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Lancaster University Management School
Working Paper
2005/025

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clusters and the UK outdoor trade, 1960-1990**

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**‘The Neglected Legacy of Lancashire Cotton: Industrial Clusters and the UK
Outdoor Trade, 1960-1990’¹**

By

Mike Parsons and Mary B. Rose (Lancaster University, UK)

Region was crucial in Britain’s industrial revolution and by 1830, Lancashire south of the Ribble, had emerged as a highly sophisticated local economy including manufacturing, commerce, finance, transport, mining, machine making and machine tools. Through the nineteenth century, sustained export market growth encouraged an unprecedented level of both vertical and, more especially, spatial specialisation and Lancashire evolved into Marshall’s classic industrial district. An industrial district can be defined as a concentrated agglomeration of interrelated firms, which are both economically and socially embedded in a region. Economies tend to be external to the firm and in Lancashire, yarn, cloth and market specialisms were underpinned by distinctive machine making in each town. In addition, Manchester’s commercial sector acted as a conduit for intermediate goods and services, while numerous shipping houses linked manufacturers with their diverse markets, though arguably separated them from their customers.²

Some industrial districts survive for centuries, evolving and changing through time. However, external changes, especially market and technological shifts, can undermine the buoyancy of an industrial district, as was the case in Lancashire.³ The twentieth century decline of the Lancashire cotton industry remains one of the most

hotly debated topics in business and economic history, with much attention directed to the reasons for the limited strategic response to growing foreign competition. The very characteristics which brought competitive advantage to nineteenth century industrial Lancashire were seen as a principal cause of decline, while the loss of the buoyant Indian market made investment in innovation singularly unattractive. Changing circumstances undermined the creative, financial, social and economic basis of Lancashire as an industrial district, while external pressures encouraged short-lived and often ineffective cartelisation. By the 1970s and 1980s King Cotton was virtually dead, mills demolished and Lancashire's industrial past increasingly either scrapped or consigned to the heritage industry.⁴

Yet, there are legacies of Lancashire's specialised structure, which have been neglected. This is because of concentration by researchers on explaining the collapse of coarse cotton spinning and weaving.⁵ In addition, much attention has been given to the problems associated with the separation of manufacturers from their markets, that came with the numerous highly specialised shippers. Compared to the countless articles revolving around the rings and mules debate, there have been few analyses of the finishing trades and still fewer looking at firms at the top of the market.⁶ Equally, with attention heavily focused on yarn and cloth production, there has been little discussion of the consumer goods into which cotton cloth was made.

The collapse of Lancashire's conventional markets had a devastating impact on spinning and weaving in the county. However, a segment of high performance fabrics and technical textiles survived and developed, related to newly emerging demands from the outdoor trade and industrial customers. This under researched element of Lancashire's cotton legacy can be understood in the context of path dependency. As Paul David has observed:

‘ the influences of past events and of the states they bring must be communicated –like the deepening of the wheel ruts by each successive vehicle- through some definite chain of intervening casual events, effects and resultant states –down to the present state, whence they can be passed on to future events.’ ⁷

This does not mean that the relationship between past and future is linear. Rather it means that the skills and knowledge embedded within a community impact upon the form that changes take. They also affect the choices made in a shifting economic and technological environment.

This article focuses on the evolution of the skill and knowledge bases associated with rubberised rainwear, including chemicals and high performance fabrics and considers their impact upon a new consumer good sector after 1960. It shows that, while the innovation process in these new sectors was anything but linear or pre-determined, it was undoubtedly shaped by Lancashire’s textile past. Through networking arrangements, underpinned by the social capital of entrepreneurs, the skills and ancillary sectors linked to these activities contributed to innovation in one of the UK’s more dynamic consumer goods sectors, from the 1960s to the 1990s. In a period of declining manufacturing and lack of international competitiveness, a number of companies manufacturing clothing and equipment for outdoor sports emerged as world leaders, enjoying international standing and growing levels of exports. Firms such as Peter Storm, Karrimor, Mountain Equipment, and much later Regatta and Rab, became household names, for rucksacks, sleeping bags and waterproof and windproof clothing. ⁸ This article explores the relationship between this new and emerging sector and the legacy of Lancashire’s declining industrial district. The article will be divided into three substantive sections. The first will

briefly survey the development of the Lancashire industrial district in the nineteenth century and its subsequent collapse, before examining the neglected legacies of rainwear and high performance fabric. It will track the evolution of Macintosh rainwear in the nineteenth century and trace the emergence of other high performance fabrics, including Burberry gabardine, Grenfell and Ventile. The second section will show the continued and evolving role of networks in the context of innovation in Lancashire. This is less in the context of cluster evolution as from the perspective of the emergence of innovatory niches. These were based on the combination of past skills and knowledge and the new demands and knowledge of outdoor sports. Such innovatory networks were strongly reliant on the interaction between suppliers and their customers in the outdoor trade. This article will show that some new companies emerged in the 1970s linked to Lancashire's past skill base. However, older firms including Perseverance Mills founded in 1901 and Baxenden Chemicals, founded in 1917 also played a part. Perseverance Mills achieved new combinations, through applying knowledge accumulated in one sphere of high performance fabrics to new uses. In the inter war period, Baxenden Chemicals shifted from saccharin into textile coating and finally to polyurethane coatings after the Second World War.⁹ In a final section conclusions will be drawn.

