Burn shows that proportionately in 1957 average cost per hour shows the UK

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[716] E. Julian Pode, The Steel Company of Wales Limited (henceforth SCoW), *Annual Report and Accounts*, 3rd October 1964, p.5.
[717] Pagnamenta and Overy, p.90.
[718] Ibid, p.92.

at 88, Germany 86, France 89, Belgium 92 and the USA as high as 275[719]. Despite lower manning levels the American steel industry did not have lower labour costs. The British steel industry was profitable and profits were growing. Labour costs per ton were only between 17-20% of costs at Port Talbot[720]. To hold out against a strike would have destroyed far more profits than would be gained[721]. These points go some way to explain the reluctance of management to address the issue.

As competition grew and profits began to fall in the 1960s management hardened their attitude to manning[722]. Yet it was 1965 before they made serious efforts to reduce overmanning. Agreement was reached with the unions to reduce the workforce in 1966 by 650 with several hundred more to follow later. Craftsmen's mates were redeployed to fill arising vacancies[723]. From December 1965 the SCoW enforced a retirement age of 65 for all operatives. These changes helped reduce the workforce by 1,000. In addition the conversion to BOS would reduce manning by a further 2,000[724]. Yet by 1967 the workforce was still as high as 16,754 (see Appendix 26).

Throughout the SCoW era production was disrupted by various industrial disputes. Some of the major disputes included :-

- A national overtime ban by maintenance workers during 1955-56 reduced profits by £4 million[725].
- In September 1961 a strike by the bricklayers brought the Steel Division to a standstill from 12th to 29th October[726].

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719 Burn, *The Steel Industry 1939-1959*, p.586.
720 Campbell Adamson quoted in Pagnamenta and Overy, p.92.
721 Ibid
722 Cartwright, 'Aim For Prosperity'. *The Dragon*, No77, July 1962, p.1.
723 E. Julian Pode, *SCoW–Annual Report and Accounts*, 2nd October 1965, p.4.
724 Anon. 'Port Talbot Developments Reviewed At Meeting Of Works Council'. *The Dragon*, No95, April 1966, p.2. WWSDC, *The Steel Industry and the Port Talbot Development*, West Wales Steel Development Committee, 1975, p.6.
725 Anon. Statement By Directors Of The Steel Company of Wales. *The Economist*, 22nd December 1956, p.1081. Anon. 'The Chairman Speaks About Our Accounts For 1956–A Year of Continued Progress'. *The Dragon*, No 45, February 1957, p.1.
726 SCoW, *Annual Report and Accounts 1961*, p.12. Ibid, *1962*, p.11.

- Early in 1962 the bricklayers struck again culminating in a 16 day plant shutdown[727].
- On 23rd December 1963, 1,000 AEU members and other craftsmen struck over pay. It reduced the trading surplus by at least £8 million[728].
- In February 1967 all 278 bricklayers came out on strike over leaving work early[729].

There were also numerous minor disputes. This occurred in an industry not known for bad industrial relations. Most major disputes involved the craftsmen. The problem partly stemmed from the pay differentials between them and the process unions largely represented by the Iron and Steel Trades Confederation (ISTC). The craftsmen believed that they were the industry's key workers but their wages lagged behind the process workers, partly because craft wages related to those of craftsmen outside of the steel industry which were generally lower than those of process workers. Craftsmen therefore wanted parity with the highest paid process workers. The SCoW argued that their skills were transferable but the process workers' skills were not[730].

In 1957 the SCoW withdrew from the Iron and Steel Trade Employers Association which negotiated wages across the industry. They were then faced with the problem of negotiating with a large and diverse labour force. This resulted in a very liberal wages policy for both the craftsmen and process workers. The problem was that the craftsmen saw the gap between their wages and the higher paid process workers widen[731]. Competing unions were keen to enforce demarcation to protect their

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[727] Brinn, p.13.
[728] SCoW, *Annual Report and Accounts 1964*, p.3. Anon, 'The Port Talbot Dispute', *Steel Times*, 3rd January (1964), 9. Ibid, 'South Wales Steel Peace in Sight', 31st January (1964), 134; 'Effect of Dispute on SCoW', 24th February (1964), 205; 'SCoW's New Pay Agreement With Craft Unions', 18/25th December (1964), 849.
[729] Ibid, 'Steel Corporation Sets Up Group Board', *Steel Times*, 29th September (1967), 351.
[730] D. Murray, 'Union Trouble In The Steel Industry', *Steel Times,* 6th March (1964), 316-317, (p.316). Interview with ex-ISTC Divisional Official. Conversation with Stephen Parry, 13th November 2008.
[731] Murray, ibid.

members' jobs. The SCoW management gained a reputation for an *"inability to say 'no' to the unions*[732]."

A further complication was the issue of ownership. Management may have been less inclined to take a tough attitude towards the unions, and particularly the ISTC, for fear of hardening their lukewarm attitude towards nationalisation. But this only stored up problems that would eventually need to be addressed. It also gave an impression of weak management.

After nationalisation, with the exception of Fred Cartwright, no ex-SCoW manager reached senior positions within the British Steel Corporation (BSC). Yet this was the same management who were returning such high profits. During the 1960s managerial leadership in the SCoW was dominated by two figures. In February 1962 Julian Pode became Chairman and Fred Cartwright Managing Director[733]. Both were part of the new class of professional steel manager that emerged between the wars[734]. Pode was a chartered accountant from Sheffield. He began working for GKN at Dowlais in 1926, became GKB Company Secretary in 1938 and SCoW Managing Director in 1947. Cartwright was born in Northamptonshire, the son of a clergyman who was educated at Rugby and Cambridge where he obtained an engineering degree. He joined GKN at Dowlais as an engineer in 1929, became assistant to Port Talbot's Works Manager in 1931, technical assistant to GKB's Managing Director in 1935, a Director in 1940 and a SCoW Director and Steel Division General Manager in 1947[735]. It was Cartwright who was instrumental in determining the SCoW's technological direction. He was a leading figure in technical debates on innovating the steel industry and published widely on these matters. Perhaps he over relied on technology to address the problems that they faced. However, he understood how to delegate and was an inspiring leader to those who

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[732] Anon, 'Steel Faces A Labour Crisis–By A Special Correspondent', *Steel Times*, 7th February (1964), 167-170, (p.170).
[733] E. Julian Pode, 'I feel confident of your full support'. *The Dragon,* No73, March 1962, p.1. Harald Peake, 'A Year Of Continued Technical Progress'. *The Dragon,* No71, January 1962, pp.4-5.
[734] Owen, p.122.
[735] Anon. 'Mr W.F. Cartwright To Be Chairman'. *The Dragon,* No127, February 1967, p.1. Anon. Obituary of 'Fred Cartwright–Manager of 26,000 Steelworkers'. *Daily Telegraph,* 15th June 1998.

worked for him[736]. The relationship between Pode and Cartwright is interesting. Cartwright was particularly keen to introduce both BOS and continuous casting[737]. His thrust for technological change was tempered by the more pragmatic accountant's caution over the financial consequences. Certainly Cartwright made mistakes. The decision to go with VLN steelmaking was clearly a mistake yet even this worked in the SCoW's interests. It allowed the time to benefit from others' experiences and to install state of the art BOS plant. The failure of the continuous casting plant must rest with Cartwright yet the principle was correct. It failed because of engineering problems. On 14th February 1967 Julian Pode retired. Fred Cartwright became Chairman, David Young Deputy Chairman and Lord Layton Managing Director[738].

Despite the denationalisation of the bulk of the steel industry the Labour Party remained committed to re-nationalisation during the 1950s and the early 1960s. As the steel industry's profits declined from 1960 it argued that the industry was incapable of restructuring itself[739]. The October 1964 General Election brought the return of a Labour Government set on renationalising the steel industry. With only an overall majority of four, and two MPs, Desmond Donnelly and Woodrow Wyatt, opposed to nationalisation little was done until the General Election of March 1966[740]. The main opposition came from the Conservative Party, the steel firms and the BISF. Julian Pode, as SCoW Chairman and President of the BISF, was in the forefront of that opposition. He argued against nationalisation on the grounds that it was a distraction from the working of the company; that it would harm a productive and competitive industry; that control could be obtained without state shareholding; that the Labour Party had not analysed the situation objectively to maximise steel's contribution to the national economy; and that it would divide the country[741].

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[736] H.G. Jones, 'Early OR in the Steel Company of Wales', *The Journal of the Operational Research Society*, 43(6) (1992) 563-567 (p.563).
[737] Kindersley, 2006.
[738] Anon. 'Mr W.F. Cartwright To Be Chairman'. *The Dragon,* No127, February 1967, p.1.
[739] Dudley and Richardson, p.29.
[740] Dudley and Richardson, pp.53-58. Keith Ovenden, *The Politics of Steel* (London: The MacMillan Press Ltd, 1978), p.44.
[741] SCoW, *Annual Report and Accounts 1964*, p.5, *1965* p.3. Anon. 'Review Of Accounts For The Year To September 1964'. *The Dragon,* No104, January 1965, p.4. BISF, *Annual Report, 1965*.

After the Labour victory in the March 1966 General Election with a big majority legislation to renationalise the steel industry was introduced in July 1966 and the Iron and Steel Act became law on 22nd March 1967[742]. The SCoW was one of 14 companies to be nationalised[743]. The compensation paid was :-

Table 8.2: Compensation Paid to the SCoW at Nationalisation[744]

Security	Unit	Compensation Value
Ordinary Shares	£1	£1-5s-3d
5½% 1st Debenture stock 1980-1985	£100	£83-13s-11d
5½% 2nd Debenture stock 1964-1987	£100	£83-10s-2d

The compensation was based upon a 61 month average stock market price from April 1961. Bryer et al argue that the companies were over compensated resulting in the nationalised industry carrying too high a burden of debt from the start[745]. Vesting day was on 28th July 1967[746].

By the time of nationalisation the SCoW, like the rest of the British steel industry, was in financial decline. They were beginning to address some of the fundamental issues that they faced such as building a deep water harbour and converting steelmaking to the BOS process. These reduced the cost of steelmaking and allowed the SCoW to compete with the new strip mills. Only tentatively were they beginning to address their overmanning.

The period 1961-1967 was one of consolidation, modernisation and financial decline. That decline was serious but proportionately less than the wider steel industry. The building of the two new strip mills increased competition and the slower than forecast growth in demand put pressure on the SCoW. The new mills prevented the building of a second strip mill at the Abbey Works which meant that the full potential of the site could not be realised.

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[742] Ovenden, p.106. Philip Ziegler, *Wilson–The Authorised Life* (London: Harper Collins, Paperback edition, 1995), p.248.
[743] Great Britain. *Iron and Steel Act*, Schedule 1, 1967.
[744] Anon, 'Steel Corporation Sets Up Group Board', *Steel Times*, 29th September (1967), 351.
[745] Bryer et al, p.11.
[746] Lord Melchett, Statement by the BSC Chairman, *Steel Times*, 28th July (1967), 91.

During the 1950s the SCoW made some strategic mistakes. It opted for VLN technology that proved inferior to BOS and needed replacing by the latter within a decade. Arguably not locating the second tinplate works at Port Talbot was a bigger mistake which was more difficult to rectify. Unquestionably the SCoW was correct to push for a second strip mill at the Abbey Works. Yet it only made sense without the new strip mills at Llanwern and Ravenscraig. Once they were built a second strip mill only became a means to undermine them. If this second specialised mill had been built, and the problems of ore supply overcome, Port Talbot with adequate support from Ebbw Vale and Shotton would have met the UK's foreseeable demands for flat steel products. It is clear that the Ravenscraig strip mill should not have gone ahead. As regards Llanwern it is tempting to speculate that RTB's proposal to build a plant producing slabs to be rolled at Ebbw Vale with a strip mill to be added later if demand materialised may have been the way forward. If that argument is taken further, and that demand did not arise, it might have been feasible to replace steelmaking at Ebbw Vale but to have maintained the strip mill or even expanded it. Whether this would have been politically acceptable is questionable but it is intriguing.

A further complicating factor for the industry in South Wales was the relationship between the SCoW and RTB. Certainly tentative steps were taken after nationalisation to merge the two under RTSC but it never developed into a full merger largely because of the change of Government. A full merger between the two would have allowed unified control of the South Wales strip mills and tinplate sector. That would have made commercial sense as long as the strip mill at Llanwern did not go ahead. In the private sector the latter may well have brought down the merged company. Concentration of control and co-ordination of development of strip steel in South Wales was lacking between 1955 and 1967 and overcapacity, lack of strategic development and destructive competition was the outcome. This was the difficult historical legacy that the nationalised industry was to struggle with after 1967.

Chapter 9: From Nationalisation to 1978: The Oil Crisis and Frustrated Expansion

Between nationalisation in 1967 and 1978 the British steel industry experienced a difficult period. Stimulated by forecasts of rapid growth in steel demand both the traditional steelmaking countries and developing countries' steelmakers planned to increase steelmaking capacity. After the 1973-74 oil crisis and ensuing recession these forecasts for demand failed to materialise just as the new capacity came online, resulting in worldwide overcapacity. BSC, moreover, was faced with the additional problems of coal strikes and the opening up of the home market to increased continental competition following Britain's entry into Europe. These pressures exposed the flawed structure of the British steel industry with too many steelmaking sites of sub-optimal size in less than ideal locations. No sector suffered as much as the strip mill sector. Britain simply had too many strip mills. Despite this, before the oil crisis, BSC had embarked on a major expansion in capacity including the strip mill sector. This included a substantial increase in Port Talbot's capacity, linked to ending steelmaking at Shotton. Much of this period was spent arguing on the merits of expanding Port Talbot or retaining Shotton. The resulting stalemate, largely arising from the obstinacy of BSC Chairman, Monty Finniston, meant that BSC failed to exploit the opportunities of Port Talbot's conversion to BOS steelmaking and its new harbour. Not only did the stalemate mean that Port Talbot failed to meet growing customer quality requirements in a shrinking market but the less well located steelworks at Llanwern and Ravenscraig were expanded and modernised. Only after Port Talbot's expansion was abandoned did a new local strategy begin to emerge focussing on improved quality and efficiency and becoming more customer focussed.

For the thirty years after World War Two global steel production grew on average by 6.16% per annum. This pattern of growth changed abruptly in 1974 when average steel production in the established Western steel producing countries declined by 1% per annum as world consumption grew by an average of 2%[747].

[747] Howell et al, *Steel and State–Government Intervention and Steel's Structural Crisis* (London/Boulder: Westview Press, 1988), pp.15-19.

The catalyst for change was OPEC's quadrupling of oil prices in 1973. It caused massive recessions in Europe and the United States which badly affected the car, chemical, heavy machinery and textile industries. Their decline reduced steel demand[748]. Between 1974 and 1978 the British steel industry operated against a background of a major recession, changing patterns of world steel production and increasing import penetration following Britain's entry into Europe. After 1974 supply outstripped demand both domestically and internationally. It exposed the British steel industry's structural problems of too many poorly located steelmaking sites of sub-optimal size.

(i) Port Talbot under BSC reorganisation, 1967-1976

At formation in 1967 BSC's crude steel output of 23.2 million tonnes was the second largest in the Western World behind only US Steel. Only US Steel ($4,006 million) and Bethlehem Steel ($2,594 million) exceeded its sales of $2,571 million. At nationalisation BSC was grouped into 4 regional divisions (Midlands, Northern and Tubes, Scottish and North-West, and South Wales)[749]. The SCoW along with RTB and Guest Keen Iron and Steel formed the South Wales Group. It had capital of £413 million, a capacity of 6.1 million tons/annum and a workforce of 57,000. Fred Cartwright became Managing Director with C.E.H. Morris as Director, SCoW Division[750].

The idea was to encourage competition between the divisions. Yet competition for the South Wales Group was limited as it produced a large proportion of the UK's sheet and all its tinplate and electrical sheet[751]. Additionally, the retention of former company identities ensured that the old rivalries persisted[752]. Thus customer choice was reduced but full cooperation was not achieved.

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[748] John P. Hoerr, *And The Wolf Finally Came* (Pittsburgh: University of Pittsburgh Press, 1988), p.137.

[749] BSC, *Annual Report and Accounts 1967-68*, p.13, p.20, pp.38-39. Abromeit, p.123. Brinn, p.18. Dudley and Richardson, p.33.

[750] W.F. Cartwright, 'A Formidable Group–We join RTB and GKIS to meet big challenge'. *The Dragon*, No135, August 1967, p.1. Ibid, Anon, Our Group States Its Objectives. No140, January 1968, p.1. Anon, 'Steel Corporation Sets Up Group Board', *Steel Times*, 29th September (1967), 351. Brinn, p.18.

[751] Cartwright, A Formidable Group.

[752] Heal, pp.152-157. Abromeit, p.123. Dudley and Richardson, p.33.

The unsatisfactory nature of this structure soon became apparent. BSC Chairman, Lord Melchett, recruited Monty Finniston as a Deputy Chairman to review it. Finniston produced two reports in 1969 recommending a new structure based upon product grouping[753]. The new groups were introduced on 23rd March 1970 (General Steels, Special Steels, Strip Mills, Tubes, Constructional, Engineering and Chemicals). Each Division was to be a complete business engaged in making and selling its own defined products[754]. They would allow rationalisation of sales, employ plants to their maximum efficiency and plan capital investment[755]. In order to make any future privatisation more difficult all the assets of the former companies where transferred to the Corporation[756]. As a result the SCoW disappeared.

Port Talbot became part of BSC's Strip Mills Division[757]. Fred Cartwright was appointed as a BSC Deputy Chairman and Stephen Gray became Strip Mills Managing Director. During 1968-69 the Division produced 7.6 million tonnes of liquid steel with an estimated £500 million turnover and 70,205 employees on 30th June 1969[758]. Port Talbot became the Port Talbot Group, Strip Mills Division, BSC. In September 1972 Bob Scholey became Strip Mills Division Managing Director. He was replaced by Philip Bromley in December 1973 when he became BSC Chief Executive. In November 1972 Peter Allen became Director, Port Talbot Group[759].

But no sooner was the reorganisation initiated than the strategy changed again. On 29th June 1975, Monty Finniston, now BSC Chairman following Lord Melchett's death in 1973, submitted proposals to the Secretary of State for Industry for a further

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[753] BSC, *Annual Report and Accounts 1968-69*, p.5. Abromeit, p.123. Dudley and Richardson, pp.33-34.

[754] BSC, ibid, *1970-71*, p.5. Anon. 'New BSC Is Given The Go-Ahead'. *Steel News*, December 1969, No21, p.1.

[755] Ibid. 'New BSC Is Given The Go-Ahead'. Ibid, 'How The New BSC Will Work'. p.8; 'Product Divisions 'Feasible'–Managing directors–designate named'. June 1969, No15, p.1. BSC, *Annual Report and Accounts 1969-70*, p.6. Ibid, *1970-71* p.5. Abromeit, p.123. Dudley and Richardson, p.34.

[756] BSC, *1968-69*, p.5; *1969-70*, p.6.

[757] Anon. 'Who's Who In The New Organisation'. *Steel News*, January 1970, No22, p.9. Brinn, p.19.

[758] Anon. 'Thrusting Into The 70s–and the cost is £260 million'. *Steel News*, November 1969, No20, p.1.

[759] Brinn, pp.19-21.

reorganisation[760]. This envisaged returning to a regional organisation. It was felt that a more centralised commercial operation with dispersed production areas was needed[761]. In reality the multi-product plants then envisaged made it impractical to group plants into Product Divisions[762].

On 4th April 1976 the main iron and steel activities were reorganised into 5 Manufacturing Divisions (Scottish, Scunthorpe, Sheffield, Teesside and Welsh). Additionally four Product Units were established for Billet, Bar and Rod Products; Plates; Sections and Strip Mill Products. These were responsible for sales and plant loading within the Manufacturing Divisions. Port Talbot became part of the Welsh Division with the Product Unit being Strip Mill Products based at Newport. The rest of BSC was organised into 14 Profit Centres. Trostre and Velindre became part of the Tinplate Profit Centre[763]. This complex structure allowed BSC to load up the lower cost plants and to isolate plants it wanted to close. At Port Talbot BSC's changing structure made little practical difference. Yet nationally a constantly changing organisation created uncertainty and inefficiency.

Throughout most of BSC's history it was a loss maker (see Appendix 27). Several factors contributed to this including a declining steel market; the poor financial state of the firms nationalised; delays in rationalisation and modernisation resulting in higher costs; and Government price control policies up to 1974[764]. Additionally BSC inherited debts of at least £342 million from overcompensation of the security holders of the former private companies and debts of £271 million[765]. These factors significantly contributed to their initial capital debt of £834 million[766].

BSC returned trading deficits of £19 million in 1967-68 and £23 million in 1968-69. They were not generating enough to repay their debts. In 1969 BSC proposed to the Government that £700 million of the £834 million debt be converted into Public Dividend Capital (PDC) allowing larger repayments when business was good but

[760] Ibid, p.21. BSC, *Annual Report and Accounts 1975-76*, p.18.
[761] Monty Finniston, in Brinn, p.22.
[762] Abromeit, p.124. Dudley and Richardson, p.89.
[763] BSC, *1975-76*, p.18. Brinn, p.22.
[764] Bryer et al, p.12. Abromeit, pp.138-139.
[765] BSC, *1967-68*, p.10.
[766] Ibid. Dudley and Richardson, p.36.

little or none when business was bad. It brought BSC's financial structure more in line with ordinary commercial undertakings[767]. BSC wanted a PDC debt ratio of 70:30 but Treasury imposed 55:45. Their borrowing limit was increased from £400 million to £500 million[768]. In 1976 the Treasury worsened the formula to 45:55. BSC's financial performance and ability to invest was always undermined by the debt that it carried.

(ii) Strategy & Technological change at Port Talbot

By 1970 BSC's management was convinced that to make it internationally competitive and profitable capital investment of £73 million in 1967-68 and £74 million in 1968-69 was insufficient[769]. They were heavily influenced by the Benson Report. This argued that the British steel industry should be concentrated on large coastal steelworks using BOS steelmaking and imported high quality coal and iron ore[770]. BSC's early development strategy, the 'Heritage Programme', concentrated on exploiting the potential of its major steelworks at Port Talbot, Llanwern, Teesside, Scunthorpe and Ravenscraig[771]. BSC believed that by 1975 these sites could produce between 30-34 million ingot tons/annum[772].

At Port Talbot the late 1960s involved completing the BOS plant, harbour and other features of Scheme A. The first commercial ship to use the harbour early in 1970 was the 'Forth Bridge' delivering 46,410 tons of Canadian iron ore[773]. Using 100,000 ton ore carriers resulted in cost savings of 25p/ton on Norwegian ore, 80p/ton on Brazilian ore and £1-80/ton on Australian ore[774]. The harbour's jetty is shown below:-

[767] BSC, *1968-69*, p.5. Dudley and Richardson, p.36.
[768] Dudley and Richardson, ibid. Bryer et al, p.168.
[769] BSC, *1967-68* p.17; *1968-69* p.14. Dudley and Richardson, p.37.
[770] Heal, p.181. Bryer et al, p.23.
[771] Great Britain. *British Steel Corporation: Ten Years Development Strategy.* (Cmnd 5226). London: HMSO, February 1973, p.9.
[772] Melchett, 'Big output potential at existing works'. *Steel News,* April 1969, No13, p.1.
[773] Anon. 'Forth Bridge first'. *Steel News,* March 1970, No24, p.1.
[774] Kenneth Warren, *World Steel–An Economic Geography* (Newton Abbot: David and Charles, 1975), pp.31-32.

The BOS plant cost £42 million and produced its first steel on 26th October 1969[775]. These changes resulted in the closure of the VLN Plant in July 1969, the Abbey Melting Shop in November 1970 and Port Talbot Dock in December 1971. Problems with the BOS plant were not resolved until the end of 1970[776]. By May 1972 weekly production exceeded the combined record output of the Abbey Melting Shop and the VLN Plant[777].

The BOS process needed a continuous supply of good quality iron. This required further modernisation to the blast furnaces, including an increase in the working capacity of Number 2 blast furnace, installation of a second tap hole in Number 4

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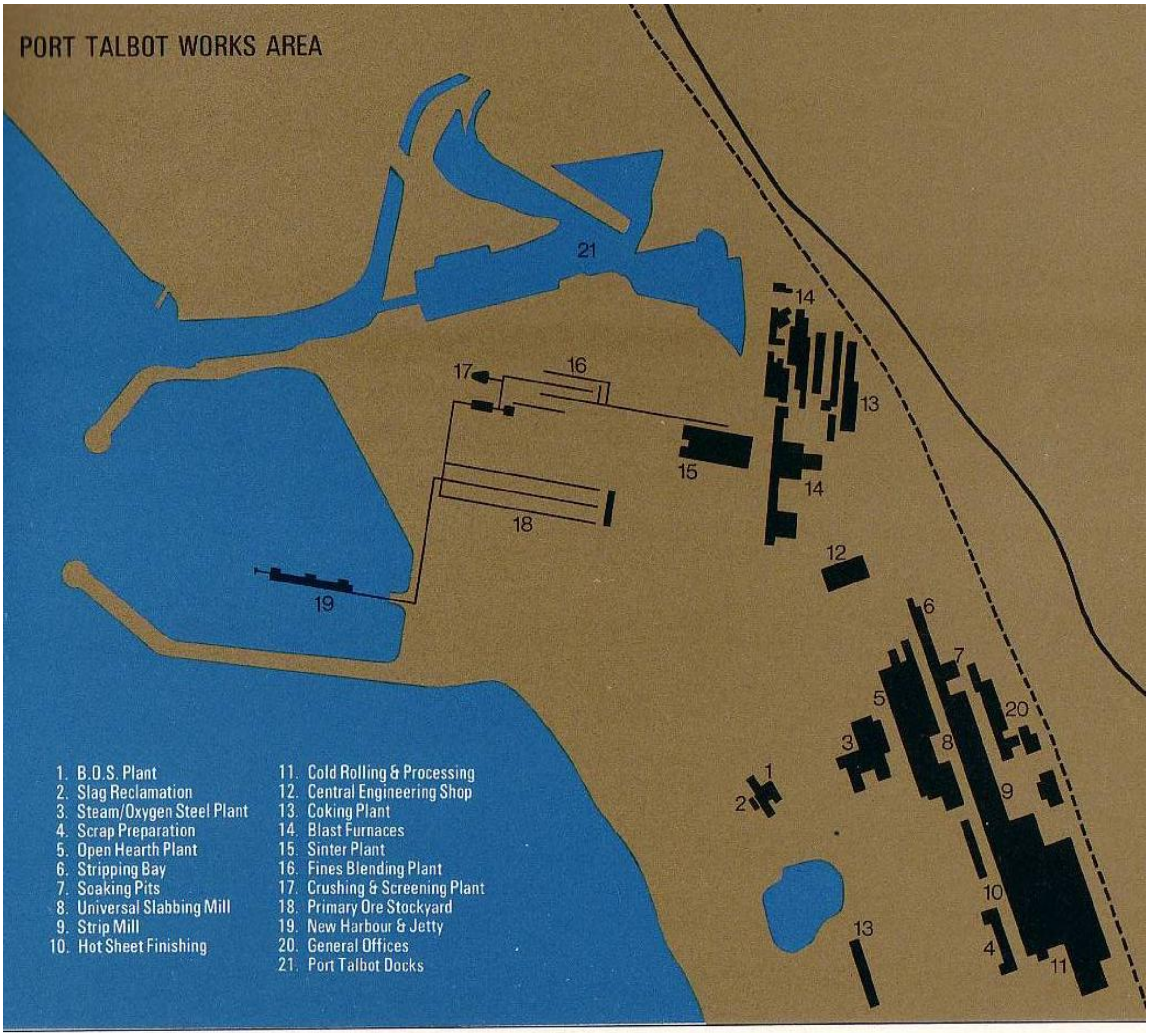
[775] Anon, 'Thrusting Into The 70s–and the cost is £260 million'. *Steel News*, November 1969, No20, p.1.
. Ibid, 'Approved £230 million stake in the future'. February 1970, No23, p.9. BSC, *1967-68*, p.14. Heal, p.170.
[776] BSC, *1969-70*, p.2; *1970-71* p.6, p.26, *1971-72*, p.25. Anon. 'Setbacks which hit Division profit plans'. *Steel News*, 5th August 1971, No51, p.1.
[777] Ibid, 'Setbacks which hit Division profit plans'. Ibid, 'BOS Plant Notches 10 Millionth Tonne'. 6th June 1974, No119, p.3. Brinn, p.20.

and improvements in the burden preparation[778]. These changes resulted in a steady improvement in blast furnace performance. Number 4 became the first UK blast furnace to achieve an output of over 3,000 tonnes/day and 20,000 tonnes/week. Other changes included the completion of the SCoW's strategic computerisation. Computer control was established on the 5 stand cold mill at a cost of £544,000 in 1968[779]. In 1971 the commercial department introduced a computerised method of 'order acceptance' allowing quicker checking of orders[780].

These changes largely revolved around the conversion to the BOS process, but other essential investment was also needed at Port Talbot. It was perhaps symptomatic of wider issues across BSC. Major investment tended to be concentrated on the steelmaking end rather than on rolling operations. Port Talbot's strip mill was nearly 20 years old and was beginning to fail to fully satisfy growing quality demands. If more attention had been devoted to this issue BSC and Port Talbot might have lost less market share during the 1970s. It was not a case of replacing the strip mill but upgrading the existing mill to improve quality. A plan of Port Talbot during 1970-71 is shown below[781] :-

[778] Brinn, p.19.
[779] BSC, *1968-69*, p.16.
[780] Anon. 'Customer's orders: Computer takes over at Port Talbot'. *Steel News*, 6th May 1971, No45, p.1. Anon, 'BSC Modernisation Projects Reviewed–Part 2–Port Talbot Group', *Steel Times*, February 1972, p.186.
[781] BSC, *1970-71*, p.27.

Fig 9.1: Port Talbot Steelworks 1970-71



A decision of immense strategic importance taken during 1971-72 was to import Llanwern's iron ore through Port Talbot Harbour. It required a third unloader at the ore jetty, extensions to the stockyard and rail loading equipment[782]. Llanwern, unlike Port Talbot, now had to absorb the rail transport costs. Nevertheless importing the ore through Port Talbot still gave Llanwern cost advantages over Ravenscraig. It also reduced the costs per ton of discharged material for Port Talbot. In 1976 BSC signed a £19 million contract with British Rail to move up to 59 million tons of iron ore to Llanwern from Port Talbot over 12 years involving up to 7 trains daily, 6 days a

[782] Ibid, *1971-72*, p.25. Anon. 'Port Talbot harbour to handle ore for Llanwern'. *Steel News*, 4th May 1972, No69, p.3.

week[783]. The additional transport costs weakened Llanwern economically in relation to Port Talbot and made it more vulnerable.

(iii) BSC Development Plans: Ambition and Reality

BSC's Ten Year Development Strategy can be traced back to their 1970-71 Development Plan. This envisaged eventual BSC production of 43 million tonnes/annum of steel with 32-33 million tonnes/annum by 1975 and 40 million tonnes/annum by 1980[784]. It included the creation of a new 'greenfield' steelworks producing about 15 million tonnes/annum with Teesside, Scunthorpe, Ravenscraig, Llanwern and Port Talbot producing the rest[785].

The Department of Trade and Industry (DTI) set up a Joint Steering Group (JSG) to examine the proposal. It reported after the consultants, McKinseys, forecast 1980 demand to be just 23 million tonnes[786]. In May 1972 the Minister for Industry, Tom Boardman, announced that investment would be concentrated on the 5 main plants without the greenfield site. The JSG recommended a 1980 capacity of between 28-36 million tonnes[787]. In the event, during the strike affected year of 1979-80 BSC produced just 14.1 million tonnes[788].

In February 1973 the Government published a White Paper '*British Steel Corporation: Ten Year Development Strategy*'[789] which committed £3 billion to the development strategy. Despite overall growth in steel demand of only 1.7% per annum between 1955 and 1970 it forecast overall growth of 50% during the 1970s attributed to rising demand for investment goods, consumer durables, cars,

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[783] Anon. 'Giant ore train deal is success'. *PTG*, 1st July 1976, p.1.
[784] Kew, NA, Ref BT255/734, Note of the Minister for Industry's Meeting with the British Steel Corporation, 10th March 1972. Ibid, Department of Trade and Industry, British Steel Corporation: Review of Long-Term Financial And Development Position, 1972; 'Choosing Between the Investment Options Facing The BSC'. Report by McKinsey and Co for the Department of Trade and Industry, para 2(1)(a).
[785] Anon. '1980: The Vital Decisions'. *Steel News*, May 1970, No26 p.1. Abromeit, p.129. Dudley and Richardson, p.40.
[786] Abromeit, p.130. Dudley and Richardson, pp.40-41.
[787] Dudley and Richardson, p.51.
[788] BSC, *Annual Report and Accounts 1979-80*, p.60.
[789] Great Britain. *British Steel Corporation: Ten Years Development Strategy.* (Cmnd 5226). London: HMSO, February 1973.

equipment for North Sea oil exploration and Britain's entry into Europe[790]. It recognised that BSC had to minimise costs and meet growing quality requirements. To minimise costs it was essential to use richer foreign ore transported in large bulk carriers, large blast furnaces, and large-scale BOS steel production. Costs would be lowest at integrated steelworks with capacities of 6 million tonnes/annum and ready access to a deep-water ore terminal. The subsequent economies of scale would yield significant savings. Consequently steelmaking in older, smaller, technically obsolete open-hearth plants and less favourably located plants would be phased out during the 1970s. BSC was set the objective of achieving an average annual return on net assets of 8% to March 1977 and at least as high thereafter[791].

The Ten Year Development Strategy underpinning forecasts were wildly optimistic. However, faced with the available evidence at the time it made some sense. For forty years to the early 1970s demand and global production had generally moved upwards. All other major steelmaking countries were also planning to increase capacity. It was correct in concentrating production at large coastal sites using the BOS steelmaking process. However, it failed to fully appreciate the political resistance that developed to the closure programme. It was based upon Japanese experience, but unlike Britain, Japan was on the edge of a rapidly industrialising area with a growing steel market. Britain and Europe were mature industrial areas where growth was always going to be less.

Fred Cartwright, just before retirement as a BSC Deputy Chairman in 1973 was a surprising voice of caution[792]. He argued that the large scale of the new steelworks envisaged would ensure a loss of flexibility in operations which would lead to a loss of profits. Instead, he argued the case for mini mills located near customers using scrap to produce bars, rods, light sections etc with lower capital costs and more flexible operating practices.

Under the Ten Year Development Plan BSC's Welsh steelmaking capacity was to be modernised and expanded to about 10 million tonnes/annum at a cost of around

[790] Ibid, pp.5-6, p.9. Dudley and Richardson, p.5, p.9.
[791] Cmnd 5226, p.7, p.9, p.12.
[792] W.F. Cartwright, 'The Place Of Mini-Steelworks In The World', *Journal of The Iron And Steel Institute*, April (1972), 221-225.

£900 million (March 1972 prices). Port Talbot was to be expanded from 3.25 millions tonnes/annum capacity to about 6 million tonnes creating some 1,300 new jobs to produce high quality, competitively priced, strip products to feed the Trostre, Ebbw Vale and Velindre Tinplate Works and the finishing end at Shotton[793]. Doubts about the creation of new jobs at Port Talbot were raised within the DTI even before the White Paper was published as simply being a 'shot in the dark' by BSC[794].

It was also planned to increase Llanwern's capacity from about 2 million tonnes/annum to 3.8 million tonnes and Ravenscraig to about 3.2 million tonnes[795]. Port Talbot was chosen for the largest expansion because of its newer and larger BOS plant which could accommodate an additional third converter and had its own deep water tidal harbour. BSC planned to exploit Port Talbot's locational advantages to reduce production costs.

However, BSC created a major strategic complication by linking the Port Talbot expansion directly with ending steelmaking at Shotton and the consequent loss of 6,500 jobs. Modernising Shotton would cost £200 million. Even then production costs for hot rolled coil would still be more than at an expanded Port Talbot[796]. The DTI believed that modernised liquid steel production at Shotton would cost £30 a tonne and an expanded Port Talbot £29.5 a tonne[797]. Internally the DTI raised the important point that although Shotton's costs had been compared to Port Talbot there was no comparison to Ravenscraig, Llanwern or South Teesside. Surprisingly this was never raised in the ensuing debate by the DTI or by the pressure groups at Shotton and Port Talbot. When Shotton steelmaking ended in 1979 BSC claimed that it was to load the expanded and modernised facilities at Ravenscraig not Port Talbot[798].

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[793] Cmnd 5226, p.15.
[794] Kew, NA, Ref BT 255/929, Internal DTI minute from R. Morgan to Mr Pasha: Draft White Paper On BSC Strategy, 5th January 1973.
[795] Cmnd 5226, p.15.
[796] Ibid
[797] Kew, NA, Ref BT 255/929, Internal DTI minute from R. Morgan to Mr Pasha: Draft White Paper On BSC Strategy, 5th January 1973.
[798] Bryer et al, p.184.

Committing to Port Talbot's expansion and ending steelmaking at Shotton was too high a political price for the politicians to accept. During 1973 the Secretary of State advised Lord Melchett that the Government would delay Shotton's run down if recommended by the task force set up to examine the closure[799]. This would delay the start of the Port Talbot expansion. The 1973-74 oil price rise and subsequent recession undermined the White Paper's optimistic demand forecasts. It called into question the need for Port Talbot's expansion even with the closure of Shotton. Despite the delays in starting Port Talbot's expansion the increases in Llanwern and Ravenscraig's capacity went ahead. Not only was strip mill capacity being increased as demand fell but it was carried out at what BSC had perceived to be less favourable locations.

In 1972 a review of Port Talbot's plant requirements concluded that it was essential to improve ore handling facilities, increase sinter production and upgrade iron making still further[800]. Over the next few years investment was largely confined to these areas. During 1973 a third ore unloader was installed at Port Talbot Harbour and new stockyard facilities constructed for £7.5 million. By early 1975 the rail loading bunker complex for transporting ore to Llanwern was completed. In August 1973 construction of a new sinter plant designed to produce 76,000 tonnes/week of high grade sinter started. It cost £28.1 million. Due to a manning dispute it was not commissioned until the summer of 1978[801].

Further modifications to the blast furnaces were made. During 1973-74 Number 5 and Number 3 were relined and enlarged so that the former could produce 23,000 tonnes/week and the latter 12,000 tonnes/week. Number 1 was also relined and began its fifth, and last, campaign in August 1975[802]. Between mid 1975 and 1977

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[799] Kew, NA, Ref BT 255/929, Internal DTI minute from R. Mountfield to Mr Tucker, 26th January 1973.
[800] Brinn, p.20.
[801] Ibid. BSC *Annual Report and Accounts* 1975-76, p.14. Anon, 'BSC Modernisation Projects Reviewed–Part 2–Strip Mills Division–Port Talbot Division', *Steel Times*, February 1976, 122-126 (p.124). Ibid, 'BSC Modernisation Projects Reviewed–Part 2–Welsh Division', February 1977, 127-129, (p.127); 'BSC Modernisation Projects Reviewed–Part 2–Manufacturing Division–Welsh', February 1978, 170-203 (p.170). Anon. 'Brighter steel future for Port Talbot'. *PTG*, 1st June 1978, p.1.
[802] Anon. 'Target–shooters impress at Port Talbot'. *Steel News*, 27th September 1973, No102, p.3. Ibid, 'Up-Dated No5 On New Campaign'. 4th July 1974, No121, p.3. Brinn, p.20.

£13.6 million was spent on improving the raw materials handling system to support the new sinter plant and enlarged blast furnaces[803]. These improvements allowed output of approximately 2 million tons of steel during 1978-79 using three rather than four blast furnaces[804]. In February 1975 BSC announced a £70 million scheme for the construction of a new coke oven complex to be built in two phases. The first involved building 84 new 6 metre high coke ovens, a by-product plant and coal handling facilities to the south west of the steelworks. It was not part of the expansion but was intended to replace Margam Coke Ovens. The second phase involved building a new coal stockyard with a 700,000 tonne capacity[805]. The problem with these investments was that they were largely restricted to iron making, especially to support the conversion to BOS steelmaking. There was a lack of investment at the crucial value added rolling end at a time of increasing customer quality requirements, and quality issues resulted in loss of market share.

As already noted the linkage of the Port Talbot expansion to the end of steelmaking at Shotton caused BSC political problems. In May 1974 the new Labour Government's Secretary of State for Industry, Tony Benn, set up a committee headed by Lord Beswick to review BSC's entire closure programme[806]. The Beswick Report was published on 4th February 1975. It accepted BSC's closing date of 1975-1977 for Ebbw Vale but deferred the decision on Shotton[807]. BSC were clearly frustrated at not being given the Port Talbot go-ahead claiming that the features of Port Talbot and Shotton were separate issue[808].

Contrary to their claims, however, the Ten Year Development Strategy had linked Port Talbot and Shotton. BSC's frustration in failing to get approval for the expansion was apparent in correspondence with Beswick. Yet the Department of

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[803] Anon, 'BSC Modernisation Projects Reviewed', *Steel Times*, February 1977, 127-129 (p.127). Ibid, 'BSC Modernisation Projects Reviewed', February 1978, 170-203 (p.170).
[804] Anon, 'Dawn at Port Talbot Works', *Steel Times*, October 1979, 730-739 (p.730). CC Harris, *Redundancy and Recession in South Wales* (Oxford: Basil Blackwell, 1987), p.65.
[805] BSC, *Annual Report and Accounts 1974-75*, p.4, p.14. Brinn, pp.20-21. Anon, 'BSC Modernisation Projects Reviewed', *Steel Times*, February 1976, 122-126 (p.122, p.124). Ibid, 'BSC Modernisation Projects Reviewed', *Steel Times*, February 1977, 127-129 (p.129).
[806] Anon. 'Closure Review: Government's Plan'. *Steel News*, 6th June 1974, No119, p.1. Abromeit, p.134. Dudley and Richardson, p.75.
[807] Dudley and Richardson, p.78.
[808] BSC, *1975-76*, p.15.

Industry (DoI) and ministers complained about the time taken to get information from BSC on cash flow, market forecasts for hot rolled coil and other information to evaluate the development[809]. BSC also had to deal with the Shotton trade unions and local authorities attempting to retain steelmaking. It made the political price too high for the Government, particularly a Labour Government with a small majority, to sanction.

Even before the White Paper was published Flintshire County Council (FCC) had submitted a paper to the Prime Minister arguing for the retention of steelmaking at Shotton. The paper assumed that Shotton's hot strip mill would remain in production and be supplied with slabs from Redcar rather than Port Talbot. It argued that Shotton needed a new blast furnace, replacement of open-hearth furnaces with a BOS plant and a continuous casting plant to produce between 2-2½ million tons/annum at a somewhat unrealistically low cost of £50 million[810] (the Development Strategy claimed that £200 million was needed to modernise Shotton). In addition the ore port of Morpeth Dock would be enlarged to take 100,000 ton vessels[811]. FCC also argued that the £7-£10 million/annum cost of transporting slabs from Redcar or Port Talbot made production at what remained at Shotton to be uneconomical[812].

BSC never publicly responded to Flintshire County Council but Finniston in a confidential letter to Beswick stated that BSC were already planning to increase Port Talbot's capacity beyond 5.75 million tonnes/annum to 6.8 million tonnes[813]. Instead of adding a third vessel to the BOS plant, this involved building a second BOS plant with 2 converters. It was intended to exploit the advantages of Port Talbot's new blast furnace and to fully load its mills. This would further extend Port Talbot's cost advantages over Shotton.

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[809] Kew, NA, Ref BT 255/980, 'Port Talbot/Shotton', Internal DTI Minute from J.H. Pownall to Lord Beswick, 10th April 1975.
[810] Hawarden-Flintshire, County Record Office, Copy FC/13/15a, The Steel Industry Investment Programme–The British Steel Corporation Strip Mills Division, Shotton Group, Flintshire: Submission to the Prime Minister, 21st November 1972.
[811] Ibid, p.6.
[812] Ibid, p.15.
[813] Kew, NA, Ref BT 255/980, 'Port Talbot/Shotton Closure Review', Letter from BSC Chairman, Monty Finniston, to Lord Beswick, 31st January 1975.

