

## RESEARCH PAPER

### Reinventing artisanal knowledge and practice: a critical review of innovation in a craft-based industry

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*This paper presents a critical review of the ways in which the specialised knowledge and working practices of craft-based industries have been transformed in the context of broader processes of industrialisation and global competition. The opening section makes the case for artisanal knowledge as a 'Cinderella' subject that remains important yet largely uncharted territory for innovation researchers. It is followed by a critical review of existing empirical and theoretical studies that have examined the reproduction and reinvention of artisanal knowledge. The review concludes that valuable insights remain obscured because of the way in which this literature is distributed across discrete disciplines with little evidence of cross-fertilisation or integration. Several common themes emerge, which provide the basis for an outline theoretical framework. The central arguments are illustrated with reference to a case-based analysis of the technological and social innovations that have taken place in English farmhouse cheese-making over an extended period, from the pre-industrial era to the beginning of the present century. The concluding section considers how more nuanced understandings of artisanal knowledge and practice might enhance innovation theory and contribute to the continued flourishing of craft-based industries.*

## Introduction

Long-established artisanal, or craft-based, occupations, such as cabinet-making, ceramics, jewellery-making, weaving and cheese-making, are not usually seen as falling within the orbit of innovation theory. Their design and production processes are often characterised as being deeply rooted in tradition, with an inherent tendency towards conservatism. While creativity is routinely observed in the *products* arising from contemporary artisans (eg, a young designer launching a new range of furniture or clothing),<sup>1</sup> relatively little attention has been paid to the ways in which novelty is introduced into the underlying *processes*, and how artisanal activities are themselves transformed.<sup>2</sup> Stoneman (2010) introduces the concept of 'soft innovation' in an effort to integrate into an economic analysis of the innovation process, goods and services that derive value from their sensory, intellectual and aesthetic appeal. Though Stoneman's monograph is concerned primarily with the innovation taking place in today's creative industries, it cites a few examples from other sectors, including the food industry. The focus of the present study is

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somewhat narrower, being confined to artisanal production, while the approach adopted is more multi-disciplinary. However, it responds to similar themes and draws attention to forms of innovative activity that have been underemphasised (Stoneman 2010, p.1). This marginalisation of artisanal activity is surprising when one considers the extent to which craft-based enterprise has adapted and redefined itself as its actors have sought to negotiate the onslaught of industrialised products and processes. The main aim of this paper is to address this omission by examining the different ways in which artisanal knowledge and working practices have been reinvented over an extended period. In doing so, we seek to draw attention to this under-researched territory and to suggest how a renewed appreciation of artisanal activity might contribute to the wider field of innovation studies.

For the purposes of this paper, we have adopted a processual interpretation of 'knowledge', retaining the familiar term but recasting it in the active form of 'knowing', and as a phenomenon that is not readily objectified (Polanyi, 1969; Gourlay, 2006).<sup>3</sup> Although closely linked to the increasingly popular notion of craftsmanship (Sennet, 2008), our conceptualisation of artisanal knowledge, and of artisanal working practices, is somewhat narrower in scope and application. For the purposes of this paper, we define artisanal knowledge as proprietary, situated and often location-specific ways of knowing. These are characterised by the application of skills, regular recourse to personal judgement and extensive hand-working, involving individuals and small collaborative groups. The skills themselves are typically based upon, or inspired by, traditional production methods that involve a significant element of manual labour. They cannot be reproduced solely through formalised training programmes and are typically acquired through a combination of training, 'learning-by-doing' (Adamson, 2007, p.78) and recurrent 'trial and error'. Artisanal working practices demand the routine exercise of personal judgement in the application of inherently tacit knowledge to particular situations (Tsoukas, 2003). This gives rise to an emergent quality that Ray (2009, p.79) has described as "the capacity to know something that has been learned in the course of experience". The iterative relationship between 'knowing' and practical application generates in the craftsman what Sennett (2008, p.9) has described as "the intimate connection between hand and head". Artisanal knowledge takes its proprietary forms precisely because these intuitive connections can be forged only in particular concrete settings. Knowledge of this kind is also 'sticky' in a geographic sense as a consequence of its embeddedness in 'local patterns of interaction' involving people who have both "first-hand experience of the knowledge and on how to put it into use" (Asheim and Isaksen, 2002, p.86).