Lancashire Decline and the Neglected Legacy

Lancashire's nineteenth century dominance of the British cotton industry stemmed from a combination of pre-industrial skills (in both yarn and cloth manufacture and machine making) with a rising number of specialist merchants and middlemen. In addition, a growing taste for adaptable cotton cloths reinforced the expansion of the sector during the Industrial Revolution. There were, from the start, strong regional variations in the organisation and finance of production, whilst individual

communities concentrated on producing distinctive yarns and fabrics using technology which evolved synergistically.¹⁰ All of this is well known and widely researched as are the forces leading to the emergence of a complex industrial district. The life cycle of this industrial district, with Manchester at its heart, has been tracked from its appearance during the industrial revolution, through the difficulties of the 1880s, to relative and absolute decline in the twentieth century.¹¹ In many respects Manchester was the heart of the cotton industrial district, for it was far more than just an industrial town. It was the commercial heart of a highly spatially specialised industry and was the crucial link with the outside world. Its networks of information and commercial intelligence were brought together through the Manchester Royal Exchange, which has been described as the ‘power house’ of the cotton industry and the ‘nerve centre’ of the industry.¹² The city was also the base for numerous other institutions which facilitated information flow. The Manchester region became home to an enormous range of fabric types – totalling over 300 before the First World War – from engineering, to synthetic dyestuffs, to finishing trades and to a massive rubberised rainwear industry.¹³

Rubber is a natural polymer which came to Europe with Christopher Columbus in the 15th century and was used from the seventeenth century to proof fabric in Mexico. In Britain, the patent records, from the second quarter of the seventeenth century, bear witness to numerous attempts to waterproof fabrics, including experiments with rubber.¹⁴ However, in 1823 Charles Macintosh, the Glasgow chemist, patented a double textured fabric which bore his name. Rubber, softened with naphtha, was sandwiched between 2 layers of cloth to form a waterproof material. His 1823 patent claimed:

‘A manufacture of 2 or more pieces of linen, woollen, cotton, silk, leather or paper or other the like substances ...cemented together by means of a flexible cement, the nature of which said manufacture is that it is impervious to water and air.’¹⁵

Macintosh used virtually any fabric but became inseparable from the Lancashire cotton industry when he sought and gained financial backing from two Manchester cotton manufacturers the Birley Brothers and R.W. Barton. Charles Macintosh and Co, of Cambridge Mills, Chorlton-on-Medlock began trading in 1824.¹⁶

But there were problems with this rubberised fabric and the original Macintosh not only smelled terrible, but it went rigid in the cold, a problem only alleviated with the patenting of vulcanisation by Thomas Hancock in 1843 (in parallel with the better known and virtually identical innovation by Charles Goodyear, in the United States). Without this development, which made the rubber less sensitive to changes in temperature, Macintosh could have made just a fleeting appearance. But vulcanisation brought versatility to rubber products, made it possible to make elastic and meant that single coated fabrics became an alternative to the old double fabrics. Since Macintosh had formed a partnership with Hancock in 1830, his company was in a position to benefit from Hancock’s advance and the new and improved Macintosh received awards at the Great Exhibition of 1851. Improved Macintosh was actually very versatile and was developed for fashionable wear and sporting activity. Indeed an exceptionally lightweight garment was designed to fit in a cigar case:

‘Hellewells’s waterproof 5 oz, weight reversible paletot (loose cloak) surpasses all others for fine and wet weather. Can be carried in a coat sleeve of a packet and folded up in the space of a cigar case. The lightest, the best and the most portable protection from rain and dust, adapted for fishing, rowing, yachting, riding, driving, hunting, shooting, coursing and deerstalking’. ¹⁷

Clearly Macintosh did not have a monopoly and the success of his new and improved rubber goods promoted competition. Before the First World War Manchester and Salford supplied two thirds of the waterproof garments made in the UK and 90% of the world market was supplied from Britain.¹⁸ Rainwear manufacture was from the start heavily dependent on chemical processes and knowledge and spawned numerous specialist firms involved in textile finishing and coatings.

Lancashire's neglected legacy was not, however, confined to the knowledge and skills which went with rubberised rainwear but extended to competing high performance fabrics. Macintosh was impermeable and therefore did not 'breathe' and was very uncomfortable to wear for any energetic activity. The poor breathability of Macintosh created a major opportunity for potential competitors looking to design more versatile fabrics and clothing. It was a competition made possible by the high quality and variety of Lancashire fabrics in this period and which was to lay the foundation of one of the counties' other neglected legacies – its reputation for high performance fabrics.

Thomas Burberry, the Hampshire sports outfitter began to experiment to develop his breathable gabardine rainwear in the 1860s and his garments were at first made of linen rather than cotton. The trade mark for Burberry was 'Self Ventilating Weatherproof' and was registered in 1879. As its name suggests, it was a direct response to the problems of breathability associated with Macintosh.

The competitive success of Burberrys' at the top end of the market stemmed partly from the versatility of the Lancashire cotton industry. Burberrys' were not cloth manufacturers and it was only in 1920, when they went public, that they acquired their cloth suppliers Pandora Mills of Farnworth near Bolton and became a fully integrated company.¹⁹ Prior to that they worked closely with Pandora Mills for fabric

development, while the Manchester Chamber of Commerce was involved in testing windproof fabrics for Burberry garments. These included the windproofs developed for explorers including Shackleton, Scott, Nansen and Amundsen before the First World War.²⁰ However they actively engaged with the industry on fabric development and finishing. Following experiments, Burberry was supplied with a proofed cotton substitute for linen –gabardine - which, was effectively triple proofed – once in the raw material, once in the yarn and once after weaving. The fabric required long stapled, high quality Egyptian cotton and high quality weaving. Burberry was anything but cheap, however, and it was the impervious nature of Macintosh which was the other source of Burberry’s success with wealthy and increasingly health conscious customers.²¹ For the next 40 years, culminating in a volume of over 200 pages entitled *Open Spaces*, Burberry’s marketing campaign hinged upon the ways in which Macintosh damaged health, and Burberry’s benefits. Burberrys’ having first discovered an agent that made any woven fabric non-absorbent, invented machinery to force proof first into the strands of the raw material before it is twisted into yarn, secondly into the yarn as prepared for the loom and thirdly into the finished cloth.’²²

