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Cocooned: path dependence and the demise of Anderson & Robertson Ltd.: Scotland's last silk throwsters

'Keep right on till the end of the road' *(Old Scots song made famous worldwide by Sir Harry Lauder)*

Abstract

This study applies the insights of path dependence theory to a Scottish yarn producing firm which existed from 1877-1964. Previous longitudinal studies of firms and their strategies have concentrated on larger entities, but the present one tests the relevance of path dependence to smaller firms. The paper explains why the firm studied may be seen as an example of path dependence and lock-in, going on to point out why the generally accepted three-stage pathway of reducing organisational choice leading to lock-in appears to fit the case, but that more empirical research in the field would be beneficial. The paper highlights in detail the factors which reinforce path dependence and in particular, the role of organisational culture, which has not, hithertofore, been demonstrated with any precision.

Key Words: path dependence, lock-in, reinforcement, organisational culture, strategy, textile industry

Introduction

This paper extends the body of research which has built up in the area of path dependence by providing a detailed, longitudinal account of a firm which employed between 200 and 700 people, over a period of 87 years. The few detailed case studies of path dependence in organisations which exist have tended to concentrate on very large businesses, whereas the one which follows provides an opportunity to reflect on its relevance to smaller enterprises, which are much more numerous in economies than larger firms.

The company concerned was a Scottish-based manufacturing business which operated in several locations near Glasgow between the years 1877 and 1964, firstly manufacturing silk yarn and ancillary products and latterly a range of silk and other yarns, for customers in the UK, Europe and beyond. Anderson & Robertson Ltd (A&R), as the firm came to be known, was the last producer of silk yarn in Scotland, a position it occupied from quite early in its history until its closure in 1964, supplying the remains of a largely forgotten, somewhat exotic branch of the local textile industry, the manufacture of silk fabrics. [1]

The firm operated throughout its life with a business strategy that served it well for the first two-thirds of its existence, and increasingly less well for the remainder, finally leading to its exit from business. Given that faltering strategies are not normally persisted with, this led the authors to explore whether or not the firm's strategy was an example of path dependence and related 'lock-in', currently a topic of considerable interest in the management and historical literatures. We concluded that it may indeed be seen as example of this phenomenon, for reasons which will be given below.

Our study continues with a review of some key writings on path dependence, going on to provide an overview of the firm's progress from its formation in 1877 up until the time of its voluntary liquidation in 1964. This is followed by a more detailed account of the firm's final years, which will focus on its strategic thinking and its attempts to escape from the narrow business and related technological pathway to which it had become absolutely committed in the 1930s, particularly during the critical last decade of its operations as challenges in the business environment multiplied. An explanation as to why the firm may be considered an example of path dependence and associated lock-in then follows, including a discussion on the implications of the study for path dependence theory, especially in relation to smaller firms. The paper concludes with a summary of findings and closing reflections, particularly related to the deeper contextual and cultural conditions within firms which foster and reinforce path dependence.

The principal source of information on the firm is its business records, which are kept at Glasgow University Business Archives. [2] These include an almost complete series of annual accounts, board minutes and shareholder records together with miscellaneous sales and production records, correspondence, advertising materials, scrap books and reports of various kinds. The archive also contains several short articles on the company's history, including a brief but informative published article and some manuscript notes by the directors on the firm's beginnings. Together, this material represents a resource of unusual richness and thus an opportunity to look closely at the firm's decline and the internal reasoning which accompanied it, with minimal reliance on speculation or inference.

Path Dependence

The topic of path dependence has for the last thirty years or so stirred up a great deal of academic interest. As defined by two authorities on the subject, 'Most generally, path dependence means that where we go next depends not only on where we are now, but also upon where we have been. History matters'. [3] In other words, technologies, economies and firms have got to where they are today through a historical process which is likely to affect where they will go in the future. The focus of the path dependence literature has changed over the last few decades. Earlier papers such as Arthur [4] or Liebowitz and Margolis [5] explored its relevance as an alternative analytical perspective for economics, considering inter alia the effects of suboptimal technological developments such as the Qwerty keyboard or the VHS recorder on economic growth. The success of these developments, which grew to dominate their respective industries, was based on two historical circumstances, their earliness in the market place and ready adaptation to them by the market, rather than technological superiority over alternatives. They were thus path dependent. Firms which pursued and invested in superior, rival, technologies were far less successful.

As Liebowitz and Margolis [6] observe, 'if outcomes [such as these] depend critically upon insignificant and unpredictable events, rather than on underlying conditions such as endowments and technology, then a historical chronicle is elevated in importance relative to other methods of explanation'. Authors such as Foray [7] have with this in mind introduced the notion of 'regret' in economic history, discussing alternatives to the many suboptimal technologies that have gone on to dominate in the market place as a result of path dependence. These he holds to include the internal combustion engine for the motor car, the alternating current as the standard electrical supply system in the USA, nuclear power and sand moulding ferrous casting. Foray's paper examined the conditions which caused these allegedly inferior technologies to come into being. Thus, 'history matters', in a double sense. Not only is it true that a peculiar set of events in the past, rather than economic or technological logic, can determine events and outcomes. It is also true that the archivally-based, longitudinal focus of historical methodology is especially suited to highlighting these developments within the lives of firms.

Scott's [8] paper examined path dependence in relation to national infrastructure, considering the persistence of small coal wagons on Britain's railway network before World War 2. He concluded that, while the small size and carrying capacity of the UK's coal wagons made the system inefficient in terms of transport costs, there had been insurmountable problems in coordinating investment to improve wagon capacity across the many private owners, particularly of coal mines. This was based on the belief by the wagon owners that the savings from investment would not be passed on by the railway companies, on whose lines their wagons ran. Furthermore, the railway companies themselves were required by law to compensate owners for upgrading to larger wagons and would also have needed to alter their own facilities if a move to larger wagons had been possible. The problem could not therefore be solved, as the existing arrangements had grown out of a peculiar set of circumstances, had thus been path dependent and were now 'locked in'. Again, the reasons for this were discovered through historical analysis, which emphasized the importance of context in understanding path dependence.

More recent studies of path dependence have focused on organisational strategy. In this connection, Beyer [9] states that 'path dependence... stresses the historicity of institutions, assuming that decisions taken in the past, established ways of thinking and routines have a decisive impact on the present. Path dependence confines potential action alternatives and thus crucially impacts the course of future developments'. Koch [10] adds that path dependence is 'ruled by one or more self-reinforcing mechanisms which lead to a narrowing of the variation and range of (managerial) discretion'. This affects the formulation of strategy and its implementation, which may come to restrict an organisation's asset base and flexibility.

An earlier study by David pointed out that path dependence relates to the existence of systems of 'consistent mutual expectations' of how things are normally done within organizations. [11] These systems are a part of an organization's [cultural] 'capital…[*which*]… will be modified only slowly over time'. [12] They can become 'enduring constraints' that are 'self-reinforcing' in such a way that the organizational structure 'can become "locked in" to a comparatively narrow subset of routines, goals and future growth trajectories' [13] All of these factors, David pointed out 'combine to favour "stasis", or, at most, a course of change that for the most part is "incremental" and almost imperceptible'. [14]

However, it is widely recognized that path dependence may not necessarily have negative effects, and may or may not turn out to be dysfunctional. It is very important for businesses to recognise that it exists, even although it may be difficult for management to look objectively at the situation they have come to be in.

