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Theme B: Production and Use of Knowledge in the Old & New Economy

REPRODUCING ARTISANAL KNOWLEDGE IN THE NEW ECONOMY: A CASE STUDY OF ENGLISH FARMHOUSE CHEESE MAKING 1850-2000

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Abstract

This paper traces the changing dynamics of artisanal knowledge production from the pre-industrial era to the inception of the digital economy. It integrates resource-based and institutional concepts within a broadly Penrosian framework. Results are presented in two overlapping phases. The first is a broad historical analysis, periodised on the basis of changes in knowledge production and associated isolating mechanisms. The second draws on a multiple case study to provide a more fine-grained account of the growth of artisanal knowledge in two firms, from formation in the mid-1950s to the present day. The final section comprises a discussion and series of concluding remarks.

Keywords: artisanal knowledge, firms, growth, networks, Penrose, production systems.

JEL codes: L23, L66, M13, N63, N64.

Introduction

Research into knowledge production in the new economy has addressed new venture formation and industrial dynamics, primarily in relation to high-technology and ‘knowledge-intensive’ sectors (e.g. Arthur 1994, 1996, Best 2001, Keeble and Wilkinson 2000). This is complemented by empirical work that has adopted a comparative stance, in order to establish the impact of the new economy on the organisation of established firms and industry sectors (e.g. Cox and Mowatt 1999, Wielemaker *et al.* 2001). There is widespread evidence of structural change associated with the introduction of virtual ‘marketspaces’ (Rayport and Sviokla 1994), including the disintermediation and reintermediation of established activity systems (e.g. in collaborative commerce and B2B procurement, respectively). Displacement of conventional processes and services by digital products has created new patterns of intra- and inter-organisational relationships, new business models and new competitive positions. Efforts to analyse these structural changes at an ‘industry’ level have pointed to a generalised intensification of competitive pressures, both within and between the ‘new’ and ‘old’ economies (Porter 2001, Werback 2000). However, while some work has been conducted on structural changes in established industry sectors, there has been little consideration of the relationship between such changes and the reproduction of knowledge by their constituent firms and related institutions. This paper takes a ‘long view’ of the changing dynamics of artisanal knowledge production in English cheese making, tracing the complex relationship between knowledge, position and industrial dynamics from the pre-industrial era to the inception of the digital economy.

Over the course of two centuries, large-scale, mechanised modes of production have largely displaced artisanal production systems, and associated knowledge clusters (Chandler 1990, Galbraith 1967, Sabel and Zeitlin 1997). However, in certain sectors residual groups of artisanal producers have survived and prospered in an otherwise transformed industrial landscape (Note 1). The resulting mixture of large and small firms challenges universalising accounts of industrial evolution, where more ‘advanced’ organisational forms supersede those of previous eras, leaving little or no trace of their forebears. While this pattern may be characteristic of the high technology heartlands of the new economy, other sectors, such as food, furniture, clothing and construction, present a more complex picture. Here, the

new economy has revealed possibilities for co-ordinating production and consumption that were unforeseen in the Galbraithian era, including novel combinations of organisational forms:

‘[S]uddenly the repertoire of economic forms deemed appropriate to current conditions contains such types as the small firm which twenty years ago were viewed as close to extinction and combinations of types – such as the small contractor collaborating as an equal with a much larger customer in the design of a new product – which were quite literally unthinkable. It is as though the prehistoric and the imaginary creatures in the industrial bestiary had suddenly come to life’. (Sabel and Zeitlin 1997: 3)

The artisanal knowledge embodied in cheese making provides a unique insight into the dynamics of knowledge production in the ‘old’ and ‘new’ economies. Like many everyday products, cheese is amenable to both hand-crafted and mechanised production processes (Boissard and Letablier 1997, Kupiec and Revell 1998). However, it is unusual in that both artisanal and highly mechanised cheese manufacturing systems have been in operation for more than 150 years. The co-existence of these contrasting modes of production over such an extended period raises interesting questions regarding the constitutive role of this kind of knowledge in industrial economies:

- How are rents attributable to artisanal knowledge protected?
- How are knowledge flows mediated between industrial and artisanal systems?
- How has the reproduction of artisanal knowledge been altered over the period?
- How is ‘new’ artisanal knowledge created in a mechanised world?

The new economy has created a new interface between these two modes of production. The basic terms of engagement between mechanised and artisanal knowledge are being transformed, as mass production technologies associated with the ‘Old’ economy are replaced by dispersed and networked production systems. The nature of the new ‘embrace’ remains somewhat ambiguous. On one hand, it appears to present attractive opportunities for independent action on the part of artisanal producers, through transformed governance mechanisms (e.g. the role of Internet in facilitating disintermediated ‘global niche’ marketing). However, there is also evidence that artisanal producers are entering into closer engagements with large ‘networked’ corporations, raising the prospect that long-standing strategic positions may be eroded (Blundel and Hingley 2001). The argument presented in this paper is

that the key to these contemporary questions is to draw on insights arising from the extended period of co-existence that has characterised this industry sector.

The paper is organised as follows. The first two sections introduce the conceptual approach adopted and outline the research methods and data sources. The following section is an historical analysis of the changing position of artisanal knowledge in this industry over an extended period, from the mid-19th century to the present day. The final section comprises a discussion and series of concluding remarks.

