

Food for thought: Transport within the food supply chain

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Abstract

Recently Hayden and Zunino Singh wrote in the *Journal of Transport History* of the greater need to study food movement. Whilst accepting their general premise, we argue that they downplay the fact that the evolution of logistics and supply chains has received sparse attention in the historical literature. Using case studies of the domestic British milk trade (1919–c.1945) and international quail trade (c.1850–1914), we demonstrate how a concept originating in the study of modern supply chains – supply chain governance – can be illuminating. As a conceptual framework, this can facilitate the identification of key agents, institutions and goods movements within supply chains, and the nature of the relationships between them, whilst illuminating how change and development is shaped by regulation, economic cycles, consumer demand, and, of course, transport. The concept's application therefore presents a robust way to better understand the movement of goods in history.

Keywords

Quail, milk distribution, supply chains, food mobility, transport history

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Introduction

The history of food movement has received little study, something long recognised by scholars.¹ Writing about changing consumption patterns in Europe, Victoria de Grazia noted in 1998 that “the evolution of modern systems of distribution is astonishingly under-studied”.² Similarly, in a recent *Survey and Speculation* article on food mobility in this journal, Hayden and Zunino Singh highlighted that mobility historians have “been curiously quiet on the subject of food, or has left it largely to the sub-field of transport logistics and economic history, and, particularly, as a part of railway or shipping history”.³

Whilst accepting the general premise of their piece, we feel that the suggestion that food mobility has been left “largely to the sub-field of transport logistics and economic history” significantly overstates the extent to which transport historians have given attention to the evolution of logistics, supply chains and distribution. De Graef recently argued that “the broader tendency in transport history was to give the supply side of transport infrastructure centre stage, whereas the specific demand for transport remained largely overlooked”,⁴ this being reflected in the dearth of material on user transport choices and the contextual influences upon them throughout supply chains. Moreover, some transport historians are alert to the need to develop, as Divall argued in the case of inter-war British railways, “...a more sophisticated understanding of the legislative, regulatory and commercial (sic) context” that shaped transport operators’ policies.⁵

Despite this shortfall in understanding, some scholarship from varied disciplines nonetheless offers important insights. As an example, Suzanne Freidberg considers transport a factor influencing our understanding of what “fresh” food means, yet the “...technological shift has to be understood in light of larger changes in where and how people lived, and in how they understood the value of perishable goods”.⁶ The late Roger Scola’s account⁷ of the food supply of Manchester during the eighteenth and nineteenth centuries as well as Shane Hamilton’s account of the relationship between trucking, the

¹ Based upon a survey of the two most recent complete volumes of the *Journal of Transport History*.

² Victoria de Grazia, “Changing Consumption regimes in Europe, 1930–70: Comparative perspectives on the distribution problem”, in Susan Strasser, Charles McGovern, Matthias Judt (eds), *Getting and Spending: European and American Consumer Societies in the 20th Century* (Cambridge: Cambridge University Press, 1998), 59–84, here 59. Distribution in the retail sense in Britain is considered in: Lawrence Black and Thomas Spain, “How Self-Service Happened: The Vision and Reality of Changing Market Practices in Britain”, in David Thackeray, Andrew Thompson and Richard Toye (eds), *Imagining Britain’s Economic Future, c.1800–1975: Trade, Consumerism and Global Markets* (Cham: Palgrave Macmillan, 2018), 159–180.

³ Tiana B. Hayden and Dhan Zunino Singh, “Food and mobility”, *Journal of Transport History* 41:2 (2020), 278–288.

⁴ Pieter De Graef “The Fruits of Better Roads and Waterways: Facilitating Fertiliser Improvement through Transport Innovations in 18th-Century Flemish Husbandry”, *The Journal of Transport History* 39:2 (2018), 171.

⁵ Colin Divall, “Conceiving Distribution in the United Kingdom: the (London and) North Eastern Railway’s Discursive Response to Road Haulage, 1921–39”, in Colin Divall and Ralph Roth (eds), *From rail to road and back again? A century of transport competition and interdependency* (Farnham: Ashgate, 2015), 91–107.

⁶ Suzanne Freidberg, *Fresh: A Perishable History* (London: Belknap/University of Harvard Press, 2009), 5.

⁷ Roger Scola, *Feeding the Victorian City: The Food Supply of Manchester, 1770–1870* (Manchester: Manchester University Press, 1992).

growth of agribusiness, consumerism and politics in twentieth century United States embed transport within a distribution chain that goes – as Peter Maunder put it when commenting on a lack of histories on food processing – well “beyond the farm gate”.⁸

Indeed, food transport is a complex, multi-faceted subject that perhaps transcends disciplines, compounding the disconnection Maunder alludes to. Nevertheless, a more fulsome examination of the subject’s breadth would allow us to better understand the world in which transport operates. We suggest here that an approach drawn from outside the established domains of transport history or mobility studies might be a rewarding way to explore this, especially when the focus of attention is the interrelations between organisations, regulatory authorities and the operating environment. This article proposes that drawing upon research within supply chain and logistics management literature provides a way of achieving this, with the concept of supply chain governance (SCG) offering a flexible framework for conceptualising the supply chain and its many working parts. Our objective is therefore to expand the historian’s analytical toolbox.

The article starts by reviewing some key themes within SCG literature and puts it into practise in two case studies on milk and quail transport that places food freight into its national and international distribution contexts.