In their important paper of 2009, Sydow, Schreyogg and Koch [15] attempt to extend the theoretical dimension of studies in path dependence relative to firm strategy, by producing a schematic which examines its emergence in three phases. Phase I is an 'open situation' of wide choice available to the management of firms. Phase II is introduced at a 'critical juncture' and brings about reduced choice together with the gradual emergence of an organisational path. Phase III is where 'lock-in' to this path occurs and this can result in the organisation becoming so inflexible it cannot respond to changes or shocks in the environment and may be destroyed. In Phase III, the scope for choice has been narrowed by replicating the pattern of action, entered into at earlier stages, even more. The authors of this model do, however, state that 'its functioning is likely to differ from context to context according to the prevailing conditions', so they do not expect that it will apply precisely in all situations. [16] Whether that is the case or not, they note that the resultant lock-in 'may be of a predominantly cognitive, normative, or resource-based' kind, [17] or even a combination of all three, in the sense that beliefs and ways of looking at things may become entrenched and lead to a narrowing of the firm's asset base. Extreme lock-ins can rule out alternative courses of action, but in organisational settings, because of their social nature, while 'self reinforcing dynamics are expected to bring about a preferred action pattern, which then gets deeply embedded…orders can potentially stop inefficient replication'. [18] In other words, path dependence can be reduced or halted. However, as research has shown, it can also be very difficult to change organisational patterns and thus prevent organisational harm or disaster.

Sydow, Schreyogg and Koch [19] next consider the self-reinforcing mechanisms which can perpetuate path dependency through positive feedback. They discuss four: 1) Coordination effects, which can bring about reduced coordination costs because a firm has chosen a less complicated trajectory than it might have done, 2) Complementary effects, where for example selling costs of products are reduced, if the range of products has been deliberately restricted, 3) Learning Effects, where the longer an operation is performed, the more efficiently it is done, and 4) Adaptive Expectation Effects, which states that conformity in choices often comes from the social need for belonging among managers and the rewards that come with it. Sydow, Schreyogg and Koch add that contextual conditions in path dependent organisations need further exploration. This is in line with David's analysis, shown above, which refers to the influence of an organisation's cultural 'capital', in the sense of its 'ways of doing things' and their effects on strategic decision making. Sydow, Schreyogg and Koch conclude their paper with a consideration of what tools can be used to break organisational paths if they are proving to be harmful.

Some recent literature on the subject shows that there is still much controversy about path dependence. Noting that 214 papers about path dependence had appeared in seven major management journals between 2003 and 2007, Vergne and Durand observe with a sense of alarm that it remains 'a blurry and controversial construct'. [20] They are concerned that 'it is hard to tell what constitutes acceptable empirical evidence for path dependence' and that some scholars 'remain sceptical about the empirical support for path dependence'. [21] Their solution is to move away from case studies, towards simulations, experiments and counterfactual modelling in order to achieve more logical rigour in researching the role of contingency and self-reinforcement, two key factors they see as necessary for the creation of path dependence.

In a 2015 paper by Schreyogg, Sydow and Holtmann, [22] these authors developed the framework of Sydow, Schreyogg and Koch outlined earlier, in an empirical case study, that of Bertelsmann AG, clearly, by implication, taking issue with Vergne and Durand and their aversion to case study methodology. Bertelsmann, over many decades, persisted with a strategy which depended on the maintenance of a book club, from the 1950s until the recent past, notwithstanding the fact that it had been in decline over much of the period. They subjected their analysis of the firm to the three phase schema developed by Sydow et al, [23] as outlined above, finding that Bertelsmann conformed to a pattern of reducing options which led to path dependence. This was locked in by self-reinforcing processes, which included the appeal of ‘the glorious past’, together with the sharing of fixed costs and investment with the firm’s other publication activities. Various attempts to take the firm in other strategic directions, including exit from book club operations, were unsuccessful because ‘the old pattern proved so dominant’. [24] The authors of this paper expressed the view that their case study had gone ‘well beyond most former efforts’, many of which have referred to path dependence in a crude and imprecise fashion. They call for more precision in future studies of path dependence, both in examining the phenomenon itself and in studying the self-reinforcing feedback processes which bring it into being and perpetuate it.

The study which follows responds to their call, as well as to Sydow, Schreyogg and Koch’s 2009 [25] exhortation to explore the deeper contextual conditions within firms which foster and reinforce path dependence.

A&R from 1877 to 1964-an overview

The silk throwing business in the West of Scotland began in 1820 in Govan, Glasgow, when Morris Pollok erected the first mill in Scotland to undertake this type of work. At that point, demand for silk, to manufacture Paisley shawls and other silk products, caused about fifty ‘throwsters’ to follow Morris Pollok’s lead and set up businesses in or near Glasgow. The process of ‘throwing’ involved the cleaning, turning, twisting, dyeing and reeling of imported hanks of raw silk, mainly from China, on special machines. The reeled silk was then sold to manufacturers of silk fabric. In 1876, George Robertson, who had been a cashier with Morris Pollok, took the opportunity to set up an independent silk throwing factory at John Street, Govan. A year later, William Anderson joined in partnership with Robertson, forming a silk-throwing business known as Anderson & Robertson. The two new partners next rented the mill formerly owned by Morris Pollok, which had in the interim failed. On Pollok's death, his son diversified into silk textile production, but this was not successful, as the firm's textile operations were then in competition with those to whom they sold the silk yarn and so the business collapsed. With their main business in silk yarn production, A&R came to employ up to 700 people during that period in their two Govan premises. The new business was successful and it continuously expanded, becoming a limited company in 1895. [26] At several points in time before and after 1895, although its main business was silk yarn production, the firm carried out some weaving of fabrics in its four plants in addition to its staple business of yarn throwing.

In 1890, the firm had opened premises in Motherwell in Lanarkshire, some 15 miles away, to take advantage of the availability of female labour in a town which was fast becoming the centre of Scotland's steel industry, also purchasing a small silk mill at Glemsford, in Suffolk, to build up silk throwing capacity. A consolidation of the Govan premises took place in 1902. The Scottish silk industry was falling away at this period, so the firm found customers outside Scotland, particularly in the neighbourhood of Macclesfield, near Manchester, which had a strong silk trade. In 1912, the firm started to produce silk yarn for the insulation of electrical wires, a business which continued for the rest of its life. From about 1924, the production of silk stockings from unboiled yarn vastly increased demand nationally and internationally, and the firm's production of silk yarn rose again. In 1935, the firm centralized its production in Motherwell, having closed the Govan plant and the Glemsford factory at the same time. It produced silk yarn for wire insulation and parachute making during World War 2. From about 1951, nylon replaced silk for the manufacture of stockings, and this required new twisting machinery, together with investment in air conditioning and temperature control, which was essential for the production of nylon and the other synthetic yarns the firm started to produce. From this point onwards, silk only accounted for some ten per cent of the firm's business until its closure in 1964, which was ushered in as trading conditions deteriorated rapidly. The undernoted table summarises the firm's profitability over its life as a Limited Company:

Table 1: Anderson & Robertson Ltd., Profits after Tax and Returns on Capital Employed, 1896-1963

Year	PAT £000	RCE %	Year	PAT £000	RCE %	Year	PAT £000	RCE %
1896	2.9	10.7	**1919**	2.9	8.4	**1942**	33.7	13.3
1897	(0.8)	(3.1)	**1920**	3.0	8.7	**1943**	29.0	10.5
1898	2.7	9.3	**1921**	3.3	9.3	**1944**	7.1	2.9
1899	2.1	6.9	**1922**	6.3	21.4	**1945**	8.8	3.6
1900	1.3	4.4	**1923**	11.0	23.9	**1946**	18.0	7.2
1901	0.8	2.6	**1924**	5.6	11.3	**1947**	15.5	6.7
1902	1.3	4.5	**1925**	5.3	9.7	**1948**	15.3	6.5
1903	1.9	6.5	**1926**	5.6	10.0	**1949**	13.5	5.3
1904	0.2	0.7	**1927**	5.7	9.4	**1950**	20.1	8.3
1905	0.8	3.6	**1928**	7.7	12.5	**1951**	12.9	5.3
1906	n/a	n/a	**1929**	12.9	19.1	**1952**	(4.9)	(2.3)
1907	n/a	n/a	**1930**	12.7	17.2	**1953**	6.9	3.4
1908	1.3	5.6	**1931**	13.0	16.1	**1954**	3.4	1.6
1909	n/a	n/a	**1932**	16.0	18.0	**1955**	11.2	5.2
1910	n/a	n/a	**1933**	24.3	23.1	**1956**	17.3	7.3
1911	n/a	n/a	**1934**	20.9	18.7	**1957**	(12.3)	(5.8)
1912	2.5	10.0	**1935**	33.4	25.3	**1958**	11.1	5.1
1913	3.0	12.0	**1936**	34.7	22.9	**1959**	6.1	2.9
1914	3.0	13.7	**1937**	51.4	28.2	**1960**	9.2	4.3
1915	1.0	3.9	**1938**	n/a	n/a	**1961**	(0.9)	(0.5)
1916	3.6	11.9	**1939**	33.0	16.5	**1962**	(1.9)	(1.0)
1917	4.1	12.6	**1940**	35.1	16.3	**1963**	(22.3)	(11.1)
1918	2.9	8.7	**1941**	37.5	16.0	**1964**	NA	NA

(Source: UGD 029/5/1/1, UGD 029/5/3)

Note: Capital Employed is defined for this purpose as issued capital and reserves plus profit and loss account balance.