Burberry created their exclusive niche through the use of a combination of high quality fabrics, innovative designs and their relentless attack on rubberised fabrics. This was made possible by their close relationship with high quality Lancashire fabric manufacturers. This, combined with Burberry’s tailoring skills enabled them to occupy several top market niches as well as serve the crucial bulk military market, before and during the First World War.²³ Their competitive strategies changed the market, but did not undermine the production of rubberised clothing. This continued to expand so that by the 1890s there were 70 Macintosh

companies in Manchester. Instead the exclusivity of Burberry helped to drive rubberised rainwear into the mass market, a move which was also facilitated by the growing number of Jewish émigré rainwear manufacturers in the Salford and Cheetham Hill areas of Manchester. Several of these, including Mandleburgs and Frankensteins were also exceptionally innovative and were responsible for a number of registered designs, including Mandleburgs' patented odourless Macintosh.²⁴

Burberry's reputation for garments made of high performance Lancashire cotton cloth continued into the inter war period, when Burberry wind proofs were taken to Everest in 1922 and 1924.²⁵ But inevitably they did not have the market to themselves in the 1920s. Competition did not come from their principal rivals in the rainwear sector, Acquascutum, but from within Lancashire from Burnley cloth manufacturers Haythornthwaites. Invented for the Arctic missionary Sir Wilfred Grenfell in 1923, Grenfell cloth was a tightly woven, high quality, cotton gabardine that was used for flying suits, high quality leisure wear and, in the 1930s, for tents and clothing used in mountaineering. So high was Grenfell's quality that efforts to pirate it in the United States proved futile and American companies were unable to produce it in any volume.²⁶ Inevitably the Second World War created a stimulus for high performance fabrics, though not to Grenfell as Haythornthwaite's Burnley mill was closed in 1940 for the duration of the war. Fine cotton nylons were developed for parachutes, while Ventile was developed by Dr F.T. Pierce when he was head of the Shirley Institute – a research facility of the British Cotton Industry Research Association for wartime use:

'The first application of the fabric was to protect pilots escorting shipping convoys from Great Britain to Russia during the 1939-45 war. A pilot who had to bale out in Arctic waters could expect to survive five minutes, but if he could keep dry his

heat loss would be much reduced ... The cloth is impermeable to sea water under these conditions, and the construction of the suit prevents water entering at the wrists, neck etc., Even so the airman can, because the cloth is permeable to water vapour, wear the suit without discomfort. ‘²⁷

.This fabric was introduced in 1941 and dramatically improved survival rates with 80% of airmen surviving compared with a handful previously. ²⁸

It is clear then that one of the consequences of the development of the Lancashire industrial district was a skill, science and mechanical base which allowed the development of high quality and technical textiles, alongside the large volume of grey cloth. This, combined with the legacy of the rainwear industry can be described as part of Lancashire’s hidden or at least forgotten legacy.

The neglected legacy and the UK outdoor trade 1960-1990

According to Michael Porter:

‘Clusters continually evolve as new companies and industries emerge or decline and local institutions develop and change. They can maintain vibrancy as competitive locations for centuries; most successful clusters prosper for decades at least. However, they can and do lose their competitive edge due both to internal and external forces.’ ²⁹

This was precisely what happened in Lancashire. The decline of Lancashire’s industrial district began in the inter war period when the cotton industry and associated engineering industries stagnated as markets, especially the Indian market, collapsed. At its peak, just before the First World War, the Lancashire cotton industry employed over 600,000 people in spinning and weaving alone and produced 8050 m

yards of cloth, of which 80% was exported. In the 1960s the Lancashire cotton industry and its industrial district was in terminal decline. Investment was low, in an industry that seemed to stand still in defensive lethargy. By the 1980s cotton cloth output stood at 399 m yards while 327m yards of synthetic cloth was produced in Lancashire textiles and employed 76,000 people. The vibrant industrial district of the nineteenth century was long gone and the remnants of cotton spinning and weaving had been absorbed by the man made fibres industry in a wave of mergers.³⁰ The causes of this collapse have been well rehearsed elsewhere and some attention given to the experience of Lancashire post cotton.³¹ However, little direct attention has been given to the legacy of the textile cluster, most especially in textile finishing which actually grew in the years after the Second World War, as Table 1 suggests. This was because specialist products, even when yarn and cloth were imported, required specialist coatings and finishes.³²

Table 1 Net Output of Textile Finishing³³ 1907-1970 (£m)

1907	10.5
1912	12.5
1924	28.7
1930	19.5
1935	18.5
1948	38.4
1949	43.0
1950	50.0
1951	57.2
1952	51.0
1953	57.8
1954	61.1
1955	57.9
1956	60.0
1957	62.5
1958	57.9
1963	65.9
1968	78.9
1970	93.6

Source : Government Statistical Service, *Historical Record of the Census of*

Production 1907-1970 (London, 1976) .

A recent NWDA report concluded that, in 2000, there were 1,010 textile and textile product firms located in the North West and 695 apparel companies. In total 38,100 people were employed in traditional textiles with 24,000 in other textile related activities. In a globalised industry, there remained considerable concerns over competitiveness with low labour cost producers, especially in retail apparel, but at the top end of the market for technical textiles and specialist clothing –the very sector which has benefited from Lancashire’s hidden legacy - there was some considerable optimism.

‘Despite depressed domestic and export markets for most of the 1990s and continuous downward pressure on prices, the North West interior textile industry has remained relatively buoyant and reasonably profitable, especially in comparison with other sectors ... One of the key assets of the textile and clothing cluster in the North West is the range of companies operating in technical textile markets. There are a number of internationally recognised companies servicing a range of innovative customers in medical, automotive, aerospace, building and industrial markets. ...The sportswear apparel segment has experienced rapid growth over the past 2 decades with ... an increased emphasis on the functionality of clothing used to enhance performance.’³⁴

Whether the combination of the remnants of Lancashire cotton and the outdoor trade truly represent an element of a dynamic industrial cluster, similar to those in the third Italy must be open to question. What this article demonstrates is the extent to which knowledge embedded in a previous industrial cluster allowed new combinations of past and present expertise to be used in the building of a dynamic industrial niche. .³⁵