In late 1974 Shotton's branch of the Steel Industry Management Association (SIMA) put forward a proposal to expand Shotton's capacity from 1.85 million tonnes/annum to 2.25 million tonnes/annum and Port Talbot's to 3.5 million tonnes/annum but without a second strip mill[814]. BSC responded that the second hot strip mill was needed on quality grounds particularly for the tinplate industry[815]. This was the first time that quality was used in BSC's arguments. Finniston further argued that retaining steelmaking at Shotton was not the most economic strategy for BSC[816]. BSC estimated that SIMA's proposals would cost nearly £10 million/annum more than expanding Port Talbot and ending steelmaking at Shotton. Finniston stated that Shotton's suggestion to develop Port Talbot to 6 million tonnes/annum but to produce blooms and billets would mean that Scunthorpe and Redcar's full potential would not be realised. He also claimed that the Shotton report failed to take account of Port Talbot's cost advantages in producing hot rolled coil for tinplate production. The figures that he produced are shown below :-

Table 9.1: Expanded Port Talbot and Shotton Production Costs[817]

	Port Talbot at 5.75 mtpa: Costs/Tonne	Shotton at 2.25 mtpa: Costs/Tonne
Cost of 2.05 mpta Hot Rolled Coil for Shotton	£80.73 (with transport)	£80.51 (with Port Talbot at 3.5 mtpa)
Cost of 2.85/2.75 mtpa other purposes	£76.88	n/a
Port Talbot At 3.5 mtpa	n/a	£81.63
Average	£78.51*	£81.15

* excluding £6.1 million closure costs

Finniston dismissed Clwyd County Council's (successor to Flintshire County Council) proposals to develop Shotton's ore port, Morpeth because :-

"Port Talbot would be very much cheaper-£1.83/tonne against £3.38/tonne[818]."

[814] Ibid, internal DTI Minute from J.H. Pownall to Lord Beswick, 10th April 1975.
[815] Ibid, Letter from BSC's Deputy Chairman, M. Littman, to Lord Beswick, 27th March 1975.
[816] Ibid, 'Final Shotton/TUCSICC Report', Letter from BSC Chairman, Monty Finniston to Lord Beswick, 23rd April 1975.
[817] Ibid
[818] Ibid, 'The Report on Shotton by Clwyd County Council', Letter from Monty Finniston, to Lord Beswick, 23rd May 1975.

Beswick acknowledged the value of BSC's comments on the need for a new strip mill to produce higher quality strip. Finniston correctly claimed that quality considerations were an increasingly important factor influencing BSC's competitive strength particularly with the automotive industry[819]. As tinplate was finished to one fifth the thickness of auto body sheet a high degree of strip mill sophistication was required. Although not all the quality problems originated in Port Talbot's strip mill, half of the technical difficulties did[820]. The new mill would improve product quality but not eliminate all defects. Finniston never mentioned improvements in quality by investment in the existing strip mill and Beswick never challenged him on this. Even with a second strip mill BSC would have faced a quality issue with the first mill. BSC were originally so focussed on increasing capacity that the developing problems with quality were overlooked until it became their major commercial problem. Ford (UK) refused to buy any strip products from BSC for use in certain outer car body parts as the steel was not continuously cast. Ford (Germany) refused to purchase any BSC strip until it was continuously cast. By 1977 BSC supplied only 46% of the British automotive industry's steel needs. Before 1974 it had supplied 80%. By improving quality through continuous casting it was hoped to regain at least 65% of the market[821].

Finniston was also aware that BSC's tinplate quality rating for surface quality and finish had fallen behind the German producers and concluded that BSC urgently needed to improve its strip mill quality standards. He claimed that installing the new strip mill at Port Talbot was essential to achieve that. Finniston was correct in highlighting the seriousness of the lack of quality but improvements could have been with the existing mill. By focussing exclusively on the new strip mill BSC failed to tackle their quality issues by the other means available and actually prolonged their commercial decline. Once BSC claimed that the new mill was essential on quality grounds it meant that they could not openly acknowledge that other means existed to improve quality without undercutting their own arguments for the expansion. Finniston's personality was a problem for BSC. A forceful and determined man he was not prepared to give ground over BSC's development strategy. He tenaciously

[819] Ibid, 'New Strip Mill', Letter from Monty Finniston, to Lord Beswick, 30th May 1975.
[820] Ibid
[821] Ibid, Ref BT255/987, Internal report, Department of Industry, 'Evaluation of BSC's Port Talbot Continuous Caster Investment Project', 1978, pp.2-4.

fought for it for too long resulting in BSC continuing to lose market share and remaining at loggerheads with the Government over it.

BSC clearly supplied information to the pressure groups in Port Talbot and the wider West Wales area to bolster their case for approval for the expansion. West Glamorgan County Council produced a paper in April 1975 which lent heavily on the original White Paper. It argued that the expansion would save £9-£10 million/annum and claimed that labour costs at Port Talbot were £40 million/annum. Labour costs to produce 3 million tonnes of liquid steel were £13 a tonne but to produce 6 million tonnes would be £7 a tonne. It acknowledged that other factors would reduce the overall savings to £1-50 a tonne[822].

A more detailed case for the Port Talbot development was put forward in September 1975 by the West Wales Steel Development Committee (WWSDC), a very broad organisation of local authorities, county councils, various trades councils, MPs and the Port Talbot Steelworks Development Committee (PTSDC). This stated that in the year to August 1975 the costs of the Port Talbot development had increased by £119 million to £550 million[823]. It specifically argued against the alternative strategies. Like Finniston it argued that only a second Port Talbot hot strip mill would meet the increasing tinplate quality requirements. It also claimed that on the cost per tonne of steel produced there was an advantage of £2.80/tonne in favour of the Port Talbot development over Shotton. This was similar to Finniston's figures (see table 9.1). Overall it claimed that the Port Talbot option would save BSC about £9 million/annum. It accepted that due to transport costs coil produced at Shotton would be 22p a tonne cheaper for use at Shotton (the same as in table 9.1). Like BSC it argued that this did not take into account the economies of scale generated by Port Talbot for the Tinplate Group. Similarly it argued that to expand Shotton to 2.25 tonnes/annum and Port Talbot to 3.5 million tonnes would create 2 sub-optimal sized plants which would become uneconomic. It also addressed the issue of maintaining Shotton and expanding Port Talbot. It concluded, correctly, that there

[822] Swansea, West Glamorgan County Council, *West Glamorgan's economy–the case for development of the Port Talbot Steelworks*, April 1975, pp.5-6.
[823] WWSDC, *The Case for an Integrated Steel Industry in West Wales*, West Wales Steel Development Committee, 1975, p.1.

was no market for the extra products[824]. Yet this is precisely what the Government would shortly give approval for. What is surprising in the debate over Shotton is that no one ever suggested building the proposed new Shotton strip steel colour coating complex at Port Talbot. This would have strengthened Port Talbot's advantages still further. The complex was built at Shotton.

Despite the arguments developed by Finniston, BSC and external evaluations Beswick concluded that there was a case for retaining steelmaking at Shotton[825]. The Government accepted this. BSC made a strategic mistake in initially linking the Port Talbot development and the closure of Shotton. They later tried, unsuccessfully, to separate the issues. Surprisingly, BSC did not raise the quality issue until relatively late and only then as a means of getting approval for the full development. By doing this they had boxed themselves into a corner and neglected improving quality by other means. The DTI undercut BSC's arguments for closing Shotton by claiming that its retention would allow BSC to meet likely demand for hot rolled coil in the early 1980s[826]. The significance of the campaign to retain steelmaking at Shotton is that it prevented the start of the Port Talbot development but did not prevent investment at Llanwern and Ravenscraig. BSC then faced the problem of modernised and expanded steelmaking capacity at Llanwern and Ravenscraig but with their most favourably located strip mill now technologically lagging behind.

As already noted the underpinning forecasts that justified Port Talbot's expansion never materialised. Yet it is unfair to totally write off the scheme. By the mid 2000s Port Talbot's capacity would increase to over 5 million tonnes/annum but at the cost of ending steelmaking at Ravenscraig and Llanwern as well as Shotton. In a sense Port Talbot now has a second strip mill but it is based at Llanwern. Closing one of the modern mills was never suggested at the time.

A major part of the reason why BSC took so long to conclude that demand had been permanently reduced was Monty Finniston's leadership. As late as July 1976 he

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[824] Ibid, pp.5-6.

[825] Dudley and Richardson, p.75.

[826] Kew, NA, Ref BT 255/980, internal DTI Minute from J.H. Pownall to Lord Beswick, 'Port Talbot/Shotton', 10th April 1975.

was still talking of the next steel boom despite evidence of falling demand[827]. Finniston had seen the success of the Japanese steel industry which had concentrated production at large coastal plants and believed that this was the way forward for BSC. He did not fully appreciate the differences between the expanding East Asian steel markets and the more mature European markets. As the ISTC leader, Bills Sirs, remarked he could be headstrong[828]. He made public statements about redundancies and publicly clashed with ministers which alienated his political support to such an extent that his contract was not renewed. Finniston was replaced as BSC Chairman by Charles Villiers in September 1976[829]. Initially Villiers' views differed little from Finniston's[830]. That would change.

(iv) From Expansion to Contraction: The 1977 Plan and its Aftermath

In March 1977 the Government finally announced that it had approved BSC's plan for Port Talbot's expansion at a cost of £835 million but was also retaining steelmaking at Shotton[831]. Even the Ten Year Development Strategy had recognised that demand would never justify both and BSC had, via the WWSDC, reaffirmed this view in 1975. Yet this is exactly what the Government now proposed. It appears that for reasons of political expediency the minority Labour Government was trying to shore up its core support at Shotton and Port Talbot. To increase Port Talbot's capacity to 6 million tonnes now required an additional blast furnace, a third BOS converter, a continuous caster with a second to be added later, a second strip mill and new coke ovens. The latter two would be paid for out of the £350 million preliminary allocation announced by the Secretary of State for Industry, Eric Varley, in July 1976[832]. Port Talbot's capacity would reach 4 million tonnes/annum by 1981-82 and 6 million tonnes by 1985-86 (see Appendix 29 for costings). The first phase would involve building a 10,000 tonne/day blast furnace and installation of the third BOS converter. The second phase would include further investment to support iron making, building a 1.45m wide strip mill, uprating the existing plant and installing the

[827] Dudley and Richardson, p.91.
[828] Bill Sirs, *Hard Labour* (London: Sidgwick and Jackson, 1985), p.64.
[829] Dudley and Richardson, pp.91-93.
[830] Ibid, p.96. Abromeit, p.135.
[831] Dudley and Richardson, p.96. Charles Villiers, Chairman's statement in BSC *Annual Report and Accounts 1976-77*, p.24. Breyer et al, p.172.
[832] *Hansard* (Commons). 1st July 1976, column 1284.

continuous casting plant[833]. To secure approval the local trade unions had given a commitment to achieve international manning levels and a productivity rate of 500 tonnes of liquid steel/employee[834]. This compared to current potential maximum output of about 250 tonnes/employee.

By the time that the Government approved its plans BSC fully recognised that there was no market for 6 million tonnes/annum of steel from Port Talbot and 1.85 million tonnes from Shotton. Demand did not exist to justify the expansion without other major closures. Villiers now accepted that previously forecast demand would never materialise. After years of pressure to get Government approval BSC now needed an excuse to cancel the expansion. Two weeks later they found that excuse when 520 electricians came out on unofficial strike over pay. A few days later BSC closed Port Talbot. Despite repeated appeals from the TUC to return to work the strike lasted for 11 weeks only ending in June 1977 at an estimated cost to BSC of £60 million[835]. On return to work BSC announced that because of the strike and lower demand the Port Talbot development had been deferred[836]. In reality it was a cancellation.

As for BSC's overall commercial performance the important year was 1974-75. BSC returned a £56 million profit but during the first half-year made a profit of £82 million before the position deteriorated because of the oil crisis[837]. Both the Strip Mill Division and Port Talbot operated profitably[838]. During 1974 BSC also had to deal with the effects of the miners strike. The Strip Mill Division, restricted to just 65% of normal production, was unable to fully satisfy home demand[839]. Following Britain's

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[833] Caroline Painter, 'Jubilation as steel boss announces £835n boost'. *PTG*, 24th March 1977, p.1. Kew, NA, Ref BT 255/980, 'Final Shotton/TUCSICC Report', Letter from Monty Finniston to Lord Beswick, 23rd April 1975. Ibid, internal DTI minute from S.J. Gross to Lord Beswick, 13th February 1975; 'Port Talbot/Shotton', Internal DTI Minute from J.H. Pownall to Lord Beswick, 10th April 1975.
[834] Painter, ibid.
[835] Dudley and Richardson, p.96.
[836] Ibid. Charles Villiers, Chairman's Review in BSC, *Annual Report and Accounts 1977-78*, p.3.
[837] BSC, *1974-75*, pp.3-5. Dudley and Richardson, p.80.
[838] Brinn, p.21.
[839] BSC, *Annual Report and Accounts 1973-74*, p.15. Great Britain. *British Steel Corporation: The Road to Viability*. (Cmnd 7149). London: HMSO, March 1978, pp.1-2.

1973 entry into the EEC customers turned to continental producers to guarantee steel supplies. BSC never fully recovered from these setbacks. Between 1970 and 1975 BSC's share of the home market declined from 70.4% to 54.1%[840].

By the beginning of 1975 BSC cut back strip mill production through lack of demand which directly affected Port Talbot. It was now clear that BSC had too many strip mills. BSC estimated that the 1970s miners strikes alone cost them 6% or one million tonnes of the home market[841]. Despite this BSC was unable to meet increased customer expectations on quality and reliability on delivery. This resulted in further loss of market share. BSC's main problem area was its strip mills which accounted for about two thirds its weekly losses. Finniston's focus on the development strategy to improve quality resulted in little other action being taken to address the problem. In effect BSC failed to build on, and fully exploit, the advantages of building Port Talbot's BOS plant and the harbour. To add further to BSC's problems in the year after the 1974 miners strike they suffered 109 internal disputes. One million tonnes of production was lost[842].

By April 1975 some BSC plants were working at just 50% of their capacity. BSC responded by announcing a 20,000 reduction in the workforce[843]. To improve productivity and reduce losses BSC reached three separate agreements with the unions between May 1975 and January 1976. In January 1976 BSC unilaterally suspended weekend working and threatened to end the guaranteed working week leading to an unofficial strike of 1,200 ISTC members and a complete shutdown of Port Talbot[844].

C.H. Osborne, 'The Operating Plan–Failures To Meet It Is A Matter Of Concern'. *Steel News*, 8th November 1973, No105, p.3.

[840] Pryke, pp.195-200.

[841] Anon. 'Coal Strike Warning'. *Steel News,* No309, 17th May 1984, p.1.

[842] Robert Scholey, 'Deeds Not Words', *Steel News*, 10th October 1974, No127, p.1. Ibid, 'Output Results Not Good Enough', 7th November 1974, No129, p.1.

[843] Dudley and Richardson, p.82.

[844] Anon. 'The Brutal Truth £4m A Week Loss'. *Steel News*, 10th July 1975, No145, p.1. BSC, *1975-6,* p.16. Reg Matthews, 'Steel Plant Shutdown: Stalemate Sets Town Worrying'. *PTG*, 16th January 1976, p.1. Dudley and Richardson, pp.85-87. Martin Upham, *Tempered Not Quenched–The History of the ISTC 1951-1997* (London: Lawrence and Wishart Limited, 1997), pp.106-108.

By mid 1975 steel production was running at about 17,000 tonnes/week (equivalent to just 884,000 tonnes/annum) compared to 40,000 tonnes/week several months earlier[845]. With so little production Port Talbot must have contributed substantially to BSC's losses. During 1975-76 BSC made a loss of £255 million with the Strip Mills Division contributing as much as £200 million[846]. Port Talbot's share of this was never published. In consequence, Port Talbot's electro-zinc line was closed[847]. These results clearly undermined Beswick's case for retaining steelmaking at Shotton.

During 1976 BSC attempted to introduce three separate sets of price increases but were unable to enforce them[848]. Even so, during 1976-77 BSC's losses fell to £95 million[849]. At this point the EEC intervened to create a more controlled European market by preventing external dumping, introducing controls on production and prices and an attempt to remove subsidies from 1st January 1978[850].

The period July-September 1977 was a turning point for BSC[851]. The International Monetary Fund imposed public spending cuts which reduced subsidies to the nationalised industries[852]. As a consequence BSC decided to "make a new assault on the 'Beswick' plants[853]." Works were picked off individually with attractive redundancy payments to soften the closure[854]. By March 1978 the only 'Beswick plant' remaining was Shotton.

Villiers described BSC's 1977-78 £443 million loss as totally unacceptable[855]. During 1978-79 BSC lost a further £309 million[856]. This was the only year that BSC

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845 Reg Matthews, 'Steel strikers want more money–not loss of jobs'. *PTG*, 27th June 1975, p.5.
846 BSC, *1975-76*, p.11.
847 Anon. 'Export Drive To Fill Gaps'. *Steel News*, 7th November 1975, No129, p.1.
848 Dudley and Richardson, p.94.
849 BSC, *1976-77*, p.6.
850 Dudley and Richardson, p.94.
851 Ibid, p.98.
852 Owen, p.138.
853 Dudley and Richardson, p.94.
854 Ibid, p.99. BSC, *1977-78*, p.28. Charles Villiers Chairman's Review in BSC *1977-78*, p.3. Ibid, *1978-79*, p.3.
855 BSC, *1977-78*, p.6, p.38. Robert Scholey, Chief Executive's Review of Operations in BSC, *1978-1979*, p.8. Charles Villiers, Chairman's Review in BSC, *1977-78*, p.2.

published sub-divisional financial Results. The position within the Welsh Division was :-

Table 9.2: BSC's Welsh Division Performances 1978-79[857]

Unit	Profit (Loss) (£ million)	(Loss)/Ingot Tonne (£ million)
Port Talbot	(30.1)	(14.4)
Llanwern	(30.7)	(17.3)
Shotton	(27.3)	(23.9)
APG	(10.2)	n/a
Tinplate	1.7	n/a
Total Welsh Division	**(96.6)**	**n/a**

Port Talbot's loss per ingot tonne produced was less than either Llanwern or Shotton. No equivalent figures were given for Ravenscraig but with £249 million being invested at Ravenscraig the entire Scottish Division produced just 1.3 million ingot tonnes and lost £83.0 million[858]. Ravenscraig must have produced less than 1.3 million tonnes, and must have been losing considerably more per tonne than the Welsh plants. The Welsh Division's performance resulted in action to reduce costs including 1,500 job losses at Port Talbot and Ebbw Vale[859].

Port Talbot's performance appeared to increase significantly in 1978-79. In one week in October 1978 Port Talbot produced 57,000 tonnes of ingots, the highest weekly figure for 5 years[860] suggesting that Port Talbot's performance and production had improved markedly since mid 1975. However, Ravenscraig was being modernised at this time and BSC were loading up Port Talbot with available orders. This highlighted Port Talbot's potential performance. But it was not a performance that could be maintained at lower levels of capacity utilisation once Ravenscraig's modernisation was completed.

[856] BSC, *Annual Report and Accounts 1978-79,* p.3, p.43. Charles Villiers, Chairman's Review in BSC, *1978-79,* p.3.
[857] BSC, ibid, p.26.
[858] Ibid, p.18.
[859] Ibid, p.27.
[860] BSC, *1978-79,* p.27.

In 1978 the Government produced a White Paper 'The Road to Viability' on BSC's medium and long-term prospects[861]. It recognised that globally steel demand had been greatly reduced and was unlikely to increase in the foreseeable future[862]. Consequently the UK no longer needed the steelmaking capacity in the Ten Year Development Strategy. It also recognised that the additional 5½ million tonnes of capacity about to come online at Ravenscraig and Redcar would simply add to BSC's overcapacity. BSC and the Government agreed that :-

1) *"the modernisation and expansion projects already approaching completion must be completed;*
2) *there must be continuing substantial investment to improve product quality and so ensure competitiveness in the 1980s;*
3) *there is no case at present for new starts on steelmaking capacity. Accordingly the proposed expansion at Port Talbot and the construction of electric arc plants at Shelton, Hunterston, and Ravenscraig should be deferred until demand forecasts improve sufficiently to justify their construction*[863]*."*

This confirmed BSC's decision to defer Port Talbot's expansion (in effect to cancel it). It concluded that BSC's capacity needed to be brought more inline with demand[864]. Giving evidence at the House of Commons in 1980, Villiers, who only a few years earlier had argued in favour of the Port Talbot development stated :-

"The investment planned for Port Talbot which was £850 million would have doubled the capacity of Port Talbot and heaven knows what we should have done with that[865]*."*

For the expansion to have made economic sense in a reduced market would have necessitated not only the closure of Shotton but also the closure of either Ravenscraig or Llanwern. This was never suggested at the time, though this was exactly what would happen in the 1990s and 2000s. The wrangling over Shotton prevented any substantial investment and improvements at Port Talbot which might have helped to retain market share. Thus BSC failed to fully capitalise on the

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[861] Great Britain. *British Steel Corporation: The Road to Viability.* (Cmnd 7149). London: HMSO, March 1978.
[862] Ibid, pp.2-3.
[863] Ibid
[864] Ibid, p.5.
[865] Charles Villiers. Evidence supplied to House of Commons Committee On Welsh Affairs, Port Talbot/Llanwern, 5th June 1980, House of Commons, p.458 para 1327.

investment in the BOS plant and the harbour. The blame for that rests with Finniston and his determination to push the Port Talbot development to the exclusion of all else. As a result of the modernisation and expansion of Ravenscraig, including a concast plant, Port Talbot fell behind technologically. The result was to distort the economics of BSC's strip mill operations until the 1990s.

Naturally there was great local disappointment over the cancellation with queries being raised over the long-term survival of Port Talbot Steelworks[866]. The local MP and Secretary of State for Wales, John Morris, under intense pressure, summed up the situation :-

"Of course we are disappointed that the time is not opportune for the full development at Port Talbot. The truth is that with world overcapacity no one in his senses would confidently invest in increased steelmaking capacity. Who wants to make Port Talbot produce steel that cannot be sold, and weigh it down with interest charges of servicing the cost of the investment?[867]*"*

Peter Allen, the Welsh Division's Managing Director, argued that without the 1977 electricians strike contracts would have been placed for at least £500 million[868]. This view was reiterated during the 1980 national steel strike by the Port Talbot Works Group Director, Brian Moffat[869]. Neither addressed the issue of what BSC would have done with the extra output. The 1977 strike simply gave management the excuse it needed to cancel the development.

Peter Ferguson, BSC's Welsh Division's Personnel Director, stated that the Government's decision to shelve the £835 million investment would inevitably lead to Port Talbot job losses[870], perhaps suggesting that BSC had been hoarding labour in anticipation of the expansion. He also stated that at Llanwern each employee produced approximately 300 tonnes/annum of liquid steel whereas at Port Talbot it was only 200 tonnes (see Appendix 28). Since output was similar and Port Talbot was losing less money per ingot tonne than Llanwern (see table 9.2) with lower

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[866] Anon. '£835 million blow to town's hopes'. *PTG*, 30th March 1978, p.1. Reg Matthews, 'Help us win steel fight Mr Morris'. *PTG*, 6th April 1978, p.1.
[867] John Morris, quoted in, 'Mr Morris hits at ridiculous criticisms'. *PTG*, 6th April 1978, p.1.
[868] Anon. 'Electrician's strike gets the blame'. *PTG*, 6th April 1978, p.3.
[869] Reg Matthews, 'Will there be a works to go back to?' *PTG*, 17th January 1980, p.1, p.3.
[870] Anon. 'Electrician's strike gets the blame'. *PTG*, 6th April 1978, p.3.

manning at Llanwern, this indicates the effect of other factors. This was the cost of transporting ore to Llanwern by rail from Port Talbot.

Ferguson's statement about redundancies at Port Talbot undercuts some of Breyer et al's widely quoted arguments for retaining steelmaking at Shotton. In their analysis they compared the capital costs for expanding Port Talbot and Shotton (as shown earlier Port Talbot was expected to undercut Shotton's operating costs by at least £1-50 per tonne of liquid steel). Their capital cost analysis includes Shotton's closure and redundancy costs in Port Talbot's capital costs but they failed to include any Port Talbot redundancy costs in Shotton's capital costs[871]. Thus their figures are distorted in favour of Shotton.

A reduction in Port Talbot's manning level was now inevitable. The unions accepted this but hoped that the reduction would be partly achieved through natural wastage and early retirement. The unions' manning agreements with management at the sinter plant and at the new concast plant already put 2,000 jobs at risk[872]. To ensure that every employee understood the seriousness of Port Talbot's situation an unprecedented communications exercise was run in October 1978. It emphasised that home demand for strip products was flat and BSC's share of that market was decreasing. Emphasis was placed on meeting customer quality and reliability requirements[873].

Superficially the decision to cancel the Port Talbot development appeared to be a disaster. Yet it was to be of long-term benefit to steelmaking in the area. Management now turned their attention to modernising the plant, manning levels and working practices within the existing capacity. These changes allowed a more cautious longer term expansion.

Unquestionably the most important investment decision at this time was the building of the continuous casting plant. The decision to build the concast plant was announced at the time the development scheme was cancelled in 1978. Full

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[871] Breyer et al, p.202.
[872] Anon. 'Brighter steel future for Port Talbot'. *PTG*, 1st June 1978, p.1.
[873] Ibid, 'Every steelman gets 'survival' message'. 19th October 1978, p.3.

authorisation came in January 1979[874]. It was intended to improve quality at a time when more customers were demanding only continuous cast sheet. Yet in 1978 only a third of production was planned to be continuously cast. Savings of £4 million/annum were expected but orders worth £18 million would be retained. The cost, along with some quality improvement plant (desulphurisation), was estimated to be £71.5 million at April 1978 prices or £92.7 million at outturn. BSC had obtained a commitment from the unions to man the plant to internationally competitive levels[875].

With continuous casting becoming crucial why was a second caster not built? The DoI claimed that as the costs outweighed the savings BSC saw no advantages in building a second concast machine[876]. Yet the plant had been designed to allow the installation of a second concaster. This might indicate a lack of funds and/or BSC wanting to gain local experience with continuous casting before installing a larger second concaster to eliminate the slabbing mill.

Other investments taking place in the late 1970s included the building of the new sinter plant, a major overhaul of Number 4 blast furnace, and investment in the cold mill to improve the quality of surface critical panels for the car industry. The latter included refurbishment of Number 2 pickle line, converting the 3 stand cold mill into a 4 stand cold mill and a new high speed side trim and coil inspection line[877]. The cold mill improvements were belated but important. Had they been made earlier less market share would have been lost especially to the car industry.

The investment during the late 1970s was intended to improve quality and reduce costs to retain and improve market share. It differed from the development strategy in that it was carried out within the existing capacity. BSC were beginning to address the deficiencies at its lowest cost strip mill. Yet it was done in such a way as to allow

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[874] BSC, *1978-79,* p.27.
[875] Kew, NA, Ref BT255/987, internal report, Department of Industry, 'Evaluation of BSC's Port Talbot Continuous Caster Investment Project', 1978, pp.2-3. Ibid, British Steel Corporation–Port Talbot Concaster. Minute from the Secretary of State at the DoI, Eric Varley, to the Chancellor of the Exchequer, 21st December 1978. Eric Varley, quoted in, '£835 million blow to town's hopes'. *PTG*, 30th March 1978, p.1.
[876] Kew, NA, ibid, 'Evaluation of BSC's Port Talbot Continuous Caster Investment Project', Internal report, Department of Industry, 1978.
[877] BSC, *1977-78,* p.25, p.31. Ibid, *1978-79,* p.27. Anon, 'Dawn at Port Talbot Works', *Steel Times,* October 1979, 730-739 (p.730).

later increases in capacity. The September 1978 photo below shows Port Talbot and its relationship with the harbour (the BOS plant is to the right of the cooling tower) :-

BSC clearly saw a future for Port Talbot but felt that it was overmanned. During 1975 Chief Executive, Bob Scholey, claimed that it was grossly overmanned and everyone recognised it[878]. With the financial pressures mounting after 1974 it is surprising that BSC did not address this problem more robustly. Between 1967 and 1978 there were apparently some major strides in reducing manning. Manning fell from 15,531 at the end of 1968 to 12,537 at the end of 1978 i.e. a reduction of 2,994 or 23.9% (see Appendix 28). Yet the closure of the VLN Plant in July 1969 and the Abbey Melting Shop in November 1970 resulted in 2,247 job losses[879]. Elsewhere there were only 727 job losses over an eleven year period. Most of these came during 1975-1977. A number of factors contributed to this slow pace. The proposed expansion was not finally cancelled until 1977. Therefore it made sense for BSC to retain trained workers. It is generally accepted that the unions were in a strong

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[878] Reg Matthews. 'Anxious Times Ahead For Steel Plant Men'. *PTG*, 29th August 1975, p.3.
[879] BSC, *1968-69*, p.21. Ibid, *1970-71*, p.26, p.40.

position. Yet as will be shown the unions, particularly the ISTC, were remarkably compliant when major job cuts occurred. They turned their attention to maximising compensation rather than fighting the cuts. For most of the 1970s, like in the 1950s, management were hoarding labour for future expansion. With its cancellation management's attitudes changed. At a meeting with the DoI in December 1978 Works Director, Brian Moffat, stated that in December 1977 Port Talbot employed 12,563. By the end of the 1978-79 financial year they hoped to reduce this to 12,000. Eventually they hoped to achieve an output of 285 liquid tonnes/employee/annum with a workforce of 11,200. He also remarked that engineering services in overseas plants were provided by sub-contractors but at Port Talbot were provided in-house as the unions opposed outsourcing[880]. Outsourcing was clearly being considered by management.

The 1970s were difficult years for the British and global steel industries. As a result of the oil crisis and its aftermath forecast growth in demand failed to materialise at a time when global steelmaking capacity was expanding which resulted in global surplus capacity. BSC also had to deal with the effects of the miners strikes and the opening up of the home market to continental competition after Britain entered Europe. These pressures exposed the industry's structural problem of too many steelmaking sites of sub-optimal size, particularly in strip mills. It was during this period that the full effects of the decisions of the 1950s were felt. BSC entered the period with five strip mills but still had four at the end.

Linking the Port Talbot expansion to ending steelmaking at Shotton was a mistake that dominated much of this period. It stifled investment and development at Port Talbot and resulted in loss of market share. After converting steelmaking to the BOS process and building the harbour the key question was how to fully exploit these advantages, but the wrangling over Shotton prevented BSC exploiting these advantages. A more flexible approach to expansion might have allowed investment at Port Talbot to improve quality and efficiency to retain more market share. BSC, and particularly Monty Finniston, simply ignored the mounting available evidence that the market did not exist for their expansion in strip mill output. Linking Port

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[880] Kew, NA, Ref BT255/987, Meeting notes between BSC and DoI re Port Talbot Continuous Caster Project, 12th December 1978, p.2.

Talbot with the Shotton closure ensured that BSC could not expand Port Talbot but could, and did, expand Llanwern and Ravenscraig. It resulted in expansion and modernisation at higher cost sites. In that sense the economics of steelmaking were distorted. Once the expansion was abandoned BSC belatedly turned their attention to addressing Port Talbot's quality and efficiency issues. Despite Port Talbot's shortcomings in the late 1970s an internal DoI minute reveals that if BSC had to close a modern plant they would prefer to sacrifice Llanwern rather than Port Talbot[881].

[881] Ibid, Port Talbot Concaster, internal Department of Industry minute from S.J. Gross to the Secretary of State, 19th December 1978.

Chapter 10: The National Steel Strike, Slimline and the Struggle for Survival 1979-1981

Port Talbot was restructured following the election of the Conservative Government in May 1979. The new Government, as part of its effort to privatise the steel industry, attempted to make the industry financially viable and imposed large manning reductions on BSC. Since BSC's main problem area was its strip mills, Port Talbot was a prime target. It resulted in manning reductions, the end of restrictive practices, a switch to flexible working and outsourcing. The local restructuring developed into an ongoing process rather than being a one off exercise. The required changes initially took local management by surprise and resulted in a rushed process. It met the demands of the politicians but it also bought time to develop a more considered longer term commercial strategy.

One aspect of these events was a shift in production from the South Wales strip mills to Ravenscraig, but this proved to be only a short-term measure to retain market share because only Ravenscraig had an operational concast plant. Once manning levels had been reduced and Port Talbot's concaster was commissioned production moved back to South Wales. The 1980-81 Corporate Plan followed this period of upheaval and was intended to introduce a more commercial approach to production.

BSC lost £309 million during 1978-79 based upon sales of 12.5 million tonnes[882] (see Appendix 27). In the following year BSC retained just 54% of the home market[883]. During 1978-79 Cardiff East Moors closed totally, whilst steelmaking and hot rolling was ended at Ebbw Vale, Shelton and Glengarnock[884]. The Welsh Division produced 5.2 million tonnes of liquid steel and lost £96.6 million with production being adversely affected by a haulage strike in January 1979[885]. Employment fell from 53,950 in 1977-78 to 48,400 in March 1979, with plant closures accounting for 4,600 or 83% of the reduction[886]. Both quality and delivery performance improved steadily during 1978-79, notably as a result of collaboration

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882 Charles Villiers, Chairman's Review in BSC, *1978-79*, p.3.
883 Ibid, *1979-80*, p.4.
884 Ibid, *1978-79*, p.3.
885 BSC, *1978-79*, p.27, p.33.
886 Ibid, pp.26-27.

with the automotive manufacturers to develop lighter and more corrosion resistant steel sheet[887].

During 1978-79 Port Talbot lost £30.1 million or £14.4 per ingot tonne[888]. Even during these difficult years considerable investment was undertaken at Port Talbot but without expanding its 3.25 million tonne capacity. On 19th January 1979 approval was received to install the twin-strand curved mould continuous slab casting machine. This was essential for the long-term future of steelmaking at Port Talbot and without a concast plant steelmaking at Port Talbot would probably have ended. However, as significant as this investment was there was an element of 'catch up' to make up for the lack of investment during the 1970s due to the controversy over the development strategy. Construction of the new Morfa coke ovens and coal handling plant continued during 1979-80 which were built to receive imported coal from the harbour by way of a 1¾ mile long conveyor and indigenous coal from nearby tipplers[889]. A new cold mill pickling line was under construction and another was being planned. To increase both quality and gauge demands the 3 stand cold mill underwent conversion to 4 stand and the entry end of the 5-stand mill was remodelled in June 1979 to handle larger coils. To boost the power supply a new power plant was built to replace the existing Margam 'A' power station[890]. In June 1978 the new sinter plant was finally commissioned. By December it had produced one million tons of high grade sinter. In the autumn of 1978 Number 4 blast furnace was relit after a reline and reached its planned output within eight weeks. In January 1979 Number 5 produced its ten thousandth cast of the campaign and a Port Talbot campaign record of 3.8 million tons. In April 1979 Number 4 achieved a new monthly fuel rate of 495 Kg/tonne, the lowest of any British blast furnace.

During November 1978 production at the strip mill was the highest for four years and it also reached its 50 millionth ton of output. Works Director, Brian Moffat, claimed

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[887] Ibid, p.27, p.33.
[888] Ibid, p.26.
[889] Kew, NA, Ref BT 255/988, S.J. Gross's notes of visit to Port Talbot on 20th August 1979. Anon, 'Review of BSC Modernisation Projects', *Steel Times*, January 1980, 21-64 (p.54).
[890] Anon, 'Review of BSC Modernisation Projects' pp.54-57. Anon, 'Dawn at Port Talbot' (pp.731-732).

that the strip mill was performing better than ever and meeting rigorous and demanding quality standards[891]. Yet on 20th August 1979, Moffat privately admitted that Port Talbot was not meeting customers' higher quality specifications[892]. He hoped that by adding a 7th stand to the strip mill its life would be extended by 15-20 years. What local senior management were saying in public and private was different. They were aware that some form of strip mill rationalisation was likely soon and they needed both to push for modernising investment and present a positive image of achievement at the same time.

During 1978-79 there was much talk of a 'new dawn' at Port Talbot :-

"……there are many on-going development plans at Port Talbot and a full order book for many months ahead is reported by the company. There are encouraging signs that business is steadily building up[893]."

It was claimed that since the autumn of 1978 all personnel were prepared for the 'Customer Campaign' quality and sales drive, and local efforts were being made to become more commercially minded. As noted earlier the trade unions had agreed to reduce manning at Port Talbot to international competitive levels. During 1978-79 various production records were set throughout the steelworks and harbour[894]. However, as has been shown, BSC were loading Port Talbot up with available orders while Ravenscraig was being modernised. Thus Port Talbot's improved performance was somewhat false. Port Talbot and Ravenscraig were developing an awkward relationship. Each performed better when the other was constrained. Although ultimately they were competitors, at times of modernisation BSC still needed both plants to maintain output.

(i) 'The Return to Financial Viability'

To address BSC's financial performance the Labour Government had initiated a rationalisation programme which developed into 'The Radical Review'[895]. This was rejected by the new Conservative Secretary of State for Industry, Sir Keith Joseph,

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[891] Anon, 'Dawn at Port Talbot Works' (pp.730-731).
[892] Kew, NA, Ref BT 255/988, S.J. Gross's notes.
[893] Anon, 'Dawn at Port Talbot Works', (p.730).
[894] Ibid. BSC, *1978-79*, p.27.
[895] C.C. Harris, p.67. Fevre, *Wales Is Closed*, p.27.

as not being radical enough. He insisted on BSC's workforce of 186,000 being reduced by 52,000. This was the basis for BSC's 'The Return to Financial Viability'. BSC's Chief Executive, Bob Scholey, presented it to the board on 10th December 1979 as a business proposal for 1980-81[896]. Thus the forthcoming radical changes were being driven by the politicians. The national unions had accepted the closures that had taken place as the local workforces had accepted them with the aid of large redundancy payments. For several years BSC was highly successful in this approach to closures[897]. 'The Return to Financial Viability' in effect became the blueprint for the future of BSC. For 1980-81 it forecast further falls in UK output of cars, mechanical engineering and other metal using industries and no change in the medium term. It estimated that UK liquid steel demand during 1980-81 would be between 14-14½ million tonnes with flat or declining demand beyond that[898]. BSC estimated that their home market prices were unsustainably about 15% above average EEC prices. They hoped to capture just 56% of the home market with a realistic sales forecast for 1980-81 of 11.2 million tonnes (9.5 million tonnes for the home market and 1.7 million tonnes of exports).

Table 10.1: BSC Forecast 1980-81 Sales by Product Group (million tonnes)[899]

	Home Sales	Export Sales	Total Sales
BBR	2.5	0.5	3.0
Sections	1.2	0.4	1.6
Plates	0.8	negligible	0.8
Strip	2.6	-	2.6
Narrow Strip	0.4	negligible	0.4
Tubes	0.6	0.3	0.9
Tinplate	0.9	0.3	1.2
Other	0.5	0.2	0.7
Total	**9.5**	**1.7**	**11.2**

As a consequence BSC proposed to reduce manned capacity to about 15 million tonnes of liquid steel[900] as shown below :-

896 ISTC, *New Deal For Steel–How British Steel could cut prices, halt closures, make profits and grow. An alternative strategy from the main steel unions;* including BSC's *The Return to Financial Viability–A Business Proposal For 1980-81* (London: Iron and Steel Trades Confederation, 1980), pp.98-153 (henceforth ISTC, 1980). Charles Villiers, Chairman's Review in BSC, *1979-80*, p.2.
897 Dudley and Richardson, p.106, p.115.
898 ISTC, *New Deal*, p.95, and *The Return to Financial Viability*, pp.101-102.
899 *The Return to Financial Viability*, p.103.

Table 10.2: BSC Planned Manned Steelmaking Capacity: January 1981[901]

Steelworks/Area	Capacity (million tonnes)
Ravenscraig	2.1
Sheffield	3.4
Lackenby	3.6
South Wales	2.7
Scunthorpe	3.1
Clydesdale	0.3
Total	**15.2**

BSC were seeking to bring production in line with likely demand. They were abandoning export markets where they could not recover production costs. BSC now openly acknowledged that Britain's steel demand was permanently lower and unlikely to recover. Yet it was the politicians who were forcing this agenda, speeding up the closure programme and forcing manning reductions at the remaining works.

Surprisingly both Labour and Conservative Governments took a similar approach to BSC. Both accepted that demand had been permanently reduced and both unrealistically expected BSC to breakeven by March 1980, primarily by concentrating production at the more modern and efficient plants. Where the two Governments differed was in the closure timeframe. The Labour Government was prepared to accept a longer timeframe to get union agreement. The Conservatives speeded up the closure process and imposed manning reductions. Even so, in reality the Conservative Government ended up propping up BSC with funds on an unprecedented scale throughout the early 1980s[902].

BSC aimed to cut capacity in such a way as to allow limited future expansion and began to develop their own agenda separate from the Government. To produce the planned reduced tonnage BSC considered the following factors :-

i) The market and product requirements.
ii) The plant facilities taking into account :-
    the benefits from recent developments;
    the age of existing facilities and the need for maintenance capital;

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[900] Great Britain. House of Commons Papers. Parliamentary Papers Session 9th May 1979 to 13th November 1980. The Committee on Welsh Affairs, 720-731 pp.415-479 No46. 5th June 1980, p.417 (henceforth HoC, 1980). Dudley and Richardson, p.102.
[901] *The Return to Financial Viability*, p.114.
[902] Dudley and Richardson, p.110.

the ability to be able to respond to upward or downward changes in demand; and

the need not to prejudice possible longer term developments.

iii) The overall production costs-present and projected [903].

BSC was under pressure to quickly push through its rationalisation programme. In July 1979 BSC announced the end of steelmaking at Shotton and Corby. This involved the loss of approximately 6,420 and 5,500 jobs respectively[904]. These job losses went part of the way towards meeting the Government's workforce reduction target of 52,000, but to reach the target the workforce at other plants, including Port Talbot, needed to be reduced.

BSC envisaged strip mill production continuing at Ravenscraig and their 'South Wales Option' i.e. Port Talbot and Llanwern (see Appendix 31). They recognised that retaining steelmaking at both South Wales plants was more expensive than closing one of them by up to £15 million/annum[905]. This was partly offset by the potential for higher sales and reduced production costs of £13 million/annum from the introduction of continuous casting at Port Talbot. By not going for the cheapest option and keeping both South Wales strip mills BSC were retaining spare capacity. This gave them a future option of closing the badly located Ravenscraig. It is evident that BSC were looking beyond the immediate crisis. Crucially, available investment was being directed towards Port Talbot to improve quality and to reduce production costs despite management's claims of possible closure.

Steelmaking costs at Ravenscraig were higher than at the South Wales strip mills. During 1978-79 losses at Ravenscraig were estimated to be £60 million when those at Port Talbot were £30.1 million and Llanwern £30.7 million[906]. Why then was BSC loading up a less efficient steelworks? Ravenscraig was the only strip mill with an operational concast plant at a time when a growing number of customers would only accept concast steel[907]. Therefore BSC was loading up Ravenscraig to retain

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[903] *The Return to Financial Viability*, p.104.
[904] Dudley and Richardson, p.106.
[905] *The Return to Financial Viability*, p.113.
[906] M. Hughes, Losses in steelmaking. *Financial Times*, 5th September 1979, p.1. BSC, 1978-79, p.26.
[907] Robert Scholey, Evidence supplied by BSC's Chief Executive to the Committee on Welsh Affairs, Port Talbot/Llanwern, 5th June 1980, House of Commons, p.451, p.456.

market share, but this would only be a short-term arrangement. The problem was that BSC had modernised and enlarged its least economic strip mill. They had started with Ravenscraig ahead of Port Talbot because the latter was embroiled in the political dispute over Shotton's closure. The result was that in the short-term Ravenscraig's concast plant was essential to retain market share.

Why then was Ravenscraig's output to be restricted to 2.1 million tonnes? This was the maximum output that could be produced on a two blast furnace operation. It was sufficient to exploit the benefits of the concast plant and was close to Ravenscraig's breakeven point[908]. Planned output from the strip mills was :-

Table 10.3: Planned Annualised Liquid Steel Output 1979–1981 (million tonnes)[909]

	1979-80 Q4	1980-81 Q1	1980-81 Q2	1980-81 Q3	1980-81 Q4
Ravenscraig	2.0	2.1	2.1	2.1	2.1
Llanwern	2.3	2.3	2.7*	2.7*	2.7*
Port Talbot	2.3	2.7			
Shotton	0.4	-	-	-	-
Total	**7.0**	**7.1**	**4.7**	**4.7**	**4.7**

* Combined Port Talbot and Llanwern output

Strip mill sales for 1980-81 were forecast at 3.8 million tonnes distributed as shown :-

Table 10.4: Planned Allocation of Strip Mill Saleable Production 1980-81[910]

Steelworks	**(million tonnes)**
Llanwern	1.2
Port Talbot	1.1
Welsh Division	***2.3***
Ravenscraig	1.5
Total	**3.8**

During this phase, Ravenscraig would deliver 737,000 tonnes of hot rolled coil for finishing at the following Welsh locations :-

[908] Ibid, p.454. *The Return to Financial Viability*, p.118.
[909] *The Return to Financial Viability*, p.120.
[910] HoC, 1980, p.427.