The firm's profits to about 1912 were consistent, if modest, as it came to terms with a reducing Scottish market and opportunities elsewhere. The years 1912 until the close of World War One show improving profits, helped by its new line of business, the production of silk windings for the insulation of electrical wire. Across the 1920's and 1930's, profits reached very satisfactory levels, which related to the build up of production of silk yarn for the manufacture of ladies stockings, peaking at £51,400 after tax, or 28.2% return on capital employed, in 1937. After World War Two, conditions became more difficult as austerity took effect. From the 1950s onwards, the change from silk to synthetic yarns for the manufacture of stockings and other products affected margins, as did the growth in the use of these yarns generally. This was based on increasing investment within the textile industry in research and development in new yarns and fabrics as well as in machinery for their mass production.

A&R did not have the vast resources required to create new synthetic yarns, which were developed by the very large petrochemical and textile combines, but it purchased new machinery for their twisting and processing. The value of machinery on the firm’s books stood at £35,000 in 1950, £65,000 in 1957 and £75,000 in 1960, as it improved its capacity for synthetic yarn production in response to the market. In 1952, 1957 and the firm’s closing years of 1961 to 1964, it made losses in spite of these investments. After exploring a number of alternatives and seeing no way out of the situation, it went into voluntary liquidation in 1964. The section which follows examines the firm’s final years in some detail.

The critical years, 1952-1964

This part of the paper focuses on the firm's final period, as the business environment became much more difficult, in order to examine how A&R thought about the emerging crisis which it faced. We present this material in very fine detail, not only because it is unusual to gain insights into the precise reasoning of company directors in crisis, but also because, as will be shown later, the company’s heart was not in the alternative courses of action it discussed. The bulk of the information which now follows comes from a report produced by two of the three working directors, JC Scott, the managing director and WFT Anderson, the chairman, with the help of their business advisors, AIC Consultants, by order of a board meeting held on 4 March, 1963, as the firm found itself in the midst of increasing losses. [27]

Around 1950, there had only been about 20 throwsters in Britain and competition was limited. While A&R were the only throwsters in Scotland at this time, 95% of their business was done in England. A&R had been founder members of the British Silk Throwsters Association, formed in 1933, which enabled member firms to make price agreements among themselves. Prices were good in 1950 and compared favourably with those in Europe, enabling A&R to build up business there. The rise in the market for yarn for nylon stockings and the advent of Terylene had called for new investment, and A&R’s asset values were to more than double by the late 1950’s. By the middle 1950’s, signs of the acceleration of competition began to emerge. Between 1955 and 1960, the undernoted firms entered into the production and processing of man-made yarns: ICI Ltd., Crossleys Ltd., Courtaulds Ltd., Gallic Crepes Ltd., Qualitex Silks Ltd., John Shaw & Sons Ltd., Burnleys (Universal) Ltd., Carrington and Dewhurst Ltd., English Sewing Cotton Co. Ltd., Lancashire Cotton Corporation Ltd. (two Branches). [28] A&R were now in competition, not only with more firms, but with the giants of the industry, which had the backing of vast technological and financial resources.

In 1956, over half of the firm's sales had been lost as customers began to use untwisted yarn for hosiery and weaving, following technological improvements in the industry. A&R immediately offset these losses by providing Terylene yarn for the Scottish curtain net industry situated at Darvel in Ayrshire. By 1960, this work rose to peak production. That same year, the firm acquired machinery to produce bulked, (also known as false-twist) synthetic yarns and as a result these reached 22% of output at the firm’s factory. At the same time, faster and faster machines, at rapidly increasing capital cost, became available throughout the industry. In 1959, pressure from competitors outside the Silk Throwsters Association had caused price agreements on bulked yarns to be abandoned. Supply exceeded demand and price-cutting began. [29] Changes in proportions of the yarns produced by the firm over the period are shown in **Table 2**.

Table 2: Proportions of Various Types of Yarns Handled at A&R, 1958-1963

Year	Nylon	Terylene	Silk	Bulk Yarns	Commission Processing	Wire Covering	Sundries	Total
1957/58	27.5	34.5	3.0	29.0	0	3.5	2.5	100
1958/59	14.0	59.0	4.0	17.0	0	2.0	4.0	100
1959-60	7.5	67.0	5.5	15.0	0	2.5	2.5	100
1960/61	7.5	61.5	5.0	21.5	0	2.0	2.5	100
1961/62	5.0	54.0	4.5	14.5	20.5	1.5	0.5	100
July 1962-Mar 1963	9.5	37.0	8.5	16.5	25.0	3.0	0.5	100

(Source: UGD 029/8)

Between 1956 and 1962, the price A&R received for false-twist yarns fell from 12/- per pound to 3/- per pound, with prices received for Normal Twisted Nylon and Terylene yarns, for curtain nets, falling from 4/10d per pound to 3/11d per pound at the same time. Even the firm’s lowest volume product, silk insulating yarn for wires, almost halved in price from 55/3d to 28/4d over this period. Although average monthly sales, in pounds of yarn, rose from 29,070 to 45,600 between 1957 and 1963, prices had never been worse. Furthermore, between 1960 and 1963, ‘Terylene’ processing fell from 67% of output to some 37% as customers increasingly took this material up, untwisted, from other suppliers. The surplus capacity created as a result led to A&R twisting yarn for other firms on a commission basis, ie receiving the material from these firms free of charge and only being paid for the processing, which was less profitable. The firm was unprofitable every year from 1961. [30] A&R noted that, from this year onwards, Kirklees Ltd., James Nelson & Sons Ltd., Lister & Co. Ltd., Park View Crepes Ltd. and S. Bourne & Co. Ltd., all large English companies, had given up yarn processing.