The textile related products of the outdoor trade include rucksacks, tents, sleeping bags, clothing and, from the 1980s footwear. It is remarkably difficult to

estimate the size of the outdoor trade and its market in the 1960s or its consumption of textiles. This is because no accurate statistics were collected and its products are not separately listed, either in trade statistics or the Census of Production.³⁶ However other evidence confirms the UK outdoor trade was tiny until the late 1960s and, with the exception of tents and some garments, most high performance clothing and equipment was imported.³⁷ From the mid 1960s turnover and market share of leading UK companies such as Karrimor rose significantly. By 1970 Karrimor held 80% of the UK rucksack a share that never fell below 50% through to the 1990s.³⁸ However, the nature of the outdoor market changed, shifting towards clothing in the 1980s. This occurred with the development of fleece and shell clothing and the blurring of the distinction between clothing for casual and fashion wear and that for outdoor activity. Today the outdoor trade is not a marginal sector as the total market for 'specialist products sold through specialist outdoor stores' is valued at £670.0m if casual lifestyle clothing and footwear are added, the market valuation reaches £1bn.³⁹ Of the sales of specialist clothing, around 50% was supplied by companies based in the UK, or by overseas companies with UK subsidiaries, though of course most manufacturing is now offshore.⁴⁰

One major legacy of the collapse of the Lancashire textile industry is the lack of upstream fibre development in the region with fibre primarily imported and dominated by Du Pont. In addition, the major fabric suppliers W.L Gore and Sympatex are also based overseas – although the US company W.L. Gore produces Gore-Tex at its Gore UK factory at Livingston in Scotland. Nevertheless, two of the outdoor sectors' vital suppliers Cloverbrook (fleece producers) and Perseverance Mills (Pertex) are located in the region. Other strengths identified by the NWDA include the number of high profile branded companies in the region, leading edge

technical knowledge and expertise and a strong 'cluster in specialist clothing (high value added garments).⁴¹ This recent evidence highlights the significance of Lancashire's largely hidden legacy for the outdoor trade in 2000 and the rest of the article sets out to explore how this contributed to the competitive advantage of several leading UK outdoor brands.

Mass participation in outdoor activities such as hill walking and cycling, began in the nineteenth century and grew strongly in the inter war period. But this did not result in a mass market since incomes were low,, even if the unemployed had plenty of time for hill and mountain sports and were extremely active in areas like the Peak District in the interwar period.⁴² Before the Second World War, the competitive advantage of UK outdoor companies lay in tents and in wind proof clothing, anything more sophisticated was imported, and this continued to be the case in the immediate post war period. However a range of forces, including increasing leisure time, greater mobility and changing access laws, made outdoor activities more popular. The first ascent of Everest in 1953 made mountaineering more visible and, through its leader John Hunt, provided a vital boost to outdoor education in the UK. The outdoor education centres became a crucial bulk market for UK outdoor companies in the 1960s and 1970s. Demand continued to rise in the 1970s and 1980s, bolstered by the development of activities like backpacking, Scottish ice climbing and skiing. Media coverage of high profile expeditions, such as Annapurna 1970 and Everest South West Face, led by Chris Bonington, were crucial too, for the exposure it brought to UK suppliers such as Karrimor, Mountain Equipment and Troll.⁴³

The new UK outdoor companies which emerged in this period have been described as world beaters and clearly demand forces were crucial to the development of these small firms. However, the impact of Lancashire's neglected legacy of the

rainwear and finishing sector was crucial to the emergent competitive advantage of companies like Peter Storm, Karrimor and much later Regatta. Other innovations, such as the windproof fabric Pertex, lay in the expertise embedded within Padiham based Perseverance Mills, a long standing producer of high performance fabrics. This was combined with the textile and sporting knowledge of its developer Steve Laycock and the close ties he developed with the outdoor trade.

There has been increasing attention given to the importance of networks as a basis of innovation. Since economic activity is embedded in society, the innovative entrepreneur can build networks which provide external sources of information and expertise and allow mutual learning and allow boundaries to be crossed. These may begin as highly personal but are likely, through time, to spread to include a range of contacts which far exceeds the immediate family and close friends. These 'weaker' ties allow the individual to reach outside his or her immediate contacts to secure a wider range of information. They are often facilitated by such economic and social institutions as trade associations, exhibitions and trade shows as well as links with tertiary education.⁴⁴ In exploring the outdoor trade supply chain it will emerge that the social capital of manufacturers was of crucial importance to the effectiveness of innovations. Just as the nineteenth century industrial cluster operated on the basis of face to face interaction, in the second half of the twentieth century outdoor trade, regular dialogue between suppliers and manufacturers on one side and manufacturers and their customers on the other was a crucial dimension of successful product development.⁴⁵

The relationship between the legacy of the Lancashire industrial district and competitive advantage in UK outdoor companies, is not a simple linear one or related to cotton spinning or weaving *per se*. Instead it was linked closely to the high level of

nineteenth century specialisation and the consequences this had for the shift to nylon in outdoor products in the 1960s and 1970s. Although there is strong evidence of path dependency, based on Lancashire's cotton past, the process was often a complicated process. The shift from proofing cotton to nylon was not straightforward. Nylon, invented by Du Pont scientists in 1934 is not naturally a wet weather fabric. Unlike cotton, it does not matter how tightly it is woven, the nature of the fibres prevent it from retaining proofing for long. In steady rain, nylon clothing becomes soaked more quickly than cotton. To counterbalance this it was necessary to apply impermeable coatings to repel water and these were also synthetics – such as neoprene - another 1930s DuPont invention or polyurethane (PU).⁴⁶ The skills from Lancashire's rainwear industry, especially those associated with coatings, undoubtedly played an important role in building the competitive advantage of companies like Peter Storm and Karrimor in the 1960s and 1970s and for Regatta in the 1990s. All these outdoor companies relied heavily upon the accumulated expertise of Lancashire suppliers of coatings- some old but some new, for the competitive performance of their clothing or rucksacks in a changing world.