Table 10.5: Welsh Destinations of Ravenscraig's Hot Rolled Coil (tonnes)[911]

Destination	Tonnage
Shotton	454,000
Tinplate	207,000
Electricals	76,000
Total	**737,000**

As noted earlier the above shows that a significant proportion of Shotton's feedstock would come from Ravenscraig not Port Talbot. BSC were also proposing to transport over 200,000 tonnes of steel from Scotland to their South Wales tinplate works. This could not be economically viable in the long-term. BSC in the short-term were loading up a modernised Ravenscraig to fully exploit their recent investment in its concast plant. Internally the DoI stated that larger savings could be obtained from the complete closure of one plant or partial closures in South Wales rather than retaining both South Wales steelworks[912]. Yet BSC turned down these options. By retaining 3 strip mills it allowed time for them to modernise their better located South Wales steelworks before relocating production.

BSC had embarked on a major plant closure programme and had political support for the closures. This was a suitable time to close one of the strip mills, but they chose not to for good commercial reasons. In the short-term, Ravenscraig was a valuable asset even though BSC believed that in the long-term the soundest location for its rationalised strip mill output was South Wales. Within a couple of years Ravenscraig's advantages had evaporated and BSC were calling for Ravenscraig's closure. By this time they had an operational concast plant at Port Talbot, reduced manning levels and new working practices in South Wales though they lacked the necessary political support for Ravenscraig's closure. However, BSC were able to load the South Wales plants with increased orders and pursue their own long-term strategy independently of the politicians. This did not yield the most savings in the short-term but would in the longer-term.

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911 Ibid

912 Kew, NA, Ref BT 255/988, Demanning At Port Talbot, internal DoI paper by S.J. Gross, 1980,

As already noted earlier to get the concast plant the Port Talbot unions had agreed to reduce manning to internationally competitive levels. Manning reductions were therefore inevitable. During 1978-79 BSC announced that 1,500 jobs would go at Port Talbot and Ebbw Vale[913]. At Port Talbot 1,000 management and white collar jobs would go during 1979-80 under the 'Fixed Cost Reduction Scheme' and 200 craft jobs under the 'Group Working Practices Agreement'[914]. These jobs would go through natural wastage. As Fevre notes, this was a continuation of the process of 'paring away' that had been underway since 1976[915]. By September 1979 negotiations with the unions were completed.

Until December 1979 local management were planning to increase Port Talbot's 1980 production from 2.3 million tonnes to 2.7 million tonnes with a workforce of 11,250[916]. By this time 'The Return to Financial Viability' had specified that instead of 4.6 million tonnes to be produced in South Wales only 2.7 million tonnes would be produced though it was not publicly specified where the 2.7 million tonnes would be produced[917]. BSC considered 4 options for South Wales[918] :-

1 Retain Port Talbot with a reduced workforce to undertake all steelmaking and rolling with Llanwern closing.
2 'Slimline' where both plants were to maintain reduced steelmaking and rolling with reduced workforces.
3 The 'dog-leg' where Port Talbot would lose all rolling activities but produce all the steel to the slab stage and Llanwern would undertake all rolling but no steelmaking.
4 Port Talbot would close and all production would be concentrated at Llanwern.

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913 BSC, *1978-79*, p.27.
914 Anon. '1,000 Steel Jobs To Go'. *PTG*, 8th March 1979, p.1. Fevre, *Wales Is Closed*, p.26.
915 *PTG*, ibid, Fevre, ibid.
916 Fevre, ibid, p.37.
917 Ibid, p.27. Peter Allen, Statement By Managing Director Of BSC's Welsh Division, December 1979, as contained in evidence given to the House of Commons Committee on Welsh Affairs, 3rd June 1980, pp.424-425.
918 Allen ibid. Fevre ibid. SCORPISW, *South Wales and The 1980 Steel Crisis–An Impact Study and Action Proposals*, Standing Conference On Regional Policy in South Wales, 1980, p.5.

Only in November 1979 was Port Talbot's Works Director, Brian Moffat, informed of the four alternatives. Moffat asked Port Talbot's management committee to produce a plan for the Slimline option whereby both Llanwern and Port Talbot would each produce 1.4 million tonnes. He felt that this was the only realistic option although he unsuccessfully argued for the closure of Llanwern and the concentration of operations at Port Talbot[919]. The Welsh Division's Managing Director, Peter Allen, decided to go with Slimline. BSC's board approved the decision on 17th January 1980. The advantage of this option to BSC was that it allowed future production increases at both South Wales steelworks[920]. It also kept BSC's options open.

The differing interests of BSC's different managerial levels emerged at this time. At the local level it often produced Works Directors who showed an immense loyalty to their works. At Ebbw Vale, Works Director, John Powell, attempted to retain steelmaking by regularly publishing new production records through the 'creative use' of statistics[921]. During this period the local press often recorded new Port Talbot production records. Local management were no doubt feeding information to the press and putting a positive spin on performance. When the closure of Consett Steelworks was announced on 27th November 1979 the Consett Works Director was moved to Teesside. It was claimed that he was the one man in management *"who would have fought like hell to keep the Works open[922]."* Moffat followed this pattern in arguing to concentrate South Wales production at Port Talbot. A consequence of BSC's managerial structure was a divergence of interest and tension between the local senior management and BSC's higher management. Local management often aligned themselves with the workforce where their interests coincided. Regional management often aligned themselves with National Management. In the end that alliance of interests was too powerful for local management to resist.

Slimline's implications for Port Talbot were worked out in December 1979. Each manager was asked how many jobs they could lose if production was cut from 2.3 to

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919 Fevre ibid.
920 Ibid, pp.28-29. BSC, *1979-80*, p.17. HoC, 1980, p.419. Sirs, p.115. Upham, *Tempered Not Quenched*, p.150.
921 Patrick Hannan, *The Welsh Illusion* (Bridgend: Wales Press Ltd, 1999), p.71.
922 Tommy Moore, *The People's History–Consett–A Commemoration of the Works* (Seaham: The People's History Ltd, 2000), p.101.

1.4 million tonnes. Each job loss had to be approved by the Works Director[923]. They arrived at an authorised manning level of 5,701 to be implemented by March 1981[924]. Current manning was 12,415 (see Appendices 32a-d).

As already noted, retaining steelmaking and rolling at Port Talbot and Llanwern was not the most efficient option in the short term. Port Talbot could have produced 2.7 million tonnes with a workforce of 7,000 i.e. an output of 386 tonnes/employee/annum. Retaining Port Talbot and Llanwern with a combined workforce of 10,600 resulted in output of 255 tonnes/employee/annum. BSC also incurred greater fixed costs. Why then did BSC decide upon this option? It certainly met BSC's requirements to reduce manning levels[925], but it was not the most productive option. As already shown the explanation lies with Ravenscraig and its operational concast plant. Until Port Talbot's concast plant started production, Ravenscraig was the only strip mill with a concast plant and loading the Ravenscraig concast plant was a way to retain market share. It also allowed time for the lower cost plants in South Wales to reduce production costs and to be modernised. Once that had been achieved, if demand had not increased (and BSC did not believe that it would) then one plant would be vulnerable. As Ravenscraig was locationally the least cost effective it would be the most vulnerable and its closure and the retention of steelmaking and rolling at Port Talbot and Llanwern would in the longer-term be the most effective way to reduce BSC's cost base for strip mill products.

(ii) Industrial conflict at Port Talbot and the 1980 Steel Strike

Prior to Slimline during the autumn of 1979 BSC returned to the unions with proposals for a further reduction of 1,800 jobs at Port Talbot[926]. This would reduce manning to about 9,000 by March 1980. Of the already 1,200 agreed job losses only 500 redundancies had taken place by November 1979. Moffat warned the unions that Port Talbot was still losing money and that the threat of closure hung over any works not showing a profit by March 1980[927]. He stated that it cost more to make a tonne of steel at Port Talbot than at Llanwern, Lackenby or at Ravenscraig. This

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[923] Fevre, *Wales is Closed*, p.28.
[924] HoC, 1980, p.431.
[925] Fevre, *Wales is Closed*, p.29.
[926] Ibid
[927] Norman Denby, '3000 Margam Jobs To Go By March'. *SWEP*, 22nd November 1979, p.1.

claim for Llanwern and Ravenscraig probably relied on some ‘creative accounting’ such as disregarding transport costs since during 1978-79 Llanwern and Ravenscraig both lost more per tonne than Port Talbot but it was a way of pressurising the local unions to accept further job losses.

The additional Port Talbot job losses were :-

Table 10.6: Proposed Additional Port Talbot Job Losses Autumn 1979[928]

Department	**Jobs Losses**
Coke and Iron Departments	319
Steel and Slabbing	169
Hot Rolled Departments	130
Cold Rolled Areas	289
Engineering	629
Operations	133
Personnel	104
Accountants	20
Janitors	100
Miscellaneous	200
Total	**2,093**

The reaction of the unions was surprisingly mixed. A minority of officials agreed to go along with these additional job losses. However, a majority said that without guarantees of no further cutbacks they would fight them[929].

BSC lost £145.6 million in the half year to September 1979 with Port Talbot losing £2.1 million and Llanwern £8.9 million[930], appearing to contradict what Moffat stated about it being cheaper to make a tonne of steel at Llanwern. The local press reported that in the last quarter before the 1980 strike that Port Talbot broke even with Llanwern almost breaking even[931]. In August 1979 Brian Moffat privately stated that in the first quarter of 1979-80 that Port Talbot had operated in the black and was

[928] Ibid
[929] Ibid
[930] Ibid, Margam Fears More Job Gloom. 30th November 1979, p.1. W.J. Harris, ‘Fair deal urged for steel plant’. Letter published in *PTG*, 10th January 1980, p.5. Elwyn Williams, quoted in, ‘Mayor feels dismay and bitterness’. *PTG*, 24th January 1980, p.1.
[931] Elwyn Williams, ibid. John Carberry, quoted in ‘Angry Steelmen will ignore BSC slim-down plan’, by Reg Matthews, *PTG*, 24th January 1980, p.1.

expected to operate profitably during 1980-81[932]. However, this was at a time when Ravenscraig was not working to its full capacity and BSC was loading up the South Wales plants with the available orders.

Throughout the second half of 1979 concerns grew in Port Talbot about job losses and even possibly closure[933]. In December 1979 concerns were expressed by local MPs as the scale of job losses emerged. Yet at the same time a £2.4 million contract was awarded for a water treatment plant at the concast plant[934]. It will also be remembered that in December 1978 the DoI noted that BSC would prefer to close Llanwern rather than Port Talbot if a South Wales mill were to close[935]. This evidence, both public and private, indicates that BSC did not seriously intend to close Port Talbot. It was part of their tactics to get the workforce to accept major manning reductions and changes in working practices.

After the Conservatives returned to power in May 1979 Margaret Thatcher stated that the Government was prepared to fund BSC's investment and redundancy programme in the short-term. They would not fund losses which arose from excessive wage costs unearned from higher productivity. If necessary they were prepared for a strike[936]. In September 1979 Villiers warned Keith Joseph that wage restraint at a time of works closures and redundancies could result in a national steel strike. He later stated that the huge adjustments in working practices necessary for the very survival of BSC made a strike virtually unavoidable[937]. Keith Joseph informed the Prime Minister on 6th December 1979 that BSC, with half year losses of £145.6 million, had abandoned its March 1980 breakeven target. As such there would be no general wage increase from 1st January 1980 apart from the

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932 Kew, NA, Ref BT 255/988, S.J. Gross's notes of visit to Port Talbot, 20th August 1979, p.1.
933 Norman Denby, 'Margam Fears More Job Gloom'. *SWEP*, 30th November 1979, p.1.
934 Paul Chambert, 'MP Demands Answers On Steel Crisis'. *SWEP*, 1st December 1979, p.1. Anon. 'MPs call on Govt to save 'steelworkers''. *SWEP*, 3rd December 1979, p.1.
935 Kew, NA, Ref BT255/987, Port Talbot Concaster, internal DoI minute from S.J. Gross to the Secretary of State, 19th December 1978.
936 Margaret Thatcher, *The Downing Street Years* (New York: Harper Collins, 1993), p.93, p.108, p.109.
937 Villiers, in BSC, *1979-80*, p.3.

consolidation of certain additional increases of 2%[938]. BSC moved to a 'nothing for nothing' principle in wage negotiations and to locally negotiated productivity deals.

After negotiations with the unions broke down on 7th December 1979 the ISTC executive council instructed their members at all BSC plants to strike from 2nd January 1980[939]. All South Wales delegates had voted against strike action[940]. On 21st December 1979 the NUB gave notice to strike from the same date[941]. On 2nd January 1980 the 92 day national steel strike started[942].

In early March 1980 BSC organised a national ballot of all employees. Their final offer was 14.4% with the opportunity to locally negotiate further increases to 18-21%[943]. The unions advised members not to take part. The result was that 56% of employees either voted against or refused to vote[944]. On 18th March the executives of the ISTC and NUB decided to seek third party intervention if further talks failed. When these talks failed the unions sought a meeting with the Industry Minister, Jim Prior. He reiterated that the Government did not wish to intervene but suggested a Committee of Inquiry. It recommended an 11% increase across the board plus 4% from local productivity plans making 15.95% in total. On 1st April the offer was accepted by the ISTC and NUB with a planned return to work on 3rd April 1980[945].

The strike at Port Talbot began on 2nd January 1980 with hundreds of men on mass picket duty at all steelworks entrances. On the weekend before the strike started damping down of the furnaces began. At this stage only two unions were involved, the ISTC and NUB. Both received 100% support from their members. There were

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938 Ibid. Thatcher, p.109.
939 Sirs, p.90.
940 Interview with ex-ISTC Divisional Official. Conversation with Stephen Parry, 13th November 2008.
941 Upham, *Tempered Not Quenched*, p.139.
942 ISTC, Strike Diary Of Events. *Man and Metal*, Vol.57(1), January and February 1980, p.1. Ray Hudson and David Sadler, *The International Steel Industry–Restructuring, state policies and locations* (London: Routledge, 1989), p.69.
943 BSC. '*Steelmen: British Steel Offer You A Democratic Way To End The Strike Do You Want A Vote?'* Advertisement in the *PTG*, 6th March 1980, p.3.
944 Sirs, p.107.
945 Ibid, pp.109-111. BSC, *1979-80*, p.20. ISTC, Strike Diary Of Events. *Man and Metal*, Vol.57(2), March/April/May 1980, p.1. Villiers in BSC *1979-80*, p.3. Upham, *Tempered Not Quenched*, p.147.

still 2,500 craft union members at work but a week later when their own pay talks failed they joined the strike[946].

Over the course of the strike local union leaders changed the strike's emphasis from one exclusively about a wage increase to linking it to the planned manning reductions[947]. Anger turned towards BSC's local and the Welsh Division's management. The unions argued that the Welsh Division had to shoulder 50% of BSC's capacity reductions and that it made more economic sense for Port Talbot and Llanwern to produce higher tonnages. The local ISTC even called for local talent to replace the 'Yorkshire Mafia' in senior positions within the Welsh Division[948].

Only hours after the strike ended at Port Talbot on 3rd April nearly 8,000 men staged a lightning walkout following the suspension of a crane driver who refused to unload a lorry that had crossed picket lines during the strike. Picket lines were quickly re-established at all entrances by about 2,000 strikers. Police had to intervene with violent scenes following management's decision to withhold a £50 payment as part of the return to work agreement. About 1,000 strikers marched to the main offices where 30 policemen barricaded the main entrance. A number of windows were smashed and 3 strikers were arrested. It took union officials to restore order. The men got their £50[949].

At the end of the strike the Welsh Division's Managing Director, Peter Allen, claimed that it had cost BSC £60 million[950]. BSC later claimed that of their 1979-80 loss of £545 million, £200 million was directly attributable to the strike[951]. An unforeseen consequence was that BSC remained within the Government's 1979-80 cash limit of £700 million[952].

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946 Anon. 'Peace talks fair–bitter fight ahead'. *PTG*, 10th January 1980, p.1. Ibid, Strikers are in no mood to give up the struggle. 17th January 1980, p.3.

947 Ibid, 10th January 1980, p.1. John Carberry, quoted in *PTG*, 24th January 1980, p.1.

948 Anon. 'Unions call for resignations of steel boss'. *PTG*, 28th February 1980, p.3. John Carberry, *PTG*, 24th January 1980, p.1.

949 Reg Matthews, '1000 Strikers storm BSC's main office'. *PTG*, 10th April 1980, p.1.

950 Peter Allen, in '1000 Strikers storm BSC's main office'. *PTG*, 10th April 1980, p.1.

951 Villiers in BSC *1979-80*, p.3. BSC, *1979-80*, p.21.

952 Villiers, ibid.

Before the strike BSC's overall UK market share was 54%[953]. In April 1980 BSC estimated that the strike would cost them 10% of their home market[954]. Surprisingly, imports during the strike from Europe were little above normal levels. British industry was hardly affected by the three month strike[955]. Villiers concluded that British industry survived the strike amazingly well to such an extent that *"BSC has learnt that it needs its customers more than they need it* [956]*."* It was clear to everyone in the industry that if British industry had hardly been affected by a three month strike then BSC faced a survival struggle. This was its legacy.

ISTC General Secretary, Bill Sirs, believed that the eventual pay rise of 15.95% was worth the sacrifice of a three month strike[957]. However, Martin Upham argues that it resulted in a transfer of power from the unions to management[958]. Locally the unions were certainly not broken but they were never as strong again. Further mass strike action either nationally or locally was never a realistic prospect. The strike brought home to the unions, like management, the precarious position that BSC was in.

One outcome of the strike was a shift in power within the ISTC. Influence shifted from the centre to local officials. The shift towards local pay agreements was the catalyst for this change. At both Port Talbot and Ravenscraig the local ISTC officials began ignoring the national union and coming to local agreements to safeguard their works[959]. Threats of works closure were a tactic successfully used by local management throughout the country. The national ISTC had little option but to accept this change.

A surprising consequence of this at Port Talbot was that local management and unions were drawn closer together. As shown earlier the different management levels within BSC had different agendas. At works level these interests often

[953] BSC, *1979-80*, p.11.
[954] Gordon Sambrook, in Reg Matthews. 'Talks begin on slimline plans', *PTG*, 17th April 1980, p.3.
[955] BSC, *1979-80*, p.11.
[956] Villiers in BSC, *1979-80*, p.3.
[957] Sirs, p.110.
[958] Upham, *Tempered Not Quenched*, pp.157-171.
[959] Ibid, pp.169-170.

coincided with the local unions. Despite the shift in power towards management both sides needed to work towards the same goal of survival.

After management's decision to implement the Slimline option, discussions with the unions concluded in March 1980. Slimline became operational by August but without full implementation of manpower reductions[960]. Even during the strike union officials had met with BSC to decide how to implement the redundancies to reach the authorised manning level of 5,701 by 31st March 1981[961].

Under Slimline 5,807 workers out of a total of 12,476 in March 1979 were made redundant[962]. The first jobs to go were those remaining under the 'Fixed Cost Reductions' and the 'Group Working Practices' agreements and finally 4,500 Slimline redundancies. By the end of 1980 actual manning was down to 6,636[963]. Of those made redundant 42% were aged 55 or over and 50% had worked at Port Talbot for 20 or more years. Therefore redundancy fell predominantly on older workers. As for the actual redundancy payments these averaged £8,000 within a range between £2,000 to £16,000[964]. Both MacGregor and the DoI regarded these payments as being very generous and possibly discouraging natural wastage at other plants[965].

BSC portrayed Slimline as a great success and the saviour of Port Talbot. However, a closer look reveals a more complex outcome. The first point is that actual manning remained higher than the authorised manning of 5,701 beyond the implementation date of March 1981. At this time, and later, Port Talbot produced greater quantities of liquid steel than the Slimline figure with even less manning. The problem for local management was that Slimline was a rushed process within tight deadlines. They met the manning reductions demanded by the politicians but no more. But it bought time to develop a more market focussed approach to production. In the process

960 BSC, *1979-80*, p.17. HoC, 1980, p.419.
961 Fevre, *Wales is Closed*, p.31. HoC, 1980, p.431.
962 R.M. Lee, 'The entry to self-employment of redundant steelworkers', *Industrial Relations Journal*, Vol.16(2) (1985), 42-49 (p.43). R.M. Lee, and C.C. Harris, 'Redundancy Studies: Port Talbot and the Future'. *The Quarterly Journal of Social Affairs*, Vol.1(1) (1985), 42-49 (p.19).
963 Fevre, *Wales is Closed*, p.23, p.37.
964 Reg Matthews, 'Steelmen go for golden handshake'. *PTG*, 22nd May 1980, p.1.
965 Kew, NA, Ref BT 255/988, Demanning At Port Talbot, internal DoI paper by S.J. Gross, 1980.

BSC in effect bought off its workforce with Government money to smooth the whole process in order to avoid resistance to the redundancies.

The other major change that occurred was the introduction of more flexible working practices. Until this time demarcation had been enforced by the unions. It has been argued that demarcation and restrictive practices were the consequence of overmanning and occupied the surplus workers. As the surplus jobs disappeared management could no longer tolerate demarcation as it prevented efficient operations. Management argued that for Slimline to work properly they needed the unions to cooperate with new flexible working practices[966]. Demarcation between various groups of craftsmen began to disappear. All craftsmen's mates were abolished. Instead, various craftsmen helped each other and even production workers helped the craftsmen[967].

A further significant change was the replacement of direct labour with contractors. Before Slimline BSC only used contractors on non capital work where their own employees could not, or would not, do the work[968]. As previously shown, by December 1978 management wanted to extend the use of contractors but opposition from the unions prevented this. The Slimline agreement increased use of contractors. Appendix 2 of the agreement specifically stated there was to be *"No restriction on the use of Contractors within or ex-works*[969]*"* (see Appendix 33 for outsourced functions). According to Fevre, the advantages of outsourcing were[970] :-

a) It helped cut direct employment which helped satisfy the politicians.
b) Contracting was headquarters policy responding to Government pressure to privatise.
c) Possibly some short-term cost advantages.
d) The switch to contracting redistributed costs rather than reducing total costs i.e. it reduced wage cost but increased other areas.

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966 HoC, 1980, p.419. Fevre, *Wales is Closed*, p.58.
967 Pagnamenta and Overy, p.101.
968 Fevre, *Wales is Closed*, pp.55-56.
969 Ibid, p.54.
970 Ralph Fevre, in 'Contract Work In the Recession' in *The Changing Experience Of Employment*, ed by K. Purcell, S. Wood, A. Watson and S. Allen (London: The MacMillan Press Ltd, 1986), pp.28-30.

BSC certainly believed that contractors reduced costs and specifically engineering maintenance costs[971]. This was attributed to using different work practices and in some cases their workforce not being on site full-time. After the 1980 redundancies they employed redundant steelworkers for nominal wages with the EEC making up 90% of their BSC wages for 78 weeks[972]. Contractors also put pressure on BSC's own workforce to accept working practice changes to match the contractors in order to prevent outsourcing[973]. The unions were unable to seriously challenge the process. One effect that outsourcing did have was that it reduced the total job losses from around 6,800 to around 4,000 as the difference was transferred to contractors[974].

An issue regarding outsourcing that Ralph Fevre does not touch upon was the relationship with the craft unions. As shown earlier many of the industrial relations problems in the 1950s and the 1960s involved the craft unions. In addition there was the long 1977 unofficial electricians strike. It is possible to speculate that management saw outsourcing as a means of resolving a long-term industrial relations problem. By buying the service from contractors rather than using their own workforce they were transferring the risk to the contractors.

(iii) MacGregor's 'Survival Plan' and its impact on Port Talbot

In September 1980 BSC was reorganised into a series of discrete, decentralised, product-based businesses each acting as a profit centre. The reorganisation aimed to achieve better competitive standards on cost, quality and service. Port Talbot became part of the Strip Mills Group[975].

In December 1980 BSC's new Chairman, Ian MacGregor, presented the new 'Corporate Plan' to the Government which aimed at achieving significant

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[971] BSC, *Annual Report and Accounts 1982-83*, p.12.
[972] Ralph Fevre, 'Contract Work In the Recession', p.69; 'Subcontracting In Steel', *Work Employment and Society*, Vol.1(4) (1987), 509-527 (p.517); *Wales is Closed*, pp.70-72. L.D. Morris, 'Patterns Of Social Activity And Post-Redundancy Labour–Market Experience', *Sociology*, Vol.18(3), August (1984), 339-352 (p.341). Lee and Morris, p.22.
[973] Fevre, *Wales is Closed*, p.128.
[974] Anon. 'Question of Survival'. *SWEP*, 15th April 1980, p.1.
[975] BSC, *Annual Report and Accounts 1980-81*, p.9.

improvements in cost and efficiency. It was to be achieved by further reducing capacity, expanding sales through more aggressive marketing and pricing efforts, and improved quality and delivery (an area that MacGregor considered to be particularly weak). Manned capacity was to be reduced from 15 million tonnes/annum to 14.4 million tonnes due to increased import penetration and severe price competition. Nationally it involved the loss of at least 20,000 jobs, some plant closures and a deferred wage claim of 7%. A further 700 Port Talbot jobs were lost. In addition to the Port Talbot job losses 1,000 jobs were to go at Velindre Tinplate Works[976]. During the first half of 1980-81 BSC's share of the home market fell from a pre-strike figure of 54% to 47%. The Corporate Plan hoped to attain a 90% utilisation rate of manned capacity[977].

Under the Corporate Plan steelmaking was retained at the three strip mills within the Strip Products Group. Total strip mill output was planned to increase to 5.5 million tonnes and both Port Talbot and Llanwern would increase production from 1.4 to 1.7 million tonnes of liquid steel (Ravenscraig was to remain at 2.1 million tonnes). Of the 5.5 million tonnes, 0.64 million tonnes was destined for BSC's Plate business[978], primarily Ravenscraig supplying the Dalzell Plate Mill. On this basis Ravenscraig would only produce 1.46 million tonnes for strip products, which was less than Port Talbot or Llanwern. MacGregor had concluded that Ravenscraig was the weakest strip mill in terms of market share and competitive cost. However, until Port Talbot's concaster started production Ravenscraig would remain open[979]. This was the start of a protracted effort by BSC to close Ravenscraig.

In early January 1981 BSC organised a ballot of its entire 130,000 workforce on the 'survival' plan. BSC claimed that it needed to convince the Government that they had the workforce's support in order to receive the £750 million needed in 1981-

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976 Reg Matthews, 'Survival plan accepted 'to save the works'', *PTG*, 15th January 1981, p.1.
977 BSC, *1980-81*, p.11. Reg Matthews, '1000 strikers storm BSC's main office'. *PTG*, 10th April 1980, p.1. Ibid, '700 More to lose jobs at steel plant. 18th December 1980', p.1; 'Steelmen face up to rival ballot'. 8th January 1981, p.1. Kenneth O. Morgan, p.184. Upham, *Tempered Not Quenched*, p.158.
978 Kew, NA, Ref BT 255/988, British Steel Corporation–Strip Products Group–Statement, 19th December 1980, p.2.
979 Ian MacGregor, *The Enemies Within–The Story of the Miners' Strike 1984-85* (London: Collins, 1986), pp.98-99.

82[980]. The NUB and SIMA had already stated that they would support the plan but the BSC ballot pre-empted the ISTC ballot. As Upham states, the arrival of MacGregor heralded an abrasive industrial relations policy stance[981]. The ballot was part of this change and intended to pressurise the ISTC. It resulted in 63,237 votes in favour of acceptance, 17,900 against and 43,225 abstentions[982]. Even before the result was known the Port Talbot unions had agreed to implement the survival plan but as one union official stated :-

"We had no alternative because the Corporation have the workers and unions nationally over a barrel and we voted to save Port Talbot Works[983]."

This is further evidence of the shift in the balance of power away from the unions. The authorised manning level was now reduced to approximately 5,000 while production increased to 1.7 million tonnes. In terms of manning and production this was well beyond the Slimline manning figures of 5,701 and production of 1.4 million tonnes.

Works Director, Brian Moffat, stated that Port Talbot's future depended on the 1981 Corporate Plan[984]. He claimed it had two features that were critical for Port Talbot i.e. increased output and lower operating costs. The changes would ensure that the manhours required to produce a tonne of steel at Port Talbot would be as low as any European steelworks. Prior to Slimline it took 9.4 manhours to produce a tonne of steel at Port Talbot. The Corporate Plan aimed to reduce this to 5.74 manhours/tonne. This became a very important point of comparison for BSC and it is important to understand some of its implications. Figures were often quoted which ignored differences in products or the functions provided by contractors. Therefore these comparisons should be treated with caution. Moffat claimed that Slimline was not an exercise in immediate profit making but an attempt to secure Port Talbot's steelmaking future. He stated that although Slimline reduced manned liquid steel

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[980] Ibid, p.100. Reg Matthews, 'Steelmen face up to rival ballot'. *PTG*, 8th January 1981, p.1. Dudley and Richardson, p.345.
[981] Upham, *Tempered Not Quenched*, p.157.
[982] Ibid, p.159. BSC, *1980-81*, p.12. Anon. 'Majority Back Survival Plan'. *Steel News*, 19th January 1981, No269, p.2.
[983] Reg Matthews, Survival plan accepted 'to save the works'', *PTG*, 15th January 1981, p.1.
[984] Brian Moffat in, 'Greater output is BSC plan at Port Talbot'. *PTG*, 19th February 1981, p.1.

capacity to 1.4 million tonnes lack of orders meant that actual output was only 1.1 million tonnes. Even so, Slimline had reduced operating costs and made Port Talbot's future more secure. At national level he saw the Corporate Plan as a means of achieving higher sales through more aggressive selling and further cost reductions (a planned 12%). This was to be achieved through reduced manning, increased yields, more rigid expenditure controls, more competitive purchasing, an improved energy policy and improved quality. Output was expected to increase in 1981, by 28% in liquid steel, 25% in iron, 22% in hot rolled coil and 43% in cold reduced coil[985].

The Corporate Plan aggressively reduced manning even as output increased. It addressed some important features missing from Slimline including more aggressive sales and better financial and energy control. It also relied heavily on outsourcing, making accurate productivity comparisons very difficult. This was MacGregor's legacy to BSC. He did not initiate the closure programme but he pushed it further and also turned BSC into a more commercially focussed and driven organisation.

During February 1981 Port Talbot reached or exceeded its targets. However, problems persisted in the rolling mills as demand improved[986]. Progress on the Number 1 pickle line was slower than expected which caused a bottleneck for the cold mill which affected deliveries[987]. By June 1981 the problems were still unresolved. As a consequence the cold mill was unable to fulfil orders. BSC blamed technical problems and restrictive practices. The hot strip mill was stopped for 24 hours as the pickle line was unable to cope with output[988]. The problem was so great that in July 1981, Works Director, Brian Moffat, had to deny rumours that Port Talbot would close[989]. In face of these difficulties, the ISTC and AUEW pulled back from any resistance based on strike action.

During October 1981 4 ISTC workers on the pickle line were sacked over poor performance. This resulted in 300 pickle line workers walking out. Other ISTC

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[985] Ibid
[986] Ibid
[987] Anon. 'Cold mill is threat to works'. *PTG,* 28th May 1981, p.1.
[988] Ibid, 'Cold mill 'bottleneck''. 18th June 1981, p.1.
[989] Ibid, 'Steel closure rumours are denied'. 2nd July 1981, p.1.

branches were not prepared to escalate the strike[990]. The strike was resolved within a week when BSC agreed to withdraw the dismissal notices and suspend the men on full pay pending the outcome of the disciplinary appeals procedure[991]. Likewise, in July and November 1981 unofficial disputes over job cuts for AUEW members saw the AUEW unwilling to support unofficial action by fitters and then have the advice of its full-time officials rejected by members when they proposed resistance to 490 redundancies[992].

The members of the AUEW after two years of massive job losses and a 13 week strike had no stomach for further industrial action. Management were now determining manning levels knowing that there would be little serious union opposition.

These redundancies reveal another aspect of management's strategic thinking. This batch of redundancies concentrated upon non steelmaking functions which could be provided by contractors. At least some of these redundancies were simply jobs transferred to contractors. Locally BSC was following a strategy of reducing production manning as far as possible and buying in other services as and when required. Overall year end manning was reduced from 5,626 in 1981 to 5,319 in 1982 and 4,797 in 1983[993] (also see Appendix 28).

While Slimline had concentrated on cutting back manning and outsourcing, the Corporate Plan now focussed attention on sales and customer service. During 1980 Port Talbot began to receive all its coal from overseas[994]. In 1981, following a Government decision to increase coal subsidies, BSC signed a contract with the NCB to supply Port Talbot with 350,000 tonnes of Welsh coal and 150,000 tonnes of Staffordshire coal[995]. This was only to prove a temporary arrangement. The old

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[990] Ibid, 'Strike threat still hangs over BSC'. 22nd October 1981, p.1.
[991] Ibid, 'Steel strike ends'. 29th October 1981, p.1.
[992] Ibid, 'Further 490 Jobs To Go'. 5th November 1981, p.3; 'Men accept job loss plan'. *PTG*, 3rd December 1981, p.1.
[993] Fevre, *Wales is Closed*, p.23.
[994] Peter Allen, Evidence supplied to House of Commons Committee On Welsh Affairs–Port Talbot/Llanwern, 5th June 1980, House Of Commons, 415-479 (p.466). Anon. 'Coal and coke in the news as BSC gets a big boast'. *PTG*, 30th April 1981, p.1.
[995] *PTG*, ibid.

special relationship with the NCB was replaced by fully commercial purchasing on global markets. Villiers described Australian coal as *"……very much cheaper and more suitable coking coal*[996]*."* Importing Port Talbot's coal requirements illustrates the fundamental changes that were taking place. The SCoW had tried to import some of its coal requirements in the early 1960s but had been vetoed by the Government to maintain mining jobs. Thus two obstacles to efficient steelmaking and commercial success in the form of overmanning and lack of cheaper better quality imported coal had been removed. Yet a Conservative Government, ideologically committed to the free market was still prepared to interfere and force BSC to take British coal and preventing Ravenscraig's closure for political advantage in Scotland.

More investment was being directed towards Port Talbot than any other BSC works with £267 million being invested in the concast plant, coke ovens, pickle lines and ancillary equipment during 1979-80[997]. BSC claimed that approximately 50% of the investment at Port Talbot was *"for reasons of product quality*[998]." It was essential to retain market share and to develop new markets. The importance of this investment is often overlooked due to the other changes that were taking place, but it should be seen as part of the same process of improving efficiency, quality and competitiveness.

These changes linked to the Corporate Plan had major effects on Port Talbot's physical resources and operating practices. The catalyst for change was Government pressure for BSC to become commercially successful. Yet there were ambiguities to the Government's approach. They enforced manning reductions on BSC but also forced them to take British coal and were to prevent them from closing Ravenscraig for political advantage. The focus in these years was managerial assaults on overmanning, restrictive practices, outsourcing of ancillary functions, improvements in quality and adjusting output to meet market needs. Slimline was rushed and poorly prepared but it was also the precursor of a shift in mindset from

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[996] Charles Villiers. Evidence to House of Commons Committee On Welsh Affairs, Port Talbot/Llanwern, 5th June 1980, House of Commons, pp.415-479.
[997] BSC, *1979-80,* p.22.
[998] Anon. 'Quality–an investment programme of importance at Port Talbot'. *Steel News,* No271, March 1981, p.3.

the old production based philosophy of SCoW days where output was maximised to one more focussed on satisfying market requirements.

Although a full turnaround at Port Talbot was not achieved, it was apparent that some success had been achieved according to '*The Economist*' :-

"Although depressed European prices for strip steel cause them still to make a loss the Welsh mills of British Steel have performed a small miracle in productivity. At Port Talbot and Llanwern, the man hours needed to make a tonne of crude steel are now only 5.7 and 4.6 respectively. Just 18 months ago each works still took nearer 10 man hours to make a tonne of steel. Today's performance compares with the best in Europe and with the average in Japan[999]."

But BSC's structural problem still remained. Foreseeable levels of demand could be supplied from two strip mills when there were three. By October 1981 the Strip Group was still losing £2½ million/week[1000]. It was also claimed that Ravenscraig was losing between £15-£25/tonne whereas the South Wales plants were losing between nil and £5/tonne[1001]. Ravenscraig was therefore the most vulnerable of the three strip mills, and Port Talbot stood to be a major beneficiary from the demise of its historic rival strip mills.

[999] Anon. 'Slimline miracle in South Wales'. *Economist*, 11th April 1981, p.24.
[1000] Peter Allen, in 'Further 490 Jobs To Go', *PTG*. p.3.
[1001] Kenneth Morgan, 'Restructuring Steel – The Crisis Of Labour and Locality in Britain', *International Journal of Urban and Regional Research*, Vol7 (1983), 175-201 (p.182).

Chapter 11: 1982 to 1988: Continuing Change, the Marginalisation of Ravenscraig and Privatisation

Between 1979 and 1988 the Conservative Government gradually pushed BSC towards privatisation. Against this background the long running story of rivalry and interdependence between the three remaining strip mills moved into a final phase which culminated in the consolidation of Port Talbot as the most productive of these plants. This led to the marginalisation and eventual closure of Ravenscraig. This chapter focuses on developments between 1982 and 1988. It shows continued investment at Port Talbot to make up for the lack of investment during the 1970s. The investment was directed towards efficiency and quality objectives. It was instrumental in the marginalisation of Ravenscraig. There was a progressive change towards more flexible working practices. This was aided by a shift in power away from the unions. Management skilfully exploited the Port Talbot workforce's insecurity about the future of steelmaking to implement the changes. Yet it shows that management continued to consult with the unions about the changes and used that to control some elements of the workforce.

The Conservative Government of 1979 took more than a year to start talking publicly about steel privatisation although management had already discreetly explored the possibility. When Ian MacGregor was appointed BSC's chairman in 1979 an arrangement was put in place to remunerate his previous employers, Lazard Freres and Co, for his services which included payments made under four headings. One of which was privatisation[1002]. Therefore privatisation was an explicit and important part of his remit.

During the 1980s management developed five different routes whereby parts of BSC were transferred to the private sector. These included direct sale of assets; joint venture companies; management buyouts; free standing companies; and contracting out of peripheral services. Direct sales of assets and management buyouts were rare. Instead, free standing companies conformed to a general Government desire for a clarification of management responsibilities and performance. They also

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[1002] Martin Upham, 'Passages on the path to privatisation: the experience of British Steel', *Industrial Relations Journal*, Vol.21, (1990), 87-97 (p.88).

functioned as ‘goods in the shop window’ for prospective buyers. By the middle of the 1980s ten such companies existed[1003]. Joint venture companies or ‘phoenixes’ were an attempt to re-introduce private capital by forming public-private sector partnerships to run a defined but rationalised sector of the industry[1004]. BSC first shed steelmaking capacity in March 1986 to the biggest of the joint ventures, United Engineering Steels. From 1983-84 BSC’s Annual Report and Accounts devoted a section to ‘Privatisation’ or ‘Joint Ventures and Disposals’[1005]. Only in the 1986-87 Annual Report and Accounts was the privatisation of BSC itself first mentioned[1006].

In June 1988 the ISTC’s General Secretary, Roy Evans, stated that the ISTC did not have the necessary resources to effectively oppose privatisation. Instead he urged his members to accept any shares on offer[1007]. Both BSC and the ISTC were vehemently opposed to a break up of BSC arguing that it should be sold as an entity. A Whitehall leak revealed that the Government supported this approach as some parts of the business were regarded as unsaleable[1008] .

An alternative proposal put forward in early 1988 by Motherwell South’s Labour MP, Jeremy Bray, involved the separate privatisation of Ravenscraig, Shotton, Clydesdale and the Dalzell Plate Mill[1009]. He argued, incorrectly, that the new organisation had more advanced technology than either Port Talbot or Llanwern[1010]. The proposal received no support from the Government[1011]. BSC did not want to retain Ravenscraig but did not want it to become a competitor[1012]. The ISTC in Wales gained assurances from all Welsh Labour MPs, a number of Conservative

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[1003] Ibid
[1004] Ibid
[1005] BSC, *Report and Accounts 1983-84*, pp.12-13, *1984-85*, pp.13-15, *1985-86*, p.16, *1986-87*, p.13.
[1006] Robert Scholey, Chairman’s Review, BSC, *1986-87*, p.3.
[1007] Upham, ‘Passages on the path to privatisation’, p.89. Ibid, *Tempered Not Quenched*, p.217.
[1008] Ibid, *Tempered Not Quenched*, p.91.
[1009] J. Buxton, Scottish-Welsh steel group proposed. *Financial Times*, 7th January 1988, p.11.
[1010] Jeremy Bray, in ibid. Ibid, letter in *Financial Times*, 7th November 1988, p.17.
[1011] Upham, ‘Passages on the path to privatisation’, p.93.
[1012] G.F. Dudley, ‘British Steel And Government Since Privatisation: Policy Framing And the Transformation Of Policy Networks’, *Public Administration*, Vol.77(1) (1999), 51-71 (p.64).

MPs and Plaid Cymru MPs that they were prepared to work towards BSC being privatised as a single entity[1013].

The privatisation of BSC as a single entity was carried out during 1988 culminating in the floatation of two billion shares in British Steel (BS) at £1-25 each in December 1988[1014]. There were 650,000 applications for shares and it was oversubscribed by a factor of 3.3[1015]. Up to 10% of the share issue was reserved for BS's employees. Each received £70 worth of free shares and a further £2 of shares for each year of service, two free shares for each bought up to a limit, a 10% discount on the offer price up to £2,200 worth of shares and priority to buy up to £10,000 worth[1016]. The offer was taken up by 95% of employees and 40% participated in BS's ongoing British Steel 'Sharesave Scheme'[1017].

With a Government ideologically committed to privatising BSC it was essential that BSC adopted a more market led approach to operations[1018]. Chairman Charles Villiers initiated the change even before the Conservatives returned to power but it came to fruition under Ian MacGregor. MacGregor believed that for privatisation to succeed BSC needed to be able to generate sufficient profits to cover all capital needs and to pay a dividend. To achieve this BSC needed to recover as much of the UK steel market as possible[1019]. MacGregor's plan was to minimise costs; concentrate production on the more efficient plants; dispose of all non-mainstream activities; eliminate production overlaps with the private sector; restrict capital expenditure to improving efficiency and competitiveness; improve marketing; sell

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[1013] M. Smith, Steel union concedes privatisation. *Western Mail*, 5th January 1988, p.1.
[1014] Anon. 'Impact day: November 23–A record half year as we go private'. *Steel News*, No2, October 1988, p.1. BS, *Report and Accounts 1988-1989*, p.1. Upham, *Tempered Not Quenched*, p.218.
[1015] Anon. 'Share Price Announced'. *Steel News*, No3, November 24th 1988, p.1. Ibid, 'Share Offer Over Three Times Subscribed'. No4, December 19th 1988, p.1. Robert Scholey, Chairman's Statement in BS,*1988-89*, p.3. Upham, 'Passages on the path to privatisation', p.94.
[1016] Anon. British Steel all set for sell off. *Western Mail*, 7th October 1988, p.1.
[1017] Robert Scholey, Chairman's Statement in BS,*1988-89*, p.3.
[1018] R. Heller, 'British Steel rolls ahead', *Management Today*, June (1995), 43-47 (p.43).
[1019] Ian MacGregor, Chairman's Review in BSC, *1981-82*, pp.2-4.

more aggressively; improve quality and customer service; and establish decentralised product based businesses which would act as profit centres[1020].

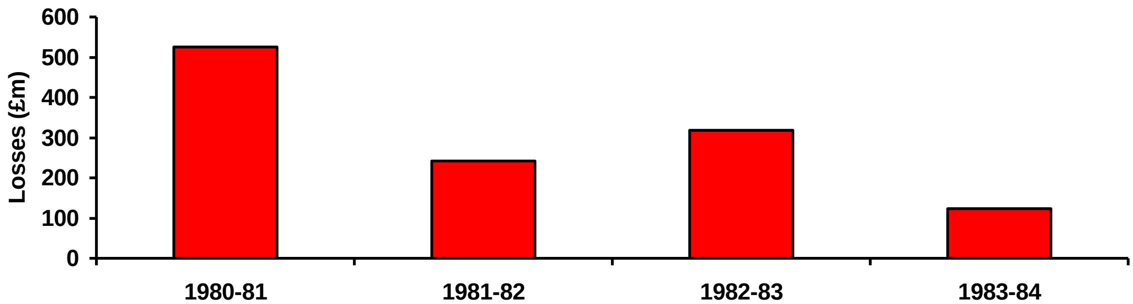
In parallel with MacGregor's BSC plan the EEC introduced the 'Davignon Plan'. This introduced national output quotas and price controls intended to stabilise the steel market to allow European steelmakers the time to rationalise production[1021]. It created a more stable trading environment and allowed a certain protection for national markets. It allowed BSC to pursue its own strategy and helped it return to profitability. The problem for BSC was that the Government would not give approval to close Ravenscraig. Therefore it was prevented from rationalising its strip steel production. This had direct implications for Port Talbot.