Subsequent developments and options

The firm noted that, as at March, 1963, a number of factors in the industry needed to be taken into account in any appraisal of future possibilities. Artificial fibres could now be made by primary producers on machines known as ‘spinnerettes’, which forced synthetic materials in liquid form through tiny holes in thimble-like metal dies, after which they dried out in usable filaments, such that the yarn twisting process was no longer required. It was anticipated that Nylon and Terylene yarns would be used in greater quantities, without twist, particularly in the production of warp threads for knitting. Since twistless yarns were cheaper, they would command a wider market. It was anticipated that ICI and British Nylon Spinners (BNS), the latter the firm which had been set up by ICI and Courtaulds to manufacture nylon in the late-1930’s, would encourage textile manufacturers to change to twistless yarns and that they would command most of the market. It was also anticipated that there would be an increase in the level of technical support required of throwsters to knitters and weavers of fabric, including the production of woven fabric samples in new materials, for their appraisal. Further, some producers of new yarns were providing assistance with advertising and sales promotion, which was increasingly expected. [31]

The prospects for silk were next assessed. Although it only at the time represented around eight per cent, by weight, of A&R's output, its pricing had not been affected nearly as badly as the synthetic yarns the firm processed. While most of the firm's silk in its earlier years had come from China, some 95% was now imported from Japan. A new trade agreement with Japan had just been signed which would allow the import into the UK of pure Japanese thrown silk at very challenging, competitive prices. It was felt that the new agreement was also likely to lead to the Japanese manipulating (increasing) the prices of raw yarn exported to the UK in order to make their thrown silk yarn imports even more competitive. A Chinese delegation was at that time visiting the Board of Trade, raising the prospects of competition for the Japanese in the form of Chinese silk imports, but the outcome was not known. The volumes of silk sold were not in any event large enough to be able to make a big difference to the firm's future. [32]

This gloomy appraisal next switched to overheads. Industrial derating, the exemption or partial exemption of manufacturing firms from factory rates, which had been introduced in the 1920's, was in 1963 being abolished in England and Wales and was under threat in Scotland. This measure had helped to protect British manufacturers from overseas imports. Wages at A&R had increased by 30% in the last five years, in the face of reducing revenues. One outcome of newer processing machinery operating 'faster and faster' was that the firm could produce more yarn in less space, causing space to become less profitable and increasingly redundant. It was also noted that subsidies to continental competitors were increasing, leading to 'formidable' competition. A&R received subsidies in some cases on nylon sourced from BNS, but this only amounted to about £500 per year. [33]

In the light of these immediate and encroaching threats, the firm had approached five major firms within the industry about the possibility of a tie-up with A&R. The first of these, English Sewing Cotton Ltd., replied in October 1962, enclosing comments from Sir Cyril Harrison, Chairman, who was also President of the Federation of British Industries. He 'was not at all happy about the prospects for the throwing capacity even within his own organisation and would, therefore, not consider a link under the present conditions'. ICI had also been approached in December 1962, and DN Marvin, a director of its Fibres Division, responded that 'the life of a company in the Throwing Industry is very limited and that 'such middlemen' will gradually disappear. [34]

When approaches were made to Mr Asquith, Managing Director of Lister and Co. Ltd., the large English manufacturers of velvet fabrics which had already withdrawn from the throwing of yarns, A&R was informed on 21 February, 1963, that they intended pulling out, as quickly as possible, from the 'synthetic field... which they consider is risky and shows a poor return'. It had also come to the attention of A&R that the Board of GH Heath & Co Ltd, a Manchester textiles manufacturer, had recorded in their Chairman's report to the AGM of 4 April, 1963, that they considered the throwing trade very difficult and that they had decided not to expand their throwing capacity and to deploy their resources in other directions. They had already closed two of their five mills. A&R had also interviewed the Managing Director of Wm. Tatton & Co Ltd on 19 February, 1963, who believed that the industry was contracting, but he felt that, with their trade connections and modern equipment, Tatton would be able to stay in throwing. They had already closed down one of their three mills. [35]

A&R associated these trends and developments with practical problems which would need to be addressed in order to maintain profitability in the face of falling prices, rising costs and a pattern of demand towards less profitable lines. Of immediate relevance was the fact that the lace net firms of Darvel, Ayrshire, which had formerly been such good customers to A&R, accounting in 1963 for some thirty per cent of turnover, looked likely to be withdrawing their business 'within about a year' as they moved over to twistless yarn. It would be 'financially impossible' to fill their factory with new equipment, nor did they have the resources to provide the levels of technical service increasingly required in the trade. [36]

The firm's premises next came in for appraisal. These consisted of the undernoted:

Table 3: A&R's Motherwell Factories - Key Data

Old Mill and New Mill

Date Built	State of Repair	Ground Floor Area	Basement Area
1883	Good	20,000 square feet	10,000 square feet
1933-1950	Good	45,000 square feet	20,000 square feet

Given these facts and facilities, what were the possible courses of action? A&R identified seven: [37]

1. Expand in the present premises, replacing all slow-producing and uneconomic plant with the latest false-twist machines. This would cost up to £300,000, resources which the company did not possess and could not acquire.
2. Consolidate present facilities and activities into the smallest space, letting or selling the rest. This would be very difficult and the overheads saved would only range from £3,000 to £6,000 annually.

3. Move to a smaller mill and sell the whole of the Motherwell factory. This would be disruptive and expensive, and could only be justified if the industry was expanding.
4. Merge with a larger firm with the capital to develop A&R. As noted above, the various attempts thus far to find partners had been unsuccessful, and in view of the state of the industry, were not likely to be successful in the future.
5. Diversify gradually within the Motherwell plant, replacing existing business product by product.
6. Diversify totally by closing down and restarting a completely new and different business.
7. Close down completely. If possible this should be avoided, for the sake of staff and in view of existing customer goodwill. A quick close down would mean that poor prices would be obtained for the firm's plant and buildings. A more gradual close down would realise better prices, but this would involve paying some overhead expenses until the closure was complete.

Any course of action chosen would require careful planning at the beginning before any time or effort could be spent on it. Any plan which resulted in the large loss of female jobs could result in a compulsory purchase order by the Burgh of Motherwell, which at the time was involved in major plans to completely redevelop the town centre. All possible consideration should be given to employees with long service, whom the company had spent much money in training. [38]

The firm's appraisal of the ongoing decline of the throwing industry led it to the conclusion that it should not depend completely upon it. In spite of increasing throughput and reducing costs, profit had still declined. Any plan to improve efficiency was likely to be no more than a ‘palliative’. It was decided therefore that A&R should explore what possibilities there were for alternative products, choosing the most suitable of these in relation to the skills, knowledge and experience of staff and also the firm’s present manufacturing facilities, going on to examine the potential market for these products, then to prepare detailed production and marketing plans. It would be necessary to effect a smooth substitution of existing production with new production, ensuring in advance that the volumes of new product were sufficient to bring in the yarn throwing turnover displaced. In case none of this proved possible, A&R determined to investigate more fully the disposal of the premises or their acquisition by the Burgh of Motherwell. Should either of these two alternatives become likely, plans to revitalise the business would need reconsideration. [39]

It was felt that the company, although making losses at that juncture, was in a ‘viable’ condition and that it had the resources to develop new lines of work which could ensure a profitable and expanding future if bold action was taken immediately. However, it was recognised that this situation might not continue for long and that the Company’s problems could become ‘insoluble’.

Subsequent Developments

These thoughts were put to the rest of the Board and their permission was sought to engage Associated Industrial Consultants (AIC) to undertake a survey report, outlining how they would assist in implementing A&R’s plans. A&R had also engaged the consultants, Robson and Morrow, in the autumn of 1962. They had been asked by the firm to assess the situation it was in, replying in a note dated December 1962 that ‘the main cause of the current low level of profit is the acute competition in the trade’. These consultants had pointed out that if A&R chose to close the business down, it would give the shareholders ‘freedom to reinvest their capital according to their own choice and presumably more profitability'. [40] Robson and Morrow had also recommended that A&R should engage AIC, which had a Market Research Division, for their advice. A&R decided, at a board meeting in the spring of 1963, that AIC should produce a survey of 'diversification prospects', which would take about three months, and the firm's surveyors were asked to explore the possibility of a development company acquiring their factory as part of the proposed development plans in Motherwell. Somewhat paradoxically, the same board meeting reported that the firm had just installed three-ring spinners which it had purchased from Lister of Bradford, the world's largest silk producers, and that a crimping machine for fibres would be ready shortly, with Lister promising to take the output. Stocks of finished thread had been building up. [41]

A board meeting held in the early summer of 1963 learned from the firm's surveyors that the Motherwell development plans would probably not include the area in which the factory stood. It was decided that Robson and Morrow should conduct a costing study of the company's products so that decisions could be made about which ones should be cut back. The company did not undertake product costing. Meantime, losses continued to be made. At a board meeting of 27 August, it was reported that the Depute Town Clerk of Motherwell had advised that the Burgh was re-planning the area around the factory and had asked whether the firm would consider moving from its present premises. JC Scott was authorised to advise the Burgh that A&R were prepared to enter into negotiations for the factory premises. The firm at this stage were considering approaching the Calico Printers Association about taking over the company, but decided to hold back in the meantime. AIC reported that A&R could examine the possibility of entering into contract assembly, contract packaging or mail order, and were going further into the first two. [42]