One of the men to contribute most to the development of nylon foul weather gear in Britain, before 1970, was Noel Bibby, founder of Nottingham based Peter Storm in 1954. Noel Bibby was, like so many of the founders of outdoor companies an outdoor enthusiast, but one who also understood textiles and clothing, for he worked in the garment trade. This background underpinned his business, for he understood what could and could not be done with fabrics, the importance of the fit of a garment to its performance and also had a good grasp of the capabilities of coatings. He applied wartime experiences in the Royal Marines to developing a company which specialised in making waterproof and thermal clothing for walking, sailing, golf and

country-wear.⁴⁷ Until the early 1960s Peter Storm anoraks and ski jackets were double texture poplin – closely woven cotton fabric which, like both Ventile and Grenfell swelled with water making the weave even tighter and blocking out water. But, in 1962 Noel Bibby pioneered Bri –nylon sailing smocks which marked the beginning of their 100 lightweight PU coated nylon range and the forerunner of the 101 Overjacket or cagoule which appeared very shortly afterwards.⁴⁸ The cagoule had originally been developed by French climber Pierre Alain, in the 1930s, using rubber coated silk.⁴⁹ Peter Storm’s 1960s nylon version, which became such a symbol of UK outdoor pursuits, was polyurethane (PU) coated. According to Noel Bibby’s son Paul, this range:

‘ really took off when he was able to source 2oz Nylon with a quality polyurethane proofing on it making the fabric 100% waterproof and proving a truly lasting finish’⁵⁰

Ironically this was not sourced in Lancashire at all but from the Swiss company Rotofil.⁵¹ But sourcing a coating for heavier fabrics proved far more difficult and led Bibby ultimately to set up his own proofing works, Stormproofing, in Manchester in 1982, drawing on skilled labour from the finishing trade. But of course PU coatings, like Macintosh in the nineteenth century did not breathe, and in sourcing chemicals for his proofing processes Bibby came in contact with Baxenden Chemicals Ltd, Accrington which had experience of developing textile coatings dating back to the interwar period,. In the 1960s they pioneered polyurethane hydrophilic coatings for textiles and in the 1970s reached an agreement with the Shirley Institute concerning their further development.⁵² Noel Bibby’s son Paul is clear that the relationship with Baxenden was crucial to Peter Storm maintaining a position in the outdoor clothing market observing:

‘The success of Gore-Tex grabbed the attention of the whole industry and our discussions with Baxenden, regarding their hydrophilic proofing system became much more important. In the end Stormproofings did most of the production testing of the formulations that Baxenden came up with and gave free time to trying out new ideas, on the understanding that Peter Storm would be the first to advantage from new breathable products. ... We were the first into the marine market with a heavy duty breathable sailing suit, our country wear range had a breathable and waterproof polycotton fabric and we won EMAP product of the year award in 1991 with our breathable Microlight range using microfibre nylon. .⁵³.

Cotton’s forgotten legacy also lay at the heart of the competitive advantage of Karrimor, the Lancashire outdoor company, especially in the rucksack market. Karrimor was founded in 1946 by Mary and Charlie Parsons to supply their Rawtenstall cycle shop with cycle bags. It began as a small workshop above the shop and when Mike Parsons joined the company in 1960 he was the 7th employee and turnover was 2/3 of the retail store. In building the business, Parsons gained a deep understanding of the manufacturing process and, based within old textile Lancashire of the capabilities of textiles and their associated processes. As an active sportsman he had a working knowledge and regular dialogue with mountaineers and those involved in outdoor pursuits. This bridge between technical knowledge and sporting needs played a crucial role in Karrimor’s growing dominance of the rucksack market. By 1975 the company employed 163 workers and controlled 80% of the UK rucksack market, exporting 40% of its turnover. In the 1960s Karrimor’s principle competitors had been Continental companies such as Norwegian Bergans, the French rucksack company Lafuma and Brown Best from Britain. In this period, packs had been made of cotton duck. Initially Karrimor’s competitive advantage came from combining

innovative design with relatively low prices. However, in the 1970s the competitive climate of the UK rucksack market was changed fundamentally by the establishment of Berghaus by Peter Lockey and Gordon Davison in 1972 in Newcastle. The battle for the UK rucksack market was intense and very personal, based heavily upon design and reliability combined with production and delivery performance and marketing abilities.⁵⁴ However a crucial advantage for Karrimor (lacked by Lockey and Davison) were deep contacts developed by Mike Parsons and his product manager Eddie Creig with the Lancashire textile industry and especially with coating companies over a 20 year period. As Eddie Creig explained :

‘The basic point on any development [is] co-operation and experience. A sharing of knowledge. Although this is concerned with the development of fabrics the same careful co-operation exists between myself and our suppliers of zips, mouldings, met fasteners, foams etc’⁵⁵