The result of MacGregor's strategy was that by privatisation BSC had been largely reduced to being a bulk carbon steelmaker with little special steelmaking capacity remaining. Of more significance commercially was that BSC's stockholding network was disposed of. The privatised BS soon re-established its own network of stockholders to act as an outlet for its products. Despite this flaw BSC's new strategy, EEC intervention and increased demand allowed a return to profitability on a much reduced output.

Between 1980-81 and 1983-84, although still losing money, BSC's financial performance improved (also see Appendix 27) :-

[1020] Ibid. Ibid, *1982-83,* pp.6-7. Kenneth O. Morgan, p.184. Robert Haslam, Chairman's Review in BSC, *1983-84,* p.4; *1984-85,* p.4. Robert Scholey, Chairman's Review in BSC, *1985-86,* p.2; *1987-88,* p.4.
[1021] Dudley, p.65.

Fig 11.1: BSC Losses 1980-81 to 1983-84 (before tax and long-term interest)[1022]



Severe weather caused operational problems during December 1981 and January 1982 as did a rail dispute in January and February 1982. These cost BSC £40 million. In March 1982 BSC recorded its first monthly pre-interest trading profit for 5 years. However, during the summer of 1983 prices collapsed[1023].

Between 1980-81 and 1986-87 BSC's labour productivity more than doubled. In 1980 UK labour productivity was just 40% of US levels. By 1986 it had exceeded US levels and almost matched those in West Germany and Japan. This was achieved by concentrating the reduced production at the more efficient works and reducing manning. During the 1970s BSC's annual liquid steel production exceeded 20 million tonnes/annum but during 1980-88 it was less than 15 million tonnes/annum. However, output per employee was significantly higher. During the 1970s the highest annual liquid steel production was 113.6 tonnes/employee. By 1987-88 it was 284.9 tonnes/employee (see Appendix 30 for details). Between 1980 and 1983 energy consumption per tonne of production was reduced by 16%[1024]. Overall BSC successfully reduced production costs at Corporate, Group and Plant levels.

The Strip Products Group's performance between 1981-82 and 1983-84 was in line with that of BSC as a whole. However, despite improving output per employee the improvement was boosted by outsourcing of some functions. Slimline had greatly increased the use of contractors at Port Talbot. After Slimline their use was further increased. Further outsourcing occurred in internal and external transport, slabbing

[1022] BSC, *1980-81*, p.5; *1981-82*, p.26; *1982-83*, p.4; *1983-84*, p.20.
[1023] Ibid, *1981-82*, pp.6-7. MacGregor, Chairman's Review in BSC, *1981-82*, p.3. Haslam, Chairman's Review in BSC, *1983-84*, pp.4-6.
[1024] Jonathan Aylen, 'Privatisation of the British Steel Corporation', *Fiscal Studies*, Vol.9(3), August (1988), 1-25 (pp.1-2).

mill crane maintenance and at the BOS plant. By 1985 when Port Talbot directly employed around 4,700 there were approximately 2,000 contractors (excluding capital projects)[1025]. Gradual outsourcing continued over the ensuing years. This partly explains the relative ease with which management were able to reduce the workforce. Contractors replaced direct employment.

The Group improved delivery performance and better quality standards. This led to increased customer satisfaction[1026]. Group performance was :-

Table 11.1: Strip Product Group Output, Turnover and Manning 1981- 1984[1027]

Year	Output Liquid Steel (million tonnes)	Turnover (£ million)	Year End Manning	Output (tonnes/man)
1981-82	5.4	1,024	27,400	197.1
1982-83	4.8	1,058	23,750	202.1
1983-84	5.6	1,238	22,630	247.5

Between 1981-82 and 1983-84 Port Talbot achieved the start up of the concast plant, continuing manning reductions and the introduction of more flexible working practices. In early 1982, Works Director, Brian Moffat, was optimistic about Port Talbot's prospects even though he thought that 1982 would be a difficult year for the steel industry. Port Talbot's manning level was now at an internationally competitive level and it was unlikely to close. Over £130 million worth of new plant, including the concast plant, was due to come online during 1982. With the new plant and lower manning Moffat believed that Port Talbot would operate highly efficiently and produce a high quality product[1028].

Liquid steel production increased from 1.9 million tonnes in 1981-82 to 2.0 million tonnes in 1983-84[1029] (see Appendix 34). With increasing production and falling manning productivity increased. The very fact that activities were being outsourced reduced manning and increased the tonnages of steel produced per employee.

1025 Fevre, *Wales is Closed*, pp.59-60.
1026 BSC, *1983-84*, p.16.
1027 Ibid. Ibid, *1981-82,* p.17; *1982-83*, p.12, p.19.
1028 Ian MacGregor, in 'White Out!' *Steel News,* No281, 21st January 1982, p.1. Peter Allen, in 'You were magnificent!' *Steel News*, 21st January 1982, No281, p.1. Brian Moffat, in 'Message of hope for local steelworkers'. *PTG,* 28th January 1982, p.1.
1029 Corus, Information supplied by Corus Port Talbot on production at Port Talbot (1980-81 to 2006-07), 2008.

Even allowing for the outsourcing it is clear that productivity was increasing. Nichols argues that scrapping less efficient plant and concentrating production into a smaller number of modern plants in itself increases labour productivity[1030]. Port Talbot is an example of this. Closure of the strip mills at Ebbw Vale and Shotton meant that production was being concentrated at the newer strip mills. Within Port Talbot only the larger blast furnaces were in production, coke production was largely concentrated on the new Morfa Coke Ovens and the concast plant would eventually lead to the closure of the slabbing mill. Closures, new investment and outsourcing pushed down direct manning requirements and increased direct labour productivity. By February 1982 production was running higher than envisaged with a number of post Slimline records being achieved :-

Table 11.2: Production: February 1982[1031]

	Weekly Average (tonnes)	Weekly Record (tonnes)
No 4&5 Blast Furnaces	35,920	38,387
Sinter Plant	41,709	46,500
Slabbing Mill	38,800	-
Hot Strip Mill	31,200	35,400

In April 1982 an order worth £10 million for 75,000 tonnes of slabs was received from the Kaiser Steel Corporation in the USA. It was won against competition from 20 other steel companies on cost, quality and delivery criteria[1032]. It showed that Port Talbot was now capable of competing, and winning, in a highly competitive international market. Despite this rumours of short time working due to a low order book persisted[1033]. Short time working materialised in October 1982 with one production shift per week being dropped[1034]. Yet during the first half of 1983 production records were again regularly being recorded along with further quality and delivery improvements[1035]. In evidence to the Commons Select Committee on Trade and Industry in February 1984 the National Association of Steel Stockholders stated

[1030] Theo Nichols, *The British Worker Question–a new look at workers and productivity in manufacturing* (London: Routledge and Kegan Paul, 1986), p.182.
[1031] Reg, Matthews, 'Slimline steel records still on increase'. *PTG*, 25th March 1982, p.1.
[1032] Peter Allen, in 'Steel order boost for Port Talbot'. *PTG*, 22nd April 1982, p.1. Brian Moffat, in, ibid.
[1033] Anon. 'New fears over short time at steelworks'. *PTG*, 10th June 1982, pp.1-2. Ibid, 'Critical time for new steel orders'. 19th August 1982, p.1.
[1034] Ibid, 'Short time at steel plant'. 14th October 1982, p.1
[1035] Anon. 'Government Approves New Hot Strip Mill At Port Talbot Works'. *Steel News*, No298, 16th June 1983, p.1.

that they hardly ever heard complaints about the quality of BSC's products. They now purchased 70-75% of their requirements from BSC. BSC's coil and sheet quality was now matching the highest international standards[1036].

The start of 1982 saw the introduction of a new Port Talbot bonus scheme. It replaced the 1981 quarterly bonus scheme which related exclusively to manhours per tonne. The new bonus was still related to this but was now also linked to BSC's Corporate Plan. If Port Talbot attained its tonnage under the Plan a quarterly bonus of 5% would be paid. If exceeded a larger bonus would be paid[1037]. One of the outcomes of the 1980 national steel strike was that it introduced an element of local wage flexibility. The bonus schemes were part of this and were being refined to suit management's need to drive down costs. Port Talbot's manning continued to fall (also see Appendix 28) :-

Table 11.3: Port Talbot Year End Manning Levels 1981-1984[1038]

Year	Manning
1981	5,626
1982	5,319
1983	4,797
1984	4,808

The most important addition to the plant between 1982 and 1988 was unquestionably the concast plant. It was a 2 strand slab caster with a 12.5m bending radius and 30m metallurgical length[1039]. Slabs of up to 250mm in thickness and 675-1850mm width could be produced at a rate of 23,000 tonnes/week[1040]. The manager for steel and slab, Kerry Philips, described it as being vital to Port Talbot's future[1041]. It allowed production of slabs of a more uniform composition, more consistent dimensions and with better surface quality[1042]. The initial market for its

[1036] Ibid, BSC Rates High Marks From A Top Customer. No307, 15th March 1984, p.1.
[1037] Ibid. Need To Reduce Losses Is Vital. No292, 16th January 1982, p.1. Moffat, in *PTG*, 28th January 1982, p.1.
[1038] Fevre, *Wales is Closed*, p.23.
[1039] Brian Cooper, 'Continuous casting at BSC Port Talbot Works', *Steel Times*, Vol.211(5), May 1983, 235-240 (p.235).
[1040] Anon, 'BSC Strip Products Group Port Talbot Works, A Special Steel Times Technical Review', *Steel Times*, Vol.210(7) July 1982, 392-414 (p.236). Ibid, 'Port Talbot HSM development on target', Vol.212(11) November 1984, 537-542 (p.407).
[1041] Kerry Philips, in 'New Steel plant is almost ready'. *SWEP*, 24th August 1982, p.3.
[1042] Caroline Painter, 'BSC's £100m leap into the future'. *PTG*, 19th August 1982, p.1.

output was the car industry and the two piece can that BSC was producing where surface critical coil and sheet were essential[1043]. About 80% of this output was suitable for the highest quality applications in the cold mill (sheet), tinplate and coated products[1044]. The initial feasibility study was undertaken in 1977[1045]. A tried and tested design was adopted for this vital plant. Work started on the site in May 1979 and the first cast was made on 26th July 1982 rising to full capacity in early 1983. It cost approximately £100 million. Initial annual capacity was approximately one million tonnes of low carbon slabs[1046]. As experience grew by the late 1980s this output almost doubled (see Appendix 34).

The concast plant meant that BSC was no longer reliant upon Ravenscraig for all its concast strip steel. Once Port Talbot's concaster became operational BSC considered the possibility of closing Ravenscraig. The caster allowed quality improvements which could not be attained through the traditional ingot route. Importantly the plant was built with the capability of later installing a second caster.

The hot strip mill was now 30 years old and was unable to match the quality of Llanwern's hot strip mill products. Towards the end of 1982 as the concast project was completed the local press indicated that a further multi-million pound investment in the strip mill was being considered[1047]. The Government and the EEC gave approval for a new strip mill during 1983-84. It would bring significant improvements with regard to coil weights and product quality. The maximum coil weight that the existing strip mill could handle was 10 tonnes. This imposed limitations on quality, efficiency and output. It also imposed constraints on the subsequent finishing mills that Port Talbot supplied. The principle objective therefore was to increase coil weight to 34 tonnes. There was to be no change in the maximum width of coil which

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1043 Anon. 'Port Talbot's Concast Performs Well During Commissioning Trial'. *Steel News,* No288, 19th August 1982, p.8.
1044 Ibid, 'Port Talbot's Works caster's 10,000 tonne milestone'. No292, 16th December 1982, p.1.
1045 Ibid, 'Port Talbot's Concast Performs Well During Commissioning Trial'. *Steel News,* No288, 19th August 1982, p.8..
1046 BSC, *1982-83*, p.20. J. Isaacs, 'New Steel plant is almost ready'. *SWEP*, 24th August 1982 p3. Painter, *PTG,* 19th August 1982, p.1. Brian Cooper, 'Continuous casting at BSC Port Talbot'. *Steel Times,* Vol.211(5), May 1983, 235-240 (p.235). p.235.
1047 Caroline Painter, 'Here's Christmas cheer Strip Mill steel deal welcome'. *PTG,* 23rd December 1982, p.1.

remained at 80". The cost of the development was estimated at £171 million. It was hoped that this investment would place Port Talbot amongst the most efficient and high quality integrated strip mills in Europe[1048].

The new mill was installed in two phases. Replacement of the existing mill started in 1983 and by August 1985 it could produce the new larger coils. The second phase involved remotoring the mill[1049]. During the installation the strip mill was kept in operation for the maximum possible time. However, it still required the closure of the mill for 10 weeks between August 1984 and December 1985[1050]. In August 1985 concast slabs were sent to Llanwern for rolling[1051]. Commissioning of the refurbished hot strip mill started, on time and on budget, on 1st January 1986[1052]. The Prince and Princess of Wales performed the official opening on 11th June 1986[1053]. In September the hot strip mill produced a weekly average of 34,252 tonnes of coil[1054].

The building of Port Talbot's concast plant and the rebuilding of the hot strip mill were intricately linked. Both were designed to support BSC's strategy of attaining commercial success through meeting customer requirements for higher quality and reducing costs. They were complemented by major quality focused improvements including new pickle lines in 1982 and by new racking and conveyor belt systems in

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[1048] R. Deitch, and N. Denby, 'Strip Mill Go-Ahead-£171m Port Talbot project', *SWEP*, 9th May 1983, p.1. Caroline Painter, 'Jubilation at hot mill news'. *PTG*, 26th May 1983, p.1. Anon. 'Government Approves New Hot Strip Mill At Port Talbot Works'. *Steel News*, No298, 16th June 1983, p.1. Ibid, 'Green Light For Hot Strip Mill'. No300, 18th August 1983, p.1; 'Re-Built Hot Mill Geared To Challenge Best In The World'. No332, 26th June 1986, piv. BSC, *1983-84*, p.16. Anon, 'Port Talbot HSM development on target', *Steel Times*, Vol.212(11) November 1984, 537-542 (p.407).p.537.

[1049] Anon. 'Green Light For Hot Strip Mill'. *Steel News*, No300, 18th August 1983, p.1. Ibid, 'Port Talbot Enjoys A Great Royal Event'. No332, 26th June 1986, p.1.

[1050] Anon, 'Prince of Wales opens Port Talbot's modernised HSM'. *Steel Times*, Vol.214(8) August 1986, 380.

[1051] Anon. 'Cooperation keeps supplies rolling'. *Steel News*, No324, 19th September 1985, p.1.

[1052] Ibid, Port Talbot Enjoys A Great Royal Event. No332, 26th June 1986, p.1. BSC, *1985-86*, p.9.

[1053] Ibid, Port Talbot Enjoys. Anon, 'Prince of Wales opens'. Anon. Royal opening for massive £171 million BSC project. Special Supplement, *Western Mail*, 11th July 1986.

[1054] Anon. 'Output at new mill best to date'. *SWEP*, 30th September 1986, p.1.

the cold mill during 1985 and 1987[1055]. In 1984 the galvanising line was refurbished involving re-motoring the line, installing a new ceramic zinc pot, the latest type of matt finish and tension control equipment and other sophisticated instrumentation[1056]. A £1 million investment was made at the Morfa coke ovens to reduce steam consumption and reduce energy costs by approximately £0.5 million/annum[1057]. Number 4 blast furnace was relined and modernised in 1985[1058]. It is shown below after modernisation :-

[1055] Anon. 'BSC future is looking up'. *PTG*, 22nd July 1982, p.3. Anon, 'BSC Strip Products Group Port Talbot Works, A Special Steel Times Technical Review', 411. Harold Bates, Cold Mill Manager in 'BSC future is looking up'. *PTG*, 22nd July 1982, p.3.
[1056] Anon. '£4 million facelift for BSC metal line'. *PTG*, 2nd February 1984, p.6.
[1057] Anon, 'Energy saving on BSC Port Talbot Morfa coke ovens', *Steel Times*, Vol.212(9) September 1984, 405.
[1058] Anon, 'BSC Strip Products Group', *Steel Times International*, September 1986, 15-33 (p.17).

The concast plant, and the eventual closure of the slabbing mill, increased yield from a given amount of liquid steel thus increasing productivity. A further controlled and relatively small expansion in capacity at Port Talbot could eliminate the need to keep Ravenscraig open even when demand was high. In 1986-87 'light degassing' was introduced into the 'steelmaking to concast route' to produce a cleaner and more consistent steel[1059].

During 1988 it was announced that Port Talbot was to have a second continuous casting machine to be commissioned in early 1991 at a cost of £75 million[1060]. By this time Port Talbot was 100% concast after the slabbing mill closed during 1986-87. The capacity of the concast plant was now restricting Port Talbot's output. The building of the second concast machine was to raise Port Talbot's overall output and allow BS to fully exploit the potential of the new strip mill. It also further reduced BS's need for Ravenscraig even when demand was high. BS aimed to reduce costs further by concentrating strip mill production on two strip mills rather than three. Increasing Port Talbot's quality and capacity removed any commercial reason to retain Ravenscraig.

During 1984-85 BSC lost £140 million on its ordinary activities. This included £180 million of costs relating to the 1984-85 miners strike. Without this BSC would have returned an operating profit of £40 million[1061]. According to Bob Scholey, BSC's Chief Executive, the strike's adverse effects on BSC included :-

- abnormal imports of coal and coke bought at 'spot' prices rather than contracted prices and at unfavourable exchange rates;
- the inland movement of all raw materials by road rather than rail;
- extra shipping, transhipment and demurrage costs for raw materials;
- non-standard material blends, operating practices and process routes at the Corporation's works;
- lost production during the first six months of the strike;

[1059] BSC, *1986-87*, p.16.
[1060] Anon. 'New Caster for Port Talbot Works'. *Steel News,* No1, 5th September 1988, p.1. J. Walters, 'Cash boost makes steel jobs secure'. *Western Mail,* 14th September 1988, p.3. Norman Denby, '£75m Steel Plant Boost'. *SWEP*, 14th September 1988, p.1. Caroline Painter, 'Big Boost For Steel-BSC to spend £75 million at Port Talbot'. *PTG*, 16th September 1988, p.1.
[1061] BSC, *1984-85,* p.2. Robert Haslam, Chairman's Review in BSC, *1984-85,* p.3. Robert Scholey, Chief Executive's review of operations in BSC, *1984-85,* p.7.

- lost sales to the National Coal Board throughout the strike; and
- higher interest charges [1062].

Port Talbot, however, experienced fewer adverse effects from the strike as its workforce and unions refused to make significant sacrifices for the striking miners. At the start of the strike BSC Chairman, Robert Haslam, warned that if any steel plant closed it might not reopen[1063]. Both Ravenscraig and Llanwern were more vulnerable than Port Talbot as they depended on rail transport. Early in the dispute the ISTC believed that it had reached agreement with the NUM and rail unions to allow movement of sufficient coal to safeguard the blast furnaces and to protect regular orders, but towards the end of May 1984 the NUM successfully pressurised the rail unions to stop all deliveries of coal and iron ore. BSC brought in lorries to deliver its coal and ore. This remained the position until the end of the strike. At the height of the strike BSC was nationally moving over 100,000 tonnes of coal and ore each day by road. A total of 4.8 million tonnes of coal and ore was transported to Llanwern and Ravenscraig during the strike[1064]. At Port Talbot imported coal through the harbour was difficult to disrupt. Throughout the strike Port Talbot Steelworks was picketed by striking miners, especially at the beginning of the strike. Despite these attempts to disrupt operations, production records were broken throughout 1984-85[1065].

In March 1984 the NUM asked the 600 strong NUB Margam Lodge to stop unloading 90,000 tonnes of coal from the 'Pacific Courage' in the harbour. The men voted unanimously to continue unloading the coal to maintain production[1066]. The NUM pressurised the regional ISTC but it was clear that members were not prepared to

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[1062] Scholey, ibid.
[1063] Robert Haslam. in Philip Bassett, and Ian Rodger 'BSC chief warns of permanent plant closures', *Financial Times*, 10th May 1984, p.1.
[1064] Anon. 'Coal Strike Warning'. *Steel News*, No309, 17th May 1984, p.1. Ibid, 'New dangers from coal, docks strike'. No311, 19th July 1984, p.1; 'NUM Strike Costs BSC £175 Million'. No319, 14th March 1985, p.1. BSC, *1984-85*, p.18. Robert Haslam, 'Business As Usual'. *Steel News*, No 314, 18th October 1984, p.1. Sirs, pp.10-19. Geoffrey Goodman, *The Miners' Strike* (London: Pluto Press Ltd, 1985), pp.105-106. Upham, *Tempered Not Quenched*, pp.181-185.
[1065] Anon. '1984-85 was a record year'. *Steel News*, No322, 13th June 1985, p.1.
[1066] Caroline Painter, 'Steelmen reject mine plea'. *PTG*, 29th March 1984, p.1. John Perring, Quoted in 'Steelmen reject mine plea'. *PTG*, 29th March 1984, p.1.

have output affected at either Port Talbot or Llanwern[1067]. By early April 1984, 11 pickets had been arrested at Port Talbot's main entrance trying to prevent coke leaving the works. Despite further NUM pleas, union officials at Port Talbot stated that foreign coal had been used for some time and that any halt in production could result in closure[1068]. The following week the 'Polyclipper' arrived at the harbour with 60,000 tonnes of Australian coal. This triggered more trouble on the picket line with 58 arrests[1069]. In July 1984 about 200 women unsuccessfully attempted to stop the morning convoy of lorries leaving Port Talbot for Llanwern[1070]. It was clear that the workforce were not prepared to curtail production to support the miners.

During September 1984 a number of striking miners got into the harbour and armed with supplies occupied the transporter cranes. After injunctions were served they came down and were arrested[1071]. The T&G union tried to prevent raw materials arriving by persuading tug men at Port Talbot not to berth ships. The men ignored the plea[1072]. No further major incidents took place at Port Talbot. A factor that may have influenced the steel unions was a feeling that they had not received sufficient support from the NUM during the 1980 strike[1073]. However, nationally the ISTC gave the NUM £65,000 during the dispute and a similar amount locally[1074].

During the strike both Port Talbot and Llanwern achieved production in excess of 40,000 tonnes/week[1075]. The strike further demonstrated the locational advantages of Port Talbot. It was less susceptible to disruption as its raw materials came by sea and involved no rail transport. Although production was maintained at all three strip mills, the cost advantages of Port Talbot over both Llanwern and Ravenscraig must have been more clearly demonstrated than at any other time.

1067 Interview with ex-ISTC Divisional Official. Conversation with Stephen Parry, 13th November 2008.
1068 Ibid. Anon. 'Rough treatment to pickets claim'. *PTG*, 5th April 1984, p.1.
1069 Caroline Painter, 'Picket Line Fury 58 arrested after violent clashes'. *PTG*, 12th April 1984, p.1.
1070 Anon. 'Picket anger 25 arrested'. *PTG*, 26th July 1984, p.1.
1071 Ibid, 'Miners' end crane raid'. 6th September 1984, p.1. Martin Adeney and John Lloyd, *The Miners Strike 1984-85 Loss Without Limit* (London: Routledge and Kegan Paul Ltd, 1986), p.125.
1072 Adeney and Lloyd, p.140.
1073 MacGregor, *The Enemies Within.* pp.261-262.
1074 Upham, *Tempered Not Quenched*, p.165.
1075 Ibid, p.182, p.185.

From the early 1960s onwards management had recognised that to maintain sales at Port Talbot product quality needed to improve. During the 1980s the British steel industry developed various systems to improve quality. A Quality Assurance Programme was developed which essentially involved including a guarantee of product quality in the price[1076]. The steel industry adopted the BS5750 standard. In practice by the mid 1980s there were mixed responses to this. Those closely in contact with customers were more aware of the need for quality assurance than those further upstream in the production process where attitudes were slower to change[1077]. This was tackled by building quality requirements into individual managers' work objectives[1078]. Later in the decade BSC adopted the Lloyds Register Quality Assurance Ltd independent certification on quality[1079]. At a national level the 1987-88 pay agreement included a link to Total Quality Performance[1080]. The idea of quality was gradually integrated into all activities in the production process.

By 1988 product quality had became a major objective of Port Talbot's recent investment, process improvements and training initiatives. Attaining the BS5750 standard in 1987 and its international equivalent ISO 9002 was felt to be essential in demonstrating Port Talbot's commitment to improving product quality and customer service[1081]. It involved a complete review and revision of Port Talbot's documentation, procedures and record of the quality management systems[1082]. In practice quality meant :-

"Get it right first time, every time, on time. Eliminate faults as they occur, prevention before detection. Prevent the waste of time, manpower and cost associated with

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[1076] I.M. Mackenzie, 'Quality assurance in the UK steel industry–an overview', *Steel Times*, Vol.212(7) July 1984, 303-304 (p.303).
[1077] Ibid, p.304.
[1078] Interview with Corus Manager. Conversation with Stephen Parry, 13th November 2008.
[1079] Anon. 'An Assurance Of Quality From LRQA'. *Steel News*, No349, 17th March 1988, pp.6-7.
[1080] Martin Llowarch, Chief Executive's Review in BS, *1987-1988* p.6.
[1081] Anon. 'Triple crown success for BSC Strip Mill Products'. *Steel News*, No347, 17th December 1987, p.1.
[1082] Ibid, An Assurance Of Quality 17th March 1988, p.6.

correcting faults. Our challenge is to assure customers that the Port Talbot Dragon MEANS QUALITY [1083]."

A measure of Port Talbot's progress occurred during 1988-89 when it received one of Ford of Europe's much sought after Q1 Quality awards for the consistent high quality of the car body sheet it supplied[1084], a dramatic change from the 1970s when Ford would not accept steel for some car bodywork parts from BSC because of its poor quality.

The improvement in quality was essentially the result of a two pronged approach. Firstly, the investment taking place and by meeting recognised external quality standards and incorporating the idea of quality into all activities to gain customer confidence and commercial success. If this change in mindset had taken place in the early to mid 1970s it is possible that Port Talbot would have helped BSC retain a greater market share. Managerial focus on capacity expansion largely prevented this.

Allied to quality is research and product development. From its formation BSC operated a number of research laboratories. This included facilities at Port Talbot. BSC's approach to research indicates some of their thinking. During BSC's early years most research was directed towards solving problems in the production process rather than product development. An exception was the development of coated sheet with PVC or other plastic coatings for an expanding market[1085]. BSC's failure to develop new products was a mistake. New products would have increased demand for strip steel, an area where they had surplus capacity. Their approach was a consequence of their production focussed mindset from the 1950s. They certainly gained production efficiencies but failed to fully exploit market opportunities. This was particularly felt when the market contracted.

After 1980 BSC's research focus shifted. Although they never fully abandoned research to support the steelmaking process more effort was directed towards

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[1083] Bernard Hewitt, in 'An Assurance Of Quality From LRQA', *Steel News*, No349, 17th March 1988, p.6.
[1084] BS, *1988-1989*, p.9.
[1085] BSC, *1967-68*, p.13; *1968-69*, p.23; *1970-71*, p.36.

improving quality and increasing the product range. Of particular interest to Port Talbot was BSC's development of a two piece can aimed at retaining market share in the food and drink markets[1086]. Research was now supporting a more commercially minded approach to production.

This period was also a period of continuing transition at Port Talbot for both working practices and pay. There were radical changes in work organisation seeking both functional and numerical flexibility[1087]. These included multi-skilling, teamworking, reductions in demarcation, moves towards merit based promotion (as opposed to seniority based promotion) as well as increased sub-contracting (as discussed earlier).

One of the main outcomes of the 1980 strike was the introduction of performance related pay. By the late 1980s and early 1990s BSC introduced 'total quality performance' which meant that bonuses depended not only on shedding manpower but also on trade unions accepting new working practices[1088]. The 1980s also saw a shift away from highly centralised pay bargaining. The last national pay agreement came into effect in 1988. Bargaining was increasingly devolved to divisional level[1089]. Port Talbot was involved early in this process. At the start of 1983 the local ISTC officials agreed a local multi-union agreement which effectively replaced the Annual Review. As a result they were removed from office by the national union[1090]. They were eventually re-instated but with a warning from the union[1091]. After 1980 a 'climate of fear' overcame the steel industry with managers able to threaten plant closure in order to pressurise local and regional union officials into accepting new

[1086] Ibid, *1981-82,* p.14; *1983-84,* p.11; *1984-85*, p.12; *1985-86*, pp.15-16; *1986-87,* pp.12-13. Anon. 'Port Talbot's Concast'. *Steel News,* No288, 19th August 1982, p.8.
[1087] Morris et al, 'Beyond survival: the implementation of new forms of work organisation in the UK and German steel industries', *The International Journal of Human Resource Management*, 3:2 September (1992), 307-329 (p.310). Bacon et al, 'Among the Ashes, Trade Union Strategies in the UK and German Steel Industries', *British Journal of Industrial Relations,* 34(1), March (1996), 25-50 (p.29).
[1088] Morris et al, p.311.
[1089] Ibid, p.313.
[1090] Upham, *Tempered Not Quenched,* pp.169-170.
[1091] Interview with Union Official. Conversation with Stephen Parry, 13th March 2008.

working practices[1092]. This was undoubtedly an influence at Port Talbot even though BSC had no intention of closing Port Talbot.

Shop floor working practices changed radically. Particularly significant was the introduction of ‘multi-skilling’ where single trade craftsmen were replaced with craftsmen with a knowledge and training in a number of skills. At Port Talbot BSC introduced just two grades of multi-skilled craftsmen, namely, ‘mechanical’ and ‘electrical’. Apprentices were trained in one of these specialities[1093]. Alongside this came the introduction of ‘teamworking’. This entails self-contained groups of workers responsible for all of the activities in the work area and a move away from rigid experienced based seniority systems[1094]. By the early 1990s its introduction into the British steel industry had been patchy and certainly at Port Talbot seniority remained the route for promotion for production workers[1095]. Teamworking was not universally accepted by management. Some mangers felt that it was not appropriate in the steel industry[1096].

Nevertheless more flexible working practices were widely introduced at Port Talbot. Examples included rollermen who band (package) steel sheets also working in other parts of the cold mill when the need arose and blast furnace process workers fitting the lances used to pierce the clay taps at the bottom of the furnaces[1097]. To run off by-products at the coke ovens now only required one man whereas before 1980 it took six. In the Transport Department locomotive drivers started to refuel their locomotives[1098].

These and other changes to working practices after 1980 were faster than at any time during the 1960s and 1970s. Bacon et al argued that the unions developed no new mechanisms to influence systems of individualised training and rewards[1099]. They also claimed that flexibility agreements and the erosion of demarcation marked

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[1092] Bacon et al, p.29.
[1093] Morris et al, p.318.
[1094] Ibid, p.321.
[1095] Ibid, p.322.
[1096] Interview with Corus Manager. Conversation with Stephen Parry, 13th March 2008.
[1097] Bacon et al, pp.30-31.
[1098] Interview with Union Official. Conversation with Stephen Parry, 13th March 2008.
[1099] Bacon et al, p.38.

a potentially decisive shift in shop floor power in the steel industry. Yet there is little evidence that the roles of the unions were displaced by new management techniques. However, union influence was certainly reduced at Port Talbot. Here, and throughout the strip mill plants, management played upon workforce insecurity to implement change. At one level management removed the union veto over change. Yet even that may be misleading. Even when the unions were much stronger in the 1950s, it was not so much that the unions had a veto, but that management were not prepared to sacrifice significant profits in order to force their will on the workforce. Despite the shift in power in the 1980s management continued to readily consult the unions on all changes. Management needed the influence of the unions at the local level even if they were hostile to them at national level. Local management wanted to avoid resistance from the workforce. Agreement and consultation with the various local unions remained a means of avoiding this.

During the period 1985-86 to 1988-89 BS's liquid steel production increased from 14.0 million tonnes in 1985-86 to 15.4 million tonnes in 1988-89[1100]. Steel deliveries are set out below :-

Table 11.4: BSC/BS Deliveries of Steel 1984-85 to 1988-89 (million tonnes)[1101]

Year	Total Deliveries	Exports	Home Sales
1984-85	10.6	2.8	7.8
1985-86	10.7	3.0	7.7
1986-87	10.3	3.7	6.6
1987-88	12.1	4.4	7.7
1988-89	13.1	4.2	8.9

As a consequence BSC/BS's financial performance improved. Their financial performance is set out below (these figures differ slightly from those in Appendix 27 as BS altered the way that it recorded its financial results in 1988-89) :-

Table 11.5: BSC/BS Financial Performance 1984-85 to 1988-89 (£ million)[1102]

Year	Trading Profit (Loss)	Profit (Loss) For Distribution*
1984/85	(64)	(383)
1985/86	91	38
1986/87	190	178
1987/88	424	410
1988/89	656	561

* After exceptional items, tax and minority items.

[1100] BSC, *1985-86*, p.11. BS, *1988-1989*, p.21.
[1101] BSC, ibid, p.10, p.14; *1984-85*, p.42; *1986-87*, p.41; *1987-88*, pp.36-37. BS ibid, p.39.
[1102] BS, ibid, p.38.

These steadily improving figures are a reflection of improved market conditions, concentrating production on more productive modern plant, a weaker pound, reduced manning and flexible working practices. By 1986 BSC's operating profit in terms of dollars per tonne exceeded anywhere in the European Community, was ahead of the deteriorating Japanese average and markedly superior to the protected loss making US steel industry[1103].

The Strip Products Group participated in this revival, though less strongly than BSC as a whole. While its home sales were strong its export growth was less strong :-

Table 11.6: BSC/BS Strip Products Group Performance 1985-86 to 1988-89[1104]

Year	Liquid Steel Production (million tonnes)	Turnover (£ million)	Manpower	Home Deliveries (million tonnes)	Exports (million tonnes)
1985-86	5.4	1,405	21,436	3.1	1.2
1986-87	5.7	1,424	21,080	3.0	1.8
1987-88	6.6	1,668	20,570	3.6	2.1
1988-89	*	*	*	4.2	1.6

* The figures are not available in comparable form

Between a quarter and a third of the Group's liquid steel production came from Port Talbot where output ranged between 1.597 million to 2.263 million tonnes/annum between 1985 and 1988 (see Appendix 34). Production was notably lower during 1985-86 due to the rebuilding of the hot strip mill. During 1987 and 1988 output per employee was between 470-485 tonnes/year/employee compared to less than 200 prior to 1973.

Throughout this period production records were broken at Port Talbot. For the week ending 10th January 1987 the concast plant produced 46,003 tonnes of slabs and a weekly average of 40,037 tonnes during January[1105]. This was equivalent to about 2 million tonnes/year which was considerably more than when the plant was first built. Yet slab production remained a bottleneck restricting output at Port Talbot after the

[1103] Aylen, 'Privatisation of' p.3.
[1104] BSC, *1985-86,* p.18, p.42; *1986-87,* p.16, p.40; *1987-88,* pp.34-35. BS, *1988-1989,* p.8.
[1105] Anon. 'World record at steel plant'. *SWEP*, 16th December 1987, p.1.

slabbing mill had closed[1106]. Also during January 1987 the refurbished strip mill produced a new weekly record of 43,663 tonnes. In February 1987 the blast furnaces produced a post Slimline weekly average of 42,000 tonnes of iron and the sinter plant 57,300 tonnes of sinter[1107]. This improved performance reflected BSC's national performance. The plant was operating at the peak of the demand cycle and as much production as possible was being concentrated at Port Talbot. It was a lower cost steelmaker because of its locational advantages and contained costs. Its quality and customer support had also improved. Once the refurbishment of the strip mill had been completed work began on installing a second reheat furnace[1108].

The Group still contained three strip mills but existing levels of demand required just two fully modernised and slightly expanded steelworks. However, during 1987-88 when demand was particularly high, bottlenecks in the production process at the three strip mills meant that all three steelworks were still needed. It has to be remembered that steelmaking is the sum of a number of sub-processes. The overall capacity is limited by the lowest capacity of the individual processes. At Port Talbot that was the capacity of the concast plant. At Ravenscraig it was the iron making capacity. Removing such bottlenecks through relatively small investment could allow BS to close one mill. Demand for the Group's products was high particularly from the motor industry as UK vehicle production rose from 94,500 to 130,500 units/annum between 1984 and 1990[1109].

It has already been argued that higher production costs at Ravenscraig made it the most vulnerable strip mill. Port Talbot with its harbour required no land transport for its ore or coal. Llanwern received all of its ore through Port Talbot Harbour. Like Ravenscraig its ore required shipment by rail that added to production costs. Yet Llanwern enjoyed considerable cost advantages over Ravenscraig in assembling its raw materials. The distance between the ore port of Hunterston and Ravenscraig was 51 miles and between Port Talbot and Llanwern 45 miles. The cost per tonne to transport ore by rail was £2.40/tonne and £1.46/tonne respectively (4.7p and 3.3p

1106 Anon. 'Record at four works'. *Steel News*, No 338, 19th February 1987, p.3.
1107 Anon. World record at steel plant'. *SWEP*, 16th December 1987, p.1.
1108 Ibid
1109 *Economic Trends–Annual Supplement* (London: HMSO, 2006), p.213.

per tonne/mile)[1110]. The difference was due to a number of factors. These included the greater distances involved, an extra locomotive needed to get the trains up an incline to Ravenscraig and the need to remove the locomotive to get into Ravenscraig over a weak bridge[1111]. Thus both Port Talbot and Llanwern enjoyed cost advantages over Ravenscraig in assembling their raw materials. Additionally, Port Talbot Harbour imported raw materials for two steelworks which meant that costs per tonne discharged were less.

One of Ravenscraig's blast furnaces was permanently closed in August 1982. This restricted iron production to two relatively small blast furnaces and liquid steel production to just 2.1 million tonnes/annum[1112]. Ravenscraig's maximum liquid steel output was 1.8 million tonnes in 1986-87[1113]. The same amount of steel could be produced at Llanwern using just its Number 3 blast furnace. At Port Talbot in 1991, based upon a two blast furnace configuration, 2.8 million tonnes of liquid steel was produced (see Appendix 28). As for steelmaking Port Talbot had two 300 tonne converters in its BOS plant, Llanwern three 185 tonne converters and Ravenscraig three 130 tonne converters[1114]. Thus the scale of steelmaking at Ravenscraig was smaller than at either South Wales plant. By contemporary standards a capacity of 3 million tonnes was regarded as the minimum economic capacity. Practical steelmaking at Ravenscraig was considerably short of this. Both Port Talbot and Llanwern would produce over 3 million tonnes of liquid steel in the future. At both South Wales plants output was limited by the capacity of their concasters. Ravenscraig was limited by actual steelmaking capacity.

A further problem with Ravenscraig's blast furnaces was the means of slag disposal. At Port Talbot and Llanwern slag was run into a pool alongside the blast furnaces, cooled and removed by road. At Ravenscraig the blast furnace configuration meant

[1110] Great Britain. House of Commons Papers. Second Report from the Committee on Scottish Affairs, Session 1982-83, *The Steel Industry in Scotland*, 1st December 1982, p.13.
[1111] *Rail Freight Today: Scotland,* Video, Telerail Productions (1990).
[1112] Dudley and Richardson, p.201.
[1113] R. Wilson, Record breakers. *Motherwell Times,* 30th April 1987, p.1.
[1114] BSC, *Port Talbot Works–Facts and Figures,* c1985. BSC, *Llanwern Works,* c1986. Anon, 'British Steel Corporation–poised for a successful future', *Steel Times International*, September 1985, 15-21 (p.20).

that the slag was tapped into railway slag pots and removed by rail[1115]. This was a more costly operation. Another problem for Ravenscraig occurred when BSC purchased Alphasteel's Newport mill and closed it on 15th January 1986. Its concaster was installed at Llanwern[1116]. Llanwern's concaster came on line during April 1988 at a cost of £47 million[1117]. Now all three strip mills had concast facilities.

A further problem for Ravenscraig was the collapse in demand for steel in Scotland. Whole sectors of Scotland's engineering and metal using industries ceased production in the early 1980s. Production ceased at the Linwood car plant, the Bathgate vehicle works and at Hoover's factory. All were major consumers of Ravenscraig's strip mill output. Consequently Britain's major markets for strip products became concentrated in the Midlands and the South East. Thus Ravenscraig became more distant from its markets than the South Wales plants[1118].

Scotland's collapse in demand for sheet resulted in the closure of the Gartcosh cold mill in March 1986. Ravenscraig's hot strip mill output could no longer be turned into sheet in Scotland. When Gartcosh closed the Scottish market took just 2.8% of Britain's cold rolled sheet production. Even with Gartcosh open Ravenscraig was at a cost disadvantage in producing sheet. Port Talbot and Llanwern had integrated cold mills. Gartcosh was located 12 miles from Ravenscraig with the consequent additional transport costs. By closing Gartcosh and loading up the South Wales cold mills BSC saved £440,000 per annum in transport costs[1119]. The Gartcosh closure was correctly seen as being a threat to the future of Ravenscraig as it took a third of Ravenscraig's output[1120]. The closure meant that the majority of Ravenscraig's hot rolled strip output would be sent to Shotton for finishing. It would supply

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[1115] *Rail Freight Today: Scotland.*
[1116] Anon, 'BSC plans to cut UK strip capacity', *Steel Times*, Vol.213(9) September 1985, 414. Scholey in BSC, *1985-86,* p.3. BSC, *1985-86,* p.9. Upham, *Tempered Not Quenched*, pp.211-212.
[1117] Anon. 'Record Tumble Across The Group'. *Steel News*, No353, 21st July 1988, p.7. BS, *1988-1989,* p.15.
[1118] House of Commons Papers. Session 1982-83, *The Steel Industry in Scotland,* p.90, p.103. Dudley and Richardson, p.201, p.216.
[1119] BSC, *1985-86,* p.19.
[1120] Ian Rodger, Scottish steel closure seen as threat to future of Ravenscraig. *Financial Times*, 7th August 1985, p.1. Dudley and Richardson, p.216. Upham, *Tempered Not Quenched,* p.196.

approximately 75% of Shotton's requirements. The outcome was becoming clear. Robert Haslam, BSC's Chairman, stated in 1984 that he believed that Ravenscraig's closure would be phased rather than a single closure[1121].

It was 1986 before any substantial investment was made at Ravenscraig. At first sight a £30 million investment appeared to be substantial. Half of this was for new coal injection facilities at the blast furnaces as BSC refused to invest in the coke ovens. This was an essential investment to maintain iron production. Other investments included a partial reline of Number 1 blast furnace at £5½ million and £2 million to rebuild Number 1 re-heat furnace[1122]. Over £20½ million of the £30 million was simply to maintain iron production. The rest was spent to allow Ravenscraig to supply 3,000 tonnes/month of 'grain orientated' electrical steel to the Orb Works in Newport in South Wales, the very town where Llanwern was located. Despite being one of the most sophisticated and complicated of bulk steels to produce this was hardly a long-term solution to Ravenscraig's problems. This investment was necessary to retain steelmaking at Ravenscraig. Meanwhile investment at Port Talbot continued to increase quality and output which was later used to replace Ravenscraig.

As late as 1988 Ravenscraig was still breaking production records. The hot strip mill produced a daily record of 7,330 tonnes[1123]. By then BSC were stating that they were committed to maximising the benefits of their Port Talbot investments[1124]. However, BSC still needed Ravenscraig so that it could meet peak demand until the bottleneck at Port Talbot of having only one concaster was removed. Ravenscraig had also been needed to maintain strip mill output during the rebuilding of Port Talbot's strip mill, a reversal of the situation in the late 1970s, when Ravenscraig was being modernised.

[1121] Haslam, Robert. House of Commons. Evidence to First Report from the Trade and Industry Committee Session 1983-84, *The British Steel Corporation's Prospects,* 18th January 1984.
[1122] Upham, *Tempered Not Quenched*, p.196.
[1123] Anon. Smashing start to the year for steelmen. *Evening Times*, 14th January 1988, p.1.
[1124] Robert Scholey, Evidence given to the Trade and Industry Committee, House of Commons, Session 1985-86, *British Steel Corporation*, 16th July 1986, p.5.

A further factor working against Ravenscraig was the location of the two South Wales strip mills in relation to each other. Being so closely located developed its own synergy. Costs were reduced by sharing assets and expertise. Contracts were let for both steelworks and an element of shared management developed which further reduced costs.