Conceptual framework

Knowledge is an ill-defined and problematic concept, which cannot be applied meaningfully without a degree of disaggregation and contextualisation (Spender 1996: 48). This paper adopts a broadly Penrosian approach, in which the firm is the, ‘locus of the production and application of a “local science”’ (*ibid*: 50), adapting the body of explicit and tacit knowledge shared by its constituents under the ‘authoritative communication’ (Barnard 1937, Boulding 1957, Penrose 1959: 20) of its managerial team. While artisanal knowledge is recognised as being of a different order to that associated with ‘high-technology’ firms (Note 1), the paper contends that many characteristics, including its creation, modification and ‘transfer’ across network dyads are amenable to similar analytical techniques (Birkinshaw and Hagström 2000, Bianchi 2001, Lam 1998). The analysis combines the two main strands of the resource-based perspective (‘RBP’) with recent work on the co-evolution of firms, networks and industries. The first strand equates to Foss’s (1997) Demsetzian classification ‘RBP Mark I’ (e.g. Barney 1991, Demsetz 1973, Lippman and Rumelt 1982, Rumelt 1984), and seeks to identify isolating mechanisms in each period (Note 2). The essentially static analysis of rents attributable to artisanal knowledge is complemented by the application of Penrosian ‘RBP Mark II’ concepts (e.g. Best 1990, 2001, Itami and Roehl 1987, Penrose 1959, Teece *et al.* 1997), in order to explore the processes associated with the reproduction of artisanal knowledge at firm and network levels (Penrose 1996). Some association between these concepts can be found in recent knowledge-based theorising in the strategy literature (e.g. Grant 1996, Kogut 2000, Spender 1996), and in the problematisation of resource-capability concepts by organisation theorists (Scarborough 1997, Clark

2000) and economists (Foss 1997a, 1999b; Loasby 1999a, 1999b). The firm-level focus of the RBP is extended by drawing on multi-level, co-evolutionary approaches (Barnett and Burgelman 1996, Lewin and Volderba 1999, Lewin and Koza 2001, Nelson 1995), including recent empirical studies in this area (e.g. Jones 2001, Huygens *et al.* 2001, Windeler and Sydow 2001). The distinctively Penrosian fusion of RBP Marks I and II is proposed as having the potential to integrate firm-level analysis with a co-evolutionary explanation of higher-level changes (Note 3). Foss (1997a, 1999), Loasby (1999a, 1999b) and Pitelis (2002) have argued that Penrose's (1959) contribution remains under-represented; other recent empirical studies adopting elements of the Penrosian approach include Best (1990, 2001), Garnsey (1998) and Kay (1997).

Research methods and sources

In common with other recent work in this area (e.g. Huygens *et al.* 2001: 981), the investigation is conducted in two overlapping stages. This serves to clarify processes occurring at different levels of analysis. The first stage is based on an historical study of cheese production and consumption from the inception of industrialised modes of cheese production in the mid-19th century to the emergence of the New Economy. This is presented in the form of a broad periodisation, based on changes in the isolating mechanisms that underpinned the structure of the industry. These are associated with changes in the cumulative growth of knowledge related to artisanal production and consumption. The study drew on archival materials and historical accounts, which were analysed in the form of a 'production narrative', relating to the changing modes of cheese making in England and a parallel 'consumption narrative', which focused on changes in the markets for English cheese. The second stage is based on a multiple case study of the growth of farm-based cheese making firms, which were established in early 1950s. The case-based account is a more fine-grained analysis of the changing productive opportunity of each firm, acting as an exemplar of the contrasting patterns identified in the latter periods of the historical study. The fieldwork, which provided the main source of primary data, involved visits to several small cheese-making businesses and related organisations. Two cheese-makers were selected to provide the focus for the main empirical study and the analytically structured narrative upon which it draws (Note 4). The first set of interviews and visits took place in March 1998, with a second set of visits in August 2000. On each occasion, semi-structured interviews were conducted over several

hours, using an *in-vivo* approach. The informal checklist of topics was used, giving scope for respondents to express views in their own terms (Miles and Huberman 1994). The researcher also spent time observing the cheese making process at each farm and made visits local retail outlets in order to follow-up issues relating to the distribution of the cheeses. Checklist topics were prepared in consultation with dairy sector specialists and were piloted with the help of a dairy farmer and cheesemaker. Each interview was recorded and subsequently transcribed in full. In each case, it was possible to verify details for the earliest period (i.e. the early 1950s) with family members who were directly involved in operating the business. Follow-up calls were made to confirm the accuracy of the transcript material and to resolve outstanding issues. The second set of visits took place during mid to late August 2000. The aim was to collect data on changes that had occurred in the intervening period, to generate additional data on the history and networking activities of each firm and to clarify a number of points raised during the earlier fieldwork. The interviews also provided an opportunity to outline the main arguments emerging from the research, and to seek the respondents' views on their explanatory value and practical relevance. Given the practical constraints, notably the respondents' limited availability for face-to-face interviews, questioning was again based around a prepared semi-structured checklist. These were based on a review of the original transcripts, in the light of subsequent developments in the firms and in the wider context, notably the growth in Internet-based retailing of specialist food products. In addition, respondents assisted in two practical exercises. First, they were asked to clarify and to add relevant details to a draft chronological chart that had been prepared for each firm. Second, they were asked to comment on an initial draft series of ego-centric network maps that had been prepared by the researcher, based on his understanding of the 'critical events' in the history of the business. The maps were based on a detailed analysis of the 'Phase One' interview transcripts, combined with a thorough review of the secondary sources. During the 'Phase Two' interviews, the researcher took care to explain the format of the maps, and to emphasise that they were provisional and open to revision. The researcher's script encouraged respondents to comment on the hand-drawn drafts and to propose any changes they considered appropriate. In the event, the respondents were keen to assist in re-drawing the network maps, both during the interviews and in a series of exchanges of correspondence in the following weeks. The draft maps were also used during the interview as prompts to inform the concluding questions, which focused on network flows and dynamics and their impact on managerial perceptions and action (Blundel 2002a).