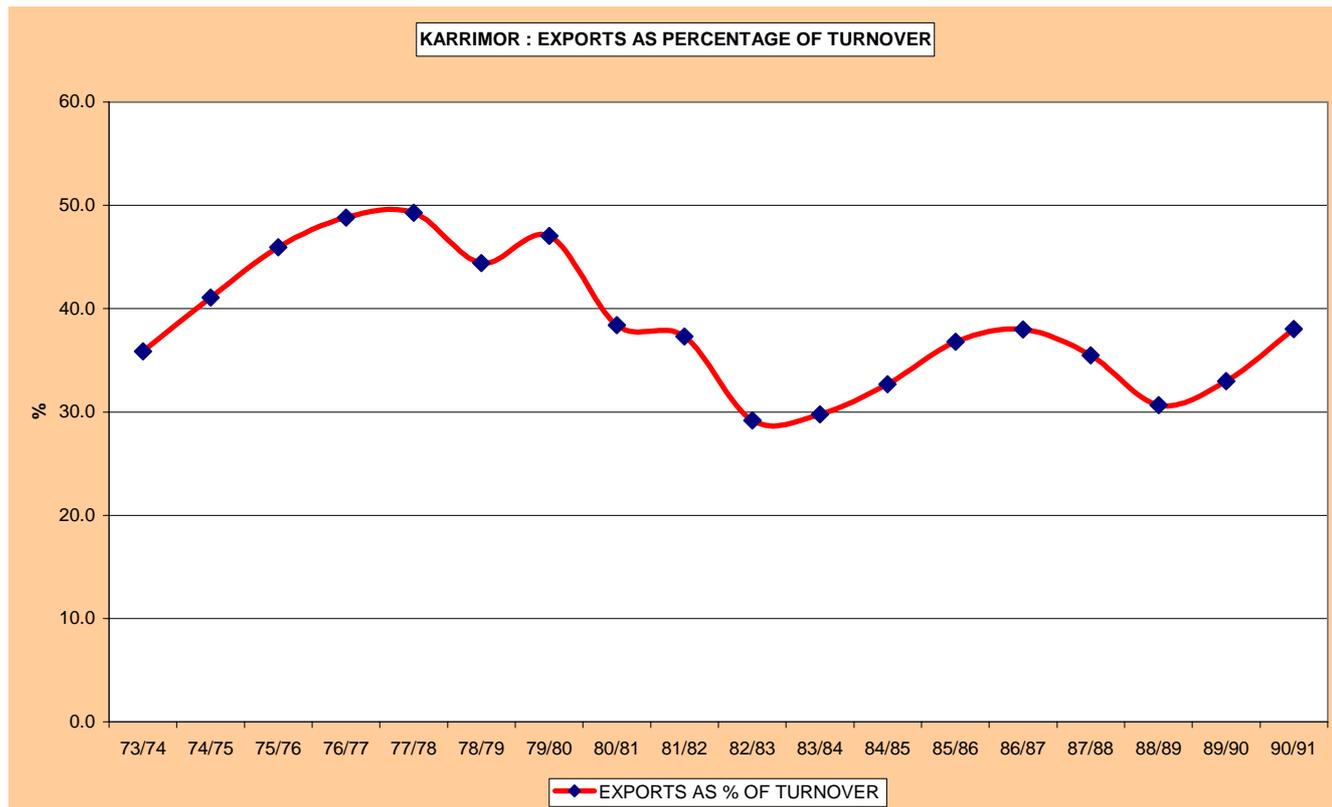
During the late 1960s Parsons began to shift rucksack production into nylon and encountered difficulties with the PU coating which regularly peeled off. This resulted in discussions with their supplier, Gordon and Fairclough of Darwen. This small company was founded in 1971 and had worked closely with Courtaulds before moving into PU coatings. The discussions were robust and ultimately creative as Karrimor product manager, Eddie Creig, recalled:

‘ “How can you expect to have the correct material if you don’t speak to the people who know what coated fabric is” ? They asked. The resultant meetings always seemed to me the main reason why we have lead the field in our section of the leisure industry... In subsequent years I got to know the dyer that our coaters were using at that time. It was most important that the fabric was properly dyed and only by close contact between dyer and manufacturer (maker up) could he have a real understanding

of what was required and why...'⁵⁶

The result of this co-operation in 1979 was the introduction of KS-100e described as 'a completely new rucksack fabric with a new elastomer coating.. The first fabric purpose designed for rucsacks' – in contrast to Cordura, the coated fabric favoured by Berghaus.⁵⁷ Confidence in the quality and performance of this fabric was such that Karrimor were able to launch lifetime guarantees on rucksacks made of the fabric. It was a radical move and a 'first' for the industry and crucial for Karrimor's competitive advantage. It was also controversial, however and some retailers viewed it merely as a marketing ploy.⁵⁸ Reliable figures have not survived which would allow quantitative testing of the impact of KS100e and the lifetime guarantee on Karrimors' performance and export figures were distorted in the early 1980s by an overvalued pound. In any event isolating a single dimension of competitive advantage of a company can be dangerous and misleading. Certainly Parsons himself is clear that this combination was a crucial move for his company and to the continued popularity of his products. In addition, Peter Lockey confirmed that the lifetime guarantee was indeed a radical step for Karrimor, which maintained its domination of the rucksack market into the 1990s.⁵⁹ In addition the company continued to export over 30% of tunrnover during the 1970s and 1980s which suggests its products were internationally competitive..

Figure 1 Karrimor Exports as a % of turnover



Source: Companies House : Karrimor Annual Reports, 1973-2000

In the context of this article the development of KS-100e and the related lifetime guarantee, demonstrate the role of Lancashire's hidden legacy in the finishing trades for a leading British outdoor company. The consistent and open dialogue between Parsons and Creig and Gordon and Fairclough created a level of understanding which allowed the fruits of this legacy to be applied to the development of consumer goods. It was a genuine innovation dialogue, which benefited both parties.⁶⁰