The problem for BSC was that considerable political opposition existed even within the Conservative Government to closing Ravenscraig. In 1982, with an approaching General Election, the Secretary of State for Industry, Patrick Jenkin, announced that steelmaking would continue at all of BSC's five integrated steelworks until 1986[1125]. This was later extended until 1989[1126]. The political support to retain steelmaking at Ravenscraig was such that the Conservative Scottish Secretary of State, George Younger, indicated in 1982 that closure would be a resignation issue[1127]. During 1982-83 keeping Ravenscraig open was estimated to have cost BSC about £100 million[1128]. Conservative political support largely evaporated with BSC's privatisation and the Government's refusal to interfere with a private company. The question was now not if, but when, it would close. Closure came after privatisation with the hot strip mill closing in 1991 and steelmaking in 1992[1129]. It was no coincidence that closure followed the opening of Port Talbot's second concast plant. A bottleneck had been removed at Port Talbot which meant, even in periods of high demand, that the South Wales plants could meet any likely demand. The last commercial reason for retaining Ravenscraig was removed.

The Conservative Government's attitude to Ravenscraig is particularly interesting. For the majority of nationalised industries the chosen model of ministerial control was the arm's length Morrisonian model where the government would agree overall strategy with the corporation but leave day to day implementation in the hands of

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[1125] Patrick Jenkin, Announcement by the Secretary of State for Industry to the House of Commons. Hansard. 20th December 1982, column 673. Dudley, p.63.
[1126] Dudley and Richardson, p.216. Dudley, pp.63-64.
[1127] Sirs, pp.119-120. Upham, *Tempered Not Quenched*, pp.162-163. Dudley, p.63.
[1128] Great Britain. House of Commons Papers. Second Report from the Industry and Trade Committee, Session 1982-83, *The British Steel Corporation's Prospects,* 16th February 1983, pxi.
[1129] BS, *Report and Accounts 1990-91,* p.10; *1992-93,* p.9.

management[1130]. With regard to Ravenscraig the Conservative Government in effect took control of BSC down to a lower level for electoral reasons. A Conservative Government, which more than any previous post war Government, embraced the idea of the free market, interfered to keep Ravenscraig open. This had a direct effect on Port Talbot in that BSC could not fully exploit the latter until Ravenscraig closed.

The benefits of the investment and changes to working practices at Port Talbot mounted during 1985-1988. The rebuilding of the hot strip mill coupled with the concast plant enabled Port Talbot to produce low cost hot strip of the highest quality. This and the decision to install a second concast machine to increase effective capacity ensured the eventual closure of Ravenscraig.

During the 1980s Port Talbot not only survived but largely regained its position as BS's primary strip mill. It received over £500 million of investment during the decade and by 1988 fears of closure had disappeared. It was claimed to be one of the most competitive and productive steelworks in Europe making a major contribution towards BS's profits[1131]. The numbers employed at Port Talbot had fallen from approximately 12,000 in the late 1970s to 4,500 in the late 1980s. It was the harbour that allowed it to maintain a cost advantage over Llanwern and Ravenscraig. Peter Allen, the Managing Director, Operations, BSC Strip Mill Products, stated in 1987 that Port Talbot, with some more changes, had a great future with little likelihood of further job losses[1132]. On the latter point he was wrong. Some difficult periods lay ahead but Port Talbot has continued to produce steel into the twenty-first century (see postscript).

Port Talbot's success was due largely to its continued exploitation of its locational advantages and particularly the harbour attached to the works. Allied to this was a workforce prepared to go along with the changes that management wanted even if this involved conflict with the national union. Management skilfully exploited their

[1130] Dudley, p.58.
[1131] J. Isaacs, 'Port Talbot triumph-£500m filter for the battle of the giants'. *SWEP*, 28th October 1987, p.16.
[1132] Peter Allen, quoted in 'Port Talbot triumph-£500m filter for the battle of the giants'. *SWEP*, 28th October 1987, p.16.

new found strength after the 1980 strike largely through threats to the future of steelmaking and a drive to make everyone aware of the commercial realities that they faced. In addition investment in the 1980s made up for the lack of investment during the 1970s. This investment, and to a lesser extent, investment at Llanwern removed the last commercial reasons to retain Ravenscraig. Privatisation largely removed the political support that Ravenscraig enjoyed and speeded up closure. BSC pushed hard to privatise BSC as an entity and it is likely that the desire to close Ravenscraig rather than create a potential rival for the South Wales strip mills was one of the reasons for this. After the traumatic events of the early 1980s, Port Talbot's position stabilised. That process was to continue after privatisation. Short-term and medium-term survival had been assured.

Chapter 12: Postscript and Conclusions

Postscript

British Steel operated Port Talbot until its merger with the Dutch steelmaker, Koninklijke Hoogovens NV, on 6th October 1999 to form Corus[1133]. In October 2006 the Indian company, Tata Steel, made an offer for Corus[1134], and took over ownership in 2007.

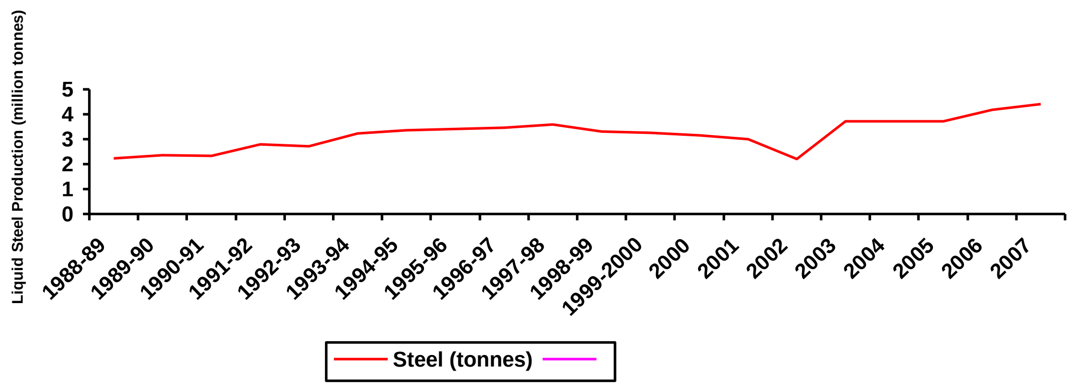
During the UK recession of 1990-91 BS decided to load up the lower cost strip mills at Port Talbot and Llanwern in preference to Ravenscraig[1135]. This resulted in the closure of Ravenscraig's hot strip mill. Ravenscraig continued to operate as a slab producer feeding the South Wales strip mills using just one blast furnace until all iron and steelmaking ended in June 1992[1136].

On 1st February 2001 Corus announced a major restructuring in response to difficult trading conditions. This involved the closure of the Ebbw Vale Tinplate Works and the end of iron and steelmaking at Llanwern although the hot strip mill continued in production[1137]. It was supplied with slabs from Port Talbot and Redcar. In 2009 all production at Llanwern temporarily stopped due to the economic downturn. This left Port Talbot as Britain's only operating hot strip mill[1138].

Liquid steel production at Port Talbot has gradually increased since 1988 stimulated by investment, the closure of Ravenscraig and the end of steelmaking at Llanwern in 2001 to reach 4.4 million tonnes in 2007 :-

[1133] Corus, A platform for future growth: Corus Group plc: Report for the six month to 1 April 2000, p.1
[1134] Ibid, Recommended Acquisition of Corus Group plc by Tata Steel UK Limited, information issued to shareholders, 2006.
[1135] BS, *1990-91*, p.10.
[1136] Ibid, *1992-93*, p.9.
[1137] Corus, *Report and Accounts 2001*, p.15.
[1138] Paul Lewis, 'Corus 'committed to plant's future''. *SWEP*, 27th January 2009, p.1.

Fig 12.1: Port Talbot Liquid Steel Production 1988-2007[1139]



During 2007 Number 5 blast furnace produced a weekly record of 48,833 tonnes of iron[1140]. Also in 2007 the hot strip mill rolled a record 3 million tonnes of coil[1141]. In November 2008 Tata announced that due to the economic downturn European production was to be reduced by 30%. Port Talbot was temporarily reduced to a one blast furnace operation (Number 5)[1142]. The major investments since privatisation have been :-

Table 12.1: Port Talbot Investment Since 1988[1143]

		Cost (£ million)
1991	Second Concast Plant	83
1992-93	Number 4 Blast Furnace Rebuild	71
1993	Degassing Unit Installed	13
1994	Link Equipment Installed in Cold Mill	12
1996-98	Continuous Annealing Line Installed	121
1998	Coal Injection at Blast Furnaces	20
2002	Rebuild of Number 5 Blast Furnace	65
2005	Third Concast Plant Installed	80
2006	Improvements to Blast Furnaces	16
2008	Investment in Energy Management	60

[1139] Corus, Information supplied by Corus Port Talbot, 2008.
[1140] Paul Lewis, 'Safety first as record smashed at steel works'. *SWEP*, 31st May 2007, p.1.
[1141] Corus, 'Well Done'. Corus advertisement in *SWEP*, 21st December 2007, p.16.
[1142] Robin Turner, ''Knee-jerk reaction' claim at Corus plant'. *PTG*, 13th November 2008, p.3. Richard Youle, 'Steel giant to slash production'. *SWEP*, November 2008, p.1.
[1143] BS, *1989-1990*, p.3; *1990-91*, p.10; *1991-92*, p.12; *1992-93*, p.13; *1993-94*, p.19; *1994-95*, p.18; *1996-97*, pp.8-9; *1998-99*, p.13. Anon. '£71m blast furnace gets into action'. *SWEP*, 8th September 1992, p.1. Corus, *2001*, p.14; *2002*, p.6, p.11. *Corus announces £60 million investment at Port Talbot steelworks in Wales*: Corus news release, 4th February 2008. Paul Lewis, 'Welcome for major steel plant boost'. *The Courier*, 10th May 2005, p.1. Ibid, '£16m act of support wins praise'. *SWEP*, 21st September 2006. p.10.

As investment took place and more activities were outsourced the workforce fell from 4,689 in 1988 to approximately 2,900 in 2005. By 2008 it has risen again to almost 3,500[1144]. It was felt that too many works critical functions had been outsourced and a strategic decision was made to bring them back in house to reduce risk[1145].

Predicting the future of steelmaking at Port Talbot is difficult. Investment in plant has been high; there is a well trained workforce and no rival integrated steelworks in Britain. The plant may be modern but it is far from ideally laid out leading to higher production costs. Steelmaking capacity exceeds rolling capacity by almost 2 million tonnes. With Llanwern back in production during 2009 in effect Port Talbot's second strip mill is located over 40 miles away and its tinplate mill 20 miles away at Trostre which is far from ideal. For Port Talbot to have a long-term future it needs substantial political support both in Wales and at Westminster. With foreign ownership and continuing globalisation long-term survival must be at least questionable.

[1144] Paul Turner, 'Cheer for workers as steel company shows huge profit'. *SWEP*, 26th August 2005, p.1. Anon. 'Corus contractor cuts 40 temporary jobs'. *SWEP*, 20th October 2008, p.1.
[1145] Corus Manager, *Conversation with Stephen Parry*, November 2008.

Conclusions

Over the period covered in this piece of work there have been a number of fundamental changes for the British steel industry. The most fundamental has been the completion of a process already underway at the start of the twentieth century, namely the replacement of home produced iron ore with foreign ore. By 1988 virtually all ore and most coal used was foreign in origin. This change altered the economics of steelmaking in Britain in favour of coastal steel production with access to an ore dock/harbour. This eliminated costly rail transport to inland steelworks. It is that change and particularly direct access to an ore dock/harbour that has largely accounted for the expansion and survival of steelmaking at Port Talbot.

A further change in steelmaking during the twentieth century was the concentration of steelmaking at fewer but larger sites. The stimulus for this change was the need to gain the economies of scale enjoyed by some foreign steelmakers. Larger steelworks needed greater amounts of raw materials which made coastal locations with access to a port even more attractive sites for steelmaking. These two trends made Port Talbot an ideal site for steelmaking. A further locational advantage was the abundant availability of low value land for expansion. Despite these advantages the evidence reveals that steelmaking started at Port Talbot almost by accident. The stimulus was that the dock owners needed to increase trade and a steelworks met that requirement. After the initial company failed Baldwins acquired the steelworks relatively cheaply. That meant that capital was available for investment. That and the locational advantages ensured that it became the largest steelworks in South West Wales and one of national importance exploiting the growing market for heavy steel products.

For most of the period covered here British steel companies lagged behind American and German companies in terms of size. In many ways the story of the British steel industry throughout the twentieth century was how it responded to the challenges of these larger overseas steelmakers. A barrier in responding adequately to these challenges was not just the difficulty in smaller firms raising the necessary capital but the need to co-operate or merge with longstanding rivals. It can be argued that British steelmaking in the twentieth century has really been a question of how to gain efficiency through scale of production. Port Talbot demonstrated what this process could achieve. It was certainly not unique in British steelmaking but mergers tended to take place here more easily than in other locations. Part of the reason for this was that the companies involved at Port Talbot once Baldwins took over were not long established firms. That gave a flexibility that long established family firms may have found more difficult to achieve.

Yet if the formation of Baldwins in the early twentieth century was an example of a successful merger which allowed the development of heavy steel production at Port Talbot the merger in 1930 to form GKB was far from ideal. Firstly it was only a partial merger which became a financial success but it was also intended to stimulate investment. Because of the divergent interests of the parent companies it actually delayed investment in the strip mill. This delay was the catalyst for the eventual merger of Baldwins with Richard Thomas. Secondly the rationalisation that followed the formation of GKB ensured the end of steelmaking at Dowlais. From the mid 1930s it is likely that Dowlais would have been profitable as an iron producer. The formation of the SCoW was a successful merger by any standards. By pooling the resources of the leading South Wales tinplate and sheet producers massive investment and high profits were made. Although the steelmakers in South Wales faced some unique problems it is tempting to speculate what could have been achieved by similar mergers in other sectors. The validity of this approach is highlighted by the fact that Port Talbot was the only British strip mill that did not cause serious financial problems for its parent company. This willingness to pool resources in South Wales related to the product mix. To remain in the flat product markets meant that they had little choice other than to gain access to the new technology and to concentrate steel production at one site. The sheer scale of investment necessitated merger to gain access to the necessary capital. This was the almost inevitable culmination of a process already underway in South Wales of the linking of the main steel companies. Yet the denationalisation of the industry in the 1950s reversed that process and further fragmented the industry in South Wales. This in turn made it more difficult for the companies to respond to the deteriorating financial position of the 1960s.

As to location Port Talbot was the obvious site, and arguably only site, for this strip mill. It already had relatively modern iron and steelmaking plant and the all important dock to unload higher quality foreign ore. It would have been impossible to have built this strip mill and associated plant at another site as the necessary additional funds to build the equivalent plant already at Port Talbot were not available. Thus the interests of the steelmakers regarding location coincided with those of the politicians, most noticeably Hugh Dalton. Port Talbot suited both parties.

Two problems existed with Port Talbot. Firstly because the strip mill was attached to pre-existing plant it ensured that the layout of the steelworks was not the most efficient. That added to production costs. Secondly, locating the tinplate mill at Llanelli on employment grounds caused inefficiency in tinplate production. This mistake was repeated when the second tinplate works was built near Swansea in the mid 1950s.

The 1950s were a period of rising production and profits for the SCoW. Yet this created problems. The pressure to increase profits caused inappropriate investment in plant. The turning point for the SCoW was the decision to built two additional strip mills. They correctly believed that demand would not justify these mills. It signified a change in operating strategy from simply maximising output in order to increase profits to become more concerned with efficiency in the production process and gaining customer satisfaction. They began to address manning levels but not vigorously enough. It also meant that Port Talbot would never have the second strip mill needed to maximise the full advantages of this site. It is tempting to speculate that with a second strip mill and with support from Shotton and Ebbw Vale Britain's strip mill requirements would have been adequately met. Yet it was the 1970s before the full significance of the two new strip mills was felt regarding over capacity.

A feature that differentiated Port Talbot from the wider industry is the flexibility to reinvent itself. Steelmaking started with a small steelworks producing tinplate bars. After its failure it reopened and expanded to produce heavy products as market opportunities emerged. That process was reversed after World War Two as it moved back into flat products to support the post war consumer boom. That flexibility allowed exploitation of new market opportunities as they arose. It was the foresight of the senior managers that achieved this. Port Talbot always seemed to have the right men in charge. John Roper Wright, Julian Pode and Fred Cartwright all showed insight in how to exploit developing market and technological opportunities. In more challenging times Charles Wright steered local steelmaking through a very difficult period by developing and maintaining good customer relationships, delegating to talented junior staff and understanding the need for mergers. Equally Brian Moffat skilfully guided steelmaking at Port Talbot through the traumatic events of the late 1970s and early 1980s to ensure survival and eventually increased capacity.

At various times Port Talbot has been both a technological industry leader and a follower. It was certainly an industry leader from the end of the Second World War until the early 1960s. That position changed due to increased domestic strip mill competition and the increasing scale of the investment needed to modernise. As costs increased so did the risk of works closure and company failure through investing in the wrong plant. It is therefore unsurprising that after 1960 tried and tested steelmaking technology was used. This was a sensible approach which built on others' experiences and reduced risk.

The impact of Government on Port Talbot has been mixed. A feature was the steady growth in Government influence up to and beyond nationalisation. The positive effects include the support in building the strip mill. Yet Government prevented the SCoW and BSC from developing Port Talbot to maximise its full potential by building a second strip mill. Failure to get Government approval in the 1970s for expansion meant that BSC could not fully exploit the advantages of the new harbour and conversion to BOS production. It meant that Port Talbot technologically fell behind Ravenscraig and Llanwern.

Throughout the period from 1900 to 1988 Port Talbot has benefited from its locational advantages. It allowed it to develop and withstand the challenges of other British steelworks. That has been the dominant factor throughout the twentieth century.

List of Appendices

Appendix 1

British Steel Ingot Output (tons): 1885-1922[1146]

	Bessemer Output	Open-Hearth Output	Total Steel Ingot Output
1885			1,880,014
1886			2,265,503
1887			3,046,619
1888			3,306,737
1889	2,141,503	1,429,169	3,570,670
1890	2,014,863	1,564,200	3,579,060
1891	1,642,005	1,514,538	3,156,540
1892	1,500,783	1,418,830	2,919,610
1893	1,493,354	1,456,309	2,949,660
1894	1,535,364	1,575,318	3,110,680
1895	1,535,225	1,724,737	3,259,960
1896	1,814,842	2,317,555	4,132,390
1897	1,884,155	2,602,006	4,486,160
1898	1,759,386	2,806,600	4,565,980
1899	1,825,074	3,030,251	4,855,320
1900	1,745,004	3,156,050	4,901,050
1901	1,606,253	3,297,791	4,094,040
1902	1,825,779	3,083,288	4,090,060
1903	1,910,018	3,124,083	5,034,100
1904	1,781,533	3,245,346	5,026,880
1905	1,974,210	3,838,072	5,812,280
1906	1,907,338	4,554,936	6,462,274
1907	1,859,259	4,663,489	6,522,750
1908	1,478,539	3,817,103	5,295,640
1909	1,733,220	4,148,408	5,881,630
1910	1,779,115	4,595,366	6,374,480
1911	1,461,140	5,000,472	6,461,610
1912	1,522,487	5,273,657	6,796,140
1913	1,600,701	6,063,175	7,663,870
1914	1,279,516	6,555,597	7,835,110
1915	1,301,224	7,049,720	8,550,000*
1916	1,601,970	7,045,562	8,991,700*
1917	1,661,546	7,835,000	9,716,500*
1918	1,356,005	7,825,551	9,539,400*
1919	789,200	6,894,800	7,894,000*
1920	820,900	7,984,100	9,067,300*
1921	238,900	3,351,000	3,703,400*
1922	468,500	5,304,709	5,880,600*

*Includes castings and electric steel

[1146] Anon, ‘Output of Steel Ingots in Great Britain 1885-1923’, *I&CTR*, 11th July (1924), 57.

Appendix 2

Port Talbot Steelworks: Technical Details: 1920[1147]

Number 1 Melting Shop
1x50ton (acid) open-hearth furnace
1x50ton (basic) open-hearth furnace
3x45ton (basic) open-hearth furnaces
1x25ton casting house crane
1x10ton casting house crane
Ingot size 24-45cwt
4 gas fired soaking pits

Number 2 Melting Shop
6x60ton (basic) open-hearth furnaces
3 overhead Wellman charges
2x100ton ladle cranes
Ingot size 6ton 6cwt–12tons
4 gas fired soaking pits (capacity 32 ingots)

Cogging Mill
1 stand 40” rolls (produced slabs 54”x14”)
Lamberton Bloom shears–blooms 11”x11” or 20”x6”

32” Heavy Bar Mill
3 stands of 2-high rolls
(used to roll sections, billets, heavy rails, slabs and blooms)

16” and 12” Light Bar Mills
16”-3x3 high stands
12”–3x2 high stands
2x5ton cranes
(used to roll sections, rounds, squares, flats and light rails)

Plate Mills (Light and Heavy)
3 reheat furnaces
3x3 high rolls for roughing, finishing and 2 high for chequering pass (light mill)
42” reversing heavy plate mill (plate 2” thick and 125” wide)
1 stand of 2 high rolls 12’ 6” in length (heavy mill)
1x20ton crane (light mill)
2 sets of electrically driven plate shears (to shear ½”) (light mill)
Products 1/8”–2” up to 50’ in length and 11’ 3” in width (heavy mill)
Rolls electrically driven

Power House
2 Williams-Siemans high pressure turbo-generators

[1147] Anon, ‘The Port Talbot Steel Works’, *I&CTR*, 17th September (1920), 362-364.

Appendix 3

Margam Steelworks: Technical Details: 1920[1148]

Coal Washery
Type: Coppee
1 shaking screen
6 Felspar washers
Capacity: 120tons/hour

Coke Ovens
Service bunker capacity: 1,000tons/hour
120 Coppee Regenerative Ovens (2 batteries of 60 ovens)
Oven dimensions: 33'4"x 8'2½"x1'7¾"
Output: 4,000tons/week

Blast Furnaces
2 blast furnaces
Builder: Head, Wrightson & Co Ltd
Bunker storage capacity: 21,000tons
Height: 84'
Hearth diameter: 12'6"
Bosh diameter: 20'
Throat diameter: 15'
Bell diameter: 10'
2 dust catchers per furnace
Capacity of charging bucket: 8tons of ore and 4tons of coke
Charging rate: 100tons/hour
10 hot blast Cowper type stoves 90' high/21' diameter

Melting Shop
4x60ton open-hearth furnaces
Designed and built by William Smith Owen Engineering
Furnace bath: 36'x12'6"
2x100ton tapping side cranes
Ingot size: 3ton 5cwt
Gas produced by a battery of 16 producers
2 groups of soaking pits in melting shop

Rolling Mill
3 stands of 36" diameter rolls (cogging, roughing and finishing)
Cogging and roughing rolls 8' long on the barrel
Finishing rolls 7'3" on the barrel
(Products: billets, bars, a range of standard sections and rails)

[1148] Horton, 'Baldwins, Ltd., Adds New Plant', *Iron Trade Review*, 21st October (1920), 1133-1139. Anon, 'The New Margam Works of Baldwins, Ltd', *I&CTR*, 17th September (1920), 354-359.

Appendix 4

Baldwins Financial Results: 1902-03 to 1916-17[1149]

Year Ending 30th June	Profit(£)	Dividend
1902-03	108,354	
1903-04	68,885	
1904-05	69,130	1¼%
1905-06	110,016	2½%
1906-07	148,712	5%
1907-08	129,693	5%
1908-09	157,602	5%
1909-10	149,083	5%
1910-11	209,529	7½%
1911-12	213,977	10%
1912-13	275,106	10%
1913-14	209,048	10%
1914-15	260,237	10%
1915-16	232,081	12½%
1916-17	224,604	12½%

Baldwins Financial Results: 1917-18 to 1937[1150]

	1917-18(£)	**1918-19(£)**	**1919-20(£)**	**1920-21(£)**	**1921-22(£)**
Trading Profit	442,900	554,997	683,405	410,758	306,132
Net Profit	359,043	471,139	567,023	325,167	86,993
Brought Forward	156,969	255,139	285,799	291,325	303,479
	516,012	**726,270**	**852,822**	**616,492**	**390,472**
Reserve	75,000	75,000	75,000	25,000	Nil
Pref Dividend	13,750	13,750	45,667	80,476	81,294
Ord Dividend	153,790	351,729	440,830	207,537	Nil
	(11½%)	(12½%)	(12½)	(5%)	
Carried Forward	273,473	285,799	201,325	303,479	309,178

	1922-23(£)	**1923-24(£)**	**1924-25(£)**	**1925-26(£)**	**1926-27(£)**
Trading Profit	484,760	493,520	214,078	255,837	120,009
Net Profit	200,902	193,412	Dr43,955	11,168	Dr129,970
Brought Forward	309,178	424,140	526,618	230,231	241,489
	510,080	**617,552**	**482,663**	**241,489**	**111,519**
Reserve	Nil	Nil	Nil	Nil	55,297
Pref Dividend	85,940	90,935	52,342	Nil	Nil
Ord Dividend	Nil	Nil	Nil	Nil	Nil
Carried Forward	424,140	526,617	230,321	241,489	55,297

1149 JISC, 'Baldwins Three Pounds For One', *Journal of the Iron and Steel Confederation*, 1922, pp.56-57, p.375.

1150 Anon. 'Baldwins Report for the year ended 30th June 1921'. *Economist*, 21st January 1922, p.84. Ibid, Y/E 30th June 1924, 13th December 1924, p.959; 'Baldwins' Lean Year', 26th November 1927, p.927; Y/E 31st December 1930, 11th April 1931, pp.796-797; Y/E 31st December 1932, 1st April 1933, p.699; Y/E 31st December 1933, 24th March 1934, p.642; 'Baldwins Progressive Report' 27th March 1937, pp.710-711; 'Baldwins Accounts', 26th March 1938, pp.698-699.

	1928(£)	1929(£)	1930(£)	1931(£)	1932(£)	1933(£)
Profit	220,107	352,042	300,905	174,080	190,599	356,457
Depreciation	79,131	80,000	80,000	60,000	60,000	60,000
Other Deductions	32,026	43,751	36,566	17,571	16,095	21,758
Debenture Interest, Sinking Fund	105,551	138,307	135,906	142,504	144,729	156,346
Increase Debenture Interest		41,679	29,242	Nil	Nil	64,152
General Reserve			20,000	Dr20,000		
Debtor Amount Written Off		23,811				
Inc/Decrease C/F	3,399	27,894	-809	-25,995	-30,225	54,201

	1934(£)	1935(£)	1936(£)	1937(£)	
Gross Profit	502,642	512,246	630,440	808,547	
Depreciation	75,000	75,000	75,000	140,000	
Income Tax & NDC	68,535	74,256	125,394	225,000	
Fees, Pensions etc	16,548	17,766	21,479	20,530	
Debenture Interests	254,259	138,653	133,598	57,544	
Preference Dividends	50,766	50,640	29,439	77,011	
Ordinary Share :-					
Earned	37,534	155,931	245,530	288,462	
Paid	26,595	96,588	158,520	188,664	
Earned (%)	3.5%	12.1%	15.5%	15.3%	
Paid	2.5%	7.5%	10%	10%	
Carried Forward	36,005	45,348	45,439	43,474	
Capital	-	1,661,732	2,078,947	2,494,737	

NB To 1926-27 Y/E 30th June, from 1928 Y/E 31st December.

Appendix 5

Port Talbot Dock: Iron Ore Imports (tons): 1922-1947[1151]

	Port Talbot Dock: Iron Ore Imports	South Wales: Iron Ore Imports
1922	83,464	565,285
1923	211,651	1,227,933
1924	302,680	1,117,853
1925		
1926	90,596	355,360
1927	128,326	704,199
1928	191,744	900,569
1929	265,719	1,121,612
1930	336,221	808,140
1931		
1932		
1933	453,426	647,759
1934	453,606	639,987
1935	408,023	657,632
1936	406,304	956,962
1937	456,232	1,217,787
1938	318,946	909,722
1939	388,024	1,175,810
1940	341,941	994,723
1941	93,188	469,107
1942	24,700	321,595
1943	28,449	310,236
1944	48,775	372,016
1945	178,269	860,895
1946	390,848	1,476,594
1947	514,612	1,470,473

[1151] GWR, *Great Western Ports, 1925,* (London: H.N. Appleby, 1925), p.109, p.124. Ibid, *1926,* p.115, p.130; *1929,* p.160, p.165; *1930,* p.161, p.166; *1931* p.167, p.172; *1932*, p.173, p.168; *1936,* p.171, p.176; *1937,* p.171, p.176; *1939,* p.172, p,177. BTC, *South Wales Ports,* (British Transport Commission, 1948), pp.86-87, pp.96-97.

Appendix 6

South Wales and British Steel Ingot/Castings Output (tons): 1920-1938[1152]

	South Wales Steel Ingot/Castings Output	British Steel Ingot/Castings Output
1920	1,884,300	9,067,300
1921	854,500	3,703,400
1922	1,873,900	5,880,600
1923	2,212,100	8,481,800
1924	2,254,600	8,201,200
1925	1,962,800	7,385,400
1926	902,100	3,596,100
1927	1,927,300	9,097,100
1928	2,158,600	8,519,700
1929	2,336,100	9,636,200
1930	1,503,200	7,325,700
1931	1,274,000	5,202,600
1932	1,347,500	5,261,400
1933	1,769,500	7,024,000
1934	1,845,900	8,849,700
1935	1,883,300	9,858,700
1936	2,421,700	11,784,600
1937	2,628,800	12,984,000
1938	1,759,400	10,393,800

Appendix 7

South Wales and British Pig Iron Output (tons)[1153]

	Pig Iron Output South Wales	Pig Iron Output Great Britain
1913	889,200	10,263,300
1929	926,500	7,589,300
1930	542,300	6,192,400
1931	279,800	3,772,600
1932	353,500	3,574,000
1933	451,400	4,136,000
1934	491,700	5,969,100
1935	512,800	6,424,100
1936	750,800	7,721,400
1937	814,500	8,496,600
1938	666,500	6,762,700

[1152] NFISM, p,11, p.14. Anon. 'Output of Pig Iron and Steel in Great Britain' *I&CTR*, 30th September (1938), 509, and 27th January (1939), 195. Carr and Taplin, p.366, p.429. BSC, *Statistical Handbook 1966*, p.10. John Williams, p.355.

[1153] I&CTR, ibids. Fox, 'The British Pig-Iron Industry', *I&CTR*, 21st January (1938), 103-104 (p.103).

Appendix 8

Hot Strip Mill Details: 1951[1154]

Stand	Working Roll Diameter
Vertical Edger	42”
Roughing Scalebreaker	36”x72”
No I Broadside	42”x130”
No 2 Rougher	36”x80”
No 3 Rougher	36”x80”
No 4 Rougher	27”x80”
No 5 Finisher	27”x80”
No 6 Finisher	27”x80”
No 7 Finisher	27”x80”
No 8 Finisher	27”x80”
No 9 Finisher	27”x80”
No 10 Finisher	27”x80”

Appendix 9

UK Liquid Steel and Flat Product Production: 1945-1966 (million tons)[1155]

	Liquid Steel Production	Imports	Exports	Tinplate Production	Hot & Cold Rolled Deliveries	Sheet Deliveries
1945	11.82	0.17	0.67	0.51		
1946	12.70	0.48	2.30	0.58		
1947	12.72	0.46	1.73	0.66		
1948	14.88	0.50	1.98	0.74		
1949	15.55	1.09	2.36	0.75		
1950	16.29	0.56	3.15	0.76		
1951	15.64	0.52	2.61	0.76		
1952	16.42	1.77	2.55	0.91		
1953	17.61	1.11	2.75	0.76		
1954	18.52	0.47	2.90	0.76		
1955	19.79	1.86	3.36	0.89		
1956	20.66	1.77	3.29	0.92		
1957	21.70	0.95	3.72	1.04		
1958	19.57	0.58	3.14	1.04		
1959	20.19	0.50	3.48	1.10		
1960	24.30	1.60	3.89	1.23		
1961	22.09	0.57	3.99	1.08	1.88	2.52
1962	20.49	0.97	3.96	1.20	1.85	2.91
1963	22.52	1.53	4.30	1.21	2.15	3.58
1964	26.23	1.98	4.63	1.19	2.40	4.03
1965	27.01	0.76	4.72	1.21	2.32	4.18
1966	24.32	1.15	4.47	1.22	2.19	4.00

[1154] Brinn, p.41.
[1155] Iron and Steel Board, 1964, p.46. BSC, *Statistical Handbook 1966,* p.6, p.14. John Williams, p.356.

Appendix 10

UK Pig Iron and Steel Production: 1945-1966 (000' tons)[1156]

	Pig Iron Production (including direct castings)	**Average No Blast Furnaces in Blast**	**Output/Furnace/ Annum**	**Liquid Steel Production**
1945	7,107.4	99	71.7	11,824.4
1946	7,761.2	98	79.3	12,695.3
1947	7,784.6	94	83.1	12,724.5
1948	9,276.4	102	90.9	14,876.6
1949	9,498.5	101	93.7	15,552.9
1950	9,632.9	100	96.6	16,292.7
1951	9,668.8	100	96.7	15,638.5
1952	10,727.7	103	104.6	16,417.9
1953	11,174.8	105	106.7	17,608.5
1954	11,883.4	100	118.6	18,519.7
1955	12,470.0	99	126.4	19,790.6
1956	13,170.1	100	131.9	20,658.9
1957	14,282.6	98	145.5	21,699.1
1958	12,974.5	88	146.8	19,565.7
1959	12,582.5	78	160.6	20,186.4
1960	15,762.9	85	185.4	24,305.0
1961	14,747.1	82	179.8	22,086.1
1962	13,692.1	73	186.8	20,491.0
1963	14,591.4	64	228.6	22,520.2
1964	17,273.6	67	257.0	26,229.9
1965	17,459.9	66	262.9	27,006.1
1966	15,709.7	60	260.4	24,315.3

[1156] BSC, *Statistical Handbook 1966*, p.8, p.10.

Appendix 11

Development Scheme L: Main Port Talbot Provisions[1157]

Facility	**Provision/Completion**
Dock	Extension to Margam Wharf. Additional 500tons/hour Transporter Bridge (1955)
Coal Preparation	Construction of 16 additional drainage bunkers, conveyors, and coal bunker (1955)
Coke Ovens	Construction of 90 coke ovens (battery No4) and ‘B’ by-product plant (1956)
Sinter Plant	Construction of No2 sinter strand (1954)
Blast Furnace	Construction of 10,000tons/week Number 4 blast furnace with 29’9” hearth diameter (Jan 1956)
Abbey Melting Shop	Construction of 4x230ton fixed open-hearth furnaces (1957)
Port Talbot and Margam Melting Shops	Increase in size of the open-hearth furnaces (75tons to 100tons)
Soaking Pits	Construction of Numbers 21-24 soaking pits (1955)
Reheat Furnaces	Construction of No4 triple zone furnace (1955)
Pickle Line	Construction of No2 continuous pickle line (1955)
Annealing Bay	Construction of 4 furnaces (1954)
Gas Holder	Construction of a 3,000,000 cubic/foot gasholder at Margam (1956)
Power plant	Construction of ‘B’ power plant (1956)

[1157] Kew, NA, Ref BE2/328-261086, Undated Iron and Steel Corporation minute to the Organisation For European Economic Co-operation Re SCoW Scheme L, 1952. Ibid, Undated Ministry of Supply note on Development of the South Wales Tinplate Industry, 1952, appendix c p.3. Brinn, p.11.

Appendix 12

Development Scheme L: Costings[1158]

Plant	**Estimated Cost: October 1951**	**Estimated Cost: October 1952**	**Estimated Cost: November 1952**
Margam Works			
Coke Ovens	£3.24m		
Mechanical Handling	£0.35m		
Plant at Blast Furnaces	£0.81m		
Sinter Plant (2nd Strand)	£1.10m		
No4 Blast Furnace	£1.14m		
No4 Blast Furnace Stoves	£0.39m		
Power Plant, Pump House & Boilers	£2.61m		
Electrical Power	£0.36m		
Rail Track 7 Earthworks	£0.37m		
Miscellaneous	£2.22m		
Margam Total	**£12.59m**		**£15.22m**
Abbey Works			
Scrap Box Filling Bay	£2.54m		
Soaking Pits	£0.30m		
Pickle Bay	£1.04m		
Rolling Stock	£0.44m		
Miscellaneous	£3.37m		
Abbey Total	**£7.69m**		**£12.80m**
Professional Fees & Admin	£0.81m		£1.12m
Other			£0.20m
Steel Division Total	**£21.09m**		**£29.29m**
Margam Wharf			£0.20m
Velindre	**£11.88m**		**£12.70m**
Total	**£32.97m**	**£40.00m**	**£42.22m**

NB There was also a requirement for £3m of working capital

[1158] Ibid, Ministry of Supply note on Development of the Tinplate Industry; Iron and Steel Corporation, note by Sir James Steele–The Steel Company of Wales Ltd–Revised Estimated Cost of 'L' Scheme, 1953.

Appendix 13

SCoW Production: 1948-1966 (tons)[1159]

Y/E	Coke	Pig Iron	Steel Ingots	Steel Plate	Steel Sheet	Tinplate & Blackplate
1948	310,000	361,000	416,000	105,000	160,000	229,000
1949	304,000	347,000	431,000	93,000	165,000	242,000
1950	305,000	341,000	463,000	65,000	184,000	257,000
1951	469,000	438,000	640,000	74,000	253,000	258,000
1952	749,000	552,000	963,000	173,000	391,000	339,000
1953	717,000	671,000	1,305,000	221,000	570,000	401,000
1954	691,000	893,000	1,559,000	259,000	646,000	477,000
1955	720,000	943,000	1,748,000	233,000	782,000	502,000
1956	956,000	1,018,000	1,728,000	254,000	700,000	523,000
1957	1,051,000	1,211,000	2,095,000	298,000	733,000	703,000
1958	1,053,000	1,327,000	2,178,000	280,000	775,000	670,000
1959	1,082,000	1,365,000	2,324,000	206,000	912,000	802,000
1960	1,494,000	1,918,000	2,777,000	194,000	1,113,000	891,000
1961	1,434,000	1,830,000	2,633,000	242,000	1,017,000	791,000
1962	1,342,000	1,929,000	2,515,000	168,000	985,000	847,000
1963	1,515,000	2,183,000	2,720,000	158,000	996,000	853,000
1964	1,324,000	1,786,000	2,419,000	180,000	877,000	768,000
1965	1,290,000	2,160,000	2,736,000	216,000	970,000	832,000
1966	1,435,000	2,155,000	2,685,000	211,000	962,000	765,000

Appendix 14

SCoW: Turnover to Profits (£,000)[1160]

Y/E	Turnover	Trading Surplus	Depreciatn	Fixed Asset Replacement Reserve	Interest	Tax Provision	Balance	Dividend
1948	22,167	1,514	549		370		595	273
1949	25,959	2,089	662		487		940	268
1950	30,343	2,381	700		953		726	268
1951	37,165	3,966	1,264		1,568		1,128	260
1952	58,684	8,408	3,054		1,877	4,000	523	355
1953	63,110	7,666	3,320		2,264	1,500	582	367
1954	74,193	14,244	3,551	800	2,408	4,200	3,285	372
1955	83,894	18,294	4,175	1,400	2,417	5,650	4,652	389
1956	86,798	14,212	4,678	1,700	3,583	1,950	2,301	390
1957	109,552	18,962	5,641	2,400	4,164	4,500	2,257	1,380
1958	113,397	22,159	6,085	2,500	4,535	6,000	3,039	2,070
1959	125,586	23,257	6,613	2,650	4,765	5,000	4,229	2450
1960	143,096	30,479	8,217	3,000	4,835	7,400	7,027	3,062
1961	133,040	23,252	8,333	2,000	4,890	3,100	4,929	2,450
1962	135,026	18,584	8,995		5,332	700	3,557	2,450
1963	138,724	18,758	9,472		5,006	950	3,330	2,450
1964	126,905	13,300	9,565		4,976	Cr 1,750	509	2,450
1965	141,015	21,118	9,395		5,278	1,050	5,395	2,350
1966	137,415	17,646	9,640		4,952	900	2,154	3,175

[1159] SCoW, *Annual Report and Accounts 1961*, p.19; *1966* p.18. BSC, *Statistical Handbook 1966*, p.8, p.10. Brinn, p.43.
[1160] SCoW, *Director's Report and Accounts 1951* p.7; *1952*, p.6; *1953* p.6; *1954* p.6; *1961* p.19; *1962* p.18; *1963* p.18; *1964* p.14; *1965* p.14; *1966* p.18. Brinn, pp.44-45.

Appendix 15

Development Scheme M: Main Port Talbot Provisions[1161]

Facility	Provision/Completion
Dock	Additional 500tons/hour Transporter Bridge (1959)
Coal Preparation	Construction Grange plant sidings, tipplers, blenders (1959)
Coke Ovens	Construction of Grange plant battery No6 (80 coke ovens) and by-product plant (1959)
Sinter Plant	Construction of No3 sinter strand (1959)
Blast Furnace	Construction of 1850tons/day Number 5 blast furnace, 31'0" hearth diameter (1959)
VLN Plant	Construction of VLN shop with 3x50ton converters (1959). Construction of 4 lime kilns and 2x1,200ton mixers (1959)
Soaking Pits	Construction of numbers 25-34 gas heated soaking pits (1958-59)
Slabbing Mill	Replaced by new universal mill: 60,000tons/week (Nov 1959)
Reheat Furnaces	Construction of No5 furnace (1960)
Pickle Line	Construction of 48" No3 pickle line (1959)
Cold Mill	Install Davy-United 4 stand cold rolling mill (1959)
Anneal Bay	Construction of number 17-33 annealing furnaces (1958)
Gas Holders	Construction of 5,000,000 cubic/foot gasholder at Margam (1962) and 1,000,000 cubic/foot gasholder at the Abbey Works (1959)

Appendix 16

SCoW Saleable Products as Proportion of Steel Ingot Production (tons)[1162]

Y/E	Ingot Production	Steel Plate	Steel Sheet	Tinplate & Blackplate	Total Saleable Products	Percentage of Ingot Production
1948	416,000				494,000	118.8%
1949	431,000				500,000	116.0%
1950	463,000				506,000	109.3%
1951	640,000				585,000	91.4%
1952	963,000	173,000	391,000	339,000	903,000	93.8%
1953	1,305,000	221,000	570,000	401,000	1,192,000	91.8%
1954	1,559,000	259,000	646,000	477,000	1,382,000	88.6%
1955	1,748,000	233,000	782,000	502,000	1,517,000	86.8%
1956	1,728,000	254,000	700,000	523,000	1,477,000	85.5%
1957	2,095,000	298,000	733,000	703,000	1,734,000	82.8%
1958	2,178,000	280,000	775,000	670,000	1,725,000	79.2%
1959	2,324,000	206,000	912,000	802,000	1,920,000	82.6%
1960	2,777,000	194,000	1,113,000	891,000	2,198,000	79.2%
1961	2,633,000	242,000	1,017,000	791,000	2,049,000	77.8%
1962	2,515,000	168,000	985,000	847,000	2,000,000	79.5%
1963	2,720,000	158,000	996,000	853,000	2,007,000	73.8%
1964	2,419,000	180,000	877,000	768,000	1,825,000	75.4%
1965	2,736,000	216,000	970,000	832,000	2,018,000	73.8%
1966	2,685,000	211,000	962,000	765,000	1,938,000	72.2%

[1161] Anon. 'This Is Scheme 4'. *The Dragon*, June 1956, pp.4-5. Ibid, 'Scheme "M" In Progress'. December 1957, pp.4-5. Brinn, p.13.
[1162] SCoW, *1961*, p.19; *1966* p.18. Brinn, p.43.

Appendix 17

Development Scheme V: Capital Costs[1163]

Plant	**Cost(£)**
Iron Making	800,000
Steelmaking	2,550,000
Continuous Casting	1,130,000
Slabbing Mill	980,000
New Hot Strip Mill	11,100,000
Velindre Pickle Line	2,850,000
Abbey Cold Mills	5,320,000
General Services and Water Supply	1,965,000
Total	**26,695,000**
Design and Construction Expenses: 4%	1,066,000
Total	**27,761,000**

Appendix 18

Development Scheme V: Main Port Talbot Provisions [1164]

Facility	**Provision/Completion**
Sinter Plant	Construction of No4 Sinter Strand (1961)
Abbey Melting Shop	Conversion of 4x200ton open-hearth furnaces to 4x400ton Maerz Boelens furnaces (1961-62)
VLN Plant	Installation of 4th 50ton VLN converter (1962) Construction of lime kilns No5-7 (1961-63)
Continuous Casting	Installation of developmental 2 strand slab casting machine (1963)
Soaking Pits	Construction of gas fired pits No35–38 and 3 electric soaking pits (1961)
Anneal Bay	Construction of 6 annealing furnaces (1961)
Temper Bay	Installation of No3 temper mill (1962)
Reservoir	Building of Eglwys Nunnydd reservoir (1963)
Other Plant	Construction of limestone preparation plant (1961)

[1163] Kew, NA, Ref BE1/337, Scheme For Increasing Production Of Cold Sheet By 350,000 Tons Per Annum, 1959.
[1164] Brinn, p.14.