Matters had not moved on much by the board meeting of 24 September. It was noted there, no doubt with some frustration, that the Burgh seemed to be doing nothing and should be pressed. Robson and Morrow had reported on product costs, but some errors required them to rectify the figures, after which they were to be asked if it would be advisable to discontinue certain lines. AIC were still investigating the prospects for contract packaging. It was decided to approach the Calico Printers Association about the prospects of a takeover. Meantime, the overdraft had risen to £76,000. [43]

By 5 November, it was reported that the sale of the factory to the Burgh would take some time, but A&R's surveyors had advised that this would still result in the firm receiving a fair price. The Secretary advised the board that the Calico Printers Association were not interested in taking the firm over, but had recommended that they approach the Lancashire Cotton Corporation Ltd and also Lindustries Ltd., but nothing had yet been heard. In the meantime, JC Scott had approached Messrs Frost, but had been advised it was unlikely they would be interested. Robson Morrow's amended product costs were tabled, and AIC had advised informally that the prospects for contract packaging were not good. ICI had agreed to pay the A &R £5,000 for the return of its Crimplene licence. A further board meeting of 21 November recorded that Lancashire Cotton Industries were not interested in a takeover, while Frost were still considering the matter. The meeting therefore agreed 'tentative plans' to call an Extraordinary General Meeting for 10 January 1964 in order to pass a Special Resolution to voluntarily wind up the company. This was followed by the discussion of the plan of two directors, Scott and Ford, to purchase items of plant should the company cease to trade, subject to independent machinery valuations, in order to continue part of the firm's existing business, the silk throwing side, if all else failed. Scott and Ford would be given until 15 February, 1964, to take this offer up, or it would lapse.[44]

In Monday 16 December, a board meeting recorded new developments: Listers had enquired if the firm would be interested in a takeover, which Scott had agreed to discuss with them shortly, on a visit to their factory. The Group Economist from Viyella was visiting Motherwell on 17 December to look at a takeover. Messrs Scott and Ford made it clear that if either of the two parties currently interested in a takeover should go ahead but not be interested in the silk plant, their offer to acquire it would still stand and their project would continue. There was to be no last minute rescue from Viyella. It was reported at a board meeting of 27 January that the firm had written after their December visit that they were not interested in expanding the type of capacity A&R had to offer, but Scott was able to report that Listers were definitely interested, and he had quoted them a share price of £27-10/-. The board minutes of 16 March record that Listers had visited the plant a few days earlier, but indicated that the share price requested was too high, so A&R agreed that the minimum price they would accept would be £20 per share. The next board meeting of 9 April was given the news by Mr Anderson and Mr Scott, who had just visited Listers, that this firm was no longer interested. The company then arranged an Extraordinary Meeting of Members for 27 May, to pass a resolution to wind the company up on the last day of July, 1964. This was reported to the Town Clerk, who had advised that the Burgh would be purchasing the factory. Scott and Ford confirmed they would be buying some of the assets for their silk venture, which they hoped would save the jobs of up to 60 of the work force. The company shut its doors on 31 July 1964. Annualised sales for its last year of trading were £533,158, but these were made at a loss, the situation since 1961. [45]

By the time the liquidator had completed the dissolution of the company in 1967, the holders of the company's 8,000 £10 ordinary shares had been paid four distributions amounting to

£25/14/- per share. In spite of four years of losses since 1960, the good values achieved for assets resulted in them receiving a payment for their shares almost the same as the 1960 financial year-end book valuation of shareholders' capital and reserves, that is, before the losses of 1961-64. [46]

Path dependence and A&R

Was the firm path dependent? Was it indeed 'ruled by one or more self-reinforcing mechanisms which lead to a narrowing of the variation and range of (managerial) discretion', as Koch has put it? [47] This raises, first, the important question of what is meant by a 'firm' in relation to the business operated by A&R. It started up as a partnership in 1877 and became a limited company in 1895, which it remained until its closure in 1964. Its Articles of Association of 1895 make it clear that the limited company was a continuation of the business formerly run as a partnership by A&R from 1877, and it is thus treated here as a single firm, [48] which, we will argue, became path dependent.

Its chosen strategy centred, from 1877 to the early 1900s, on the production of silk yarn, as a 'producer' firm which served silk fabric manufacturers. In addition to this, however, at this time it also made tailor's trimmings in Glasgow, in the 1880s, [49] and from the 1890s until about the turn of the century, it produced silk shawls, scarves and handkerchiefs in Motherwell, using 70 workers. [50] Information is limited, but the poor state of the world silk trade in the decades surrounding the beginning of the twentieth century meant that the firm continued to produce silk fabrics and related products in addition to yarn across its plants to take up production capacity, although the quantities are not known.

Prospects looked up in 1911, when the production of silk yarn windings for the emergent electricity industry, to insulate electrical wires, came into the firm, and likewise, in 1924, the production of unboiled nylon yarn for making silk stockings improved capacity utilisation and profitability, lifting profits in these depression years. By this period, the firm only manufactured silk yarn. From 1951, it made various changeovers to synthetic fibres, beginning with nylon in 1951, at which time the silk business had reduced to a marginal volume within A&R and made redundant much of the firm's silk production machinery, which on the whole was old. Over the 1950's A&R then experienced reduced demand for its products and competition within the industry, which intensified in the 1950s, leading to falling prices. These made the firm unprofitable, unable to diversify and thus unable to continue. We argue that path dependence developed, as follows, using the three stages posited by Sydow, Schreyogg and Koch (2009):

Phase one: open situation

At its commencement in 1877, as noted earlier, A&R committed itself to avoiding the trap into which the predecessor Morris Pollok silk business had fallen, of attempting to sell silk yarn to competitors while also making silk cloth and thus competing with its own yarn customers, who departed to other suppliers. Before this date, George Robertson, the founding partner, had been the cashier at Morris Pollok and thus in the perfect position to see what had gone wrong there. As John M Scott, one of A&R's first directors put it, 'by engaging in the manufacturing trade he [Pollok] lost his customers for silk yarn, as he was now competing with them'. [51] In practice, the new A&R firm had its production facilities at Govan (from 1877), Motherwell (from 1890), and Glemsford, in Surrey, slightly later, to keep occupied, and, although information is scant, as noted above, it put some fabric production into its shops from time to time and was not in practice narrowly committed to yarn production. This corresponds with the ‘open situation’ of wide choice which Sydow, Schreyogg and Koch posit in their paper of 2009 as ‘Phase One’ on the road to path dependence.

Phase two: formation

In terms of ‘Phase Two’, ‘the gradual emergence of an organisational path’, this may be seen in A&R’s response to the growing electrical industry, where it found business as producers of silk yarn for electrical wire winding, from 1912, a business in which it succeeded, which significantly increased profits and in which it remained for the rest of its life. From that year until the depressed early-1920s, the firm’s returns on capital employed moved to double digits, levels of profit not achieved since 1896. Matters had been helped by the demand for wire windings during World War 1. The onset of the mass-produced silk stocking, based on unboiled silk yarn, which the firm began to supply in 1924, kept profits at a handsome level, rising to unprecedented heights in the 1930’s, as **Table 1** shows. It is clear that the achievement of steady, and indeed rising, profits, associated with apparently ineluctable market place trends in technology and fashion, both increased confidence in the future of silk yarn. The organisational path was firming up.