Artisanal knowledge and working practices tend to generate a degree of variability and idiosyncrasy in the production process, which can be embodied in the physical attributes of the resulting products or artefacts, and in their associated representations and attributions (Schiffer and Skibo, 1997; Bianchi, 2001; Trabalzi, 2007). In the case of artisanal food products, this includes the introduction of subtle organoleptic qualities that can encourage product loyalty and premium prices (Kupiec and Revell, 1998).<sup>4</sup> However, over the course of two centuries, large-scale, mechanised modes of production have displaced artisanal production systems and associated knowledge clusters (Galbraith 1967; Chandler 1990; Sabel and Zeitlin, 1997). In certain sectors, residual groups of artisanal producers continue to prosper in an otherwise transformed industrial landscape. They include long-term survivors who can operate in small, well-protected niches, and cases in which artisanal skills

have been translated into alternative, often non-commercial, formats (eg, as voluntary or leisure-time activities). These residual craft-based practices have an important place in the overall account. However, the primary focus of the present paper is on those instances in which enterprises based on core artisanal knowledge have reinvented themselves, and continue to generate economic value despite the arrival of much larger industrial corporations (Sabel and Zeitlin, 1997, p.3). By drawing greater attention to this sub-group of economically active artisanal firms, we are also opening up to critical scrutiny the array of interesting, yet largely unexplored, forms of innovation that have facilitated their continued existence.

The paper is organised as follows. The next section comprises a critical review of the existing literature on the reinvention of artisanal knowledge and working practices. This is followed by a case-based illustration of the reinvention of artisanal knowledge and associated working practices. It takes the 'long view' of innovation in English cheese-making to examine issues that transcend the particulars of the sector and its geographic location. In the concluding discussion, we consider potential directions for future research on artisanal knowledge creation, and the wider implications for innovation studies.

### **Artisanal reinvention: a dispersed literature**

The literature on the reinvention of artisanal knowledge is sparsely populated. The sources are also widely dispersed across academic disciplines, with contributions being found in the history of science, economic history, anthropology, cultural studies, development policy, and regional studies. In this section, we have selected examples of recent research that offer novel and potentially valuable insights, and discuss how they might be applied to an innovation research agenda.

Dilley (2009) is an anthropological study that contrasts the specialised knowledge practices of traditional Senegalese artisans with those of Islamic clerics. It seeks to probe local epistemologies and social processes of knowledge acquisition and transmission. Though the contexts appear divorced from those discussed in the introduction, it contains a fascinating account of successive stages of learning in a weaving apprenticeship in which the latter stages move beyond mere instruction to incorporate "dreaming and other forms of spirit contact" (p.58), which the master weavers understand to be a source of innovation (eg, ideas for new designs or thread interlacings). This move from 'propositional' to 'secret' knowledge provides a source of domain-specific 'knowledge power', a term the author adopts to convey its dual status as a body of learning and a form of agency (pp.53-4). Hillaire-Pérez's (2007) historical analysis of scientific and industrial enlightenment in the eighteenth century makes a number of important claims for the role of artisans in the public culture of this period. In a direct challenge to Mokyr's (2002) account of the origins of the 'knowledge economy', it argues that artisans were developing an increasingly complex technical culture which was based on both specific patterns of open knowledge and an active role in the commercialisation of knowledge (Hillaire-Pérez, 2007, p.137). Institutional structures, such as the French craft guilds, play important roles, such as financing innovation and incentivising dissemination of new inventions. One of its core arguments, which is constructed with reference to numerous examples, including gunmakers, locksmiths and carpenters, is that "Our understanding of the role of artisans cannot simply be reduced to that of routine and resistance. They were the main workforce and highly innovative" (Hillaire-Pérez, 2007, p.139). This was

exemplified by their commercial strategies, which influenced public understanding of their products by creative use of dissemination tools, such as displays and a wide range of printed literature (pp.143-6). Trabalzi's (2007) study of localised food networks in southern Italy explores the concept of '*hybridity*', in which local producers 'exchange, borrow, absorb and appropriate practices, technologies, knowledge and conventions from all available models of production' (p.283). Citing the example of buffalo mozzarella cheese-making, the author demonstrates how particular communities of producers develop their own distinctive development logics. The author argues that hybridity is also a consequence of specific interactions between industrial and artisanal actors:

This is so in part because industrialized firms at times target local and nonlocal markets simultaneously, in part because artisan producers use methods and techniques drawn from the industrial world and, last but not least, in part because the very notion of how production can and should be organized rests upon the collective and individual mediation between best practices and local values and beliefs. (Trabalzi, 2007, p.287)

This review indicates how innovation researchers might engage with these diverse literatures in order to develop a richer and more multi-disciplinary understanding of the ways that artisanal knowledge is created and reinvented. Though necessarily brief, it contains a rich array of concepts related to the sources of 'knowledge power', the institutional frameworks that support open knowledge, the active role played by artisans in a competitive landscape, and the hybrid forms of knowledge and working practices that arise from localised interaction with industrial production systems. There appears to be considerable scope for innovation researchers to take on the task of making connections among these different literatures and drawing together their disparate empirical and conceptual contributions.

### **Research methods and sources**

The case-based illustrations that are presented in this paper draw on earlier studies conducted by one of the co-authors (Blundel and Smith, 2001; Blundel, 2002a; Blundel, 2002b; Blundel and Tregear, 2006), and on our subsequent examinations of the related literature. In common with other recent work in this area (eg, Huygens *et al.*, 2001, p.981), the empirical studies were conducted in two overlapping stages, which helped to clarify processes occurring at different levels of analysis. The first stage involved an historical study of cheese production and consumption from the inception of industrialised modes of cheese production in the mid-nineteenth century to the end of the twentieth century. This was based on secondary sources, such as Boisard and Letailier's (1997) analysis of the development of Camembert, and original archival materials (eg, a contemporaneous account published by Xerxes Willard, a representative of the American Dairyman's Association, who toured England in the Summer of 1866 and commented on production and marketing practices (Willard, 1872). The original analysis comprised 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 in the context of international competitive pressures experienced during the nineteenth century. These parallel narratives have been re-integrated for the purposes of this paper. The second stage of the research examined the growth of English

farm-based cheese-making enterprises from the early 1950s to the present day, with specific reference to two businesses located in rural Shropshire, Appleby's and Belton. This provided a more fine-grained analysis of the changing productive opportunity of each artisanal firm, and acted as an exemplar of the contrasting patterns identified in the latter periods of the historical study.<sup>5</sup>

While recognising that alternative analytical frameworks could be applied to the evidence, we have adopted a modified Penrosian approach (Penrose [1959] 2004; Pitelis 2002) to explore the reinvention of artisanal knowledge in this instance. Our analysis combines the two main strands of the resource-based view with recent work on the co-evolution of firms, networks and industries. The first strand has sought to identify the main isolating mechanisms in each period (eg, Demsetz 1973; Lippman and Rumelt, 1982; Rumelt, 1984; Barney, 1991). This essentially static analysis of rents attributable to artisanal knowledge is complemented by a more dynamic, neo-Penrosian, strand (eg, Best, 1990, 2001; Grant, 1996; Lockett, 2005; Clark and Blundel, 2007; Blundel, 2013) in order to explore the active reinvention of artisanal knowledge over time.<sup>6</sup> The firm-level focus is extended by drawing on multi-level, co-evolutionary approaches (Nelson, 1995; Barnett and Burgelman, 1996; Lewin and Koza, 2001).

### **Analysis: reinventing artisanal knowledge and practice**

The following section illustrates how artisanal knowledge and practices are reproduced and, in many cases, reinvented over extended periods. The case material analyses the development of cheese-making in England from the mid-nineteenth century to the present day. The artisanal knowledge embodied in cheese-making provides a unique insight into the dynamics of knowledge production during this transition. Like many everyday products, cheese is amenable to both hand-crafted and mechanised production processes (Boissard and Letablier, 1997; Kupiec and Revell, 1998). However, England is distinctive in having experienced the coexistence of farm-based artisanal cheesemaking and larger-scale mechanised production systems for more than 150 years. The focus throughout this section is on the artisanal cheese-makers and the ways in which they have maintained and adapted their proprietary knowledge and working practices. It examines their response to a spatially and temporally complex amalgam of environmental factors. These include the emergence of international competitive pressures, often associated with specific technological innovations, such as rail transport and refrigeration; long-run socio-economic and demographic changes which have stimulated changes in consumption patterns in local markets and internationally; dramatic short-run events, including economic crises and the two world wars; and radical alterations in institutional arrangements, most notably the nationalisation and subsequent privatisation of milk marketing.