Analysis: the reproduction of artisanal knowledge

The following section summarises a detailed analysis of the co-evolution of competition and knowledge production in the English cheese making industry, from the mid-19th century to the present. The focus throughout this period is on the changing position of the artisanal producer. The main periods have been classified on the basis of knowledge production and prevailing isolating mechanisms (Figure 1). The accompanying narrative provides a more rounded explanation. In each period, an outline of the nature and context of artisanal knowledge production is identified. This knowledge dynamic is linked to the isolating mechanisms in order to clarify the basis for heterogeneity at the relevant levels of analysis.

Localised collaboration and competition: the pre-industrial era (pre-1850s)

The first major advances in English cheese-making arose as a consequence of the Roman occupation. Garrison towns, such as Chester, became centres for cheese-making and marketing Roman cheese-making capabilities were spread through the common practice of discharging soldiers with a grant of land around these towns. Columella's first century agricultural treatise, *De Rustica* was an early codification of production knowledge, directed at this audience of soldiers-turned-farmers. It was, however, lost to later generations, along with the associated physical infrastructure of transportation and markets. During the centuries that followed the fall of Rome, cheese making practices were maintained within England's religious communities. Practical skills were disseminated by itinerant monks, who travelled to communities throughout England (Smith 1995: 4, Cheke 1959: 83). With the dissolution of the monasteries in the mid-16th century, the bulk of cheese production migrated to the farms. At this time, cheese-making became the prerogative of women, specifically the wives and daughters of farming families. As the amount of land in enclosure increased during the 17th century, there was a generalised move from ewes' milk to cow's milk production as the wool industry came to dominate England's rural economy. The expropriation of common land destroyed the livelihoods of smaller farmers. The owners of the enlarged estates began to focus their attention on ways of increasing the returns from agricultural enterprises, including dairying. Enclosed land was 'improved' by ditching and hedging that was better suited to the rearing of cattle. It allowed greater control over livestock, including selective breeding and managed feeding, which served to increase yields (Hickman

1995:18). England's best dairying areas were the counties of Cheshire and Somerset, which developed very large 'dairies' (herds of milk cows), resulting in a surplus of raw milk:

'In 1658 it was noted that the Cheshire farmers made 'a greate store of butter and cheese ... beyond what was required for domestic use'. Cheddar cheese was acquiring popularity (a fact noted by Samuel Pepys), for the wealthy townspeople were beginning to enjoy the superior products sold off the farms'. (Cheke 1959: 101)

Localised collaborative methods of cheese production were adopted in areas, such as the Cheshire Plain, as a means by which this highly perishable surplus could be converted into a marketable product. These novel methods, and the processes of knowledge sharing and capability development that they implied, were observed by a late seventeenth century traveller and diarist:

'Thence I went to Nantwich five long miles [...] from Nantwich to Chester town fourteen long miles the wayes being deepe [...] this is a pretty Rich land but what I wondered at was that tho' this shire [i.e. county] is remarkable for a greate deale of greate Cheeses and Dairys, I did not see more than twenty or thirty Cows in a troupe feeding, but on Enquiry I find ye Custome of ye Country to joyn their milking together of a whole village and so make their greate Cheeses'. (Fiennes [c. 1695-1697] cited in: Cheke 1959: 109, Smith 1995: 35)

The production of 'greate' (i.e. large) cheeses signalled the emergence of regionalised markets in pre-industrial England. The basis for competitive advantage in these early markets arose from a combination of pre-existing natural resource endowments (i.e. fertile grasslands, and in the case of Cheshire, salt deposits), the cumulative growth of localised capabilities (i.e. primarily in breeding productive dairy cattle and in cheese manufacture) and other locational factors, including proximity to population centres and transport connections. Product differentiation, based on the growing reputation of particular cheeses, such as Cheshire and Cheddar, provided an additional isolating mechanism in this period. The interaction of these mechanisms can be illustrated by the case of 'Red Cheshire'. Coach travellers on the transport artery between London and Holyhead (n.b. the major coastal port North Wales for sailings to Ireland) were supplied with Cheshire cheese. The popularity of this variety prompted some unscrupulous local farmers to 'pass off' their products as Cheshire. This imitative challenge encountered a surprisingly 'strong' appropriability regime (Teece *et al.* 1997), yet its effects were undermined by the characteristic unpredictability of consumer preference:

‘Pressure was applied to make the Welsh farmers colour their product red so as to distinguish the inferior cheese from true Cheshire, but, just to show how contrary customers can sometimes be, the red colouring proved so popular that the Cheshire makers found themselves obliged to add it to their cheese’. (Smith 1995: 35-36)

The red colouring failed in its initial task. However, it provided the basis for an additional, though inadvertent, source of differentiation, when artisanal producers of Cheshire cheese exploited this image-related isolating mechanism in the ‘industrial’ era.