Phase three: lock-in

By 1935, the returns on capital employed were at their highest since the firm’s commencement, exceeding 25% for the first time that year. The progressive investment over the years in faster and better silk yarn-winding machinery meant that productivity had never been higher, such that the workforce had dropped to around 300 staff. It was decided to consolidate the firm’s operations in its Motherwell factory and the Glemsford and Govan plants were closed at around the same time. A large factory extension was built at Motherwell in 1934. The firm was now very deeply and narrowly committed to silk, to silk yarn only, as a middleman operation, with all its technological resources and people skills ‘in one basket’, in one single location. From this point onwards A&R could hardly have been any more circumscribed in its strategy, indeed, it was locked into it. As Schreyogg et al put it, the lock-in phase is characterised by ‘further constriction...[whereby]... the dominant pattern gets fixed and even gains a quasi-deterministic character’. [52]

We therefore confirm that the journey to path dependence engaged on by A&R corresponds with the three phase route identified by Sydow et al [53] and developed by Schreyogg et al. [54]

Attempted breakout

World War 2 affected business, with lesser profits from the manufacture of parachute silk yarn and silk yarn for wire winding, followed by the austerity years up to 1954, when rationing was finally lifted. The company had been well aware of rival products in other man-made materials increasingly appearing on the horizon throughout the 1920’s and 30’s, such as rayon, or nylon for stockings, but stayed away from them, apart from the experimental winding of rayon, called ‘artificial silk’, for wartime purposes, of which it had gained some experience. Finally responding to these trends at the turn of the 1950s, the firm made large investments in the necessary air conditioning and filtering plant, as well as continuously updating its throwing machinery to faster versions suited to man-made fibres. As a result of the firm’s skill base being focussed on silk production up to this point, it had to engage in extensive training programmes to acclimatise staff to the production of artificial yarns. It thus switched its focus to the demand for twisted synthetic yarn. There were rejections of unsatisfactory product by A&R’s customers as the new yarns came to be produced. The results were as shown at **Table 2** above, mediocre, reducing, profits, while customers gradually turned away from twisted yarn, as throwster after throwster went out of business in the face of increasing concentration in the trade and rapidly changing, more expensive technology. There was nowhere to turn and liquidation followed. These developments, as was seen above, were a frenetic attempt, too little, too late, to reverse the firm's path dependence on silk.

Reinforcement and feedback

We now turn our attention to the reinforcing 'feedback' factors identified by Sydow, Schreyogg and Koch [55] we referred to earlier, which cause firms to remain path dependent, to see how these operated at A&R.

1) Coordination effects

The positive attributes of the firm's specialisation in the spinning of silk into yarn in its buildup to path dependence can be identified from old photographs of the shop floor in its Motherwell and Govan factories. [56] Clear and rational production layouts of spinning machinery minimised the wastage of time and thus reduced coordination and handling costs of raw materials and finished goods, which were thus able to be efficiently controlled on the shop floor by female supervisors ('denters').

2) Complementary effects

The 'complementary effects' of producing a limited range of yarns, in the form of reduced selling costs, were realised, as the narrow range of products meant that a small number of selling agents could handle all the company's output. Latterly, one sales agent sold A&Rs product for the whole of England. [57]

3) Learning effects

There were learning effects and related cost savings as the workforce and the management operated more efficiently as their experience grew. These are difficult to verify directly, as they were not measured, but it can reasonably be assumed these gains were made in a cost-conscious firm such as A&R was and were retained in the firm, as it enjoyed low staff turnover over most of its life. These advantages were nullified as it changed over to synthetic fibre production in the 1950s.

4) Adaptive expectation effects

On the other hand, no evidence of 'adaptive expectation' effects, the reluctance to speak out critically among management for fear of adverse career outcomes, can be found.

The above reinforcements provided reassurance that the selected path was a wise choice, revealing the opposite during the 1950s.

The gains outlined above enhanced the positive feedback generated by the good profits to which they contributed, climaxing at 28.2% RCE in 1937, around the point where we judge the firm became 'locked-in' and confirmed its decision to focus on the narrow path chosen. The profits only began to slide consistently in the 1950's, disappearing at the start of the 1960's, as **Table 1** and associated commentary above shows. The negative feedback effects of the reducing profits were offset by other financial factors. The vast majority of the shares were owned by members of the Anderson and Robertson families. Although the Robertsons had not continued in the business after the death of George Robertson in the 1920's, various members of the family still held 25 per cent of the ordinary shares in the 1960's. The Anderson family, represented on the board by WFT Anderson, chairman, who succeeded his father, WK Anderson, as chairman on his death in 1957, also held between them 64 percent of the shares. James Charles Scott, the Managing Director, together with other members of the Scott family, held eleven per cent of the shares. The shares they owned in the firm were thus inherited wealth, not directly contributed by themselves and not easily marketable as they were shares in a private limited company, so falling returns on capital employed and reducing dividends, the latter caused by the growing need to reinvest profits in machinery, were less noticeable than they would have been if their own cash had been involved. Also significant was the fact that the directors could rely on the good salaries they took, which included commissions on profits and occasionally bonuses. [58]

Reinforcement - contextual conditions/culture

Aside from the above more obvious and tangible forms of reinforcement of a strategic path, there are the softer, more elusive reinforcing factors which are located within an organization's culture, as pointed out by David, and to which we have referred, above. These include the 'enduring constraints' of the existing ways of doing things and the notions of what courses of action are mutually acceptable among senior management. These factors can give rise to 'stasis' within a firm, through its strategies. The authors of the present paper wished to establish what contextual constraints might have applied at A&R in the emergence of path dependence and lock-in. This posed a difficult problem for the authors, since the firm disappeared some 50 years ago, and no survivors of its management were known to exist. It was not therefore possible to ask those who had been directly involved questions about the firm's culture and related constraints.

This pushed us in the direction of the archival sources. While these are generally full and comprehensive, the firm's board minutes do not contain any direct or detailed discussions of strategy, which only appear in reports from the crisis years of the early 1960s. The information that was relevant was largely found in the firm's less formal sources, particularly the short company history written in 1957 and the manuscript notes which were made in order to prepare it. There, evidence of the firm's symbols, heroes, rituals and myths was discovered, which suggested, in accordance with Hofstede's 'onion' model, that these three signifiers, or layers, of the organisation's culture could be used to reconstruct it, and its relations with strategy, albeit partially [59]. These 'layers' are discussed in turn:

Heroes

In terms of the firm's heroes, the first of these were clearly its founders, Anderson and Robertson, who, according to WT Anderson, chairman from 1957, had 'built up a very successful silk throwing business', seeing, in 1877, the 'opportunity' afforded by the failure of the Morris Pollok business under Pollok's son. JM Scott had joined them in 1883, coming himself to share the glory afforded to the founder-directors. [60] On Scott's death in 1960 he was given the bulk of the credit by the board for building the business up across the twentieth century, being 'greatly missed in the company and by the Silk Trade generally'. [61] Anderson had, in the 1890's, at 'great personal sacrifice', rescued the firm from severe financial distress caused by the failure of a major debtor, drawing also on his friendship with a silk broker, Durant, to ease the situation. [62] Together, the three directors had overcome trade fluctuations and financial pressures, associated, significantly, with the silk trade, taking forward and strengthening the business through thick and thin, finally consolidating it in Motherwell.

Veneration of the firm's 'heroes' was perpetuated by the fact that the second generation directors were still board members until the early 1950s, as very old men, sometimes handing over to sons, sometimes sitting on the board together with their sons, the third generation of directors. On the death of WK Anderson in 1957, 'the great services he has rendered to the company and the high regard...the board had for his business acumen and general character' were eulogised in the minutes by his son and his fellow directors. [63] . Moreover, it should be noted that the firm remained 'silk-minded' until the end. The same John M Scott who had joined the firm in 1883 had, as late as 1953, stated with a mixture of regret and hope that the 'The craze for nylon yarn has meantime reduced the demand for pure silk to almost nil'. [64] He clearly hoped that silk would one day prevail again, at a time when nylon and other new materials were forging ahead across the textile industry. It is clear that the firm had been attempting to avoid the production of artificial yarns as long as it could. It was certainly well aware of their rapid uptake across the industry from the late 1920s onwards, [65] but by the 1950s, it could no longer resist.