Table 1 provides a broad brush summary of the main periods under discussion. The first column indicates the results of the periodisation that was conducted in the original research study.<sup>7</sup> However, it is important to note that the reference to particular dates (eg, the 1930s) is indicative and does not imply a simple decade-by-decade chronology. The second column indicates key characteristics of the competitive environment in each period. The corresponding rows in the right hand column highlight the prevailing artisanal knowledge and practices, and any changes

**Table 1.** Reproducing and reinventing artisanal knowledge and practices

Period	Principal features of the competitive environment	Prevailing artisanal knowledge and practices
Pre-industrial (pre-1850s)	<ul style="list-style-type: none"> <li>• Natural resource endowments</li> <li>• Basic transportation systems</li> <li>• Localised market preferences</li> <li>• Reputation and image of premium varieties disseminated amongst elite consumers</li> <li>• Quasi-statutory controls on imitation</li> </ul>	<ul style="list-style-type: none"> <li>• Primarily communal and localised knowledge and practices linked to local consumption patterns</li> <li>• Nascent territorial markets emerging in the early 19<sup>th</sup> century</li> <li>• Elite consumer preferences disseminated more widely (eg, Cheshire, stilton, Cheddar)</li> </ul>
Formative industrial-artisanal (1850s to 1930s)	<ul style="list-style-type: none"> <li>• Technological innovations in rail, road and sea transportation, including food storage</li> <li>• New competitive pressures exerted by domestic cheese factories and increasingly by imported factory cheese (primarily Cheddar) from the US and New Zealand</li> <li>• Intermittent opportunities for reputational and organoleptic differentiation advantage arising from counter-industrial revivals</li> </ul>	<ul style="list-style-type: none"> <li>• Artisanal practices modified as a result of limited interaction with external actors (eg, education, fairs, wholesale trade)</li> <li>• Exit of many artisanal producers, loss of traditional varieties and increased penetration of mass market industrial products</li> <li>• Recurrent revivalist movements amongst elite consumers increase awareness of distinctive varieties, including organoleptic qualities and artisanal production methods</li> </ul>
Regulated industrial-artisanal (early 1930s to late 1980s)	<ul style="list-style-type: none"> <li>• State regulation of milk and cheese prices, volume quotas and quality specifications under MMB</li> <li>• Continuing competitive pressure from international suppliers</li> <li>• State-imposed cessation of farm-based cheese making and specification of varieties produced during Second World War</li> <li>• Growth of multiple food retailers and concentration of supply chains</li> </ul>	<ul style="list-style-type: none"> <li>• Artisanal knowledge and practices contested by MMB as sole intermediary, production increasingly divorced from consumption and driven by utilitarian values, particularly under wartime/post-war rationing</li> <li>• Continuing interaction with other external actors (education, fairs)</li> <li>• Disappearance of several cheese varieties and cessation of associated artisanal practices</li> </ul>

*(Continued)*

**Table 1.** (Continued)

Period	Principal features of the competitive environment	Prevailing artisanal knowledge and practices
Divergent industrial-artisanal (late 1980s to present day)	<ul style="list-style-type: none"> <li>• Renewed opportunities for reputational and organoleptic differentiation in enlarged premium consumer market</li> <li>• Localism and the social reconstruction of traditional locational factors</li> <li>• Stronger legal restrictions related to traditional locations (PDO), product specifications and traceability (eg, unpasteurised, organic and biodynamic products)</li> </ul>	<ul style="list-style-type: none"> <li>• Divergent strategies:</li> <li>• Some artisans (eg, Appleby's) engage with new and emergent networks including specialist food wholesale, retail and end consumers, influencing marketing capabilities</li> <li>• Other artisans (eg, Belton) continue to engage with MMB successors and experience the isomorphic pressures exerted by multiple retailers via channel captains/category managers</li> <li>• New evidence of hybridity as cheesemakers contest isomorphic pressures with selective efforts to reclaim or reinvent artisanal knowledge and practices.</li> </ul>

Note: MMB = Milk Marketing Board for England and Wales

that were underway in this period. The accompanying narrative provides a more rounded explanation of the different ways in which artisanal producers have negotiated these developments.