Appendix 19

Development Scheme A: Main Port Talbot Provisions[1165]

Facility	**Provision/Completion**
Harbour/Wharf	Development of a deep water harbour with BTDB. Construction of unloaders and stockyard (1969)
Ore Preparation	Installation of crushing and screening plant, blending and conveying equipment (1969)
Blast Furnaces	Increase capacity of No2 blast furnace (1971)
Steel Plant	Construction of BOS plant with 2x300 ton vessels (1969)
Degassing Unit	Installation of 315ton capacity DH vacuum degassing plant (1969)
Soaking Pits	Replace electric soaking pits with conventional pits (1968)
Pickle Lines	Convert to HCI pickling (1968)
Cold Mill	Conversion of 4-stand mill to 5-stand (1968)
Other Plant	Modify galvanising line (1968)

Appendix 20

Development Scheme A: Costings[1166]

Development	**Costing(£)**
New Harbour	20,000,000 (£15.5m funded by BTDB)
BOS Plant	18,500,000
Burden Preparation	3,250,000
Blast Furnace Modifications	2,500,000
Mill Modifications	1,500,000
Finishing Mill & Coating Improvements	5,000,000
Total	**50,750,000**

[1165] Anon. ‘Company Switching To L.D.-New steel plant will boost our capacity to 75,000 tons a week’. *The Dragon*, April 1966, p.1. Brinn, p.16.
[1166] Brinn, ibid.

Appendix 21

Port Talbot and UK Steel Ingot Production: 1948-1966 (tons)[1167]

	Port Talbot	UK	Port Talbot as % Of UK Production
1948	416,000	14,877,000	2.8%
1949	431,000	15,553,000	2.8%
1950	463,000	16,293,000	2.8%
1951	640,000	15,639,000	4.1%
1952	963,000	16,418,000	5.9%
1953	1,305,000	17,609,000	7.4%
1954	1,559,000	18,520,000	8.4%
1955	1,748,000	19,791,000	8.8%
1956	1,728,000	20,659,000	8.4%
1957	2,095,000	21,699,000	9.75
1958	2,178,000	19,565,000	11.1%
1959	2,324,000	20,186,000	11.5%
1960	2,777,000	24,305,000	11.4%
1961	2,633,000	22,086,000	11.9%
1962	2,515,000	20,491,000	12.3%
1963	2,720,000	22,520,000	12.1%
1964	2,419,000	26,230,000	9.2%
1965	2,736,000	27,006,000	10.1%
1966	2,685,000	24,315,000	11.0%

Appendix 22

Port Talbot: Coke Consumption Per Ton of Pig Iron[1168]

	Coke Produced (tons)	Pig Iron Produced (tons)	Coke Consumed (ton) Per Ton of Pig Iron
1948	310,000	361,000	0.9
1949	304,000	347,000	0.9
1950	305,000	341,000	0.9
1951	469,000	438,000	1.1
1952	749,000	552,000	1.4
1953	717,000	671,000	1.1
1954	691,000	893,000	0.8
1955	720,000	943,000	0.8
1956	956,000	1,018,000	0.9
1957	1,051,000	1,211,000	0.9
1958	1,053,000	1,327,000	0.8
1959	1,082,000	1,365,000	0.8
1960	1,494,000	1,918,000	0.8
1961	1,434,000	1,830,000	0.8
1962	1,342,000	1,929,000	0.7
1963	1,515,000	2,183,000	0.7
1964	1,324,000	1,786,000	0.7
1965	1,290,000	2,160,000	0.6
1966	1,435,000	2,155,000	0.7

[1167] SCoW, *1961*, p.19; *1966* p.18. BSC, *Statistical Handbook 1966*, p.8, p.10. Brinn, p.43.
[1168] SCoW, ibids. Brinn, ibid.

Appendix 23

SCoW Trading Profits as a Percentage of Turnover/Company Value (£,000)[1169]

Y/E	Turnover	Trading Surplus	Trading Surplus as % of Turnover	SCoW Value	Trading Profit as % of Value
1948	22,167	1,514	6.8%		
1949	25,959	2,089	8.0%		
1950	30,343	2,381	7.8%		
1951	37,165	3,966	10.7%		
1952	58,684	8,408	14.3%	77,736	10.8%
1953	63,110	7,666	12.1%	89,851	8.5%
1954	74,193	14,244	19.2%	98,164	14.5%
1955	83,894	18,294	21.8%	112,267	16.3%
1956	86,798	14,212	16.4%	130,102	10.9%
1957	109,552	18,962	17.3%	144,889	13.1%
1958	113,397	22,159	19.5%	161,907	13.7%
1959	125,586	23,257	18.5%	174,688	13.3%
1960	143,096	30,479	21.3%	184,429	16.5%
1961	133,040	23,252	17.5%	183,317	12.7%
1962	135,026	18,584	13.8%	183,924	10.1%
1963	138,724	18,758	13.5%	173,222	10.8%
1964	126,905	13,300	10.5%	162,932	8.2%
1965	141,015	21,118	15.0%	166,727	12.7%
1966	137,415	17,646	12.8%	166,056	10.6%
1967	134,107	14,312	10.7%	174,735	8.2%

[1169] SCoW, *Director's Report and Accounts 1951* p.7; *1952,* p.6; *1953* p.6; 1954 p.6; *1961* p.19; *1962* p.18; *1963* p.18; *1964* p.14; *1965* p.14; *1966* p.18; *1967* p.6. Brinn, pp.44-45.

Appendix 24

SCoW Adjusted Trading Surplus (£,000)[1170]

Y/E	Turnover	Trading Surplus	Depreciation	Interest	Adjusted Profit	Adjusted Profits as % of Turnover
1948	22,167	1,514	549	370	595	2.7%
1949	25,959	2,089	662	487	940	3.6%
1950	30,343	2,381	700	953	726	2.4%
1951	37,165	3,966	1,264	1,568	1,128	3.0%
1952	58,684	8,408	3,054	1,877	3,477	5.9%
1953	63,110	7,666	3,320	2,264	2,082	3.3%
1954	74,193	14,244	3,551	2,408	8,285	11.2%
1955	83,894	18,294	4,175	2,417	11,702	13.9%
1956	86,798	14,212	4,678	3,583	5,951	6.6%
1957	109,552	18,962	5,641	4,164	9,157	8.4%
1958	113,397	22,159	6,085	4,535	11,539	10.2%
1959	125,586	23,257	6,613	4,765	11,879	9.5%
1960	143,096	30,479	8,217	4,835	17,427	12.2%
1961	133,040	23,252	8,333	4,890	10,029	7.5%
1962	135,026	18,584	8,995	5,332	4,257	3.2%
1963	138,724	18,758	9,472	5,006	4,280	3.1%
1964	126,905	13,300	9,565	4,976	-1,241	-1.0%
1965	141,015	21,118	9,395	5,278	6,445	4.6%
1966	137,415	17,646	9,640	4,952	3,054	2.2%
1967	134,107	14,312				

Appendix 25

Profits After Depreciation: SCoW and 14 Leading Steel Producers (£,000)[1171]

	Capital Employed 14 Companies	Capital Employed SCoW	Profits After Depreciation 14 Companies	Profits SCoW After Depreciation	14 Companies Profit Capital Ratio	SCoW Profit Capital Ratio
1958	624,000	161,907	108,000	16,074	17.2%	9.9%
1959	696,000	174,688	109,000	16,644	15.7%	9.5%
1960	750,000	184,419	141,000	22,262	18.8%	12.1%
1961	840,000	183,317	104,000	14,919	12.4%	12.7%
1962	1,010,000	183,924	67,000	9,589	6.6%	5.2%
1963	1,238,000	173,222	59,000	9,286	4.8%	5.4%
1964	1,189,000	162,932	87,000	3,735	7.3%	2.2%
1965	1,194,000	166,727	80,000	11,723	6.7%	7.0%
1966	1,230,000	166,056	47,000	8,006	3.8%	4.8%
1967	1,228,000	174,735	23,000		1.9%	

[1170] Ibid, all.
[1171] Ibid, all. BSC, *1967-68*, p.7. Brinn, pp.44-45.

Appendix 26

Port Talbot Steel Division: Workforce and Steel Production: 1948–1967[1172]

Y/E	Manning	Steel Production (tonnes)	Output Per Man/Annum (tonnes)
1948	4,337	416,000	95.9
1949	4,452	431,000	96.8
1950	4,863	463,000	95.2
1951	7,441	640,000	86.0
1952	9,071	963,000	106.2
1953	10,063	1,305,000	129.7
1954	11,051	1,559,000	141.1
1955	12,390	1,748,000	141.1
1956	13,754	1,728,000	125.6
1957	14,824	2,095,000	141.3
1958	15,497	2,178,000	140.5
1959	17,627	2,324,000	131.8
1960	18,352	2,777,000	151.3
1961	17,790	2,633,000	148.0
1962	18,006	2,515,000	139.7
1963	17,847	2,720,000	152.4
1964	17,764	2,419,000	136.2
1965	17,487	2,736,000	156.5
1966	16,762	2,685,000	160.2
1967	16,754		

[1172] Manning: Fevre, *Wales is Closed*, p.13; Production: Brinn, p.43.

Appendix 27

BSC: Financial Performance: 1968-1988 (£ million)[1173]

	Turnover	Profit/(Loss) Before Taxation and Long-Term Interest	Adjusted Profit/(Loss)
1967-68	1,071	(21)	(19)
1968-69	1,196	(22)	(23)
1969-70*	682	10	12
1970-71	1,457	7	(10)
1971-72	1,292	(45)	(68)
1972-73	1,478	9	3
1973-74	1,775	56	50
1974-75	2,256	144	73
1975-76	2,357	(129)	(253)
1976-77	3,059	69	(95)
1977-78	3,154	(275)	(443)
1978-79	3,288	(137)	(309)
1979-80	3,105	(381)	(545)
1980-81	2,954	(526)	(668)
1981-82	3,443	(242)	(358)
1982-83	3,231	(318)	(869)
1983-84	3,358	(128)	(256)
1984-85	3,736	(70)	(409)
1985-86	3,735	130	38
1986-87	3,461	226	178
1987-88	4,116	472	410

*6 months only

NB Post 1980-81 the method of calculating the 'Profit (Loss)' varied :-

1981-82 First Loss is 'Trading loss after depreciation', the second is 'Loss before taxation'.

1982-83 First Loss is 'Loss on ordinary activities', the second is 'Total loss for the year'.

1983-84 First Loss is 'Loss in ordinary activities before interest payable', the second is 'Loss for the financial year'.

1984-85 First Loss is 'Loss on ordinary activities before interest and exceptional costs', the second is 'Loss for the financial year'.

1985-86 to 1987-88
First Profit is 'Profit on ordinary activities before interest and exceptional costs', the second is 'Profit for the financial year'.

[1173] BSC, *1971-72*, p.6; *1974-75*, p.3; *1978-79*, p.7; *1980-81*, p.5; *1981-82*, p.6, p.26; *1982-83*, p.4; *1983-84*, p.20; *1984-85*, p.24; *1985-86*, p.24; *1986-87*, p.3; *1987-88*, p.3.

Appendix 28

Port Talbot Steel Output and Manning Levels: 1968-1988

	Liquid Steel Output (tonnes)[1174]	**Liquid Steel Output (tonnes)**[1175]	**Manning Levels**[1176]	**Output/ Employee/Year****
1968			15,531	
1969		1,797,520	14,884	120.8
1970		1,660,066	14,725	112.7
1971		2,144,591	14,029	152.8
1972		2,509,473	13,642	184.0
1973		2,798,640	13,812	202.6
1974		2,038,209	14,053	145.0
1975	1,793,600	1,829,406	13,492	135.6
1976	2,259,600	2,097,142	13,140	159.6
1977	1,604,900	1,653,395	13,226	125.0
1978	2,189,300	1,929,425	12,537	153.9
1979	1,855,600	2,314,528	12,468	185.6
1980*	1,360,500	902,735	6,669	135.4
1981	1,941,000	1,785,156	5,659	315.5
1982	1,704,200	1,653,773	5,409	305.7
1983	1,964,200	1,818,873	5,054	359.9
1984	2,020,700	1,921,204	4,808	400.0
1985	1,597,500		4,736	337.3
1986	1,901,000		4,764	399.0
1987	2,263,400		4,670	484.7
1988	2,219,100		4,689	473.3
1989	2,354,800		4,579	514.3
1990	2,334,200		4,466	522.7
1991	2,795,800		4,398	635.7
1992	2,735,500		4,118	664.3
1993	3,227,000		4,041	798.6
1993	3,373,400		4,157	811.5
1994	3,424,500		4,214	822.6
1995	3,466,600		4,276	810.7
1996	3,540,000		3,941	898.2
1997			3,904	

*Strike affected

**For steel output BS figures used from 1975

BS figures are Y/E 31st March, Fevre's figures calendar Y/E

[1174] Information supplied by British Steel Port Talbot, 1997 and 1998 in Stephen Parry, *The Case of A Local Labour Market–Continuing Development And The Significance Of Contracting.* Unpublished MA Dissertation–University of York, 1998.

[1175] Fevre, *Wales is Closed*, p.127.

[1176] Ibid, p.23 for 1975-1997, BS ibid in Parry, 1998 for 1968-1974.

Appendix 29

Port Talbot Expansion: Costs (April 1977)[1177]

Plant	Cost (£m)
Harbour/Raw Materials Handling	40.1
Coke Oven Replacements	57.5
Blast Furnaces	120.2
BOS Plant	74.7
Continuous Casting	73.3
Slab Treatment	44.8
1.45m Wide Hot Strip Mill	242.4
Services	104.5
Contingencies	37.8
Engineering Services	39.7
Total	**835.0**

	New Capacity (tonnes)
Iron Making*	2,930,000
Steelmaking**	3,130,000
Hot Rolled Coil	3,275,000

*Existing iron making reduced to around 2,000,000 tonnes/annum.
**Existing hot strip mill to be limited to around 1,800,000 tonnes/annum.

Investment Timetable

	£m
1977/78	23.9
1978/79	173.4
1979/80	348.9
1980/81	114.0
1981/82	11.7
1982/83	30.9
1983/84	84.0
1984/85	48.2
Total	**835.0**

Commissioning was to be phased between 1981/82 to 1985/86

[1177] Kew, NA, Ref BT255/987, Letter from BSC's W.G. Moore to European Commission and Investment Project Summary regarding the Port Talbot expansion, 29th March 1977. Ibid, Letter from DoI's J.H. Pownall to BSC's J.C. Siddons re Select Committee on Nationalised Industries Sub Committee, 19th May 1977.

Appendix 30

BSC Production, Deliveries (both million tonnes*) and UK Manning[1178]

	Liquid Steel Production	Steel Deliveries Home	Steel Deliveries Exports	Total Steel Deliveries	UK Employees (000s) at Year End	Liquid Steel Production (tonnes)*/ Employee
1967-68*	22.9	13.6	3.5	17.1	254.0	90.2
1968-69	24.6	16.2	3.0	19.2	254.0	96.2
1969-70**	12.5	8.6	1.4	10.0	255.2	96.4
1970-71	26.1	16.8	2.9	19.7	252.4	49.5
1971-72	21.5	12.8	3.7	16.5	229.7	113.6
1972-73	25.1	14.4	3.6	18.0	226.6	110.8
1973-74	23.0	15.4	2.7	18.1	220.4	104.4
1974-75	20.8	13.0	2.1	15.1	228.3	91.1
1975-76	17.2	10.5	2.2	12.7	210.2	81.8
1976-77	19.7	11.0	2.7	13.7	207.9	94.8
1977-78	17.4	10.2	3.2	13.4	196.9	88.4
1978-79	17.3	9.6	2.9	12.5	186.0	93.0
1979-80	14.1	8.0	2.5	10.5	166.4	84.7
1980-81	11.9	7.2	2.3	9.5	120.9	98.4
1981-82	14.0	8.0	2.7	10.7	103.7	135.0
1982-83	11.7	6.8	2.5	9.3	81.1	144.3
1983-84	13.4	7.5	2.9	10.4	71.1	188.5
1984-85	13.0	7.8	2.8	10.6	64.5	201.6
1985-86	14.0	7.7	3.0	10.7	54.2	258.3
1986-87	11.7	6.6	3.7	10.3	52.0	225.0
1987-88	14.7	7.7	4.4	12.1	51.6	284.9

*production for 1967-68 is measured in tons
**6 month period only

[1178] BSC, *1970-71*, p.4; *1971-72*, p.6, p.38; *1975-76*, p.3; *1978-79*, p.7; *1979-80*, p.6; *1980-81*, p.5; *1981-82*, p.6; *1982-83*, p.4; *1983-84*, p.3; *1984-85*, p.43; *1985-86*, p.43; *1986-87*, p.41; *1987-88*, p.37.

Appendix 31

BSC's South Wales Option For Restructuring 1979[1179]

The physical characteristics of the Port Talbot and Llanwern plants are as follows:-

Port Talbot

own harbour
new coke ovens
new large sinter plant
no4 & 5 blast furnaces refurbished together with 3 smaller furnaces
a large modern BOS shop with 300 tonne cast weights
vacuum degassing facilities
a universal slabbing mill
continuous casting being installed together with further iron and steel refining

It should be noted that when the slab caster is installed the slabbing mill bottle neck will be removed enabling higher steel makes up to 3 million tonnes.

The hot mill was installed in 1949 and has been enhanced but there remain serious limitations on coil weights, and output eg the reheating furnaces restrict slab length and the result is coil weights under 10 tonnes on most widths (480 lbs/inch width maximum).

The picklers and cold mills. These are being refurbished and will be comparable in performance to new facilities. One of the cold mills is a wide mill meeting the small requirements of the market for over 56" material.

The hot dipped galvanising plant.

The main factors mitigating against the complete closure of Port Talbot are :-

Loss of benefit of iron and steelmaking facilities adjacent to deep water terminal.
Loss of use of modern large BOS shop.
Loss of vacuum and degassing and concast facilities.

Llanwern

no harbour – iron ore by rail from Port Talbot
older coke ovens need replacing
1 new blast furnace of 5,000 tonnes per day plus 2 other furnaces smaller than no4 & 5 at Port Talbot
a BOS shop with a smaller cast weight–180 tonne casts
no continuous casting, vacuum degassing or other iron and steel refining facilities
a universal slabbing mill

The hot mill is superior to any other in the Corporation in terms of coil weights and output potential. It has 5 large reheat furnaces (30' in width compared with 18'6" at Port Talbot) thus producing heavier coils up to 27 tonnes at widest width (1,000 lb/inch width) and the output potential is about 60kt of HR coil/week.

[1179] ISTC, *New Deal For Steel*, pp.111-113.

The main factors mitigating against the complete closure of Llanwern are :-

Loss of modern hot mill with about 40% greater capacity than the Port Talbot mill. The latter requiring substantial investment to cover refurbishment. Thus the potential overall hot coil make in South Wales would be lower by about 0.75 million tonnes/annum.

Loss of a plant which has a good reputation with users such as the motor industry.

Appendix 32a

Port Talbot and Llanwern: Employment Broad Timetable: June 1980[1180]

Date	Port Talbot	Llanwern
1st September 1979 actual	12,584	9,353
1st April 1980 actual		8,546
1st May 1980 actual	11,486	
Mid June 1980 planned	11,202	8,636
Mid September 1980 planned	6,723	5,050
Mid December 1980 planned	6,342	4,984
Mid March 1981 planned	6,053	4,899
End March 1981 planned	5,701	4,899

Appendix 32b

Port Talbot: Manning Reductions By Major Category[1181]

	29th September 1979	Jobs To Go	Jobs To Remain
Management	712	214	498
Staff	2,690	1,394	1,296
Process	4,441	2,674	1,767
Maintenance *	4,741	2,601	2,140
Total	**12,584**	**6,883**	**5,701**

*Includes apprentices and trainees

Appendix 32c

Port Talbot: Manning Reductions By Trade Union[1182]

	29th September 1979	Jobs To Go	Jobs To Remain
Staff			
Management	712	214	498
ISTC	2,031	1,127	904
NCCC	586	258	328
TASS	73	9	64
Sub Total	**3,402**	**1,608**	**1,794**
Industrial Grades			
ISTC	4,818	2,943	1,875
NUB	1,228	780	448
T&GWU	463	293	170
AUEW	1,185	502	683
EEPTU	533	221	312
ASB	182	67	115
UCATT	297	193	104
BRTTS	7	5	2
GMWU	50	50	0
Apprentices/Trainees	419	221	198
Sub Total	**9,182**	**5,275**	**3,907**
Total	**12,584**	**6,883**	**5,701**

[1180] Great Britain. House of Commons Papers. The Committee on Welsh Affairs 1980, p.431.
[1181] Ibid
[1182] Ibid

Appendix 32d

Port Talbot: Ongoing Plant Configuration: June 1980[1183]

	Current No Units	**Configuration Shifts**	**Ongoing No Units**	**Configuration Shifts**
Coke Ovens				
Margam	205	21		
Grange	80	21		
Morfa			84	21
Ore Terminal				
P.T. Ore }				
Llan. Ore }	1	21	1	15
Coal }				
Ore to Llanwern		21		10
Sinter	1	21	1	15
Blast Furnaces	3	21	1	21
BOS	1	21	1	20
Universal Mill	1	21	1	15
Hot Strip Mill	1	21	1	15
Cold Temper Mill	1	15	1	5
Slitter	1	15	1	10
Cold Rolling				
Pickle Line	2	21	1	15
3 Stand	1	15		
4 Stand				4 Crew-3x15 Shift System
5 Stand	1	21		1 Spare Crew on duty
Annealing	1	21	1	10
Temper Mills				
No1	1	10		
No2	1	15	}	4 Crew–10 Shift on No 2 and 3 Mills
No3	1	21	}	
Cut Up/Rewind Lines	1	10	1}	
	1	10	1}	5 Crews Mons to Fri
	1	21	1}	
	1	15	1}	
Galvanising	1	21	1	21
Despatch	1	15	1	10
Other Despatch		10		5
21 Bay		15		15

[1183] Ibid, p.430.

Appendix 33

Port Talbot Activities Scheduled To Be Outsourced 1980[1184]

Maintenance/Repairs inclusive of Civil Engineering and Bricklayers
Mobile Plant
Internal Road Transport
Slag Tipping
Scrap Handling and Preparation
Catering~
Amenities
General Housekeeping and Plant Cleaning
Technical Publications
Project Engineering

Failure to reach agreement with the contractor meant it was kept in-house in the short-term.

Appendix 34

Port Talbot Works Output: Financial Years 1980-81 to 2007 (tonnes)[1185]

	Coke	Sinter	Iron	Liquid Steel	Ingots	Slab
1980-81	537,600	1,397,320	1,139,020	1,360,510	1,299,830	
1981-82	986,300	1,850,150	1,641,050	1,940,970	1,854,400	
1982-83	1,031,870	1,655,150	1,478,900	1,704,180	1,330,980	291,790
1983-84	1,176,060	2,053,650	1,670,000	1,964,150	853,020	1,006,130
1984-85	1,226,830	2,292,280	1,732,050	2,020,740	570,690	1,359,180
1985-86	1,222,980	1,920,150	1,449,980	1,597,450	189,690	1,345,680
1986-87	1,149,580	2,297,750	1,702,190	1,901,010	6,150	1,828,990
1987-88	1,278,840	2,684,690	2,009,050	2,263,380		2,199,010
1988-89	1,215,210	2,697,530	1,943,490	2,219,080		2,142,180
1989-90	1,221,320	2,860,920	2,084,250	2,354,840		2,269,590
1990-91	1,190,970	3,022,800	2,096,400	2,334,200		2,291,140
1991-92	1,163,700	3,394,500	2,467,950	2,795,750		2,692,720
1992-93	1,185,470	3,193,550	2,457,130	2,735,490		2,676,400
1993-94	1,207,000	3,498,000	2,903,000	3,227,000		3,157,000
1994-95	1,257,238	3,600,700	2,979,050	3,373,394		3,294,055
1995-96	1,265,500	3,740,960	3,043,330	3,424,507		3,354,279
1996-97	1,304,929	3,916,890	3,180,343	3,466,559		3,369,623
1997-98	1,266,291	4,099,222	3,260,510	3,591,000		3,492,747
1998-99	1,282,759	3,835,585	3,085,260	3,303,267		3,202,839
1999-00	1,236,886	3,703,828	3,034,964	3,246,210		3,147,017
2000	1,208,228	3,471,896	2,925,240	3,155,129		3,054,720
2001	989,792	3,367,724	2,750,120	2,996,146		2,892,456
2002	755,381	2,844,047	1,905,260	2,210,794		2,149,702
2003	667,993	3,893,389	3,328,050	3,721,059		3,604,270
2004	525,312	3,827,692	3,339,568	3,705,888		3,594,113
2005	683,531	3,940,366	3,380,476	3,709,319		3,595,812
2006	921,532	4,574,567	3,638,309	4,177,783		4,042,699
2007	944,745	4,405,515	3,855,281	4,413,902		4,295,603

[1184] Fevre, *Wales is Closed*, p.54.
[1185] Corus, Information supplied by Corus Port Talbot, 2008.

Bibliography

Primary Sources

Original Manuscripts

National Archives, Kew
Companies Registration Papers

Kew, National Archives (henceforth NA), Port Talbot Iron And Steel Company Limited – Memorandum and Articles of Association, 1900, Ref BT 31/9058/67018

Kew, NA, Port Talbot Iron And Steel Company Limited – Certificate of Incorporation, 24th August 1900, Ref BT 31/9058/67018

Kew, NA, Port Talbot Iron And Steel Company Limited – Summary Of Capital And Shares, 28th September 1900, Ref BT 31/9058/67018

Kew, NA, Port Talbot Iron And Steel Company Limited – Copy of the Register of Directors or Managers, dated 8th January 1901 and registered 9th January 1901, Ref BT 31/9058/67018

Kew, NA, Port Talbot Iron And Steel Company Limited – Special Resolutions, passed 11th December 1901 and confirmed 6th January 1902, Ref BT 31/9058/67018

Kew, NA, Port Talbot Iron And Steel Company Limited – Statement of Increase of Nominal Capital, 21st January 1902, Ref BT 31/9058/67018

Kew, NA, Port Talbot Iron and Steel Company Limited – Return of Allotments from 1st February 1902 to the 20th May 1902, Ref BT 31/9058/67018

Kew, NA, Port Talbot Iron and Steel Company Limited – Summary Of Capital And Shares, 14th January 1903, Ref BT 31/9058/67018

Kew, NA, Port Talbot Iron and Steel Company Limited, Letter from the Liquidator to the Registrar of Joint Stock Companies, 28th March 1904, Ref BT 31/9058/67018

Kew, NA, Port Talbot Steel Company Limited, Report pursuant to s.12 of the Companies Act 1900 (63 and 64 Vict c.48), 1906, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Application for a Certificate of Incorporation which does not issue any invitation to the public to subscribe for its Shares (Section 2(3) of the Companies Act 1900), 8th August 1906 and registered 10th August 1906, Ref BT 31/17841/8923

Kew, NA, Port Talbot Steel Company Limited, Declaration of Compliance with the requisition of the Companies Acts, made pursuant to s1(2) of the Companies Act 1900 (63 764 vict. Ch 48), 8th August 1906 and registered 10th August 1906, Ref BT 31/17841/8923

Kew, NA, Port Talbot Steel Company Limited, Memorandum of Association, 8th August 1906 and registered 10th August 1906, Ref BT 31/17841/8923

Kew, NA, Port Talbot Steel Company Limited, Certificate of Incorporation, 13th August 1906, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Copy of Register of Directors or Managers, 22nd August 1906 and registered 24th August 1906, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Return of Allotments, 16th August 1906 and registered on 24th August 1906, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Capital and Shares Made Up to 31st October 1906 and Registered on 2nd November 1906, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Return of Allotments, 21st February 1907 and registered on 26th February 1907, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Resolution Passed At The Extraordinary General Meeting of the Shareholders at Port Talbot, 30th May 1907 and registered 17th June 1907, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Particulars Relating To A Debenture Under The Companies (Consolidated) Act, 1908, 26th May 1909, Registered 2nd June 1909 for £74,000, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Certificate of the Registration of a Series of Debentures where there is no Trust deed, 2nd June 1909, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 9th June 1909, registered 17th June 1909 and Balance Sheet at 31st March 1909, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Notice of Satisfaction of Mortgage To The Extent of £1,000 To The Registrar of Joint Stock Companies, registered 5th July 1909, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Memorandum of Satisfaction of Mortgage or Charge for £1,000, 26th May 1909 and registered on 5th July 1909, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 13th June 1910, registered 16th June 1910 and Balance Sheet at 31st March 1910, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Memorandum of Satisfaction of Mortgage or Charge for £1,000, 30th May 1910 and registered on 29th July 1910, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 15th June 1911, registered 13th June 1911 and Balance Sheet at 31st March 1911, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Memorandum of Satisfaction of Mortgage or Charge for £1,000, 22nd May 1911 and registered on 29th June 1911, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Memorandum of Satisfaction of Mortgage or Charge for £1,000, 28th March 1912 and registered on 2nd April 1912, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 8th June 1912, registered 19th June 1912 and Balance Sheet at 31st March 1912, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Special Resolutions passed 27th June 1912, confirmed 15th July 1912 and registered 24th July 1912, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Companies (Consolidation) Act 1908, Return of Allotments Made On 14th August 1912, registered on 12th September 1912, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares at 21st June 1913 and registered 25th June 1913 and Balance Sheet at 31st March 1913, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Companies (Consolidated) Act 1908, Memorandum of Satisfaction of Mortgage or Charge of £74,000, 26th May 1909, Satisfied on 18th March 1914 and registered on 3rd April 1914, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Companies (Consolidated) Act 1908, Memorandum of Satisfaction of Mortgage or Charge of £40,000, 17th August 1906, Satisfied on 19th March 1914 and registered on 3rd April 1914, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Companies (Consolidated) Act 1908 : Particulars Supplied to Registrar for an Issue of Debenture for Stock for £300,000, 27th March 1914 and registered on 8th April 1914, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Certificate of the Registration of a Mortgage or Charge for £300,000, 8th April 1914 and registered 14th April 1914, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 12th July 1914, registered 17th July 1914 and Balance Sheet at 31st March 1914, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 12th June 1915, registered 15th June 1915 and Balance Sheet at 31st March 1915, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 10th August 1916, registered 14th August 1916 and Balance Sheet at 31st March 1916, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 6th August 1917, registered 10th August 1917 and Balance Sheet at 31st March 1917, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 12th August 1918, registered 12th August 1918 and Balance Sheet at 31st March 1918, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 17th July 1919, registered 28th July 1919 and Balance Sheet at 31st March 1919, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 23rd July 1920, registered 26th July 1920 and Balance Sheet at 31st March 1920, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 26th August 1921, registered 29th July 1921 and Balance Sheet at 31st March 1921, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 11th August 1922, registered 16th August 1922 and Balance Sheet at 31st March 1922, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 13th July 1923, registered 20th July 1923 and Balance Sheet at 31st March 1923, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 2nd January 1925, registered 3rd January 1925 and Balance Sheet at 30th June 1924, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 24th November 1925, registered 24th November 1925 and Balance Sheet at 30th June 1925, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 24th November 1926, registered 30th November 1926 and Balance Sheet at 30th November 1926, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 8th November 1927, registered 11th November 1927 and Balance Sheet at 30th June 1927, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, Summary of Share Capital and Shares to 9th October 1928, registered 10th October 1928 and Balance Sheet at 30th June 1928, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, The Companies Acts 1908 to 1917, Memorandum of Satisfaction of Mortgage or Change, 6th February 1929, Ref BT 31/1784/8923

Kew, NA, Port Talbot Steel Company Limited, The Companies Acts 1908 to 1917, The Return of Final Winding-Up Meeting, 22nd April 1930, registered 29th April 1930, Ref BT 31/1784/8923

Ministry of Munitions Papers

Kew, NA, Ministry of Munitions of War correspondence with Baldwins Limited, 1st March 1916, Ref Mun 4/5226/231881

Kew, NA, J. Mann, internal Ministry of Munitions minute seeking copy of costs for the extensions at Baldwins' Steelworks, 2nd October 1916, Ref Mun 4/5226/231881.

Kew, NA, Correspondence from O.H. Smith at the Ministry of Munitions of War to Baldwins, 19th April 1917, Ref Mun 4/5226/231881

Kew, NA, C.W. Sparrow, Internal Ministry of Munitions of War minute to Sir John Hunter setting out estimated capital expenditure for Baldwins Limited, 13th October 1917, Ref Mun 4/5226/231881

Kew, NA, List of Ministry of Munitions approved schemes for extensions to Baldwins Limited Steelworks and the new works at Port Talbot, undated 1918, Ref Mun 4/5226/231881

Kew, NA, Syme, F., Correspondence with R.R.J. Turner of the Munitions Board of the Ministry of Munitions of War re problems with an order for rails at the Port Talbot Steelworks, undated 1918, Ref Mun 4/5226/231881

Kew, NA, Correspondence from the Secretary of Munitions Board of the Ministry of Munitions of War to the Port Talbot Steel Company, 8th April 1918, Ref Mun 4/5226/231881

Kew, NA, Correspondence from the Secretary of Munitions Board of the Ministry of Munitions of War to the Port Talbot Steel Company giving approval for a finishing machine to be installed, 4th May 1918, Ref Mun 4/5226/231881

Kew, NA, Piercy, P.A., Ministry of Munitions Form MWB6–approving capital expenditure of £6,942 for the heavy plate mangle and starter (£6,197 and finishing machine £745), 19th October 1918, Ref Mun 4/5226/231881

Ministry of Town and Country Planning Papers

Kew, NA, Guest Keen Baldwins Iron and Steel Company Limited, Port Talbot, Proposed 80" Strip Mill, May 1944, Ref HLG 79/583 – 223474

Kew, NA, W. Charles Wright in the forward to Guest Keen Baldwins Iron and Steel Company Limited – Port Talbot, Proposed 80" Strip and Plate Mill, May 1944, HLG 79/583-223474

Kew, NA, Internal Ministry of Town and Country Planning minute from A.M. Jenkins to R.D. Jones, 4th May 1945, Ref HLG 79/583 223474

Kew, NA, Internal Ministry of Town and Country Planning Minute from R.D. Jones to A.M. Jenkins, 10th May 1945, Ref HLG 79/583 223474

Kew, NA, 12th RDJ Committee Meeting minutes, 23rd May 1945, Ministry of Town and Country Planning, Ref HLG 79/583-223474

Kew, NA, Regional Distribution of Industry Committee minutes, Cardiff 23rd May 1945, Ministry of Production–Wales Regional Board, Ref HLG 79/583-223474

Kew, NA, minute from Herbert Morrison, Minister of Town and Country Planning to ‘Smith’ at the Board of Trade, 6th June 1945, Ref HLG 79/583-223474

Kew, NA, D.J. Young, GKB Company Secretary, quoted in ‘Record of Interview’ 6th June 1945 with Representatives of Messrs Guest Keen and Baldwins Ltd regarding the proposed Strip and Plate Mill at Margam, Ministry of Town and Country Planning, Ref HLG 79/583-223474

Kew, NA, internal Board of Trade minute, 13th June 1945, Ref HLG 79/583-223474

Kew, NA, Internal Ministry of Town and Country Planning minute from the Chief Regional Planning Officer to Mr Pepler, 16th July 1945, Ref HLG 79/583–223474

Kew, NA, G.P. Wibberley, *Proposed Development of the Hot Strip Mill at Margam Moors Near Port Talbot,* minute from Ministry of Agriculture and Fisheries to the Ministry of Town and Country Planning, 14th August 1945, Ref HLG 79/583–223474

Kew, NA, Minute from the Board of Trade to the Cabinet–Lord President’s Committee–Distribution of Industry Sub-Committee, May 1947, Ref HLG 79/583–223474

Kew, NA, Internal Minute to Regional Controller, Ministry of Town and Country Planning, 5th May 1947, Ref HLG 79/583 223474

Kew, NA, Presentation to ‘Panel A’ by W.F. Cartwright on the Proposal for the Modernisation and Development of Sheet and Tinplate in South Wales, 6th May 1947, Ministry of Town and Country Planning papers, Ref HLG 79/583–223474

Kew, NA, Internal Minute from D.I. Williams, Ministry of Town and Country Planning to S.W.C. Phillips, 13th May 1947, Ref HLG 79/583 223474

Kew, NA, minute from the Iron and Steel Board’s N. Iles to T.H. Williams, Ministry of Town and Country Planning, 13th May 1947, Ref HLG 79/583–223474

Kew, NA, letter from Julian Pode to D.T. Williams of the Ministry of Town and Country Planning, 17th May 1947, Ref HLG 79/583-223474

Kew, NA, N. Iles, of the Iron and Steel Board to T. H. Williams, Ministry of Town and Country Planning, 3rd June 1947, Ref HLG 79/583–223474

Kew, NA, Outline of Developments at Port Talbot By The Steel Company of Wales Limited, 6th June 1947, Ref HLG 79/583–223474

Kew, NA, Internal Ministry of Town and Country Planning minute from D.I. Williams to S.W.C. Phillips, 10th June 1947, Ref HLG 79/583–223474

Kew, NA, 'Sociological Implications Arising From The Siting Of The Hot Strip Mill At Port Talbot'. Internal Ministry of Town and Country Planning Minute from D.I. Williams to SWC Phillips, 24th June 1947, Ref HLG 79/583 – 223474

Kew, NA, Scheme For The Modernisation And Development Of Sheet And Tinplate Production In South Wales, The Ministry Of Supply Parliamentary Secretary notes and Paymaster General letter, 1st December 1947, Ref HLG 79/583-223474

Kew, NA, Internal Minute At The Ministry Of Town And Country Planning, 20th December 1947, Ref HLG 79/583 223474

Kew, NA, Internal Ministry of Town and Country Planning Minute from A.E Gibb to 'Prosser', 24th December 1947, Ref HLG 79/583 223474

Kew, NA, 'Margam Steel Works–Labour Requirements', internal Ministry of Town and Country Planning Minute from D.S. Prosser, to the Regional Controller, 6th January 1948, Ref HLG 79/583 223474

Kew, NA, Letter from David J. Young, Secretary of the Steel Company of Wales to D.I. Williams of the Ministry of Town and Country Planning notifying an increase in labour requirements, 28th January 1948, Ref HLG 79/583-223474

Kew, NA, Minutes of Ministry of Labour Office and Ministry of Town and Country Planning meeting, 28th January 1948, Ref HLG 79/583-223474

Treasury Papers

Kew, NA, The Steel Company of Wales Limited, Offer for sale in compliance with the Order made under Section 1 of the Borrowing (Control and Guarantee Act 1946) 1947, Ref T228/147–250657

Kew, NA, The Steel Company of Wales Limited, anonymous Ministry of Supply minute to the Treasury's Sir Herbert Brittain, 20th June 1947, Ref T228/147–250657

Kew, NA, A letter from the Chairman of The Steel Company of Wales, Ernest H. Lever, to the Issuing House, 10th October 1947, Ref T228/147–250657

Kew, NA, Internal Treasury Minute to Sir Herbert Brittain, 8th November 1948, Ref T228/147–250657

Iron and Steel Corporation of Great Britain Papers

Kew, NA, H.F. Spencer, ISC Report On Future Demand For Tinplate To A Joint Committee Of RTB and SCoW, 24th November 1951, Ref BE2/328–261086

Kew, NA, James Steele, Steel Company of Wales Ltd – Richard Thomas Baldwins Ltd – Proposals For Development In Tinplate Production, internal ISC note, 1952, Ref BE2/328–261086

Kew, NA, Undated Ministry of Supply note on Development of the South Wales Tinplate Industry, 1952, Ref BE2/328–261086

Kew, NA, Undated Iron and Steel Corporation of Great Britain minute to the Organisation For European Economic Co-operation Re SCoW Scheme L, 1952, Ref BE2/328-261086

Kew, NA, 'Considerations leading to the choice of Llangyfelach as a site for the proposed new 5 stand Continuous Tinplate Mill', note from SCoW Chairman, Ernest Lever to the ISC's James Steel, 11th March 1952, Ref BE2/328–261086

Kew, NA, SCoW Press Statement Announcing Approval of Development Scheme L, 29th November 1952, Ref BE2/328–261086

Kew, NA, Letter and notes from the SCoW Secretary, D.J. Young to S. Wilson of the Iron and Steel Agency of Great Britain re Heckett (Wales) Ltd, 1953, Ref BE2/328–261086

Kew, NA, Iron and Steel Corporation of Great Britain, note by Sir James Steele,–The Steel Company of Wales Ltd–Revised Estimated Cost of 'L' Scheme, Ref BE2/328–261086

Kew, NA, Internal minute, Ministry of Supply, April 1954, Ref BE2/328-261086

Iron and Steel Board Papers

Kew, NA, Notes on devesting of the RTSC Group, Iron and Steel Board, 19th January 1955, Ref BE1/335-254647

Kew, NA, 'Development Scheme 'M' – Proposals To Increase Ingot Output From 48,000 Tons To 60,000 Tons Weekly In Order To Increase Output Of Flat Rolled Products', Steel Company Of Wales paper, 29th January 1955, Ref BE1/335–254647

Kew, NA, Correspondence between SCoW/RTB Chairman, Ernest Lever and the ISB's Archibald Forbes, 25th February 1955, Ref BE1/335-254647

Kew, NA, Internal Iron and Steel Board minute from the Chairman to the Deputy Chairman raising points re Scheme 'M', 8th March 1955, Ref BE1/335-254647

Kew, NA, Correspondence between SCoW/RTB Chairman, Ernest Lever and Chairman of the ISB, Archibald Forbes re production of cold reduced grain orientated electrical quality steel sheets, 6th May 1955, Ref BE1/335-254647

Kew, NA, Notes of a meeting between the ISB and The Steel Company of Wales, Norfolk House, 22nd July 1955, Ref BE1/335-254647

Kew, NA, Announcement by the Iron And Steel Holding Realisation Agency: Richard Thomas And Baldwins Ltd and The Steel Company of Wales Ltd, 19th October 1955, Ref BE1/335–254647

Kew, NA, Notes on ISB meeting with BIC(Ore) Ltd on the shipping problems associated with Development Scheme 'M', 2nd December 1955, Ref BE1/335-254647

Kew, NA, Notes on ISB visit to the Steel Company of Wales, 8th December 1955, Ref BE1/335-254647

Kew, NA, 'Thomson Mclintock Report–'M' Scheme', Produced for the ISB, 1956, Ref BE1/335-254647

Kew, NA, internal ISB minute from M. McArthur re Thomson McLintock Report on Scheme M, 1956, Ref BE1/335-254647

Kew, NA, 'Port Talbot Dock', internal ISB minute, 20th January 1956, re meeting with the Dock section of the British Transport Commission, 18th January 1956, Ref BE1/335-254647

Kew, NA, Letter from E.J. Pode to Sir Archibald Forbe of the ISB, 16th May 1957, Ref BE1/335-254647

Kew, NA, E.J. Pode and W.F. Cartwright, Report by Mr E. Julian Pode and Mr W.F. Cartwright On The Proposals Which Have Been Made For The Building Of A Fourth UK Wide Strip Mill, 19th May 1958, Ref BE1/335-254647

Kew, NA, W.F. Cartwright, Future Expansion of the Steel Company of Wales, 9th September 1958, Ref BE1/335–254647

Kew, NA, ISB and the Steel Company of Wales meeting notes re plans for a Swansea hot strip mill, 16th September 1958, Ref BE1/335-254647

Kew, NA, ISB and the Steel Company of Wales meeting notes, 11th November 1958, Ref BE1/335-254647

Kew, NA, Letter from Steel Company of Wales Chairman, Harald Peak to Chairman of the Iron and Steel Board, 20th November 1958, Ref BE1/335-254647

Kew, NA, Scheme For Increasing Production Of Cold Sheet By 350,000 Tons Per Annum, 1959, Ref BE1/337

Kew, NA, 'S.C.W. – Scheme 'V', Internal ISB minute from J.R.C. Boys to the ISB Chairman, 15th January 1959, Ref BE1/337