* INSERT TABLE 1 ABOUT HERE

The ‘cheese factories’: formative industrial-artisanal (1850s to early 1930s)

Throughout the second half of the 19th century and into the early years of the 20th century, all of the main English regional varieties were influenced by the application of scientific methods in the pursuit of more consistent and reliable products, with lower wastage. However, Cheddar was in the forefront of the changes. Cheddar was identified as being particularly amenable to ‘improvement’, and the methodical experiments of several Cheddar makers were formalised into ‘systems’ involving precise control of key variables such as temperature and acidity. Innovation in production methods was driven by increased competition from imported cheeses, initially from the Netherlands. However, the new industrialised methods were open to imitation. Entrepreneurial manufacturers in Canada, the United States, New Zealand and Australia adapted the Cheddar system for large-scale manufacture (Note 5). These new production capabilities were extended through the exploitation of emerging transportation and storage technologies, notably railways, steamships and refrigeration. This led to an influx of cheap imported cheese, which served England’s growing and highly urbanised mass market. Foreign competition prompted moves to establish domestic ‘cheese factories’. However, resistance from established interests contributed to a slow introduction. England’s first cheese factory opened in 1870, approximately 20 years after the inception of American factory system. By 1911, only 18 per cent of domestic consumption was home-produced, most of which continued to be sourced from farms (Cheke 1959: 244, Rance 1982: 132). English cheese factories had operated as a pool for unwanted raw milk, rather than as a dedicated base for continuous production; this reinforced their relatively minor role in

production in this period and contributed to a damaging reputation for inferior quality output. Hence, the primary competitive threat faced by farmhouse cheese makers was from imported factory products:

‘Farmhouse cheese was still accounting for some three quarters of the country’s output [in the late 1920s], and the best of it fetched a higher price on a specific market than the imported cheese. [...] Unfortunately, only a proportion of the farmhouse cheese was of the highest standard, the remainder was very variable and often inferior in quality [to factory and imported cheese]’. (Cheke 1959: 250)

The increasing penetration of imported cheese, primarily Cheddar derivatives, contributed to the decline and exit of artisanal producers in locations that were marginal in relation to the isolating mechanisms of the pre-industrial period. Instability in the milk market and disruptive events, notably the First World War, accelerated the withdrawal from farm-based artisanal production. The basis for competitive advantage amongst surviving artisanal producers included a capability to service premium markets associated with particular varieties such as Stilton and Red Cheshire (Rance 1982), often via long-established linkages with specialist wholesalers. Other strategic positions were based on residual local loyalties (e.g. for Caerphilly cheese). These long-term trends prompted public initiatives, notably investment in agricultural education and generic product promotion. There were also periodic expressions of concern from elite consumers, seeking to address what one polemicist described as, ‘the neglect of English cheese generally, and to the gradual attrition of English cheeses by foreign invasion and native indifference and ignorance’ (Squire 1937: 11) (Note 6).

In suspension: regulated industrial-artisanal (early 1930s to late 1980s)

The fundamental problem for both artisanal and factory producers was the cost of the primary ingredient, raw milk. Following extensive research, statutory authorities for the milk and dairy industry were established in 1933. The Milk Marketing Board for England and Wales (MMB) remained in existence until 1994. In some respects, this period saw a suspension of competitive interaction between artisanal and mechanised production, through tight controls on the quantity, quality and volume of cheese production, and similar controls on milk supplied for manufacturing. However, there was also a major discontinuity. During the Second World War, the Government introduced a series of strict controls on agricultural production. This included the cessation of farmhouse cheese making, and the transfer of all milk supplies to the cheese factories for the manufacture of six

designated pressed cheese varieties. The policy had profound and lasting effects on both production and consumption knowledge in this national context. Artisanal production was decimated, and large-scale production was concentrated in cheese factories, which were now known as ‘creameries’ (Table 2). Quotas, pooled milk supplies and standardised grading procedures reduced variety, and the fixed pricing system removed incentives for product differentiation and engendered modified practices at the level of the firm. The knowledge of consumers was also shaped by the years of rationing, reinforcing pre-existing mass market preferences for Cheddar and other designated varieties (Note 5).

* INSERT TABLE 2 ABOUT HERE

When wartime restrictions were eased in the early 1950s, many English dairy farmers took the opportunity to (re-) establish on-farm cheese dairies. The remaining sections draw on the fieldwork research, which produced a detailed account of two successful artisanal producers. The names of the two firms are Appleby’s and Belton (n.b. Blundel (2002a) is a more elaborate presentation of this aspect of the study). The return to artisanal cheese making took place in an intensely regulated market. The MMB continued to operate as the sole purchaser of milk from its farmer members, and the sole seller of milk to the processing sector. In addition, all farm-made cheese was sold exclusively through the MMB and its agents. At this point, the focal firm networks of both firms contained similar linkages, both ‘upstream’ and ‘downstream’. Belton differed in one important respect, having an additional link to the MMB, providing additional milk supply for cheese making. The current owner-manager commented that this link reflected his grandfather’s entrepreneurial skills in securing supplies from a highly regulated monopoly and in making use of existing on-farm storage facilities (Blundel 2002a: 9-10). This contrasted with Appleby’s approach, which was to limit cheese production to milk available from the farm’s own dairy herd. However, these differences in raw materials sourcing and consequent scale of production had little immediate effect. Like all artisanal producers, both firms were required to deliver a similar product during the period of post-war regulation, typically, a large (50lb / 22.7kg) cheese, which was collected weekly by the MMB, or their agents. Payment was on a fixed scale, based on a pool price. Cheeses were graded by the MMB, on the basis of which a bonus payment was calculated. Neither firm had any control over, or awareness of, the subsequent cutting, packaging, distribution and retailing of their product.

De-regulation: divergent industrial-artisanal (late 1980s to present)

There was an appearance of stability in the institutional rules, isolating mechanisms and in the capability development of these firms over a period of thirty years (i.e. from the early 1950s to the early 1980s). However, managers of both firms detected changes arising from the introduction of an increasingly powerful network actor. The expansion of multiple food retailers created pressure for rationalising changes in product specifications to facilitate pre-packing and ease of storage. The two major product innovations of this period were to form cheeses into large rectangular blocks and to add a wax coating to traditional cylindrical cheeses. These changes presented an obvious challenge to established artisanal practices. Some farm-based producers, including Belton, began to supply cheese in the block format, suited to pre-packing, whilst others, including Appleby's, retained traditional practices. The change is highlighted in the following extract from an interview with the cheese maker:

That was when it started splitting up. There was people like ourselves who remained traditional, making calico [i.e. cloth-wrapped cheese], there was traditional cylindrical cheeses that started to wax, and then some of them expanded and made block cheeses. So, instead of all making traditional calico-bound cheeses, this is farmhouse makers now, it split into three categories really, and that is how it has remained now, just leaving ourselves [...] we're the only ones cloth binding.