### ***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 grants 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, p.4; Cheke, 1959, p.83). With the dissolution of the monasteries in the mid-sixteenth 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 seventeenth century, there was a generalised move from ewe's 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. 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, p.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 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. 1695-7] cited in Cheke, 1959, p.109; Smith, 1995, p.35)

The production of 'greate' (ie, 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 (ie, fertile grasslands, and in the case of Cheshire, salt deposits), the cumulative growth of localised capabilities (ie, 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 (the major coastal port in 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, pp.35-6)

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.



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

Throughout the second half of the nineteenth century and into the early years of the twentieth century, all 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 at the forefront of the changes (Blundel and Tregear, 2006). 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.<sup>8</sup> 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 the American factory system. By 1911, only 18% of domestic consumption was home-produced, most of which continued to be sourced from farms (Cheke, 1959, p.244; Rance, 1982, p.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, p.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 (eg, 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 ... the gradual attrition of English cheeses by foreign invasion and native indifference and ignorance” (Squire, 1937, p.11).<sup>9</sup>

***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’. 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.

When wartime restrictions were eased in the early 1950s, many English dairy farmers took the opportunity to (re-) establish on-farm cheese dairies. 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. In this section, we focus on the two artisanal producers introduced in the methods section, Appleby’s and Belton, both of which established cheese manufacturing businesses on their family-owned dairy farms in this period. In these early years, the focal firm networks of these two businesses contained similar linkages, both upstream and downstream of the farm. Belton differed in one important respect, in that it was sourcing an additional milk supply from the MMB for use in its cheese-making.<sup>10</sup> 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 the present day)***

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 (ie, 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 forming cheeses into large rectangular blocks and adding 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 [were] people like ourselves who remained traditional, making calico [ie, cloth-wrapped cheese], there [were] 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 farm-house 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 which are 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] 2004, pp. 31-1; 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, pp.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. By 2002, Belton was also converting its own farm to organic production, and was assisting in the conversion of other 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] 2004, pp.31-2) of selling direct to the market. The Appleby family took this opportunity, and in 1982 established contact with a specialist retailer in London and delivered 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 broad customer base comprising specialist retailers and distributors as well as some multiple retail contracts. The spread of customers has a pragmatic logic (ie, "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 "Basically, we've built a brand, haven't we? ... In this day and age, brands are wonderful things!" (cited in Blundel, 2002a, p.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 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 hybrid forms, combining conventional outlets with retail websites. 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, by 2002 Belton had established a web presence ([www.beltoncheese.co.uk](http://www.beltoncheese.co.uk)) on a site that offered detailed information on the firm's products and its heritage. However, it has been designed for business to business interaction; the firm had not developed an independent retail facility. Appleby's reported that these technological innovations were first experienced in the form of 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 deeply-held views regarding the integrity of their artisanal product (Blundel, 2002a, p.24). Despite close downstream relationships with conventional retailers, the firm had not

established direct connections to e-retailers. During the 2002 fieldwork interviews, several online delicatessen sites were identified. Mrs Appleby's Cheshire cheese could be obtained from English sources (eg, [www.norburys.co.uk](http://www.norburys.co.uk)), but was also available to consumers in San Francisco ([www.projecttruffle.com](http://www.projecttruffle.com)) and in Seattle ([www.jamescookcheese.com](http://www.jamescookcheese.com)), along with detailed product information and interpretation. At this point, Appleby's had viewed this productive opportunity from the perspective of informal network connections (eg, citing examples of friends and acquaintances who had experimented with the specialist food retailing via the Internet), reflecting on its own previous experiences in supplying conventional mail order firms. The company had reached the point of identifying additional capability requirements, but remained understandably cautious about the prospect of marketing its products via the web:

[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? (cited in Blundel, 2002a, p.20)

In the decade following this interview, Appleby's online presence has grown in scale and sophistication, albeit with a strong sense of its distinctive style.<sup>11</sup>