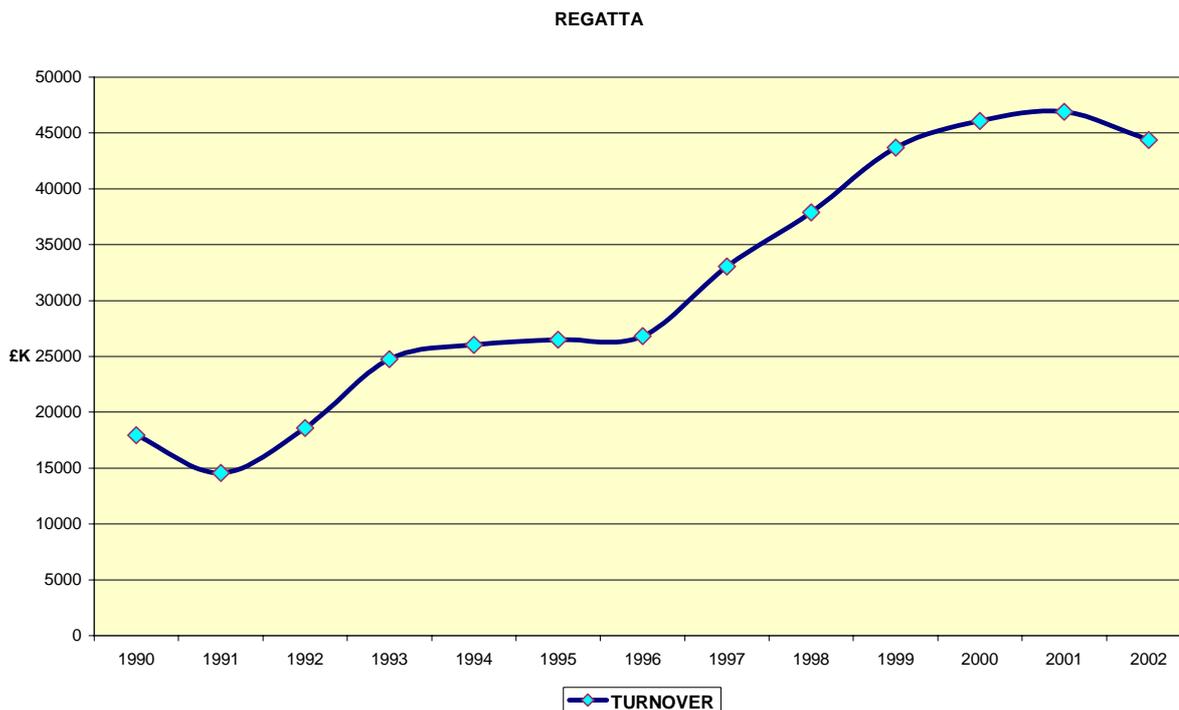
Currently Britain's largest outdoor brand is Regatta with sales totalling £46.2m in 2001-2.⁶¹ The company was a relative late comer to the outdoor trade, yet one where Lancashire's legacy of the rainwear sector, firmly underpinned by sustained dialogue, was a crucial advantage. This new outdoor player appeared in 1990. Risol –to be renamed Regatta in 1996- was a sales led company which set out to capture the general as opposed to the specialised outdoor market.⁶² Their owners saw an enormous potential market for cheap breathable waterproofs for the general

walker – from the casual country walker to urban dog walkers. They were right as there was an estimated 10m occasional walkers in the UK in 1995.⁶³ Good breathable waterproofs in the 1990s were expensive and arguably the vast majority of walkers did not venture onto the hills and were probably over-equipped. Of course some jackets, like the Berghaus Trango, were bought as much as fashion and status symbols as for the hills. The Blacks, who owned Risol, had been Lancashire rainwear manufacturers from the 1930s and, like Noel Bibby, used their knowledge of coatings and garments to build a mass market brand. Keith Black, the current MD of Regatta, drew a clear line between his family's textile clothing background and the sports and mountaineering enthusiasm of many in the outdoor trade. It was this background and the use of offshore manufacturing which he believed allowed Regatta to break the mould by producing the first mass market, affordable, breathable clothing using the Isotex coating⁶⁴. According to Black, Regatta did this

‘by working with textile mills and through close personal relationships within the Lancashire area... you know, in fact two of my best friends are fabric importers and he brought in the fabric, and another of my very close friends has a coating plant and ... the technology became available... We used to buy the fabric out in Asia, bring it into this country, coat it here, then send the garments back to be manufactured and then brought it back here and the price was amazing, it just hugely opened up the market place, because until then all the breathability was basically Gore-Tex or Sympatex. We have quite a fascination with fabrics and are constantly looking for the next fabric.’⁶⁵

Turnover grew consistently during the 1990s as Figure 2 suggests and profits averaged £25m per annum 1990-2000.⁶⁶

Figure 2 Regatta Turnover (£000) 1992-2002



The networks based upon Lancashire's neglected legacy provide some important insights into the innovation process in the predominantly small and medium sized companies which dominated the UK outdoor trade. Typically companies such as Karrimor, Peter Storm and later Regatta did not have large internal R and D departments and nor did they directly employ scientists to conduct sophisticated chemical research. Knowledge of the functional demands of their products led them to seek collaborative arrangements with other companies. In turning to Baxenden Chemicals, when he was looking to develop breathable garments,, Noel Bibby was drawing on decades of knowledge of coatings from scientists in Baxenden's Applied Chemicals Division. Moreover, by this time Baxenden was part of the US based Witco Chemical Group which significantly increased its research capacity.⁶⁷

However, successful collaboration is based upon mutual gain and, by collaborating with Peter Storm, Baxenden gained a partner keen to undertake the crucial product testing that turns an invention into an innovation. Gordon and Fairclough Ltd , was a a very different kind of company from Baxenden. Unlike Baxenden, with its large R

and D capabilities, Gordon and Fairclough were themselves an SME which worked under contract developing technical coatings on behalf textile users like Karrimor. Chemical knowledge was needed for this kind of work but this was provided by their sales director, Rod Chambers, himself a chemist, rather from the work of large laboratories.⁶⁸ Family owned Regatta was far larger than firms like Karrimor, but it is also clear that the Blacks relied on the supply chain for textile innovation rather than on in house activity.

So far discussion has centred upon the impact of the Lancashire coatings industry on the outdoor trade. It has shown the way in which Lancashire's skill base, derived from rainwear and associated chemicals and finishing industries, often stimulated the establishment of new companies and new developments which underpinned the competitive advantage of outdoor products. Much of the initiative in fabric development has shifted to the United States and Japan since 1970 and Lancashire textile manufacture has collapsed. In the changing world of the twentieth century the only markets in which textile producers in a developed economy could hope to maintain competitive advantage were those demanding high performance, high value added products. It has been shown that Lancashire had enjoyed considerable competitive prowess in high performance textiles for outdoor sports before the Second World War. A range of factors including war-time utility schemes, inexperience in Continental European markets, supply side weaknesses, structural changes and government policy, made it hard for firms at the lower end of the market to shift in ways which might have stemmed Lancashire's decline.⁶⁹ However, for some specialist firms, a deep and lengthy knowledge of high performance fabrics brought with it a crucial legacy from Lancashire's past, which has impacted on

product development in the outdoor trade.