This three-way product categorisation introduced a strategic isolating mechanism that shaped subsequent capability development. Block cheese makers pursued a trajectory that took them closer to the supermarkets and hence to a more industrialised production system. They grew in terms of output, and now occupy the intermediate grouping of small-medium producers, most of whom are now engaged in supply relationships with multiple retailers. Belton's subsequent development appears characteristic of this process. In the initial period of full deregulation (1994-1998) Belton's network architecture was still essentially unchanged, as the firm continued to work with the MMB's successors. There was considerable evidence of isomorphic pressure (DiMaggio and Powell 1983), as the firm adopted certification schemes and processes associated with the larger industrial producers. Capability development was also influenced by a close collaborative relationship with Dairy Crest, an MMB successor firm that had become a category manager for many of the larger multiple retailers. This collaboration extended to the employment of a former Dairy Crest manager to act as a quality manager. However, contrary to some 'path dependent' interpretations, the firm has also displayed a recurrent capacity to reflect on changes in prevailing isolating mechanisms. Belton's strategic choices in this

period exemplify the process of managerial conjecture in relation to resources, capabilities and unfolding productive opportunity (Penrose 1959: 31-31, Loasby 1999b). Three examples illustrate the process. First, the fieldwork revealed a retrospective recognition that block cheese production in the period between the late 1960s and early 1990s had eroded the firm's traditional basis for product differentiation. This was addressed through the re-invention of earlier practices, including a reversion to network connections that had been lost in the preceding period (Blundel 2002a: 15-16). Second, between the first and second stages of the fieldwork, the firm made a fundamental change to its milk supply network, negotiating direct contracts with local farms in order to ensure greater control over the composition and consistency of its supplies and to meet the increased 'traceability' requirements of its multiple retailer customers. Third, the firm exploited its newly developed capabilities in milk sourcing in order to pursue the previously resisted productive opportunity in organic cheese production. This has involved the formation of international links, to overcome a short-term shortfall of domestically-produced raw milk. Belton is also converting its own farm to organic production, and is assisting in the conversion of farms in its supply network, in anticipation of a future requirement for local sourcing.

The course followed by those small firms that did not produce block cheese is more complex, but the Cheshire cheese case is illustrative. There has been a steady decline in the overall numbers, from ten artisanal producers in production at the introduction of block cheese, to three that remain active today. The survival of artisanal producers such as Appleby's has been based on the firm's ability to establish new strategic isolating mechanisms that have proved appropriate to the changed institutional context arising from de-regulation. Until the early 1980s, the Appleby's continued to sell all of their cheese direct to the Milk Marketing Board (MMB). Their standard product was still the large (50lb / 22.7kg) cheese, at a volume of approximately 12 cheeses per day over a five-day week. However, deregulation of the dairy industry provided artisanal cheese makers with a new productive opportunity (Penrose 1959: 31-32) of selling direct to the market. The Appleby family took this opportunity, and in 1982 established contact with a specialist retailer in London and delivering cheeses to several retail and wholesale customers, initially using the family's own Land Rover. It proved to be a very effective promotional device, establishing a distinctive image and reputation, primarily by word-of-mouth. Today, Appleby's has a customer base of between 60 and 70 specialist retailers and distributors. The spread of customers has a pragmatic logic (i.e. 'nobody owes us very much at any one time'), but it

also reflects the family's ethos, which is to build close relationships with firms committed to supplying a traditional product. These reputational and network resources have bolstered the existing artisanal knowledge to provide what might be regarded as an 'extended' and highly differentiated product. The producers are fully aware of the role of these resources in providing a defence against commoditisation; their reflection on these developments being that, 'Basically, we've built a brand, haven't we? [...] In this day and age, brands are wonderful things!' (cited in: Blundel 2002a: 14). The firm has experienced an increase in regulatory pressure, an institutional development that has affected the food industry as a whole. However, by virtue of its specialist delicatessen supply network, it has avoided the extensive certification programme embarked on by firms such as Belton.

The new economy in perspective?

The most obvious signal of change in this industry sector has been market entry by on-line specialist food retailers and a migration of existing firms into 'surf and turf' hybrids. There have also been changes in procurement, with further disintermediation in the supply chains of multiple retailers. These changes have prompted different responses from artisanal producers, reflecting their distinctive trajectories, capabilities and isolating mechanisms. For example, Belton has established a web presence (www.beltoncheese.co.uk) on a site that offers detailed information on the firm's products and its heritage. However, it has been designed for 'business to business' interaction; the firm has not developed an independent retail facility. For Appleby's, the new economy was first experienced as an increasing pressure from wholesale customers to supply smaller, packaged cheeses that could be distributed directly via mail order. Their reluctance to produce for this market reflected long-established views regarding the integrity of their artisanal product (Blundel 2002a: 24). Despite close downstream relationships with conventional retailers, the firm has not established direct connections to e-retailers. During the fieldwork interviews, several online delicatessen sites were identified. 'Mrs Appleby's' Cheshire cheese could be obtained from English sources (e.g. www.norburys.co.uk), but was also available to consumers in San Francisco (www.projecttruffle.com) and in Seattle (www.jamescookcheese.com), along with detailed product information and interpretation. The Appleby's perceptions of this productive opportunity were via *informal* connections with others who had experimented with the specialist food retailing via the Internet, and through reflection on previous experience in supplying conventional mail order firms. As a consequence of this interaction, the firm's

managers had identified additional capability requirements and remained understandably cautious regarding their direct participation in the new economy:

‘[D]istribution is a problem, distribution is expensive, and you’re talking about guaranteeing next day delivery and all this sort of thing. Well, we’re not – it’s just not something we’re geared up necessarily to do ourselves, but we’ve got to support these people who are trying to do it [...] I don’t know if it’s going to be as wonderful as everyone makes out, is it?’ [laughter] (cited in Blundel: 2000a: 20)

Discussion and concluding remarks

This paper has investigated the ‘recombinability and interpenetration’ of different forms of economic organisation (Sabel and Zeitlin 1997: 2), through an examination of one industry sector over an extended period. The analysis has sought to clarify the complex interactions that have shaped artisanal knowledge production over a period in which mechanised processes have come to dominate the food industry. The approach adopted has been to connect a Penrosian resource-capability dynamic to prevailing isolating mechanisms. This combination appears to have considerable explanatory potential, in efforts to explore the co-evolution of firms, networks and industries (Koza and Lewin 2001). Above all, it allows an exploration of firm-level agency and strategic choice (Child 1972, 1997) to be incorporated into a multi-level framework:

‘Strategic isolating mechanisms are central to the resource-based view; however, few studies explore the processes by which firms gain or destroy them’. (Jones 2001: 937)

One important limitation in approaches of this kind is that the complexities of narrative detail tend to ‘crowd out’ the fundamental relationships. However, it is possible to identify a basic tension that has been a common factor, or ‘generative mechanism’ (Jones 2001, Pentland 1999, Reed 2001, Tsoukas 1989), driving these processes over an extended period (Figure 1). The basic tension, which can be interpreted in terms of ‘cost versus differentiation’, resolves into a ‘quantity versus quality’ argument (Note 7). This tension has been explored through two knowledge-related ‘narratives’, one centred on production and the other to consumption. The structure and dynamics of both mechanised and artisanal

modes of cheese production, and their associated knowledge bases, has been explained in terms of the interplay between these narratives. Artisanal knowledge has been reproduced differently over time in this industry sector, engaging different configurations of firms and other network actors in response to the shifting balance in the underlying generative mechanism. Isolating mechanisms have also altered, reflecting the influence of particular actors (e.g. governmental agencies, multiple retailers) and ‘structure-loosening events’ (Madhavan *et al.* 1998) (e.g. wartime regulation, market liberalisation). As a consequence, the strategic ‘positions’ and underpinning capabilities of artisanal cheese makers have been transformed in the periods identified, contributing to the co-evolutionary effects at the levels of the firm and the industry sector. The paper focused on the ‘successful’ trajectories of surviving artisanal firms in this industry sector. However, the analytical approach could be extended in order to account for the systemic failure of firms in specific periods (Note 8). The concluding remarks summarise the findings and point to some outstanding issues.

* INSERT FIGURE 1 ABOUT HERE

The paper has indicated two divergent trajectories, illustrated by the firms profiled. The impact of these trajectories on the reproduction of artisanal knowledge highlights the temporally and spatially situated nature of these processes (Spender 1996). This divergence echoes Jones’s (2001) study, which argued that the American film industry was shaped by two contrasting entrepreneurial strategies arising from distinct groups of entrepreneurs. The outcome of the co-evolutionary process for ‘content firms’ and ‘technology firms’ was shaped by the application of different sets of isolating mechanisms, including property rights and strategic networks, and by interaction between these mechanisms and by the capabilities engendered in firm-level practices. As in the cheese industry, changes in consumer preferences proved a decisive factor in the fortunes of specific firms and contributed to a re-shaping of the industry. In film, the technology firm’s early ‘economising logic of action’ became a source of competitive advantage as a result of the ‘crisis in narrative’, prompting a shift in capabilities from technology to content, an influx of new entrants and the failure of most of the original firms (Jones 2001: 930-932). Similarly, in cheese, the productive opportunity of artisanal producers was influenced by a resurgence and subsequent dissemination of elite consumer preference. The first instance was identified between the late 19th and early 20th century, when concerns over the perceived decline of

traditional varieties appeared to strengthen existing network connections between premium producers and retailers. A similar configuration was detected in the late 20th century, and was exploited by those producers who abandoned the established MMB network in order to forge new connections with the emerging specialist food wholesale and retail markets. In the Appleby case, artisanal knowledge was preserved by leveraging it through entrepreneurial networking (Johannisson 2000). The Belton case indicated a re-discovery of artisanal heritage, which has also provided an additional isolating mechanism. This, in turn, was secured on consumer demand for premium and speciality products, mediated by the multiple retailers and their category managers (Kupiec and Revell 1998).