Kew, NA, ISB and the Steel Company of Wales meeting notes, 20th October 1959, Ref BE1/337

Kew, NA, ISB and the Steel Company of Wales meeting notes, 11th November 1959, Ref BE1/337

Kew, NA, Internal ISB memo from W.L. Hewlett to ISB Secretary, 5th December 1959, Ref BE1/337

Kew, NA, Letter from ISB's Cyril Musgrave to Julian Pode re decision against giving approve to build another Port Talbot strip mill, 15th December 1959, Ref BE1/337

Prime Ministerial Papers

Kew, NA, Minute from Ministry of Power's R. Wood to Prime Minister re importing American Coal, 8th May 1961, Ref Prem 11/4135

Kew, NA, Minute From The Prime Minister, Harold MacMillan to the Minister of Power, 10th May 1961, Ref Prem 11/4135

Department of Trade and Industry/Department of Industry Papers

Kew, NA, Department of Trade and Industry, British Steel Corporation: Review of Long-Term Financial And Development Position, 1972, Ref BT255/734

Kew, NA, 'Choosing Between the Investment Options Facing The BSC'. Report by McKinsey and Co for the Department of Trade and Industry, Ref BT255/734

Kew, NA, Note of the Minister for Industry's Meeting with the British Steel Corporation, 10th March 1972, Ref BT255/734

Kew, NA, Internal DTI minute from R. Morgan to Mr Pasha: Draft White Paper On BSC Strategy, 5th January 1973, Ref BT255/929

Kew, NA, Internal DTI minute from R. Mountfield to Mr Tucker, 26th January 1973, Ref BT255/929

Kew, NA, 'Port Talbot/Shotton Closure Review', Letter from BSC Chairman, Monty Finniston, to Lord Beswick, 31st January 1975, Ref BT255/980

Kew, NA, Internal DTI minute from S.J. Gross to Lord Beswick, 13th February 1975, Ref BT255/980

Kew, NA, Letter from BSC's Deputy Chairman, M. Littman, to Lord Beswick, 27th March 1975, Ref BT255/980

Kew, NA, 'Port Talbot/Shotton', Internal DTI Minute from J.H. Pownall to Lord Beswick, 10th April 1975, Ref BT255/980

Kew, NA, 'Final Shotton/TUCSICC Report', Letter from BSC Chairman, Monty Finniston to Lord Beswick, 23rd April 1975, Ref BT255/980

Kew, NA, 'The Report on Shotton by Clwyd County Council', Letter from BSC Chairman, Monty Finniston, to Lord Beswick, 23rd May 1975, Ref BT255/980

Kew, NA, 'New Strip Mill', Letter from BSC Chairman, Monty Finniston, to Lord Beswick, 30th May 1975, Ref BT255/980

Kew, NA, Internal DTI minute from Martin Llowrach to Lord Beswick, 5th June 1975, Ref BT255/980

Kew, NA, Letter from BSC's W.G. Moore to European Commission and Investment Project Summary regarding the Port Talbot expansion, 29th March 1977, Ref BT255/987

Kew, NA, Letter from DoI's J.H. Pownall to BSC's J.C. Siddons re Select Committee on Nationalised Industries Sub Committee, 19th May 1977, Ref BT255/987

Kew, NA, 'Evaluation of BSC's Port Talbot Continuous Caster Investment Project', Internal report, Department of Industry, 1978, Ref BT255/987

Kew, NA, Meeting between BSC and DoI re Port Talbot Continuous Caster Project, 12th December 1978, Ref BT255/987

Kew, NA, Port Talbot Concaster, internal Department of Industry minute from S.J. Gross to the Secretary of State, 19th December 1978, Ref BT255/987

Kew, NA, British Steel Corporation–Port Talbot Concaster. Minute from the Secretary of State at the DoI, Eric Varley, to the Chancellor of the Exchequer, 21st December 1978, Ref BT255/987

Kew, NA, S.J. Gross's notes of visit to Port Talbot on 20th August 1979, Ref BT255/988

Kew, NA, Demanning At Port Talbot, internal DoI paper by S.J. Gross, 1980, Ref BT255/988

Kew, NA, British Steel Corporation–Strip Products Group–Statement, 19th December 1980, Ref BT255/988

Bank of England Papers

London, Bank of England Archives, Bruce Gardner Papers, Simon, W., Special Report on Cardiff and Dowlais Works, 28th September 1929, Ref SMT 3/168

London, Bank of England Archives, Bruce Gardner Papers, Comparison of actual cost with estimated cost of new plant at Cardiff 1931, Ref SMT 3/168

London, Bank of England Archives, Bruce Gardner Papers, Rintoul, P., Report on proposals to reorganise plants of British (GKB) Iron and Steel Company, 13th March 1931, Ref SMT 3/168

London, Bank of England Archives, Bruce Gardner Papers, Memorandum setting out the position of GKB's South Wales Scheme, 24th April 1931, Ref SMT 3/168

London, Bank of England Archives, Bruce Gardner Papers, Notes on Cardiff Works Scheme No4, 1933, Ref SMT 3/168

London, Bank of England Archives, Bruce Gardner Papers, Hewitson-Hall, Memo on development of Cardiff Works, June 1933, Ref SMT 3/168

London, Bank of England Archives, Bankers Industrial Development Trust, Memo on Brymbo Steel (Successors) Ltd, 26th June 1935, Ref BID 1/14

Printed Primary Sources

Gilbertson, Arthur, 'Letter to T.M. Franklen', 13th February 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) p.79

Gilbertson, Arthur, 'Letter to T.M. Franklen', 4th April 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) p.80

Gilbertson, Arthur, 'Letter to T.M. Franklen', 10th April 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) pp.80-81

Gilbertson, Arthur, 'Letter to T.M. Franklen', 14th April 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) p.93

Gilbertson, Arthur, 'Letter to Charles Cheston', 16th April 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) p.82

Gilbertson, Arthur, 'Letter to T.M. Franklen', 17th July 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) p.82

Gilbertson, Arthur, 'Letter to Owen Davies', 19th July 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) p.84

Gilbertson, Arthur, 'Letter to T.M. Franklen', 21st July 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson 2001 (Swansea: West Glamorgan Archive, 2001) p.84

Gilbertson, Arthur, 'Letter to T.M. Franklen', 26th July 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) p.84

Gilbertson, Arthur, ‘Letter to T.M. Franklen’, 1st August 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) p.85

Gilbertson, Arthur, ‘Letter to T.M. Franklen’, 5th August 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) p.86

Gilbertson, Arthur, ‘Letter to T.M. Franklen’, 6th August 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) pp.86-87

Gilbertson, Arthur, ‘Letter to T.M. Franklen’, 9th August 1902, in *The Letter – Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) p.88

Gilbertson, Arthur, ‘Letter to T.M. Franklen’, 13th August 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) p.88

Gilbertson, Arthur, ‘Letter to Owen Roberts’, 19th August 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) p.91

Gilbertson, Arthur, ‘Letter to S.B. Barlow’, 18th August 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001), pp.90-91

Gilbertson, Arthur, ‘Letter to Messers Barlow and Barlow’, 27th August 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001) p.93

Gilbertson, Arthur, ‘Letter to T.M. Franklen’, 29th August 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson (Swansea: West Glamorgan Archive, 2001), p.94

Gilbertson, Arthur, ‘Letter to Charles Chesterton’, 22nd September 1902, in *The Letter–Books of W. Gilbertson and Co Ltd,* ed by P.W. Jackson 2001 (Swansea: West Glamorgan Archive, 2001). p.95

Annual Reports and Accounts

British Iron and Steel Federation, *Annual Report 1954*

British Iron and Steel Federation, *Annual Report 1957*

British Iron and Steel Federation, *Annual Report 1959*

British Iron and Steel Federation, *Annual Report 1960*

British Iron and Steel Federation, *Annual Report 1961*

British Iron and Steel Federation, *Annual Report 1962*

British Iron and Steel Federation, *Annual Report 1963*

British Steel, *Report and Accounts 1988-1989*

British Steel, *Report and Accounts 1989-1990*

British Steel, *Report and Accounts 1990-91*

British Steel, *Report and Accounts 1991-92*

British Steel, *Report and Accounts 1992-93*

British Steel plc*, Report and Accounts 1993-94*

British Steel plc*, Report and Accounts 1994-95*

British Steel plc*, Report and Accounts 1996-97*

British Steel plc*, Report and Accounts 1998-99*

British Steel Corporation, *Annual Report and Accounts 1967-68*

British Steel Corporation*, Annual Report and Accounts 1968-69*

British Steel Corporation, *Annual Report and Accounts 1969-70*

British Steel Corporation, *Annual Report and Accounts 1970-71*

British Steel Corporation*, Annual Report and Accounts 1971-72*

British Steel Corporation*, Annual Report and Accounts 1972-73*

British Steel Corporation*, Annual Report and Accounts 1973-74*

British Steel Corporation*, Annual Report and Accounts 1974-75*

British Steel Corporation, *Annual Report and Accounts 1975-76*

British Steel Corporation, *Annual Report and Accounts 1976-77*

British Steel Corporation, *Annual Report and Accounts 1977-78*

British Steel Corporation, *Annual Report and Accounts 1978-79*

British Steel Corporation, *Annual Report and Accounts 1979-80*

British Steel Corporation, *Annual Report and Accounts 1980-81*

British Steel Corporation*, Annual Report and Accounts 1981-82*

British Steel Corporation, *Annual Report and Accounts 1982-83*

British Steel Corporation, *Report and Accounts 1983-84*

British Steel Corporation, *Annual Report and Accounts 1984-85*

British Steel Corporation*, Report and Accounts 1985-86*

British Steel Corporation, *Report and Accounts 1986-87*

Corus, A platform for future growth: Corus Group plc: Report for the six month to 1 April 2000, p.1

Corus, *Report and Accounts 2001*

Corus*, Report and Accounts 2002*

Haslam, Robert, Chairman's Review in British Steel Corporation–*Annual Report and Accounts 1983-84,* pp.4-6

Haslam, Robert, Chairman's Review in British Steel Corporation–*Annual Report and Accounts 1984-85,* pp.3-4

Llowrach, Martin, Chief Executive's Review in British Steel *Report & Accounts 1987-1988,* pp.6-12

MacGregor, Ian, Chairman's Review in British Steel Corporation*, Annual Report and Accounts 1981-82,* pp.3-5

MacGregor, Ian, Chairman's Review in *British Steel Corporation, Annual Report and Accounts 1982-83,* pp.5-7

Margam Estate, *Estate Accounts – Year Ending 24th March 1906*, Port Talbot Library Archives

Pode, E. Julian, Chairman's statement in *The Steel Company of Wales–Annual Report and Accounts*, 3rd October 1964

Pode, E. Julian, Chairman's statement in *The Steel Company of Wales–Annual Report and Accounts,* 2nd October 1965

Scholey, Robert, Chief Executive's Review of Operations in British Steel Corporation *Annual Report and Accounts 1978-1979*, pp.8-13

Scholey Robert, Chief Executive's review of operations in British Steel Corporation Annual Report and Accounts 1984-85, p.7-12

Scholey, Robert, Chairman's Review in British Steel Corporation *Report and Accounts 1985-86,* pp.2-4

Scholey, Robert, Chairman's Review in British Steel–*Report and Accounts 1986-87,* pp.2-3

Scholey, Robert, Chairman's Review in British Steel–*Report and Accounts 1987-88,* pp.4-5

Scholey, Robert, Chairman's Statement in *British Steel–Report and Accounts 1988-89,* pp.3-5

The Steel Company of Wales Limited, *Director's Report and Accounts 1951*

The Steel Company of Wales Limited, *Director's Report and Accounts 1952*

The Steel Company of Wales Limited, *Director's Report and Accounts 1953*

The Steel Company of Wales Limited, *Director's Report and Accounts 1954*

The Steel Company of Wales Limited, *Annual Report and Accounts 1961*

The Steel Company of Wales Limited, *Annual Report and Accounts 1962*

The Steel Company of Wales Limited, *Annual Report and Accounts 1963*

The Steel Company of Wales Limited, *Annual Report and Accounts 1964*

The Steel Company of Wales Limited, *Annual Report and Accounts 1965*

The Steel Company of Wales Limited*, Annual Report and Accounts 1966*

The Steel Company of Wales Limited*, Annual Report and Accounts 1967*

Villiers, Charles, Chairman's statement in British Steel Corporation *Annual Report and Accounts 1976-77*, p.24

Villiers, Charles, Chairman's Review in British Steel Corporation *Annual Report and Accounts 1977-78*, pp.2-5

Villiers, Charles, Chairman's Review in British Steel Corporation *Annual Report and Accounts 1978-79,* pp.3-6

Villiers, Charles, Chairman's Review in British Steel Corporation *Annual Report and Accounts 1979-80*, pp.2-5

Company and Union Books/Booklets

ABP, *The History and Development of Port Facilities at Swansea and Port Talbot* (Associated British Ports, c1985)

ARMCO, *ARMCO Today–Seventy-Fifth Anniversary Issue* (Middleton–Ohio, The American Rolling Mill Corporation, 1975)

Baldwins, Company brochure for the visit of King George V to Swansea 20th October 1920 : West Glamorgan Archives – Ref Z208

BISF, *The Battle of Steel* (London, British Iron and Steel Federation, 1946)

BS, Information supplied by British Steel Port Talbot, 1997

BS, Information supplied by British Steel Port Talbot, 1998

BSC, *Statistical Handbook 1966, Volume 2, L-Z* (London: British Steel Corporation 1967)

BSC, *British Steel Corporation Welcomes You To Ebbw Vale – Strip Mills Division – Tinplate Group*, Brochure produced by the British Steel Corporation, c1972

BSC, *Port Talbot Works–Facts and Figures,* c1985

BSC, *Llanwern Works,* c1986

B.S.S., *British Steel Smelters Reports 1916,* (Manchester, British Steel Smelters, Mill, Iron, and Tinplate Workers Union).

BTC, *South Wales Ports*, British Transport Commission, 1948

Corus, *Port Talbot A Century In Steel,* (Port Talbot: Private Publication, 2002)

Corus, Recommended Acquisition of Corus Group plc by Tata Steel UK Limited, a wholly owned indirect subsidiary of Tata Steel Limited–information issued to shareholders, 2006

Corus, Information supplied by Corus Port Talbot on production at Port Talbot (1980-81 to 2006-07) and Llanwern (1962 to 2002), 2008

Corus, *Corus announces £60 million investment at Port Talbot steelworks in Wales*: Corus news release, 4th February 2008

GKB, *Guest Keen Baldwins Iron and Steel Co Ltd,* (Port Talbot: Private Publication, 1937)

GWR, *Great Western Ports-World's Largest Dock System–1925,* (London: H.N. Appleby, 1925)

GWR, *Great Western Ports–World's Largest Dock System–1926,* (London: H.N. Appleby, 1926)

GWR, *Great Western Ports–World's Largest Dock System–1929,* (London: H.N. Appleby, 1929)

GWR, *Great Western Ports–World's Largest Dock System–1930,* (London: H.N. Appleby, 1930)

GWR, *Great Western Ports–World's Largest Dock System–1931,* (London: H.N. Appleby, 1931)

GWR, *Great Western Ports – World's Largest Dock System–1932,* (London: H.N. Appleby, 1932)

GWR, *Great Western Ports–Britain's Western Gateways-1936,*(London: H.N. Appleby, 1936)

GWR, *Great Western Ports–Britain's Western Gateways-1937,* (London: H.N. Appleby, 1937)

GWR, (1939) *Great Western Ports–Britain's Western Gateways-1939, (* Produced and Published by H.N. Appleby : By Arrangement With The Great Western Railway Company.

de la Praudiere, E., *Port Talbot And Its Progress,* (Port Talbot: Port Talbot Railway and Docks Company, 1919)

Hoogovens, *Steel At Sea* (Hoogovens Groep Public Relations, Hoogovens Ijmuiden Steelworks, c1989)

ISTC, *New Deal For Steel–How British Steel could cut prices, halt closures, make profits and grow. An alternative strategy from the main steel unions;* including BSC's *The Return to Financial Viability–A Business Proposal For 1980-81* (London: Iron and Steel Trades Confederation, 1980)

ISTC, Strike Diary Of Events*. Man and Metal–Journal Of The Iron and Steel Trades Confederation*, Vol.57(1), January and February 1980, p.1

ISTC, Strike Diary Of Events*. Man and Metal- Journal Of The Iron and Steel Trades Confederation*, Vol.57(2), March/April/May 1980, p.1

JISC, Baldwins Three Pounds For One, *Journal of the Iron and Steel Confederation*, 1922, pp.56-57 and p.375

PTR, *The Port Talbot Railway and Dock Co – Handbook of Rates, Dry Dock Accommodation and General Information* (Port Talbot: Private Publication, 1913)

PTSC, Advertisement for the *Port Talbot Steel Company Limited* in de la Praudiere *Port Talbot and Its Progress,* (Port Talbot: Port Talbot Railway and Dock Company,1919)

NFISM, *Statistics of the Iron and Steel Industries,* National Federation of the Iron and Steel Manufacturers, 1923

Company Newspapers/Magazines

The Dragon- The Monthly Publication of the Steel Company of Wales Limited

Anon. Company Strengthens Its Ties With South Wales*. The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No1, December 1955, p.1

Anon. Europe's Biggest Blast Furnace Ready For Production - £40 Million Scheme Gets Under Way. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No2, January 1956, p.1

Anon. Margam's Giant New Blast Furnace Blown In. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No3, February 1956, p.1

Anon. This Is Scheme 4. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No7, June 1956, pp.4-5

Anon. 100 Tons Of Oxygen Daily For Abbey. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No10, September 1956, p.1

Anon. Development Scheme Is Taking Shape. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No11, October 1956, p.3

Anon. Steel Trade To Have Its Own Shipping Fleet. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No12, November 1956, p.3

Anon. All-Out Drive To Re-Start No 4 Furnace. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No15, February 1957, pp.1-2

Anon. Milford Haven. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No15, February 1957, p.1

Anon. The Chairman Speaks About Our Accounts For 1956 – A Year of Continued Progress. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No 45, February 1957, pp.1-2

Anon. Big Effort Helped To Restore No 4 Furnace. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No16, March 1957, pp.4-5

Anon. Oxygen Now Helps Margam To Speed Up Output – Special Gun Designed By Steel Division Staff. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No18, May 1957, p.1

Anon. Steam Gives Way To Diesel. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No22, September 1957, pp.4-5

Anon. A New Company Pension Scheme–A Personal Message From The Managing Director. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No24, November 1957, p.1

Anon. Scheme 'M' In Progress. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No25, December 1957, pp.4-5

Anon. Milford Could Be Europe's Greatest Ore Port. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No29, April 1958, pp.2-3

Anon. Margam's £2 Million Railway Hump Yard Takes Shape. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No30, June 1958, p.1

Anon. Reclaiming 'lost' metal from the slag tips. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No35, October 1958, p.2

Anon. Universal Mill Changeover–12½ Day Feat. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No37, December 1958, p.1

Anon. No 1 Furnace to be relined. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No40, March 1959, p.1

Anon. Speeding-up on vital ore delivery. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No41, April 1959, p.4

Anon. Note on lighting up No 5 Blast Furnace. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No43, June 1959, p.1

Anon. Another Strip Mill Proposed For Abbey. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No48, January 1960, p.1 and p.8

Anon. Continuous Casting–One of world's biggest plants for Abbey. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No50, March 1960

Anon. Its Push-Button And Margam Gets The Best. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No53, May 1960, p.3

Anon. Abbey Process Gets A New Name. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No59, December 1960, p.1

Anon. Development Scheme 'W' Is Approved. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No59, December 1960, p.1

Anon. 400-Ton Furnace Lift – Big conversion feat at Abbey Works. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No61, February 1961, p.1

Anon. 82½ ft pit for Continuous Casting Plant. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No61, February 1961, p.1

Anon. Iron Production Research – Oil injection trials at No1 Blast Furnace. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No62, March 1961, p.8

Anon. Galvanising plant For Abbey Work - £900,000 project due to start in November, *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No66, July 1961, p.1

Anon. Automatic Drills To Tap Blast Furnaces. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No69, October 1961, p.1

Anon. Margam Melting Shop. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No73, March 1962, p.1

Anon. 400,000,000 Gallon Reservoir Under Way. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No74, April 1962, p.1 and p.8

Anon. New Converter Will Step Up Output. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No80, October 1962, p.8

Anon. Employee's Interests Safeguarded – Margam Melting Shop Closes On March 30*. The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No84, February 1963, p.1

Anon. Our aim market development and big sales effort. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No84, March 1963 p.4

Anon. Plans For New Research Centre. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No86, April 1963, p.1

Anon. Japanese Attitude To Research–'Dynamic'–And their 1970 steel target is 48,000,000 tons. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No85, May 1963, p.2

Anon. Self-discharging ore carrier in Milford Margam experiment. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No91, September 1963, p.1

Anon. No hitch in 'Ore Convoy' experiment. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No92, October 1963, p.5

Anon. Hot Strip Mill Automation. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No95, April 1964, p.1

Anon. Review Of Accounts For The Year To September 1964. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No104, January 1965, pp.4-5

Anon. Company's £60m Plans–Proposed development for 1965-70 include a new strip mill. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No107, April 1965, p.1

Anon. Company Looks Ahead–Re-Organises–Revised management structure now gives us four divisions, *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No 109, June 1965, p.1

Anon. Government Gives Port Talbot The Go-Ahead For New £17m Ore Terminal. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No110, July 1965, p.1

Anon. Review Of Accounts For The Year To September 1965–Extract From The Chairman's Statement. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No117, February 1966, p.4

Anon. Company Switching To L.D. – New steel plant will boost our capacity to 75,000 tons a week. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No119, April 1966, p.1

Anon. Port Talbot Developments Reviewed At Meeting Of Works Council. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No95, April 1966, p.2

Anon. Statement by C.E.H. Morris, General Manager, Iron and Steel Division, Works Council Meeting, 22nd March 1966, *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No119, April 1966, p.2

Anon. Blast Furnace Blown-In – First in Britain to incorporate twin tapholes. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No120, May 1966, p.8

Anon. Heavy Rate Burden–position so serious that the new deep water harbour may be delayed. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No120, May 1966, p.1 and p.8

Anon. Port Talbot's £17,000,000 harbour gets 'go ahead'. *The Dragon – The Monthly Publication of the Steel Company of Wales Limited*, No 124, September 1966, p.1

Anon. Sales Re-Organisation–Company establishes new division in drive to meet growing competition. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No 124, September 1966, p.1

Anon. Mr W.F. Cartwright To Be Chairman. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No127, February 1967, p.1

Anon. Review Of Account For The Year To September 1966 – Chairman's statement to shareholders. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No130, March 1967, p.4

Anon. Our Group States Its Objectives. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No140, January 1968, p.1

Cartwright, W.F., Aim For Prosperity – keep costs down and increase productivity. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No77, July 1962, p.1

Cartwright, W.F., A Formidable Group–We join RTB and GKIS to meet big challenge. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No135, August 1967, p.1

Evans, R.W., Bessemers Will Produce 12,000 Tons Each Week. *The Dragon–The Monthly Publication Of The Steel Company Of Wales Limited,* No12, November 1956, p.2

Fancott, H., Port Talbot Steelworks Has Now Been Working For Half A Century. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No14, January 1957, p.3

Peake, Harald, The Chairman Talks To 'Dragon' Readers. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No26, January 1958, p.1
Peake, Harald, A Year Of Continued Technical Progress. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited,* No71, January 1962, pp.4-5

Pode, E. Julian, I feel confident of your full support. *The Dragon–The Monthly Publication of the Steel Company of Wales Limited*, No73, March 1962, p.1

Steel News – British Steel Corporation/British Steel Newspaper
Allen, Peter, Quoted in You were magnificent! *Steel News–Strip Products Group–Wales,* 21st January 1982, No281, p.1

Anon. Product Divisions 'Feasible'–Managing directors–designate named. *Steel News–The Monthly Newspaper Of The British Steel Corporation–South Wales Group Edition,* June 1969, No15, p.1

Anon. Thrusting Into The 70s–and the cost is £260 million. *Steel News–The Monthly Newspaper Of The British Steel Corporation–South Wales Group Edition*, November 1969, No20, p.1

Anon. New BSC Is Given The Go-Ahead. *Steel News–The Monthly Newspaper Of The British Steel Corporation–South Wales Group Edition*, December 1969, No21, p.1

Anon. How The New BSC Will Work. *Steel News–The Monthly Newspaper Of The British Steel Corporation – South Wales Group Edition*, December 1969, No21, p.8

Anon. Who's Who In The New Organisation. *Steel News–The Monthly Newspaper Of The British Steel Corporation–South Wales Group Edition*, January 1970, No22, p.9

Anon. Approved £230 million stake in the future. *Steel News–The Monthly Newspaper Of The British Steel Corporation–South Wales Group Edition*, February 1970, No23, p.9

Anon. Forth Bridge first. *Steel News–The Monthly Newspaper Of The British Steel Corporation–South Wales Group Edition,* March 1970, No24, p.1

Anon. The Queen thanks Welsh steelmen. *Steel News–The Monthly Newspaper Of The British Steel Corporation–South Wales Group Edition*, May 1970, No26, p.1

Anon. 1980: The Vital Decisions. *Steel News–The Monthly Newspaper Of The British Steel Corporation–South Wales Group Edition*, May 1970, No26 p.1

Anon. Customer's orders: Computer takes over at Port Talbot. *Steel News–Strip Mills Division–South Wales Group Edition*, 6th May 1971, No45, p.1

Anon. Setbacks which hit Division profit plans. *Steel News–Strip Mills Division–South Wales Group Edition*, 5th August 1971, No51, p.1

Anon. Port Talbot harbour to handle ore for Llanwern. *Steel News–Strip Mills Division–South Wales Group Edition*, 4th May 1972, No69, p.3

Anon. No 4 blast furnace does it again! *Steel News–Strip Mills Division–South Wales Group Edition*, 6th July 1972, No74, p.3

Anon. BOS Plant 'Swallows' Wharf Cranes. *Steel News–Strip Mills Division–South Wales Group Edition,* 19th April 1973, No92, p.3

Anon. 300 tonne torpedo ladle for BOS plant. *Steel News–Strip Mills Division–South Wales Group Edition,* 17th May 1973, No94, p.4

Anon. Target – shooters impress at Port Talbot. *Steel News–Strip Mills Division–South Wales Group Edition*, 27th September 1973, No102, p.3

Anon. BOS Plant Notches 10 Millionth Tonne. *Steel News–Strip Mills Division–South Wales Group Edition,* 6th June 1974, No119, p.3

Anon. Closure Review: Government's Plan. *Steel News–Strip Mills Division–South Wales Group Edition*, 6th June 1974, No119, p.1

Anon. Up-Dated No5 On New Campaign. *Steel News–The Newspaper Of The British Steel Corporation–Strip Mills Division–South Wales Edition,* 4th July 1974, No121, p.3

Anon. The Brutal Truth £4m A Week Loss. *Steel News–The Newspaper Of The British Steel Corporation–Strip Mills Division–South Wales Edition*, 10th July 1975, No145, p.1

Anon. Export Drive To Fill Gaps*. Steel News–The Newspaper Of The British Steel Corporation–Strip Mills Division–South Wales Edition*, 7th November 1975, No129, p.1

Anon. Giant Leads The Way. *Steel News–The Newspaper of the British Steel Corporation*, 24th April 1980, No 253, p.2

Anon. Majority Back Survival Plan*. Steel News–Strip Products Group–Wales,* 19th January 1981, No269, p.2

Anon. Quality–an investment programme of importance at Port Talbot. *Steel News–Strip Products Group–Wales*, No271, March 1981, p.3

Anon. First battery gets into gear. *Steel News–Strip Products Group–Wales*, No272, April 1981, p.3

Anon. Need To Reduce Losses Is Vital. *Steel News–Strip Products Group–Wales*, No292, 16th January 1982, p.1

Anon. Port Talbot’s Concast Performs Well During Commissioning Trial. *Steel News–Strip Products Group–Wales*, No288, 19th August 1982, pp.8-9

Anon. Port Talbot’s Works caster’s 10,000 tonne milestone. *Steel News–Strip Products Group–Wales*, No292, 16th December 1982, p.1

Anon. Government Approves New Hot Strip Mill At Port Talbot Works. *Steel News–Strip Products Group–Wales*, No298, 16th June 1983, p.1

Anon. Green Light For Hot Strip Mill*. Steel News–Strip Products Group–Wales*, No300, 18th August 1983, p.1

Anon. BSC Rates High Marks From A Top Customer. *Steel News–Strip Products Group–Wales,* No307, 15th March 1984, p.1

Anon. Coal Strike Warning*. Steel News–Strip Products Group–Wales,* No309, 17th May 1984, p.1

Anon. New dangers from coal, docks strike*. Steel News–Strip Products Group–Wales*, No311, 19th July 1984, p.1

Anon. NUM Strike Costs BSC £175 Million. *Steel News–Strip Products Group–Wales*, No319, 14th March 1985, p.1

Anon. 1984-85 was a record year*. Steel News–Strip Products Group–Wales*, No322, 13th June 1985, p.1

Anon. Cooperation keeps supplies rolling*. Steel News–Strip Products Group–Wales*, No324, 19th September 1985, p.1

Anon. Mr Moffat’s Head Office Appointment*. Steel News–Strip Products Group–Wales*, No328, 20th February 1986, p.1

Anon. Re-Built Hot Mill Geared To Challenge Best In The World. *Steel News–Strip Products Group–Wales*, No332, 26th June 1986, piv

Anon. Port Talbot Enjoys A Great Royal Event. *Steel News–Strip Products Group–Wales*, No332, 26th June 1986, p.1

Anon. Record at four works*. Steel News–Strip Products Group–Wales*, No 338, 19th February 1987, p.3

Anon. Triple crown success for BSC Strip Mill Products. *Steel News–Strip Products Group–Wales*, No347, 17th December 1987, p.1

Anon. An Assurance Of Quality From LRQA. *Steel News–Strip Products Group–Wales,* No349, 17th March 1988, pp.6-7

Anon. Record Tumble Across The Group*. Steel News–Strip Products Group–Wales*, No353, 21st July 1988, p.7

Anon. New Caster for Port Talbot Works*. Steel News–British Steel Products–Wales,*: No1, 5th September 1988, p.1

Anon. Impact day: November 23–A record half year as we go private….' *Steel News –British Steel Products–Wales*, No2, October 1988, p.1

Anon. Share Price Announced. *Steel News–British Steel Products–Wales*, No3, November 24th 1988, p.1

Anon. Share Offer Over Three Times Subscribed. Steel News–British Steel Products –Wales, No4, December 19th 1988, p.1

Haslam, Robert. Business As Usual. *Steel News–Strip Products Group–Wales*, No 314, 18th October 1984, p.1

Hewitt, Bernard. Quoted in 'An Assurance Of Quality From LRQA', *Steel News–Strip Products Group–Wales,* No 349, 17th March 1988, pp.6-7.

MacGregor, Ian, White Out! *Steel News–Strip Products Group–Wales*, No281, 21st January 1982, p.1

Melchett, Big output potential at existing works. *Steel News–The Monthly Newspaper Of The British Steel Corporation,* April 1969, No13, p.1

Osborne, C.H., Quoted in, The Operating Plan–Failures To Meet It Is A Matter Of Concern. *Steel News–Strip Mills Division–South Wales Group Edition*, 8th November 1973, No105, p.3

Scholey, Robert, Quoted in, The Operating Plan–Failures To Meet It Is A Matter Of Concern. *Steel News–Strip Mills Division–South Wales Group Edition,* 8th November 1973, p.3

Scholey, Robert, Disputes: Deeds Not Words, *Steel News–The Newspaper Of The British Steel Corporation–Strip Mills Division–South Wales Edition*, 10th October 1974, No127, p.1

Scholey, Robert, Output Results Not Good Enough, *Steel News–The Newspaper Of The British Steel Corporation–Strip Mills Division–South Wales Edition*, 7th November 1974, No129, p.1

Government/Parliamentary Papers

Allen, Peter, Statement By Managing Director Of The Welsh Division, BSC, December 1979 as contained in evidence given to the House of Commons Committee on Welsh Affairs, 3rd June 1980, Appendix 2, 424-425

Allen, Peter, Evidence supplied to House of Commons Committee On Welsh Affairs – Port Talbot/Llanwern, 5th June 1980, House Of Commons, 415-479

Economic Trends–Annual Supplement (London: HMSO, 2006)

Great Britain. *Iron and Steel Act,* Third Schedule, 1949

Great Britain. *Iron and Steel Act*, Schedule 1, 1967

Great Britain. Ministry of Suppy. *Iron and Steel Industry-Reports By The British Iron And Steel Federation And The Joint Iron Council.* (Cmnd 6811). London: HMSO,1946

Great Britain. *British Steel Corporation: Ten Years Development Strategy.* (Cmnd 5226). London: HMSO, February 1973

Great Britain. *British Steel Corporation: The Road to Viability.* (Cmnd 7149). London: HMSO, March 1978

Great Britain. House of Commons Papers. Parliamentary Papers Session 9th May 1979 to 13th November 1980. The Committee on Welsh Affairs, 720-731 pp.415-479 No46. 5th June 1980

Great Britain. House of Commons Papers. Second Report from the Committee on Scottish Affairs, Session 1982-83, *The Steel Industry in Scotland,* 1st December 1982

Great Britain. House of Commons Papers. Second Report from the Industry and Trade Committee, Session 1982-83, *The British Steel Corporation's Prospects,* 16th February 1983

Hansard (Commons). 17th October 1944, columns 2319-2324

Hansard (Commons). 3rd August 1961, columns 16-17, Vol.644

Hansard (Commons). 1st July 1976, column 1284

Haslam, Robert. Evidence to First Report from the Trade and Industry Committee Session 1983-84, *The British Steel Corporation's Prospects.* House of Commons. 18th January 1984

Iron and Steel Board, *Development In the Iron and Steel Industry – Special Report* (London: HMSO 18th November 1964)

Jenkin, Patrick. Announcement by the Secretary of State for Industry to the House of Commons. Hansard (Commons). 20th December 1982, column 673

Villiers, Charles. Evidence supplied to House of Commons Committee On Welsh Affairs, Port Talbot/Llanwern, 5th June 1980, House of Commons, pp.415-479

Scholey, Robert. Evidence supplied by BSC's Chief Executive to the Committee on Welsh Affairs, Port Talbot/Llanwern, 5th June 1980, House of Commons, pp.415-479

Scholey, Robert. Evidence given to the Trade and Industry Committee, House of Commons, Session 1985-86, *British Steel Corporation*, 16th July 1986

Newspapers and Periodicals

Allen, Peter, quoted in 'Steel plan decision expected in March', *Port Talbot Guardian*, 3rd February 1977, p.1

Allen, Peter, quoted in '1000 Strikers storm BSC's main office', *Port Talbot Guardian*, 10th April 1980, p.1

Allen, Peter, quoted in 'Further 490 Jobs To Go', *Port Talbot Guardian*, 5th November 1981, p.3

Allen, Peter, quoted in 'Steel order boost for Port Talbot'. *Port Talbot Guardian*, 22nd April 1982, p.1

Allen, Peter, quoted in 'Port Talbot triumph-£500m filter for the battle of the giants'. *South Wales Evening Post*, 28th October 1987, p.16

Anon. Blast Furnaces For Port Talbot – Big Anglo-German Enterprise. *South Wales Daily Post*, 1st March 1902, p.3

Anon. Great Steel Combine. *South Wales Daily Post,* 26th March 1902, p.3

Anon. Big Iron and Steel Combine – Company's Registration Papers Lodged. *South Wales Daily Post,* 9th April 1902

Anon. Russian Pig-Iron At Swansea – Another Consignment On The Way Here. *South Wales Daily Post,* 29th April 1902

Anon. Steel Companies Results. *The Economist,* 24th March 1906, pp.491-492.

Anon. Gloucester Railway Carriage and Wagon Company AGM, 26th August 1908. *The Economist,* 29th August, 1908, p.413

Anon. Gloucester Railway Carriage and Wagon Company AGM, 26th July 1915. *The Economist,* 31st July 1915, pp.190-191

Anon. Baldwins AGM 28th October 1915, *The Economist*, 30th October 1915, p747

Anon. Port Talbot's Welcome To Prince of Wales–A Red Letter Day–Local Enthusiasm. *South Wales Daily Post,* 20th February 1918

Anon. The Firm Striking Details Of Industrial Scope. *South Wales Daily Post*, 20th February 1918

Anon. Baldwins AGM. *The Economist,* 1st February 1919, p.162

Anon. Baldwins Limited, Authorised Capital - £7,000,000, Offer of Purchase of 1,000,000 5% Cumulative 'B' preference Shares. *The Economist,* 18th October 1919 p.751

Anon. Big Rise In Baldwins. *The Times,* 19th February 1920, p.19

Anon. The Offer to Baldwins Shareholders. *The Times,* 30th November 1920, p.20

Anon. Baldwins and British Mannesmann Fusion. *The Economist*, 21st January 1921, p.150

Anon. Baldwins AGM. *The Economist,* 29th January 1921, p.197

Anon. Baldwins Limited. *The Economist,* 11th June 1921, p.1284

Anon. Baldwins Report for the year ended 30th June 1921. *The Economist*, 21st January 1922, p.84

Anon. The Iron and Steel Industry in 1922. *The Economist,* 3rd February 1923 pp.201-202

Anon. Baldwins Report for the year ended 30th June 1924. *The Economist*, 13th December 1924, p.959

Anon. Baldwins' Lean Year. *The Economist*, 26th November 1927, p.927

Anon. Baldwins Limited–Reorganisation Scheme–Extraordinary General Meeting 26th June 1928. *The Economist*, 30th June 1928 p.1348

Anon. Neath Assessment Committee–Tin, Iron and Steel Works Dealt With–1677 Appeals. *Port Talbot Guardian.* 8th March 1929, p.3

Anon. Baldwins and Guest Keen. *The Economist*, 11th January 1930, p.80-81

Anon. Brighter Industrial Outlook–Local Significance of Welsh Steel Merger. *Port Talbot Guardian,* 10th January 1930, p.2

Anon. Port Talbot Piers-£300,000 Scheme of Dock Extension. *Port Talbot Guardian*, 14th March 1930, p.1

Anon. More Orders – How Closing of Dowlais Works Affects Margam – Prospects 'Reasonably Fair'. *Port Talbot Guardian*, 10th October 1930, p.1

Anon. Hopeful Prospects – Steady Progress at Port Talbot – Industrial Review for April. *Port Talbot Guardian,* 9th May 1930, p.1

Anon. Baldwins Report for the year ended 31st December 1930. *The Economist*, 11th April 1931, pp.796-797

Anon. Baldwins Report for the year ended 31st December 1932. *The Economist*, 1st April 1933, p.699

Anon. Ship Steel Agreement. *The Economist*, 13th January 1934, p.63

Anon. Port Talbot Trade Boom – Advisory Committee's Encouraging Report. *Port Talbot Guardian,* 16th March 1934, p1

Anon. Baldwins Report for the year ended 31st December 1933. *The Economist,* 24th March 1934, p.642

Anon. Unemployment Figures Drop – Development Committee and Improved Trade. *Port Talbot Guardian*, 13th April 1934, p.1

Anon. Port Talbot Unemployment Figures. *Port Talbot Guardian,* 18th April 1935

Anon. More Men at Work at Port Talbot. *Port Talbot Guardian*, 16th August 1935

Anon. Trade Improvement Continues – Good Prospects For The Future. *Port Talbot Guardian*, 27th September 1935

Anon. Baldwins Progressive Report*. The Economist*, 27th March 1937, pp.710-711

Anon. Baldwins Accounts. *The Economist*, 26th March 1938, pp.698-99

Anon. Strip Mill A Revolution in Industry – Mr Bert Sutcliffe's Views on Serious Problem, *Port Talbot Guardian,* 30th May 1938, p.1

Anon. Strip Mill Causes Crisis in Tinplate Industry – Heavy Sacrifice Needed To Solve Serious Problem. *Port Talbot Guardian*, 3rd June 1938, p.1

Anon. Tinplate Crisis : Labour's Co-operation Urgent – Room For Second Strip Mill. *Port Talbot Guardian*, 17th June 1938, p.1

Anon. Mass Meeting to Discuss Strip Mill Menace – Iron and Steel Trades and Mechanisation Fears. *Port Talbot Guardian*, 1st July 1938, p.1

Anon. Worker's Campaign to Combat Strip Mill Menace. *Port Talbot Guardian,* 8th July 1938, p.1

Anon. Welsh Steel Under Subscription. *The Economist,* 19th July 1947, pp.118-119

Anon. Steel Works in the Making. *The Economist*, 15th November 1947, pp.810-811

Anon. The Steel Bill Examined. The Economist, 6th November 1948, pp.756-758

Anon. Statement By Directors Of The Steel Company of Wales. *The Economist*, 22nd December 1956, p.1081

Anon. Steel of Wales Offer. *The Economist,* 9th March 1957, p.834

Anon. Coal Imports Requested By Steel Firm. *The Times,* 8th May 1961

Anon. Steel Company of Wales statement on Port Talbot Melting Shop closure in, The Final Days Of A Once Thriving Works. *Port Talbot Guardian,*12th May 1961, p.1

Anon. Giant ore train deal is success. *Port Talbot Guardian*, 1st July 1976, p.1

Anon. Steel And So Say All Of Us. *Port Talbot Guardian*, 24th March 1977, p.3

Anon. £835 million blow to town's hopes. *Port Talbot Guardian*, 30th March 1978, p.1

Anon. Electrician's strike gets the blame. *Port Talbot Guardian*, 6th April 1978, p.3

Anon. Brighter steel future for Port Talbot. *Port Talbot Guardian*, 1st June 1978, p.1

Anon. Every steelman gets 'survival' message. *Port Talbot Guardian*, 19th October 1978, p.3

Anon. 1,000 Steel Jobs To Go. *Port Talbot Guardian*, 8th March 1979, p.1

Anon. MPs call on Govt to save 'steelworkers'. *South Wales Evening Post*, 3rd December 1979, p.1

Anon. Peace talks fair–bitter fight ahead. *Port Talbot Guardian,* 10th January 1980, p.1

Anon. Strikers are in no mood to give up the struggle. *Port Talbot Guardian,* 17th January 1980, p.3

Anon. Unions call for resignations of steel boss. *Port Talbot Guardian*, 28th February 1980, p.3

Anon. Question of Survival. *South Wales Evening Post,* 15th April 1980, p.1

Anon. Cold mill is threat to works. *Port Talbot Guardian*, 28th May 1981, p.1

Anon. Cold mill 'bottleneck'. *Port Talbot Guardian*, 18th June 1981, p.1

Anon. Steel closure rumours are denied but…. *Port Talbot Guardian*, 2nd July 1981, p.1

Anon. Steel mill problems a threat. *Port Talbot Guardian*, 20th August 1981, p.1

Anon. Strike threat still hangs over BSC. *Port Talbot Guardian*, 22nd October 1981, p.1

Anon. Steel strike ends. *Port Talbot Guardian*, 29th October 1981, p.1

Anon. Further 490 Jobs To Go. *Port Talbot Guardian*, 5th November 1981, p.3

Anon. Men accept job loss plan. *Port Talbot Guardian*, 3rd December 1981, p.1

Anon. Slimline miracle in South Wales. *The Economist*, 11th April 1981, p.24

Anon. Coal and coke in the news as BSC gets a big boast. *Port Talbot Guardian*, 30th April 1981, p.1

Anon. New fears over short time at steelworks. *Port Talbot Guardian,* 10th June 1982, pp.1-2

Anon. BSC future is looking up*. Port Talbot Guardian*, 22nd July 1982, p.3

Anon. Critical time for new steel orders. *Port Talbot Guardian,* 19th August 1982, p.1

Anon. Short time at steel plant. *Port Talbot Guardian*, 14th October 1982, p.1

Anon. £4 million facelift for BSC metal line. *Port Talbot Guardian*, 2nd February 1984, p.6

Anon. Rough treatment to pickets claim. *Port Talbot Guardian,* 5th April 1984, p.1

Anon. Picket anger 25 arrested. *Port Talbot Guardian*, 26th July 1984, p.1

Anon. Miners' end crane raid*. Port Talbot Guardian,* 6th September 1984, p.1

Anon. Royal opening for massive £171 million BSC project. Special Supplement, *Western Mail,* 11th July 1986

Anon. Output at new mill best to date. *South Wales Evening Post*, 30th September 1986, p.1

Anon. World record at steel plant. *South Wales Evening Post,* 16th December 1987, p.1

Anon. Smashing start to the year for steelmen. *Evening Times*, 14th January 1988, p.1

Anon. British Steel all set for sell off. *Western Mail*, 7th October 1988, p.1

Anon. £71m blast furnace gets into action*. South Wales Evening Post*, 8th September 1992, p.1

Anon. Obituary of Fred Cartwright–Manager of 26,000 Steelworkers*. Daily Telegraph* 15th June 1998

Anon. Corus contractor cuts 40 temporary jobs. *South Wales Evening Post*, 20th October 2008, p.1

Bates, Harold, Cold Mill Manager quoted in 'BSC future is looking up'. *Port Talbot Guardian*, 22nd July 1982, p.3

Bray, Jeremy. Quoted in Scottish-Welsh steel group proposed. *Financial Times*, 7th January 1988, p.11

Bray, Jeremy. Letter in *Financial Times*, 7th November 1988, p.17

BSC. Steelmen: British Steel Offer You A Democratic Way To End The Strike Do You Want A Vote? Advertisement in the *Port Talbot Guardian*, 6th March 1980, p.3

Buxton, J. Scottish-Welsh steel group proposed. *Financial Times,* 7th January 1988, p.11

Carberry, John. ISTC Divisional Organiser quoted in Angry Steelmen will ignore BSC slim-down plan, by Reg Matthews, *Port Talbot Guardian*, 24th January 1980, p.1

Chambert, Paul. MP Demands Answers On Steel Crisis. *South Wales Evening Post*, 1st December 1979, p.1

Corus, *Well Done.* Corus advertisement in *South Wales Evening Post*, 21st December 2007 p.16

Deitch, R. and N. Denby. Strip Mill Go-Ahead-£171m Port Talbot project, *South Wales Evening Post,* 9th May 1983, p.1

Denby, Norman. 3000 Margam Jobs To Go By March. *South Wales Evening Post,* 22nd November 1979, p.1

Denby, Norman. Margam Fears More Job Gloom. *South Wales Evening Post,* 30th November 1979, p.1

Denby, Norman. £75m Steel Plant Boost. *South Wales Evening Post*, 14th September 1988, p.1

Fisher, P. Town Bites Dust, *South Wales Evening Post*, 21st July 2000, p.1

Harris, W.J.. Fair deal urged for steel plant. Letter published in *Port Talbot Guardian,* 10th January 1980, p.5

Haslam, Robert. Quoted in *BSC chief warns of permanent plant closures.* Philip Bassett, and Ian Rodger, *Financial Times*, 10th May 1984, p.1

Hicks-Beach, J.. Chairman's Address to the Gloucester Railway Carriage and Wagon AGM, 25th August 1909. *The Economist*, 28th August 1909, p.430

Hughes, M.. Losses in steelmaking. *Financial Times*, 5th September 1979, p.1

Isaacs, J.. New Steel plant is almost ready. *South Wales Evening Post,* 24th August 1982, p.3

Isaacs, J.. Port Talbot triumph-£500m filter for the battle of the giants. *South Wales Evening Post*, 28th October 1987, p.16

Lever, Ernest. The Steel Company of Wales Limited: Statement by the Chairman. *The Economist*, 12th March 1949, p.493

Lewis, Paul. Safety first as record smashed at steel works. *South Wales Evening Post,* 31st May 2007, p.1

Lewis, Paul. Welcome for major steel plant boost. *The Courier*, 10th May 2005, p.1

Lewis, Paul. Mixed feelings as furnace falls. *The Courier*, 25th January 2005, p.9

Lewis, Paul. £16m act of support wins praise. *South Wales Evening Post,* 21st September 2006. p.10

Lewis, Paul. Corus 'committed to plant's future'. *South Wales Evening Post*, 27th January 2009, p.1

Matthews, Reg. Steel strikers want more money–not loss of jobs. *Port Talbot Guardian*, 27th June 1975, p.5

Matthews, Reg. Anxious Times Ahead For Steel Plant Men. *Port Talbot Guardian*, 29th August 1975, p.3.