Neither Burberry nor Grenfell remained significant players in the outdoor sport market after the Second World War, although Ventile remains a high performance outdoor fabric –especially for polar exploration.⁷⁰ One company where expertise and knowledge of high performance fabrics has evolved from the early twentieth century to have a major impact on product development for the outdoor trade world wide is Perseverance Mills Ltd of Padiham in Lancashire. Founded in 1901, the company manufactures Pertex., the almost micro-fabric which has revolutionised the development of breathable wind proof shells, and covers for sleeping bags and the design of down clothing. Pertex is used for a range of other products, including parachutes and clothing for extreme sports.⁷¹

Perseverance Mills was founded in 1901 by Herbert Noble and produced grey cloth for the Indian market up to 1914. Its move into high performance fabrics came during the First World War with a shift into balloon fabric for barrage balloons to guard against anticipated German air raids. The shift into industrial and technical fabrics continued post war and the firm also moved into typewriter ribbon manufacture and into synthetics in the interwar period. By 1925 their product mix was listed in *Skinnners' Cotton Trade Directory* as follows:

‘ Aeroplane cloths, artificial silk, artificial silk fancies, austrias, balloon cloths, brilliantes, cambrics, cellulars, doria stripes, fancy figured cloths, hair cords, jaconettes, (fine) lawns, limbricks, linings shot), lustres, mercerised cotton, fancies, mock lino, fine muslins, pongees, poplin stripes, poplins, pyjama cloths, shadow stripes, shirtings, typewriter cloth, umbrella cloths, voiles, warp satins’⁷²

Their position in the specialist textile sector was further reinforced in the Second World War when the company became a major Air Ministry and Admiralty supplier .

This continued post war with accounts for balloons, air, dinghies and life rafts for Air and Sea rescue. Typewriter and then computer ribbon – products they continue to produce – became increasingly important.⁷³ In the late 1970s Pertex, production manager Steve Laycock began applying computer ribbon technology to fabrics for the outdoor trade and Pertex was the result. This was a genuine example of new combinations resulting from applying technology understood in one sector to the products of another. It was also an example of shop floor knowledge in a relatively small company, as opposed to laboratory innovation, in the first instance. To improve the light, windproof and breathable fabric, he worked in close contact with his outdoor customers, first Hamish Hamilton and later Rab Carrington.

Pertex's ability to move moisture out of the fabric made it ideal for Hamish Hamilton's needs and he was their first outdoor customer. He used a combination of pile which also shed water and Pertex for his Gemini sleeping bags launched at Harrogate in 1985 with a clothing range based on the same principle the following year.⁷⁴ Dave Brook of the Leeds University Textile Testing Unit – who did the original tests on the sleeping bags- was impressed by the idea though pointed out that since pile was quite heavy, they never caught on in the market place.⁷⁵

Hamilton's outdoor company Buffalo was on the same Sheffield industrial estate as Rab Carrington, and Hamish put him in contact with Laycock and Perseverance. This was the beginning of a highly successful and innovative relationship which parallels the ties companies like Karrimor and Peter Storm had with their suppliers. Laycock really listened and a genuine dialogue developed which benefited both companies and crucially genuinely improved products. Superficial changes to fabrics that created cosmetic changes to products had no attraction for Rab because he was looking for were genuine improvements . Rab became the first commercial down sleeping bag

company to use Pertex. On the strength of this Carrington and Steve Laycock of Perseverance developed highly functional, versatile fabrics to meet specific needs in the outdoor trade. For Carrington Rab recalled a particularly fruitful trip to a trade show in Chamonix :

‘ We drove out and we were talking fabrics and I said , ‘Oh, you know, what we need for a fabric... that would actively move moisture from the skin, out to the outside, rather than just dispersing it, and you know, Steve said, ‘ Well I think there is a way of doing that’, and this was...before 1990, I’m sure, and he produced a fabric which lay dormant for about ten years, and it’s now one of the exciting fabrics that *Perseverance* has got, - their Equilibrium fabric, and we had been discussing this, you know and you know, sometimes the time’s not quite right for things, and you’ve got to just wait and see what happens, and bide your time’⁷⁶

Conclusions

This article has demonstrated the complexity of the legacy of cotton Lancashire and has explored the changing face of the county’s industry, even after the massive collapse of the UK’s largest nineteenth century export industry. It has shifted attention away from the much debated cotton manufacturing sector towards those parts of the industry which were more highly knowledge intensive and science based on the one hand, and linked to high value added sectors on the other. The knowledge and skill base associated with the Manchester rainwear industry proved crucial to the emerging competitive advantage of the UK outdoor trade from the 1960s. The article has shown that both old and new companies developed close synergistic relationships with emerging outdoor companies allowing the development of new combinations. Similarly analysis of the experience of the high performance fabric sector has been seriously neglected, not least because the options for moving up market were

eschewed by the majority of companies. Yet the article has demonstrated the way in which Perseverance Mills developed an innovative fabric which was to transform the performance of outdoor clothing in the 1980s and 1990s.

The collapse of spinning and weaving of cotton and of fibre production is significant, for both its scale and the impact on future innovative capacity at the top end of the market. However, the concentration of academic research on the production of yarn and cloth rather than on the consumer products produced has inevitably distorted the way in which the Lancashire legacy has been interpreted. Since innovation is about new combinations, fostered often through dynamic cluster evolution, this analysis allows greater understanding of the way new products evolved, through sustained dialogue across sectoral boundaries. From 1960 to the 1990s, there evolved a set of supply chain relationships which were crucial to the competitive advantage of the UK outdoor trade and where the relationship between textile related specialisms and outdoor companies was undoubtedly synergistic. The article demonstrates that far from being the monopoly of R and D departments in large companies innovation was based firmly in the supply chain of the outdoor trade and relied strongly on networking activity.

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