The second generation successors also received joint approbation from the third generation, WFT Anderson and JC Scott, for negotiating 'the very difficult transition from large scale silk throwing to large scale throwing of man-made fibres'. [66] The veneration of predecessors was of course inextricably bound up with the, clearly good, filial relationships between the various generations and the financial provision each generation had made for the succeeding one through the business. The lock-in of the mid-thirties was indeed culturally-related, bound up with the veneration by the firm's leaders, of silk, a material which, over the years, was subject to wide fluctuations of supply, especially during and after World War 2, and also to the whims of fashion, which the directors knew too well but continued to downplay well into the 1950s.

Rituals

There were two activities within the firm which were not strictly necessary in business terms, although they had some usefulness, which may be seen as organisational rituals. The first of these was the firm’s membership of the British Silk Throwsters Association, of which it was a founder member from 1933. Its relationships with the Association, as well as keeping it abreast of trade prices, price agreements and other developments, acted as a reinforcement of the firm’s sense of longevity in a trade which provided up-market goods, a further source of pride. A second ritual was the firm’s use of, and respect for, Scottish chartered accountants (CAs), the most prestigious Scottish body of professional accountants. A&R’s auditors from 1895 were CAs, Thomson, Jackson, Gourlay and Taylor. Its company secretary, JC Gemmill, had been a CA from the auditors’ practice for many years. A non-executive member of the board, JM Carswell CA, was also from the firm’s auditors. JC Scott, the last managing director, was himself a CA. In due course, when the firm was liquidated, the liquidators were members of the auditors’ CA practice. Clearly the firm valued financial strength and the sense of respectability and reassurance afforded by these links, given through the annual ‘rituals of verification’ [67] and the frequent holding of board meetings in the auditors’ offices in Glasgow. At the AGM in 1958, it was noted that 'the company is in a strong position financially, thanks to the wise policy pursued by our predecessors over many years’, which they intended to continue. At the 1963 AGM, it was recorded that the firm had ‘again had able and invaluable help from Mr Carswell and Mr Gemmill’. [68]

The firm’s prominence in the Silk Throwsters’ Association from 1933 is likely to have played its part in 1935, when it locked-in its strategic path around silk yarn manufacture, with large investments, relocation to, and concentration in, Motherwell. Its other ‘ritualistic’ activity of immersing itself in chartered accountants, which served it increasingly from its incorporation 1895 until the end, appears to have given it a sense of financial invulnerability which both eased its lock-in, in 1935, and inured it to the truth about its imminent demise until the early 1960s.

Symbols

Another component of the organisation's culture was the symbolism deployed within the firm. This was largely confined to the long-standing use of the Scottish bluebell trade mark on its stationery. This signified the national origin of its goods (the bluebell flower is regarded as a symbol of Scotland) and also served to remind those who were aware of it that the firm was descended from Scotland's first silk throwsters and, from the beginning of the twentieth century, was the last of the Scottish silk throwsters. There was also the firm’s telegraphic address, ‘Cocoon, Motherwell’, helping to keep its silk heritage in the public eye as well as in the eyes of staff. Having been adopted as a trade mark in 1912 as A&R took up silk wire-winding yarn, the humble bluebell remained an inspiration and a reminder of the firm's successful lines of silk business at the time of lock-in, as did the ‘Cocoon’ address, adopted from 1935.

Myths

There were also organisational ‘myths’ which contributed to the strong sense of culture within the business, related to past events in its history. Although not cited as a layer of the cultural ‘onion’ devised by Hofstede, Gabriel [69] has observed that organisational stories and myths ‘are essentially fulfilments of unconscious wishes’ and as such, form part of organizational culture and are thus pertinent to the present case. The firm continued to be very proud of the fact that its factory girls (at the time still working for Morris Pollok), had waved to Queen Victoria and Prince Albert as they sailed up the Clyde in 1849, welcoming the Queen ashore by singing the National Anthem. As the royal yacht, the *Victoria and Albert*, passed the Govan factory, ‘Her Majesty graciously bowed her acknowledgement to the singers, who replied by cheering and waving silk handkerchiefs’ which had been specially woven for this purpose. A&R had an etching of the scene made up as a letterhead they were using for communications with employees 50 years later and still referring to the event in a short company history published by a trade journal as late as 1958. [70] While the firm wished to read this event as validation of its worth and its products from the Queen herself, there is of course no proof that Victoria had taken special notice of A&R, its workforce or its products at all.

Nevertheless, a print of the scene remained in the managing director's office until the end. Similarly, in 1886, at the Edinburgh International Exhibition, Mr Anderson had presented Queen Victoria with a dozen silk handkerchiefs, specially woven out of A&R silk yarn at their stand, of which the firm made much across the generations. Another way in which the firm constructed a meaningful past for itself related to its service to the country during World War Two. It believed that 'at least two-thirds of all British aeroplanes that flew during the war carried in their electrical instruments Motherwell processed silk or rayon', but this was probably an optimistic guess. [71] Again, these imaginings by the firm of its importance in the world of silk and to the nation that must have contributed to the lock-in of the mid-1930s and during the years immediately following.

In short, A&R was a very proud firm with a long and successful history, one that the shop floor employees, as well as the directors, are likely to have absorbed as a result of the close, 'hands on' involvement of the directors in the firm's Motherwell factory. The brief history of 1958, referred to above, concluded with the following statement, which clearly emanated from A&R:

‘In future, the Company will serve the textile industry at home and abroad with all the skill acquired in the manipulation of yarns over the last 82 years, and with the technical and scientific skills to be acquired over the next 82’.

Clearly the firm's strong sense of pride made it difficult for it to believe that it could ever be forced out of the throwing industry. It was, in making the above statement, ignoring what was happening within it and all around it, which, while it may have been accepted intellectually by the directors, was never fully accepted in practice, and cash drained out of the firm between 1961 and 1964 as a result of its failed ‘breakout’ attempt. As the account given above reveals, in the spring of 1963, with the help of consultants, A&R had laid out and considered, with impeccable, detailed logic, the diversification options realistically open to the firm on the one hand, while on the other hand, the great irony was that the directors had just purchased ring spinners for the processing of bulk yarns, betraying their real desire to continue as throwsters. The dogged detail in which it examined the various strategic options it saw was perhaps an over-intellectualisation which helped the directors to defer the anxiety that the firm they loved so much might well be doomed. [72] Meantime, they continued to hold out hope of rescue by takeover, suffering losses in order to preserve the firm as a going concern, to attract a purchaser. This solution would have allowed the firm to continue as a subsidiary of a larger firm, perhaps still retaining its separate identity and with the same directors.

Even after the door was shut, a new firm was formed in late 1964, Scott and Ford Ltd, opening premises at Java Street in a different part of Motherwell, employing some 60 people in silk yarn throwing for wire insulation and other purposes. The lingering appeal of silk yarn manufacture, although it had suffered greatly from the time of World War 2, could not be resisted, even beyond A&R's end. No records of the new firm are known to have survived, but its liquidation is recorded in the London Gazette of 1972. [73] Scott and Ford, in opening this plant, also ignored the principle that Scott himself had been involved in formulating at A&R in 1961, when one of the options considered was to: 'Move to a smaller mill and sell the whole of the Motherwell factory'. It had been noted at the time, as was discussed earlier, that 'This would be disruptive and expensive, and could only be justified if the industry was expanding'. [74] It was not. Today, with the exception of one Italian factory, all silk yarn is produced outside Europe, coming mostly from China and Japan, a development that was looking likely in the early 1960s and well known to A&R, [75] if never fully accepted. Furthermore, from the 1950's onwards, greater and greater amounts of electrical cable across the world were being insulated with PVC and related plastics, [76] also a well known fact at the time which the working directors either chose to disregard or failed to discover.