### Discussion and concluding remarks

We have sought to redress the balance in favour of a hitherto under-represented form of knowledge and working practice, and to contribute a fresh perspective on its relationship to innovation theory. Great swathes of the more traditional examples of artisanal knowledge and their associated working practices were long ago displaced or eliminated by machine production. However, in contrast to the conventional focus on the industrial firm, this paper has redirected attention towards the innovative activity of artisanal enterprises. In this respect, its argument is similar to that made recently with respect to the need to integrate experience goods into innovation theory (Hawkins and Davis, 2012). Our review of the existing literature on the reinvention of artisanal knowledge revealed that it remains sparsely populated and widely dispersed across academic disciplines. While it is possible to identify some novel and potentially valuable insights, there is considerable scope for a multi-disciplinary research initiative by innovation researchers that could connect the existing literatures and seek to integrate their empirical and conceptual contributions. In common with Stoneman (2010), we would argue that the scope of innovation studies does not have to be confined to those significant improvements in functionality that arise from advances in product and process technologies. His study makes the case for the economic significance of soft innovation, which incorporates a variety of goods and services whose value is derived primarily from their aesthetic appeal, encompassing the human senses of sight, touch, taste, smell and sound (Stoneman, 2010, p.24). Though it concentrates on the creative industries, the scope of the argument extends to food manufacturing, which the author sees as a sector that exemplifies the capacity of soft innovation to generate economic value (p.113). In this concluding discussion, we draw out some of the main themes of the cheese-making case, highlighting possible directions for future research on the rein-

vention of artisanal knowledge and indicating some broader implications for innovation research.

The case illustration sought to clarify the complex interactions that shaped the reinvention of artisanal knowledge during a period that saw mechanised processes come to dominate much of the agri-food industry, from 'plough to plate'. Knowledge is an ill-defined and problematic concept, which cannot be applied meaningfully without a degree of disaggregation and contextualisation (Spender, 1996, p.48; 2005, pp.104-14). In an effort to address this issue, we sought to connect a Penrosian resource capability dynamic to prevailing isolating mechanisms. This combination has previously demonstrated its explanatory potential in efforts to explore the co-evolution of firms, networks and industries (Lewin and Koza, 2001), while also allowing an exploration of firm-level agency and strategic choice (Child, 1972; Child, 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, p.937)

One important limitation in approaches of this kind is that the complexities of narrative detail tend to crowd out fundamental relationships. However, it is possible to identify some basic tensions that have helped to drive the reinvention of artisanal knowledge and associated working practices over this extended period. These relate to arguments around issues such as cost *versus* differentiation, or alternatively, quantity *versus* quality with respect to artisanal cheeses and their industrial counterparts. We have explored these tensions through two knowledge-related narratives, one centred on production and the other on consumption. The continued coexistence of mechanised and artisanal modes of cheese production has been explained in terms of an interplay between these narratives. Artisanal knowledge has been reinvented in a number of ways over the last two centuries, engaging different configurations of firms and other network actors in response to changes in the competitive environment (Table 1). Institutional changes have played a significant role, reflecting the political influence of particular actors (eg, governmental agencies, multiple retailers) and the sometimes unanticipated consequences of structure-loosening events (Madhavan *et al.*, 1998) (eg, wartime regulation, market liberalisation).

The paper focused on the successful trajectories of surviving artisanal firms in this industry sector.<sup>12</sup> Over the last century and a half, artisanal producers in this sector have experienced a succession of forbidding challenges. The survivors have been those who perceived and pursued a succession of new productive opportunities that have required reinvention and the introduction of new hybrid combinations that connect traditional artisanal knowledge to new forms of scientific and technological knowledge. These neo-Penrosian processes of conjectured capability development have also re-shaped the industry sector, which is now characterised by a much more vibrant and diverse firm population than has been evident in the previous century. Further reinventions of artisanal knowledge will doubtless be required if enterprises of this kind are to continue to thrive in the face of the remorseless, economising logic of mechanised food production and retailing. There are also likely to be differential effects on artisanal producers, reflecting in part the divergent trajectories they have pursued in the past. The full implications are yet to be realised, but some

challenges to firm-level heterogeneity are already apparent. For example, large-scale creameries are now investing in production technologies that seek to imitate the organoleptic qualities of artisanal products (Kupiec and Revell, 1998), while other forms of technological innovation, regulatory pressures (eg, for the pasteurisation of raw milk supplies) and the notoriously capricious tastes of the consumer threaten to undermine the economic value attributed to this particular form of artisanal knowledge.