Porter (2001: 78) has argued that the Internet was, ‘often not disruptive to established industries or established companies’, and that it rarely nullified the most important sources of competitive advantage in an industry. The ‘long view’ presented in this paper appears to support Porter’s proposition with respect to this industry sector. The new economy is unlikely to unleash the kinds of institutional changes identified in the turbulent history of these artisanal producers. Over the last century and a half, artisanal producers have experienced a succession of challenges. The survivors have pursued a changing horizon of productive opportunity through a Penrosian process of conjectured capability development that has also shaped the industry sector. The re-production of artisanal knowledge in the new economy will require similar levels of self-awareness and strategising, as producers seek to bolster the isolating mechanisms that shield them from the economising logic of mechanised production and multiple retailing. The new economy is likely to have differential effects on artisanal producers, reflecting the divergent trajectories that they have pursued. The full implications are yet to be realised, but some challenges to firm-level heterogeneity are already apparent. Creameries, the contemporary ‘cheese factories’, are investing in production technologies that seek to imitate the organoleptic qualities of artisanal products (Kupiec and Revell 1998). Technological innovation, regulatory pressures (e.g. for the pasteurisation of raw milk supplies) and the notoriously capricious tastes of the consumer threaten to undermine current isolating mechanisms that preserve rents attributable to artisanal knowledge. There is a strong resonance between these emerging patterns of competitive imitation and socially constructed knowledge, and those experienced during the ‘Red Cheshire’ episode in the pre-industrial era. If there is any ‘lesson’ from history, it is that the systematic effects of these interactions will remain decisive, as an ancient craft is reproduced in the new economy era.

Notes

- 1 Artisanal firms are defined, for the purposes of this paper, as drawing heavily on a core of tacit knowledge that is used to reproduce traditional and often geographically-specific practices. Many of these practices involve hand-working, which yields an inherent variability in output and idiosyncrasy in the final products (Kupiec and Revell 1998, Bianchi 2001).
- 2 The term isolating mechanism has been used refer to, ‘phenomena that limit the *ex post* equilibration of rents among individual firms’. (Rumelt [1984] 1997: 141). Oliver (1997) contrasts ‘strategic’ isolating mechanisms, which are a function of firms’ inability to acquire and imitate resources’, with ‘institutional’ isolating mechanisms, which arise from, ‘firm’s unwillingness to acquire and imitate resources’, but which may also be involuntary and exogenous, as in the case of constraints due to pressure from key stakeholders.
- 3 Following Foss (1997, 1999) and Spender (1994, 1996), this paper concentrates on interactions within and between firms, that have maintained coherent and collective bodies of artisanal knowledge in this transformed industry context.
- 4 The analytically structured narrative (ASN) has been described as generating, ‘case-like cameos in which the temporality of events and placeness of spatiality are implicated’ (Clark 2000: 113). The ASN approach is inductive, requiring the author’s ‘immersion’ in the details of the industry’s history (Jones 2001: 918) as the basis for a process of abstraction and theory-building (Pentland 1999). ASNs are constructed using a wide range of research techniques, including archival searches, semi-structured interviews, analysis of secondary data and participant observation. The intention is to embrace the complexities of unfolding structure and agency, while retaining a degree of analytical clarity. It is therefore a self-conscious attempt, on the part of the researcher, to balance subjective and objective elements in the narrative. The effort to combine the idiographic and the nomothetic extends the knowledge claims associated with case study-based research. Additional details of the research methods are reported in Blundel (2002a, 2002b)
- 5 Historical sources, including Cheke (1959), provide more detailed accounts of the standardisation of Cheddar production. In some instances, production knowledge was ‘transferred’ in direct ways. For example, one of the sons of a leading innovator, Joseph Harding, exported his father’s ‘system’ to Australia. Another son introduced the system to Scotland. Cheese consumption in England remains dominated by the Cheddar variety, which accounts for 58 per cent of retail sales. The market also remains heavily weighted towards imported products, though to a much lesser degree than was the case a century ago (Tables 3 and 4).
- * INSERT TABLES 3 AND 4 ABOUT HERE
- 6 Sir John Squire’s (1937) polemical text arose out of a correspondence in *The Times* newspaper. A French connoisseur had complained that during visits to England he was unable to obtain Stilton cheese. The following extract indicates the nature of the concern, and hence the potential for a resurgent artisanal production in this period:

‘There are few parts of England which do not remember cheeses extinct or nearly extinct. Not all of them, I dare say, deserve resuscitation; the evidence suggests, for instance, that the man who ate Suffolk cheese might just as well have been eating old motor tyres. But it was possible a century ago to travel throughout England and sample local cheeses everywhere. Today most of them are unobtainable unless in small quantities from eclectic merchants’. (Squire 1937: 13-14)

Similar sentiments have been expressed in the late 20th century, signalling the return to a similar configuration of competitive forces following the period of state regulation.

- 7 This tension has been highlighted in historical accounts of the industry. Cheke (1959: 238) noted that, ‘cheese, by its initial variation, is a product especially susceptible to the sensitive consumer. It is not therefor surprising that by 1906 some people were demanding cheese of better quality and flavour, and that writers were bemoaning the loss of “real old Cheshire cheese ... rich Stilton and fine old Cheddar”’.
- 8 The paper has focused on the reproduction of artisanal knowledge in surviving firms. However, it has also indicated the exit of many firms at various periods. The failure of artisanal producers in the post-regulation period (1980s to the present) appears to have followed their inadvertent pursuit of a hybrid strategy, retaining traditional practices while remaining entrenched in post-MMB networks. These firms did not establish either of the sets of isolating mechanisms the cheese makers profiled in this section. As a consequence, they became exposed to the economising logic of the multiple retailers and collapsed under the ensuing isomorphic pressures.