Closing remarks -breaking paths

Sydow, Schreyogg and Koch [77] consider a variety of approaches to breaking organisational paths, centred on 'addressing the emotional side of inertial organisational patterns', which are driven by 'self-reinforcing dynamics', [78] an assertion the present case study has borne out. Unfortunately, recommendations by the above authors to utilise techniques such as 'Assumption Surfacing', designed to isolate and then question the underlying logic behind strategy, are only suited to management groups in larger organisations and beyond the reach of firms of the scale of A&R. There were only three active directors in the firm, who worked 'hands on' in their business on a day-to-day basis, themselves with three or four others constituting the senior site management and unlikely to be available for rarefied discussions, even if these techniques had been available to a firm which ceased to exist in 1964.

Not available to the firm, either, were any of the mental supports of modern strategic management theory, even simple ones such as SWOT analysis, which would have required the firm to think seriously about threats and weaknesses. Thinkers on strategy such as Ansoff [79] had yet to come into the public eye, with Porter [80] and Mintzberg [81] decades in the future. A&R relied on their consultants, who were only able to confirm their own analysis, also relying on their own knowledge of their business, but as has been shown, emotional and historical attachment distorted their reasoning. The directors did, however, to their credit, liquidate the business before its assets drained away, either by good luck, good judgement, or both, finally unlocking a satisfactory value from their shares which was greater than they would have been prepared to sell the company for. In that sense, they did not leave it too late, although it is likely that Scott and Ford Ltd squandered some of the capital recovered in a new business that appears to have been doomed from the start. In some respects, therefore, A&R enjoyed some post lock-in success, if not of a lasting kind: keeping the business alive throughout the 1950s and early 1960s; achieving good exit values for shareholders; sustaining a short-lived successor business. This achievement confirms the views of Scheyrogg, Sydow and Holtmann that lock-in should not be seen as a 'situation of total rigidity that excludes any further choices...[and thus]...it cannot be equated with determinism'. [82]

Conclusion

In summary, the above study has demonstrated in quite precise detail the decline of a path dependent firm, A&R, validating the broad three-phase analytical framework of Sydow, Schreyogg and Koch [83] as a tool suitable for the analysis of path dependence in smaller firms, subject to further investigation through more detailed empirical studies.

The present study has also analysed, in considerable detail, some of the less obvious and more elusive self-reinforcing mechanisms producing or maintaining path dependence, as called for by Sydow, Schreyogg and Koch. [84] These, as was shown, were powerful, deeply rooted in the firm's culture, linked to and reinforced by the firm's succession through three key families which shared ownership and direction of the firm across three generations. Whereas Schreyogg, Sydow, and Holtmann, in their study of Bertelsmann's Book Club, refer broadly to the influence of the firm's 'glorious past' on its path-dependent strategy, we have enhanced understanding of this aspect by managing to trace developments and biases at A&R which give valuable insights into how this firm perceived its own 'glorious past' and how this was transmuted into its present and future, a useful insight for students of management. [85]

The limitations of the above case study relate to the nature of academic discourse concerning path dependence, and to the constraints of historical research more generally. In progressing our study, we came across many of the 'blurry and controversial constructs' to which Vergne and Durand refer. [86] We pondered the practical meaning of unclear phrases such as 'contingent choice' or 'critical juncture' in academic papers as we attempted to make sense of A&R's experience, eventually understanding these as referring to the more significant changes, as we saw them, in the nature of their business. This brought us to the conclusion that our interpretation of the firm's history was to some extent tentative, especially when the information surviving was patchy in a few places, causing us to wonder if more important facts which might have been hidden from us in the firm's past would have significantly changed our interpretation. These problems are, however, part of the warp and woof of historical research, and, on balance, we feel that we are broadly right. We certainly disagree with Vergne and Durand when they state that the abandonment of the case study as a research tool would lead to greater insights into path dependence, since other methods, too, have their drawbacks. [87]

To recapitulate, in this paper, we have gone behind technological and strategic aspects of path dependence to touch on its deep roots in an organisation's psyche, exposing another vital link between culture and strategy in firms. As Sydow, Schreyogg and Koch observe, this is 'an issue of high relevance in strategic management and organizational decision making', [88] and as such, deserving of even more research.

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[1] UGD 029/11/5.
[2] UGD 029.
[3] Liebowitz and Margolis, "Path Dependence."
[4] Arthur, "Competing Technologies."
[5] Liebowitz and Margolis, "Path Dependence," 991.
[6] *Ibid*., 222
[7] Foray, "Dynamic Implications."
[8] Scott, "Coal Wagon Problem."
[9] Beyer, "Same or Not the Same," 1.
[10] Koch, "Strategic path dependecnce."
[11] David, "Carriers of History," 210.
[12] *Ibid*., 213.
[13] *Ibid*., 214.
[14] *Ibid*., 215.
[15] Sydow, Schreyogg and Koch, "Organizational Path Dependence."
[16] *Ibid*., 692.
[17] *Ibid*., 649.
[18] *Ibid*., 694.
[19] *Ibid*.
[20] Vergne and Durand, "The Missing Link," 737.
[21] *Ibid*.
[22] Schreyogg, Sydow and Holtmann, "How History Matters."
[23] Sydow, Schreyogg and Koch, "Organizational Path Dependence."
[24] *Ibid*., 94.
[25] *Ibid*.
[25] *Ibid*., 649.
[26] UGD 029/11/4.
[27] UGD 029/8.
[28] *Ibid*.
[29] *Ibid*.
[30] UGD 029/5/3.
[31] UGD 029/8.
[32] *Ibid*.
[33] *Ibid*.
[34] UGD 029/3/1.
[35] UGD 029/2/3.

[36] *Ibid*.
[37] UGD 029/8.
[38] *Ibid*.
[39] *Ibid*.
[40] *Ibid*.
[41] UGD 029/2/3.
[42] *Ibid*.
[43] *Ibid*.
[44] *Ibid*.
[45] UGD 029/2/4.
[46] *Ibid*.
[47] Koch, "Strategic path dependence", 4.
[48] UGD 029/1.
[49] UGD 029/11/4.
[50] *Motherwell Heritage Society Newsletter*.
[51] UGD 029/11/4.
[52] Schreyogg, Sydow and Holtmann, "How History Matters," 85.
[53] Sydow, Schreyogg and Koch, "Organizational Path Dependence."
[54] Schreyogg, Sydow and Holtmann, "How History Matters."
[55] Sydow, Schreyogg and Koch, "Organizational Path Dependence."
[56] UGD 029/11/1.
[57] UGD 029/2/3.
[58] *Ibid*.
[59] Hofstede et al, "Measuring organisational cultures."
[60] UGD 029/11/4.
[61] UGD 029/3/1.
[62] UGD 029/11/4.
[63] UGD 029/3/1.
[64] *Ibid*.
[65] UGD 029/11/1.
[66] UGD 029/11/4.
[67] Power, The Audit Society.
[68] UGD 029/3/1.
[69] Gabriel, "Organizational Stories," 427.
[70] UGD 029/11/5.
[71] *Ibid*.
[72] Arnold, "Intellectualisation."
[73] *London Gazette*, 17 July 1972, 8549.
[74] UGD 029/8.
[75] UGD 029/11/5.
[76] Black, Electrical Cables.
[77] Sydow, Schreyogg and Koch, "Organizational Path Dependence."
[78] *Ibid*., 702
[79] Ansoff, Corporate Strategy.
[80] Porter, Competitive Strategy.
[81] Mintzberg, Managerial Work.
[82] Schreyogg, Sydow and Holtmann, "How History Matters," 85-86.
[83] Sydow, Schreyogg and Koch, "Organizational Path Dependence."
[84] *Ibid.*
[85] Schreyogg, Sydow and Holtmann, "How History Matters."
[86] Vergne and Durand, "The Missing Link."
[87] *Ibid*.
[88] Sydow, Schreyogg and Koch, "Organizational Path Dependence," 701.