The processes described in this paper can be seen as part of a wider phenomenon of a recombining and interpenetration of different forms of economic organisation (Sabel and Zeitlin, 1997, p.2). At the firm level, the paper traced two divergent trajectories extending back to the mid-twentieth century. The impact of these trajectories on the reproduction of artisanal knowledge highlights the temporally and spatially situated nature of these processes. This divergence echoes Jones's (2001) study, which argues 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 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 reshaping 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, pp.930-2).

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 nineteenth and early twentieth centuries, 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 twentieth 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.

There is a strong geographic dimension to the innovation processes described in this paper, which provides a link to the broader concerns of innovation studies. Though some contemporary artisanal activity has relatively few connections to its local setting, much of it is based on the kinds of locally embedded interactions described by Asheim and Isaksen (2002). In the cheese-making case, we have seen how artisans have engaged in innovative activity involving the use of more formal, scientific forms of knowledge, such as the Internet. However, the success of these innovations has been underpinned by the distinctively artisanal knowledge that is carried by the key actors. This implies a multilevel approach that takes more account of the non-codified knowledge that often resides at a local level in order to

gain a more nuanced understanding of how it interacts with higher-profile and more geographically dispersed forms of scientific and technical knowledge. This has a particular resonance for future research on knowledge creation and the growth of firms in developing economies, including the critical role played by institutional rules and standards (eg, Perez-Alman, 2011; Obeng *et al.*, 2012; Blundel, 2013).

## Notes

1. Numerous examples can be found on the website 'Etsy', which describes itself as "the world's handmade marketplace" ([www.etsy.com](http://www.etsy.com)). Etsy can also be seen as an indicator of the extent to which contemporary artisanal activity has been transformed through its engagement with industrial technologies.
2. Hawkins and Davis (2012) have examined a similar set of issues in relation to innovation in experience goods.
3. As Ray and Clegg (2007, p.181) note, 'knowledge' is an abstract noun, "but is often used as if it were an adjective to produce terms such as 'knowledge economy' or 'knowledge worker' and – not least of all – 'knowledge management', which sound important. And people can agree that they are important, even if they disagree about what they mean."
4. The term 'organoleptic' refers here to those properties of a food product that may be detected by the senses (ie, its taste, smell, visual appearance and texture).
5. Full details of the fieldwork stage can be found in Blundel (2002a, b). These firm-level findings have been reviewed for the purposes of this paper and the authors have confirmed that the accounts reflect current conditions, with the two firms cited in the study continuing to operate in a broadly similar way to that described in the case narrative, and both having an active web presence (see [www.beltoncheese.co.uk](http://www.beltoncheese.co.uk) and [www.applebyscheese.co.uk](http://www.applebyscheese.co.uk)).
6. In addition, related work has been conducted by strategists (eg, Grant, 1996; Spender, 1996; Kogut, 2000; Clark *et al.*, 2004), organisation theorists (Scarbrough, 1997; Clark, 2000; Clark and Blundel, 2007), and economists (Foss, 1997a; Foss, 1997b; Foss, 1999; Loasby, 1999a; Loasby, 1999b; Loasby, 2009).
7. The original study was presented in the form of an analytically structured narrative (ASN) in order to prove the basis for abstraction and theory-building (Clark, 2000, p.113).
8. 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% 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.
9. 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, pp.13-14). Similar sentiments were expressed in the late twentieth century, signalling the return to a similar configuration of competitive forces following the period of state regulation.
10. The current owner 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, pp.9-10).



11. Appleby's now has its own online farm shop ([www.applebyscheese.co.uk](http://www.applebyscheese.co.uk)). The company also provides downloads of recipes and information on where to find its products. Belton Cheese continues to have a web presence ([www.beltoncheese.co.uk](http://www.beltoncheese.co.uk)), but does not engage in direct online sales of its products.
12. This approach could also be adapted to account for the failure of individual artisanal firms or the decline of artisanal production in particular sub-sectors or regions.

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