Matthews, Reg. Steel Plant Shutdown: Stalemate Sets Town Worrying. *Port Talbot Guardian*, 16th January 1976, p.1

Matthews, Reg. Help us win steel fight Mr Morris. *Port Talbot Guardian*, 6th April 1978, p.1

Matthews, Reg. Will there be a works to go back to? *Port Talbot Guardian*, 17th January 1980, p.1 and p.3

Matthews, Reg. 1000 strikers storm BSC's main office. *Port Talbot Guardian*, 10th January 1980, p.1

Matthews, Reg. Steelmen go for golden handshake. *Port Talbot Guardian*, 22nd May 1980, p.1

Matthews, Reg. 700 More to lose jobs at steel plant. *Port Talbot Guardian*, 18th December 1980, p.1

Matthews, Reg. Steelmen face up to rival ballot. *Port Talbot Guardian,* 8th January 1981, p.1

Matthews, Reg. Survival plan accepted 'to save the works', *Port Talbot Guardian*, 15th January 1981, p.1

Matthews, Reg. Steel warning that targets must be hit. *Port Talbot Guardian*, 2nd April 1981, p.1

Matthews, Reg. Slimline steel records still on increase. *Port Talbot Guardian*, 25th March 1982, p.1

Moffat, Brian. Quoted in, 'Greater output is BSC plan at Port Talbot', *Port Talbot Guardian*, 19th February 1981, p.1

Moffat, Brian. Quoted in, 'Message of hope for local steelworkers'. *Port Talbot Guardian*, 28th January 1982, p.1

Moffat, Brian. Quoted in, 'Steel order boast for Port Talbot'. *Port Talbot Guardian,* 22nd April 1982, p.1.

Morris, John, Quoted in, Mr Morris hits at ridiculous criticisms, *Port Talbot Guardian*, 6th April 1978, p.1

Painter, Caroline. Jubilation as steel boss announces £835m boast. *Port Talbot Guardian*, 24th March 1977, p.1

Painter, Caroline. A day Port Talbot will never forget. *Port Talbot Guardian*, 14th February 1980, p.1

Painter, Caroline. BSC's £100m leap into the future. *Port Talbot Guardian*, 19th August 1982, p.1

Painter, Caroline. Here's Christmas cheer Strip Mill steel deal welcome, *Port Talbot Guardian,* 23rd December 1982, p.1

Painter, Caroline. Jubilation at hot mill news*, Port Talbot Guardian*, 26th May 1983, p.1

Painter, Caroline. Steelmen reject mine plea*, Port Talbot Guardian,* 29th March 1984, p.1

Painter, Caroline. Picket Line Fury–58 arrested after violent clashes*, Port Talbot Guardian*, 12th April 1984, p.1

Painter, Caroline. Big Boost For Steel-BSC to spend £75 million at Port Talbot*, Port Talbot Guardian*, 16th September 1988, p.1

Perring, John. Quoted in 'Steelmen reject mine plea'*. Port Talbot Guardian*, 29th March 1984, p.1

Philips, Kerry. Quoted in 'New Steel plant is almost ready'. *South Wales Evening Post,* 24th August 1982, p.3

Rodger, Ian. Scottish steel closure seen as threat to future of Ravenscraig. *Financial Times*, 7th August 1985, p.1

Sambrook, Gordon. Quoted in 'Talks begin on slimline plans' by Reg Matthews, *Port Talbot Guardian*, 17th April 1980, p.3

Smith, M.. Steel union concedes privatisation. *Western Mail,* 5th January 1988, p.1

Thomas, J.. Quoted in, Steel plant development campaign will continue. *Port Talbot Guardian,* 30th May 1975, p.5

Turner, Paul. Cheer for workers as steel company shows huge profit. *South Wales Evening Post*, 26th August 2005, p.1

Turner, Robin. 'Knee-jerk reaction' claim at Corus plant*. Port Talbot Guardian*, 13th November 2008, p.3

Turnock, quoted in, Neath Assessment Committee–Tin, Iron and Steel Works Dealt With–1677 Appeals. *Port Talbot Guardian,* 8th March 1929 p.3

Walters, J.. Cash boost makes steel jobs secure. *Western Mail*, 14th September 1988, p.3

Williams, Elwyn. Quoted in, Mayor feels dismay and bitterness*. Port Talbot Guardian,* 24th January 1980, p.1

Wilson, R. Record breakers. *Motherwell Times,* 30th April 1987, p.1

Wright, John Roper. Great Steel Combine. *South Wales Daily Post,* 26th March 1902

Wright, John Roper. Baldwins Limited – Increase of Capital Sanctioned. *The Economist,* 15th May 1915, p.950

Wright, John Roper. Chairman's Address at Baldwins AGM. 26th October 1916. *The Economist,* 28th October 1916, pp.833-834

Wright, John Roper. Chairman's Address at Baldwins AGM. 28th October 1915. *The Economist,* 30th October 1915, p.747

Wright, John Roper. Baldwins Limited–The Negotiations With Messrs Sperling and Co, *The Economist.* 10th July 1920, p.69

Wright, W. Charles. Baldwins Limited AGM. *The Economist,* 27th November 1925 p.930

Wright, John Roper. Baldwins Limited–Increased Profits–Capital Requirements. *The Economist,* 29th January 1921, p.197

Varley, Eric. Quoted in, £835 million blow to town's hopes. *Port Talbot Guardian*, 30th March 1978, p.1

Vassar-Smith, Richard. Chairman's Address to the Gloucester Railway Carriage and Wagon Company AGM, 26th August 1908. *The Economist,* 29th August 1908, p.413

Vassar-Smith, Richard. Chairman's Address to the Gloucester Railway Carriage and Wagon Company AGM, 27th July 1914. *The Economist,* 1st August 1914, pp.246-247

Youle, R.. Steel giant to slash production. *South Wales Evening Post,* November 2008, p.1

Personal Communications

Corus Manager, interview with Stephen Parry, 13th November 2008

Ex-ISTC Divisional Official, interview with Stephen Parry, 13th November 2008

Kindersley, Hugo, Ex-SCoW Non Executive Director 1960-1967, interview with Stephen Parry, 23rd February 2006

Union Official, interview with Stephen Parry, 13th March 2008

Pressure Groups

Hawarden-Flintshire, County Record Office, The Steel Industry Investment Programme–The British Steel Corporation Strip Mills Division, Shotton Group, Flintshire: Submission to the Prime Minister, 21st November 1972, Copy FC/13/15a

SCORPISW, *South Wales and The 1980 Steel Crisis–An Impact Study and Action Proposals* : Standing Conference On Regional Policy in South Wales, 1980

Swansea, West Glamorgan County Council, West Glamorgan's economy–the case for development of the Port Talbot Steelworks, April 1975

WWSDC, *The Steel Industry and the Port Talbot Development,* West Wales Steel Development Committee, 1975

WWSDC, *The Case for an Integrated Steel Industry in West Wales*, West Wales Steel Development Committee, 1975

Trade Papers

Anon, 'Baldwins', *Journal of the Iron and Steel Confederation*, 1920

Anon, 'The New Margam Works of Baldwins, Ltd', *The Iron & Coal Trades Review*, 17th September (1920), 354-359

Anon, 'The Port Talbot Steel Works', *The Iron & Coal Trades Review*, 17th September (1920), 362-364

Anon, 'Iron and Steel Works in 1921', *The Iron & Coal Trades Review,* 20th October (1922), 566

Anon, Share price quoted in *The Iron and Coal Trades Review*, 20th January (1922), 108

Anon, 'Review of the Iron and Steel Trades (South Wales)', *The Iron & Coal Trades Review,* 29th December (1922), 966-968

Anon, 'Output of Steel Ingots in Great Britain 1885-1923', *The Iron & Coal Trades Review,* 11th July (1924), 57

Anon, 'Baldwins Limited–Reorganisation Scheme', *The Iron & Coal Trades Review*, 15th June (1928), 923

Anon, 'Baldwins Limited AGM', *The Iron and Coal Trades Review,* 11th April (1930), 626

Anon, Guest Keen-Baldwins Fusion–Financial Details, *The Iron and Coal Trades Review,* 11th April (1930), 624
Anon, 'Baldwins Limited AGM', *The Iron and Coal Trades Review*, 17th April (1931) 644

Anon, 'Works Visited By Members Of The Iron and Steel Institute–The Port Talbot Branch of the British (Guest Keen Baldwins) Iron and Steel Company Limited', *The Iron and Coal Trades Review,* 2nd October (1931), 497-501

Anon, 'Baldwins Limited AGM', *The Iron and Coal Trades Review*, 8th April (1932), 614

Anon, 'Guest, Keen and Nettlefolds Limited'*, The Iron and Coal Trades Review*, 1st July (1932), 26

Anon, 'Guest, Keen and Nettlefolds Limited', *The Iron and Coal Trades Review*, 16th June (1933), 958

Anon, 'Baldwins Limited AGM'. *The Iron and Coal Trades Review,* 6th April (1934), 592

Anon, '*Guest, Keen and Nettlefolds Limited', The Iron and Coal Trades Review*, 29th June (1934), 1078

Anon, 'Baldwins Limited AGM', *The Iron and Coal Trades Review*, 5th April (1935), 607-608

Anon, 'Baldwins Limited AGM', *The Iron and Coal Trades Review*, 3rd April (1936), 656

Anon, 'District Iron and Steel Trade Reports – South Wales'*, The Iron and Coal Trades Review*, 12th March (1937), 505

Anon, 'District Iron and Steel Trade Reports – South Wales'*, The Iron and Coal Trades Review*, 19th March (1937), 549

Anon, 'District Iron and Steel Trade Reports – South Wales'*, The Iron and Coal Trades Review,* 12th November (1937), 819

Anon, '*District Iron and Steel Trades Review – South Wales', The Iron & Coal Trades Review,* 7th January (1938), 21

Anon, 'A Comparison of Cast Iron Scrap Prices – Average Monthly Prices of Cast Iron Scrap in the Principle Districts in the Years 1931-33'*, The Iron & Coal Trades Review,* 21st January (1938), 105

Anon, 'District Review of the Iron and Steel Trade – South Wales', *The Iron & Coal Trades Review,* 21st January (1938), 130-131

Anon, 'District Review of the Iron and Steel Trade – South Wales', *The Iron & Coal Trades Review*, 4th February (1938), 247-249

Anon, 'District Review of the Iron and Steel Trade – South Wales', *The Iron & Coal Trades Review,* 11th February (1938), 287-289

Anon, 'District Review of the Iron and Steel Trade – South Wales', *The Iron & Coal Trades Review*, 18th February (1938), 338-339

Anon, 'District Review of the Iron and Steel Trade – South Wales', *The Iron & Coal Trades Review,* 25th February (1938), 379-381

Anon, 'District Review of the Iron and Steel Trade – South Wales', *The Iron & Coal Trades Review*, 4th March (1938), 417-419

Anon, 'District Review of the Iron and Steel Trade – South Wales' *The Iron & Coal Trades Review,* 11th March (1938), 457

Anon, 'Developments in the Steel Industry of South Wales and Northamptonshire', *The Iron & Coal Trades Review* , 24th June (1938), 1094-1096

Anon, 'District Review of the Iron and Steel Trade – South Wales', *The Iron & Coal Trades Review*, 26th August (1938), 333

Anon, 'District Review of the Iron and Steel Trade – South Wales', *The Iron & Coal Trades Review*, 28th October (1938), 715

Anon, 'ARP at Steelworks – Guest Keen Baldwins' Scheme', *The Iron & Coal Trades Review*, 3rd November (1938), 733

Anon, 'Wages and Work', *Iron and Coal Trades Review,* 7th April (1939), 648

Anon. 'Output of Pig Iron and Steel in Great Britain', *The Iron & Coal Trades Review,* 30th September (1938), 509

Anon, 'Output of Pig Iron and Steel in Great Britain', *The Iron & Coal Trades Review,* 27th January (1939), 195

Anon, 'Industrial Notes–Extensions to Margam Coking Plant', *The Iron & Coal Trades Review*, 19th May (1939), 906

Anon, 'District Review of the Iron and Steel Trade – South Wales'*, The Iron & Coal Trades Review*, 26th May (1939), 1054

Anon, '*District Review of the Iron and Steel Trade – South Wales', The Iron & Coal Trades Review*, 7th July (1939), 27

Anon, 'District Review of the Iron and Steel Trade – South Wales', *The Iron & Coal Trades Review*, 14th July (1939), 64

Anon, 'Richard Thomas and Baldwins – Fusion Proposed', *The Iron and Coal Trades Review,* 17th November (1944), 775

Anon, 'Iron And Steel Trade', *The Iron and Coal Trades Review,* 8th December (1944), 887

Anon, 'Richard Thomas & Baldwins Fusion – Modernisation of Sheet and Tinplate Trades', *The Iron and Coal Trades Review,* 8th December (1944), 889-890

Anon, 'British Iron and Steel Industry in 1944 Production', *The Iron and Coal Trades Review,* 12th January (1945), 83-86

Anon, 'Steel Production Since 1939 – High Annual Average', *The Iron and Coal Trades Review,* 28th September (1945), 489

Anon, 'British Pig-Iron Production During The War–A Brief Statistical Record', *The Iron and Coal Trades Review*, 9th November (1945), 719-720

Anon, 'No 1 Blast-Furnace at the Margam 1 Works', *Journal of the Iron and Steel Institute,* Vol1–(1947), 289-290

Anon, 'Steel Share Prospect', *Steel Times*, 3rd January (1964), 11

Anon, 'The Port Talbot Dispute', *Steel Times*, 3rd January (1964), 9

Anon, 'South Wales Steel Peace in Sight', *Steel Times*, 31st January (1964), 134

Anon, 'Effect of Dispute on SCoW', *Steel Times*, 24th February (1964), 205

Anon, 'SCoW's New Pay Agreement With Craft Unions', *Steel Times*, 18/25th December (1964), 849

Anon, 'South Wales Ore Port Development', *Steel Times*, 9th July (1965), 37-39

Anon, 'Green light for Red Dragon', *Steel Times,* 19th August (1966), 237-238

Anon, 'Steel Faces A Labour Crisis – By A Special Correspondent', *Steel Times*, 7th February (1964), 167-170

Anon, 'Steel Corporation Sets Up Group Board', *Steel Times*, 29th September (1967) 351

Anon, 'New Harbour and Steel Facilities at Port Talbot', *Steel Times,* August 1969, 539-542

Anon, 'BSC Modernisation Projects Reviewed – Part 2 – Port Talbot Group', *Steel Times*, February 1972, 186-192

Anon, 'BSC Modernisation Projects Reviewed – Part 2 – Strip Mills Division – Port Talbot Division', *Steel Times*, February 1976, 122-126

Anon, 'BSC Modernisation Projects Reviewed – Part 2 – Welsh Division', *Steel Times,* February 1977, 127-129

Anon, 'BSC Modernisation Projects Reviewed – Part 2 – Manufacturing Division – Welsh', *Steel Times,* February 1978, 170-203

Anon, 'Dawn at Port Talbot Works', *Steel Times,* October 1979, 730-739

Anon, 'Review of BSC Modernisation Projects', *Steel Times*, January 1980, 21-64

Anon, 'BSC Strip Products Group Port Talbot Works, A Special Steel Times Technical Review', *Steel Times,* Vol.210(7) July 1982, 392-414

Anon, 'Port Talbot HSM development on target', *Steel Times*, Vol 212(11) November 1984, 537-542

Anon, 'Energy saving on BSC Port Talbot Morfa coke ovens', *Steel Times*, Vol.212 (9) September 1984, 405

Anon, 'BSC plans to cut UK strip capacity'*, Steel Times*, Vol.213(9) September 1985, 414

Anon, 'British Steel Corporation–poised for a successful future', *Steel Times International*, September 1985, 15-21

Anon, 'Prince of Wales opens Port Talbot's modernised HSM'*, Steel Times*, Vol.214(8) August 1986, 380

Anon, 'BSC Strip Products Group', *Steel Times International*, September 1986, 15-33

'Blast Furnace Statistics', *The Iron & Coal Trades Review*, 11th February (1910), 224

'Blast Furnace Statistics', *The Iron & Coal Trades Review*, 25th April (1913), 665

'British Blast Furnaces For The Quarter Ended September 30th 1922', *The Iron & Coal Trades Review,* 20th October (1922), 580

'British Blast Furnaces For The Quarter Ended 30th June 1923', *The Iron & Coal Trades Review,* 3rd August (1923), 177

'British Blast Furnaces For The Quarter Ended 30th September 1923', *The Iron & Coal Trades Review*, 26th October (1923), 641

'British Blast Furnaces For The Quarter Ended 31st March 1924', *The Iron & Coal Trades Review*, 9th May (1924), 804

'British Blast Furnaces For The Quarters Ended 30th September 1924 and 31st December 1924', *The Iron & Coal Trades Review*, 30th January (1925), 190

'British Blast Furnaces For The Quarter Ended 31st March 1925', *The Iron & Coal Trades Review,* 24th April (1925), 668

'British Blast Furnaces For The Quarter Ended 30th June 1925', *The Iron & Coal Trades Review,* 24th July (1925), 149

'British Blast Furnaces For The Quarter Ended 31st December 1926', *The Iron & Coal Trades Review*, 21st January (1927), 109

'British Blast Furnaces For The Quarter Ended 30th September 1927', *The Iron & Coal Trades Review,* 28th October (1927), 630

'British Blast Furnaces For The Quarter Ended 31st December 1927', *The Iron & Coal Trades Review*, 20th January (1928), 88

'British Blast Furnaces For The Quarter Ended 31st March 1928', *The Iron & Coal Trades Review,* 11th May (1928), 721

'British Blast Furnaces For The Quarter Ended 30th September 1928'*, The Iron & Coal Trades Review,* 19th October (1928), 582

'British Blast Furnaces For The Quarter Ended 30th June 1929'*, The Iron & Coal Trades Review*, 19th July (1929), 94

'British Blast Furnaces For The Quarter Ended December 31, 1930', *The Iron and Coal Trades Review*, 23rd January (1931), 184

'British Blast Furnaces For The Quarter Ended March 31, 1931', *The Iron and Coal Trades Review*, 1st May (1931), 705

'British Blast Furnaces For The Quarter Ended December 31, 1932', *The Iron and Coal Trades Review*, 20th January (1933), 94

'British Blast Furnaces For The Quarter Ended March 31, 1933', *The Iron and Coal Trades Review*, 21st April (1933), 616

'British Blast Furnaces For The Quarter Ended June 30, 1933', *The Iron and Coal Trades Review*, 21st July (1933), 102

'British Blast Furnaces For The Quarter Ended September 30, 1933', *The Iron and Coal Trades Review*, 20th October (1933), 603

'British Blast Furnaces For The Quarter Ended June 30, 1934', *The Iron and Coal Trades Review,* 13th July (1934), 56

'British Blast Furnaces For The Quarter Ended December 31, 1934', *The Iron and Coal Trades Review*, 18th January (1935), 140

'British Blast Furnaces for the Quarter Ended June 30, 1935', *The Iron and Coal Trades Review*, 19th July (1935), 102

'British Blast Furnaces for the Quarter Ended September 30, 1935', *The Iron and Coal Trades Review,* 18th October (1935), 646

'British Blast Furnaces for the Quarter Ended December 31, 1935', *The Iron and Coal Trades Review,* 17th January (1936), 158

'British Blast Furnaces For The Quarter Ended September 30, 1936', *The Iron and Coal Trades Review,* 16th October (1936), 670

'British Blast Furnaces For The Quarter Ended December 31, 1936', *The Iron and Coal Trades Review,* 23rd January (1931), 184

'British Blast Furnaces in the Quarter Ended December 31, 1936', *The Iron and Coal Trades Review*, 22nd January (1937), 193

'British Blast Furnaces in the Quarter Ended March 31, 1937', *The Iron and Coal Trades Review*, 23rd April (1937), 759

'British Blast Furnaces in the Quarter Ended June 30, 1937', *The Iron and Coal Trades Review*, 23rd July (1937), 151

'British Blast Furnaces in the Quarter Ended September 30, 1937', *The Iron and Coal Trades Review,* 22nd October (1937), 675

'British Blast Furnaces in Quarter Ended 30th June 1938', *The Iron & Coal Trades Review*, 15th July (1938), 103

Brooke, W.J., 'Co-Ordinated Heat Conservation At The Normanby Park Steel Works, Scunthorpe', *The Journal of the Iron and Steel Institute*, Vol CXXVIII-1933(2)

Cartwright, W.F., 'Preliminary Planning of Margam and Abbey Works in A Technical Survey of the Abbey, Margam, Trostre and Newport Plants of The Steel Company of Wales Limited', *The Iron and Coal Trades Review - Special Issue* (1952), 9-12

Cartwright, W.F., 'Production control in an integrated iron and steelworks', *Journal of The Iron and Steel Institute,* June (1960), 137-144

Cartwright, W.F., 'The Place Of Mini-Steelworks In The World', *Journal of The Iron And Steel Institute*, April (1972), 221-225

Cole, H., 'British Iron and Steel and World Trade', *The Iron and Coal Trades Review*, 28th April (1922), 602-605

Cooper, Brian. 'Continuous casting at BSC Port Talbot Works', *Steel Times,* Vol211(5), May 1983, 235-240

Fox, E.J., 'The British Pig-Iron Industry–A Review of Progress From 1929-1937'*, The Iron & Coal Trades Review,* 21st January (1938), 103-104

Foxwell, G.E., 'By-Product Coking During and After 1937 – Steady Expansion of Capacity Anticipated', *The Iron & Coal Trades Review*, 21st January (1938), 92-94

'Dock Trading Statistics', *The Iron & Coal Trades Review*, 7th January (1910), 30

'Dock Trading Statistics', *The Iron & Coal Trades Review*, 14th January (1910), 71

'Dock Trading Statistics', *The Iron & Coal Trades Review*, 11th February (1910), 232

'Dock Trading Statistics', *The Iron & Coal Trades Review*, 18th March (1910), 429

'Dock Trading Statistics', *The Iron & Coal Trades Review*, 27th May (1910), 864

'Dock Trading Statistics', *The Iron & Coal Trades Review*, 17th June (1910), 983

'Dock Trading Statistics', *The Iron & Coal Trades Review*, 24th June (1910), 1030

Eppelsheimer, D., 'Development of Continuous Strip Mills', *The Iron and Coal Trades Review,* 28th October (1938), 683-684

Evans, E.C., 'Blast-Furnace Data And Their Correlation–Part II', *Iron and Steel Institute*, (1931)

Finniston, Monty, Quoted in David Brinn's 'BSC's Port Talbot Works', *Steel Times*, July (1976), p.22

Gray, William, 'The Shipbuilding Industry in 1936', *The Iron and Coal Trades Review*, 15th January (1937), 125-126

Greenwood, Viscount, 'The British Iron And Steel Industry 1938 – A Year Of Recession But Brighter Prospects', *The Iron & Coal Trades Review*, 20th January (1939), 101-102

Griffiths, L., 'Margam Reconstruction in A Technical Survey of the Abbey, Margam, Trostre and Newport Plants of The Steel Company of Wales Limited', *The Iron and Coal Trades Review – Special Issue* (1952)

Horne, R., 'Baldwins Annual Meeting', *The Iron and Coal Trades Review*, 28th December (1923), 984

Horton, J., 'Baldwins, Ltd., Adds New Plant – British Steel Syndicate Is Completing Work on Self Contained Unit in South Wales District – Parent Company, Capitalised at £7,000,000, Controls Works in England, Wales and Canada', *Iron Trade Review*, 21st October (1920), 1133-1139

Journal of the Iron and Steel Confederation, (1927), 53

Lever, Ernest H., Chairman Of Richard Thomas and Company Limited quoted in 'Richard Thomas & Baldwins Fusion – Modernisation of Sheet And Tinplate Trades', *The Iron and Coal Trades Review*, 8th December (1944), 889-890

Mackenzie, I.M., '*Quality assurance in the UK steel industry–an overview', Steel Times*, Vol.212(7) July 1984, 303-304

Melchett, Statement by the Chairman of BSC on Vesting Day, *Steel Times*, 28th July (1967), 91

Murray, D. 'Union Trouble In The Steel Industry'*, Steel Times,* 6th March (1964), 316-317

'News Item', *The Iron & Coal Trades Review,* 6Th February (1903), 379

'News Item', *The Iron & Coal Trades Review*, 1st November (1912), 733

'News Item', *The Iron & Coal Trades Review*, 14th November (1913), 787

'News Item', *The Iron and Coal Trades Review*, 3rd February (1922), 178

'News Item', *The Iron & Coal Trades Review*, 6th April (1923), 510

'News Item', *The Iron & Coal Trades Review*, 27th April (1923), 619

'News Item', *The Iron & Coal Trades Review,* 21st March (1924), 492

Pode, E. Julian, 'Statement by the Chairman of The Steel Company of Wales', *Steel Times,* 15th January (1965), 75

Simon, John, 'Speech by Chancellor of the Exchequer to the British Iron and Steel Federation', *The Iron and Coal Trades Review,* 17th February (1939), 325-328

Summers, S, 'Iron and Steel Imports and Exports in 1939–Review of the Principle Factors Operating During the Year', *The Iron and Coal Trades Review*, 20th January (1939), 102-104

Wright, John Roper, 'Chairman's Address to Baldwins AGM', 30th June 1920, *The Iron & Coal Trades Review,* 9th July (1920)

Wright, John Roper, 'Chairman's Address to Baldwins AGM', *The Iron and Coal Trades Review,* 3rd February (1922), 186

Wright, John Roper, 'Chairman's Address to Baldwins AGM', *The Iron and Coal Trades Review*, 12th January (1923), 68

Wright, W. Charles, 'Baldwins Limited AGM', *The Iron and Coal Trades Review*, 26th December (1924), 1061 and *The Economist,* 20th December 1924 p.1102

Wright, W. Charles, 'Baldwins Limited AGM', *The Iron and Coal Trades Review,* 3rd December (1926), 878

Wright, W. Charles, 'Baldwins Limited AGM', *The Iron and Coal Trades Review,* 23rd December (1927) 956 and *The Economist*, 3rd December 1927, p.993

Wright, W. Charles, 'Baldwins Limited AGM', *The Iron and Coal Trades Review,* 3rd May 1929, 700

Videos/DVDs

Rail Freight Today: Scotland, Video, Telerail Productions (1990)

Secondary Sources

Books

Abromeit, Heidrun, *British Steel – An Industry between the State and the Private Sector* (Leamington Spa/Heidelberg: Berg Publishers Ltd, 1986)

Adeney, Martin, and John Lloyd, *The Miners Strike 1984-85 Loss Without Limit* (London: Routledge and Kegan Paul Ltd, 1986)

Atkinson, M. & C. Baber, *The Growth and Decline Of The South Wales Iron Industry 1760-1880 – An Industrial History* – Social Science Monographs (Cardiff: University of Wales Press, 1987)

Barrie, D.S.M., *A Regional History of the Railways of Great Britain, Volume 12, South Wales* (Newton Abbot: David & Charles, 1980)

Benn, Tony, *Arguments for Socialism* (Harmondsworth: Penguin Books, 1980)

Bryer R.A., T.J. Brignall and A.R. Maunders, *Accounting for British Steel – A Financial Analysis of The Failure Of The British Steel Corporation 1967-1980, And Who Was To Blame* (Aldershot: Gower Publishing Company Limited, 1982)

Burk, Kathleen, *The First Privatisation – The Politicians, The City, And The Denationalisation Of Steel* (London: The Historian's Press, 1988)

Burn, Duncan, *The Economic History of Steelmaking 1867-1939* (Cambridge: At The University Press, Second Edition, 1961)

Burn, Duncan, *The Steel Industry 1939-1959 – A Study In Competition And Planning* (Cambridge: At The University Press, 1961)

Carr, J.C. and W. Taplin, *History Of The British Steel Industry* (Oxford: Basil Blackwell, 1962)

Chappell, E.L., *History of the Port of Cardiff* (Cardiff: The Priory Press Ltd, 1939)

Dalton, Hugh, *The Fateful Years – Memoirs 1931-1945* (London: Frederick Muller Ltd, 1957)

Daunton, Martin, *Wealth and Welfare–An Economic Social History of Britain 1851-1951* (Oxford: Oxford University Press, 2007)

Dudley, G.F. & Richardson J.J., *Politics and Steel in Britain 1967-1988 – the Life and Times of the British Steel Corporation* (Aldershot: Dartmouth Publishing Company Limited, 1990)

Evans, A. Leslie, *The Story of Taibach and District* (Port Talbot: Private Publication, 1963)

Evans, A. Leslie, *Royal Visitors to the Afan District* in *Royalty and Afan* (Port Talbot: Afan Borough Council, 1977)

Evans, D. Gareth, *A History Of Wales 1906-2000* (Cardiff: University Of Wales Press, 2000)

Fevre, Ralph, in *Contract Work In the Recession* in *The Changing Experience Of Employment,* ed by K. Purcell, S. Wood, A. Watson and S. Allen (London: The MacMillan Press Ltd, 1986)

Fevre, Ralph, *Wales Is Closed* (Nottingham: Spokesman, 1989)

Fisher, D.A., *The Epic Of Steel* (New York, Evanston and London : Harper and Row, 1963)

GCHT, *Glamorgan County History Trust – Volume 5 – Industrial Glamorgan from 1700-1970* (Cardiff: Private Publication, 1980)

Goodman, Geoffrey, *The Miners' Strike* (London: Pluto Press Ltd, 1985)

Greaves, Julian, 'British Steel in the 1930s, Adaptation Under Duress?', in *After the Slump,* ed C. Buckheim and W.R. Garside (London: Peter Long, 2000), pp111-132

Hannan, Patrick, *The Welsh Illusion* (Bridgend: Wales Press Ltd, 1999)

Hanson, J. Ivor, *Profile Of A Welsh Town* (Port Talbot: Private Publication, 1969)

Hanson, J. Ivor, *Outline Of A Welsh Town* (Port Talbot: Daffodil Publications, 1971)

Hatch, F.H., *The Iron and Steel Industry of the United Kingdom under War Conditions* (London: Harrison and Sons, 1919)

Harris, C.C., *Redundancy and Recession in South Wales* (Oxford: Basil Blackwell, 1987)

Heal, David W., *Industrial Britain – The Steel Industry In Post War Britain* (Newton Abbot: David and Charles, 1974)

Hodge, John, *The South Wales Main Line – Part Four – Bridgend (West) To Swansea* (Didcot: Wild Swan Publications Ltd, 2005)

Hoerr, John P., *And The Wolf Finally Came* (Pittsburgh: University of Pittsburgh Press, 1988)

Holmes, Graeme M., *Wright, Sir John Roper*, *Dictionary of Business Biography,* Vol 5 S-Z (London: Butterworths, 1986) pp.897-903.

Holmes, Graeme M., *Wright, Sir William Charles*, *Dictionary of Business Biography,* Vol 5 S-Z (London: Butterworths, 1986) pp.904-911.

Howell, Thomas R., William A. Noellert, Jess G. Kreier, and Alam William Wolff, *Steel and State – Government Intervention and Steel's Structural Crisis* (London/Boulder: Westview Press, 1988)

Hudson, Ray and David Sadler, *The International Steel Industry–Restructuring, state policies and locations* (London: Routledge, 1989)

Keeling, B.S. & A.E.G. Wright, *The Development Of The Modern British Steel Industry* (London: Longmans, Green and Co Ltd, 1964)

Jackson, P.W., *The Letter-Books of W. Gilbertson & Co. Ltd., Pontardawe, 1890-1929* (Cardiff: South Wales Record Society, 2001)

Jones, Edgar, *A History of GKN : Volume 1 : Integration and Enterprise, 1759-1918* (Basingstoke and London: McMillan Press, 1987)

Jones, Edgar, *A History of GKN : Volume 2 : The Growth of a Business 1918-1945* (Basingstoke and London: McMillan Academic and Professional Ltd, 1990)

Laybourn, Keith, *Britain on the Breadline – A Social and Political History of Britain 1918-1939* (Stroud: Sutton Publishing Limited, paperback edition, 1998)

Lenton, H.T. and J.J. College, *Warships of World War 2 - Part 1 – Capital Ships* (London: Ian Allan Limited, 1962)

MacGregor, Ian, *The Enemies Within–The Story of the Miners' Strike 1984-85* (London: Collins, 1986)

Michie, Ranald C., *The London and New York Stock Exchange 1850-1914* (London: Allen and Unwin, 1987)

Mitchie, Ranald C., *The London Stock Exchange–A History* (Oxford: Oxford University Press, 1999)

Moore, Tommy, *The People's History–Consett–A Commemoration of the Works* (Seaham: The People's History Ltd, 2000)

Morgan, H., *South Wales Branch Lines* (Shepperton: Ian Allan, 1984)

Morgan, Kenneth O., *Rebirth of a Nation, Wales 1880-1980* (Oxford: Oxford University Press, 1982)

Nichols, Theo, *The British Worker Question – a new look at workers and productivity in manufacturing* (London: Routledge and Kegan Paul, 1986)

Ovenden, Keith, *The Politics of Steel* (London: The MacMillan press Ltd, 1978)

Owen, Geoffrey, *From Empire To Europe–The Decline And Revival Of British Industry Since The Second World War* (Hammersmith, London: Harper Collins,1999)

Page, James, *Forgotten Railways South Wales,* (Newton Abbot: David & Charles, 1979)

Pagnamenta, Peter and Richard Overy, *All Our Working Lives* (London: British Broadcasting Corporation, 1984)

Payne, Peter L., *Colvilles and The Scottish Steel Industry* (Oxford: Clarendon Press, 1979)

Potts, M. and G.W. Green, *Industrial Locomotives of West Glamorgan* (Oakham: Industrial Railway Society, 1996)

Protheroe-Jones, Robert, *Welsh Steel* (Cardiff: National Museum Of Wales, 1995)

Pryke, Richard, *The Nationalised Industries – Policies And Performance Since 1968* (Oxford: Martin Robinson, 1981)

Rees, A., *Aberavon Forge* (Port Talbot: Private Publication, 1972)

Rees, Morgan D., *Industrial Archaeology of Wales* (Newton Abbot: David & Charles, 1975)

Rees, W. and C. Rees, *Brief Historical Surveys of Taibach and Cwmavon* (Port Talbot: Private Publication, 1972)

Rees, Ronald (2000), *King Copper – South Wales and The Copper Trade 1584-1895* (Cardiff: University of Wales, 2000)

Riden, Philip. and John Gilbert Owen, *British Blast Furnace Statistics 1790-1980* (Cardiff : Merton Priory Press, 1995)

Robens, Lord. *Ten Year Stint* (London: Cassell, 1972)

Roberts, C.W., *A Legacy From Victorian Enterprise – The Briton Ferry Ironworks And The Daughter Companies* (Gloucester: Alan Sutton Publishing Ltd, 1983)

Roberts, David, *Reflections of Neath and Port Talbot* (Derby: The Breedon Books Publishing Company Ltd, 2002)

Sirs, Bill, *Hard Labour* (London: Sidgwick and Jackson, 1985)

Sloman, John, *Economics* (Hemel Hempstead: Harvester Wheatsheaf, 1991)
Smith, Gordon, *A Century of Shotton Steel* (Shotton: British Steel, 1996)

Thatcher, Margaret, *The Downing Street Years* (New York: Harper Collins, 1993)

Tolliday, Steven, *Business, Banking, and Politics – The Case of British Steel 1918-1939* (Cambridge Massachusetts and London England: Harvard University Press, 1987)

Tonks, E.S., *Industrial Locomotives of South Wales and Monmouthshire* (Birmingham: The Birmingham Locomotive Club, 1951)

Upham, Martin, *Tempered Not Quenched – The History of the ISTC 1951-1997* (London: Lawrence and Wishart Limited, 1997)

Vaizey, John, *The History of British Steel* (London: Weidenfeld & Nicholson, 1974)

Warren, Kenneth, *The British Iron and Steel Sheet Industry Since 1840* (London: G Bell and Sons Ltd, 1970)

Warren, Kenneth, *World Steel – An Economic Geography* (Newton Abbot: David and Charles, 1975)

Warren, Kenneth, *Big Steel – The First Century of the United States Steel Corporation* (Pittsburgh: University of Pittsburgh Press, 2001)

Williams, John, *Digest of Welsh Historical Statistics–Volume 1* (Aberystwyth: University College of Wales, 1985)

Ziegler, Philip, *Wilson – The Authorised Life* (London: Harper Collins, Paperback edition, 1995)

Dissertation

Parry, Stephen. *The Case of A Local Labour Market–Continuing Development And The Significance Of Contracting.* Unpublished MA Dissertation–University of York, 1998

Journals

Aylen, Jonathan, 'Privatisation of the British Steel Corporation', *Fiscal Studies*, Vol.9(3), August (1988), 1-25

Aylen, Jonathan, 'Construction of the Shotton Wide Strip Mill', *Transactions–Newcomen Society,* Number 78 (2008), 57-85

Aylen, Jonathan, 'Natural experiments in innovation : radical adoption of computers and changes to 'physical' and 'social technologies' at Llanwern steelworks, South Wales, *Manchester Institute of Innovation Research,* 2010 (pre publication)

Bacon, Nick, Paul Blyton and Jonthan Morris, 'Among the Ashes, Trade Union Strategies in the UK and German Steel Industries', *British Journal of Industrial Relations*, 34(1), March (1996), 25-50

Brinn, David, 'BSC's Port Talbot Works', reprinted as an independent publication by BSC after originally being published in *Steel Times,* (1976), 511-554. The page references refer to the former

Dudley, G.F., 'British Steel And Government Since Privatisation: Policy Framing And the Transformation Of Policy Networks', *Public Administration*, Vol.77(1) (1999), 51-71

Fevre, Ralph, 'Subcontracting In Steel'*, Work Employment and Society,* Vol.1(4) (1987), 509-527

Hale, M., 'From Port Talbot to the Garw', *The Welsh Railways Archive–The Journal of the Welsh Railways Research Circle,* Vol.1(9)–May (1994), 243-246

Harrison, John, 'The Iron Ladies–Part 1', *Ships in Focus–Record 23* (2003), 154-167

Harrison, John, 'The Iron Ladies–Part 2', *Ships in Focus–Record 24* (2003), 205-215

Harrison, John, 'The Iron Ladies–Part 3', *Ships in Focus–Record 25* (2003), 24-36

Heller, Robert, 'British Steel rolls ahead', *Management Today*, June (1995), 43-47

Hughes, J.V., 'Emily Charlotte Talbot (1840-1918)', *Transactions of the Port Talbot Historical Society,* Vol.II(3) (1974), 85-95

Jones, H.R., 'The Tinplate Industry in Port Talbot', *Transactions of the Port Talbot Historical Society,* Vol.2(2) (1971), 26-34

Jones, H.R., 'Early OR in the Steel Company of Wales', *The Journal of the Operational Research Society*, Vol46(6) (1992), 563-567.

Lee, R.M., 'The entry to self-employment of redundant steelworkers', *Industrial Relations Journal*, Vol.16(2) (1985), 42-49

Lee, R.M. and C.C. Harris, 'Redundancy Studies: Port Talbot and the Future'. *The Quarterly Journal of Social Affairs*, Vol.1(1) (1985), 42-49

Morgan, Kenneth, 'Restructuring Steel – The Crisis of Labour and Locality in Britain', *International Journal of Urban and Regional Research*, Vol7 (1983), 175-201

Morris Jonathan, Paul Blyton, Nick Bacon and Franz Hans-Werner, 'Beyond survival: the implementation of new forms of work organisation in the UK and German steel industries', *The International Journal of Human Resource Management*, 3:2 September (1992), 307-329

Morris, L.D., 'Patterns Of Social Activity And Post-Redundancy Labour – Market Experience', *Sociology*, Vol.18(3), August (1984), 339-352

Rees, A., 'Aberavon Forge', *Transactions of the Port Talbot Historical Society*, 1 (IV) (1990), 80-82

Ribbons, R.T. ‘Recent Developments In Locomotives Used By A Heavy Industry’, *Journal of the Institution of Locomotive Engineers*, Vol.54(5) (1964-65), 406-464

Roberts, R.O., ‘The Bank of England, the Company of Copper Miners and the Cwmavon Works 1847-52’, *Welsh History Review,* Vol.4(3) (1969), 219-234

Slaven, Anthony, ‘British Shipbuilders-Markets Trends and Order Patterns Between The Wars’, *Journal Of Transport History*, Vol.3(2) (1982), 37-61

Upham, Martin, ‘Passages on the path to privatisation: the experience of British Steel’, *Industrial Relations Journal,* Vol.21 (1990), 87-97

Watts, D.G., ‘Changes in Location of the South Wales Iron and Steel Industry 1860-1930’*, Geography,* Vol.53(3) (1968), 294-307

Wordsworth, C., ‘Locomotives for Heavy Industry’, *Journal of the Institution of Locomotive Engineers*, Vol.45 (1955), 609-672

Websites

Anon. ‘Luftwaffe Attacks On South Wales and Surrounding Bridgend Area’, w.w.w.islandfarm.fsnet.co.uk