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Table 1: Isolating mechanisms and artisanal knowledge production: 1850s-2000

<i>Period</i>	<i>Isolating mechanism(s)</i>	<i>Knowledge production</i>
Pre-industrial (pre- 1850s)	Natural resource endowments Transportation systems Localised market preferences Reputation and image of premium varieties amongst elite consumers Quasi-statutory controls on imitation	Primarily communal and localised practices, including consumption Nascent territorial markets Elite consumer preferences disseminated to more widely (e.g. Cheshire, Stilton, Cheddar)
Formative industrial-artisanal (1850s to 1930s)	Natural resource endowments Transportation systems Localised market preferences Increasing competitive pressure exerted by domestic ‘cheese factories’ and imported industrial production (primarily Cheddar) Intermittent reputational and organoleptic differentiation advantage arising from counter-industrial revivals	Farm-based practices, some interaction with external actors (education, fairs, wholesale trade) Exit of many artisanal producers, loss of ‘traditional’ varieties and increased penetration of mass market industrial products Recurrent ‘revivalist’ movements amongst elite consumers increase awareness of distinctive varieties and organoleptic qualities
Regulated industrial-artisanal (early 1930s to late 1980s)	State regulation of milk and cheese prices, volume quotas and quality specifications State-imposed cessation of farm-based cheese making and specification of varieties produced during Second World War.	Farm-based practices, MMB as sole intermediary, production divorced from consumption Continuing interaction with other external actors (education, fairs) Disappearance of several cheese varieties and associated practices
Divergent industrial-artisanal (late 1980s to present)	Reputational and organoleptic differentiation amongst enlarged elite consumer market ‘Social reconstruction’ of traditional, locational factors Stronger legal restrictions related to traditional locations (PDO) Stronger legal restrictions related to aspects of product specification and traceability	(a) Farm-based practices, new interaction with emergent network of external actors (specialist food wholesale/retail/end consumer) influencing marketing capabilities (b) Farm-based practices, continued interaction with MMB successors. Isomorphic pressures exerted by multiple retailers via channel captains/category managers countered by efforts to reclaim artisanal practices.

Source: Blundel (2002b) [Note: MMB = The Milk Marketing Board for England and Wales]

Table 2: Collapse of artisanal knowledge?: farmhouse cheese makers in 1939 and 1948

<i>Year</i>	<i>Cheshire</i>	<i>Lancashire</i>	<i>South West (inc. Cheddar)</i>	<i>Wensleydale</i>
1939	405	202	514	176
1948	44	29	61	9
Change	(89%)	(86%)	(88%)	(95%)

Source: MMB / Ministry of Agriculture register of cheese makers – cited in Rance (1982: 133)

Table 3: Wholesale cheese production in the UK - 1999

<i>Type</i>	<i>Cheddar</i>	<i>Other long-life territorials</i>	<i>Short-life territorials</i>	<i>Blue vein</i>	<i>Mozzarella</i>	<i>Other</i>	<i>Total</i>
<i>Volume (thousand tonnes)</i>	209	28	18	10	43	53	360
<i>% share</i>	58.1	7.7	5.0	2.7	11.9	14.7	100

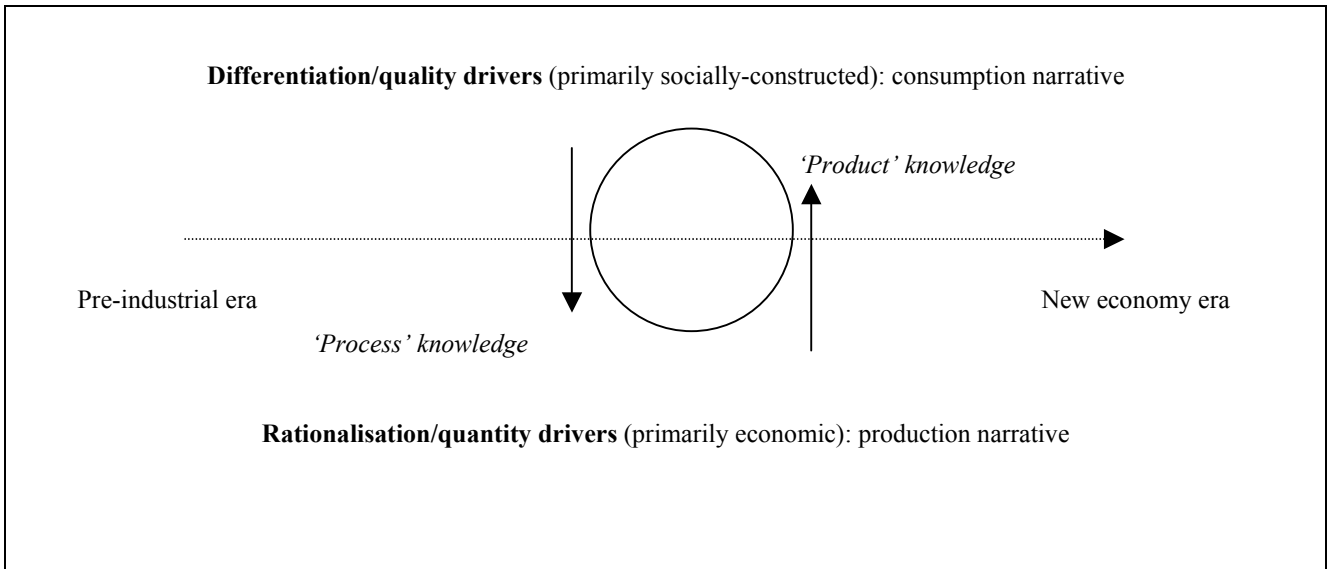
Source: MAFF (2000: table 8 – n.b. excludes farm cheese production)

Table 4: The UK Cheese market - imports and exports - 1999 (thousand tonnes)

<i>Domestic production</i>	<i>EU imports</i>	<i>Non-EU imports</i>	<i>EU exports</i>	<i>Non-EU exports</i>	<i>Total new supply</i>	<i>Change in stocks</i>	<i>Total for domestic useage</i>
368	236	41	48	13	584	(1)	583

Source: MAFF (2000: table 9 – n.b. includes farm cheese production)

Figure 1: Reproducing artisanal knowledge: the fundamental tension



DRUID 2002 – Blundel
10 May 2002