Supply chain governance

SCG is defined as who, how and why agencies might control and govern the different parts and processes with a supply chain.⁹ This concept emerged in the mid-2000s as scholars, practitioners and organisations explored how they could better understand and govern, rather than simply manage, disaggregated global supply chains to guard against environmental, social and economic abuses that may be perpetrated by participants, and protect business reputations from damage.¹⁰ As will be demonstrated, the concept can be readily adapted for use in historical research, enabling explorations beyond the transfer of wealth within the supply chain.

The notion of where overarching control is situated within a supply chain, how it changes, and sometimes its absence, has profound implications for both the food being distributed, its associated transport infrastructure, and impacts upon individuals, societies and organisations at both ends of a given supply chain – the producers, consumers and labour. Moreover, an analytical framework based upon governance has the benefit of breadth; it helps identify the key agencies, encompasses regulatory process, considers social and technological change and reflects upon the social and economic values assigned to the products being consumed, and how these manifested into stakeholder

⁸ Peter Maunder, “Food Processing”, in Peter Johnson (ed.), *The Structure of British Industry* (London: Unwin and Hyman, 1988), 188; Roger Scola, *Feeding the Victorian City: The Food Supply of Manchester, 1770–1870* (Manchester: Manchester University Press, 1992); Shane Hamilton, *Trucking Country: The Road to America’s Wal-Mart Economy* (Princeton NJ: Princeton University Press, 2008).

⁹ Gary Gereffi, John Humphrey and Timothy Sturgeon, “The Governance of Global Value Chains”, *Review of International Political Economy* 12 (2005), 77–104.

¹⁰ Esteban Koberg and Annachiara Longoni, “A systematic review of sustainable supply chain management in global supply chains”, *Journal of Cleaner Production* 207 (2019), 1084–1098, here 1083.

action. The result is a well-rounded perspective through SCG that highlights the endogenous and exogenous factors influencing food movement and its transport requirements.

The literature on SCG discusses a range of dimensions found within supply chains, for instance, issues of transparency, traceability, auditing, market versus non-market mechanisms, resilience, and asset specificity. However, coordination, trust, power dynamics, and transaction costs nonetheless figure most prominently, and our case studies will explicitly show how exploring these dimensions of SCG can be illuminating in writing histories of freight transport.

Coordination lies at the heart of the recent work on SCG, research being framed by the nature of international disaggregated supply chains, where focal companies, usually in the global north, buy from suppliers located elsewhere in the world, who in turn purchase from sub-suppliers. Governance therefore emerges to guard against said suppliers committing “environmental, social and economic abuses” and to oversee chain functions. Dolci *et al.* thus argue that where actors in the supply chain have different interests, “governance emerges as a set of practises to guarantee the control and co-ordination of actions in the chain”.¹¹ Nonetheless, this framing is largely atemporal, and ignores different supply chain configurations in earlier eras.

Ghosh and Feodorowicz argue that “[t]he objective of any supply chain is to optimise operational chain performance by delivering a product or service to the ultimate customer at minimal cost and at the required time”.¹² This applies, theoretically at least, irrespective of whether the chain comprises a series of individual stakeholders or is vertically integrated within an organisation; this is something our food-based case studies on milk and the quail trade will later exemplify. Our application of SCG as a concept in a historical sense therefore facilitates a broader view of the place of freight transport within the food supply chain. The SCG literature makes clear that the relationship between network players is central to the nature, form and change within supply chains, as our case studies exemplify. Pilbeam *et al.* argue that “Relational constructs, like trust and power, are vital for understanding better the possible interactions between context, intervention and outcome in supply networks”.¹³

Many relationships in supply chains start in the domain of formal agreements and mechanisms.¹⁴ These lower transaction costs and reduce the risks caused by opportunistic behaviour that can occur from what Brito and Miguel call “misaligned incentives” and they also “coordinate the expectations and behaviour of the partners” through contracts, the setting of common standards, assigning and receiving acceptance of particular roles within the networks, and the development of (command

¹¹ Pietro Cunha Dolci, Antonio Carlos Gastaud Maçada, and Ely Laureano Paiva, “Models for understanding the influence of Supply Chain Governance on Supply Chain Performance”, *Supply Chain Management: An International Journal* 22:5 (2017), 425.

¹² Anupam Ghosh and Jane Fedorowicz, “The Role of Trust in Supply Chain Governance”, *Business Process Management Journal* 14:4 (2008), 453–470, here 453.

¹³ Colin Pilbeam, Gabriela Alvarez and Hugh Wilson, “The governance of supply networks: a systematic literature review”, *Supply Chain Management* 17:4 (2012), 358–376, here 371.

¹⁴ Renata P. Brito and Priscila L.S. Miguel, “Power, Governance, and the Value in Collaboration: The Differences Between Buyer and Supplier Perspectives”, *Journal of Supply Chain Management* 53:2 (2017), 61–87, here 71.

and) control systems.¹⁵ The purpose of these agreements is to control opportunistic behaviour and bind individual stakeholders together. However, vertical integration in the supply chain replaces the need for such contractual relationships between chain partners through the subsumption of different chain functions within one organisation; nonetheless, the objective was the same, to exert coordination and control. Indeed, contractual relationships still controlled and determined expectations where relationships with independent transport providers were concerned.

The literature has also focused to a large extent on the matter of trust between chain participants. As Ghosh and Fedorowicz stress, trust interrelates with contracts and bargaining power to become a mechanism in the governance of supply chains. They suggest that the development of a relationship is phased; initially trust between partners emerges through bargaining power and agreement.¹⁶ Indeed, Pilbeam *et al.* suggest that as firms work together more often, familiarity means that contract-based relationships will transform into goodwill based ones, although this was not proved empirically.¹⁷ In many respects, trust “reflects the confidence of one party in a two-way relationship that the other party will not exploit its vulnerabilities”.¹⁸

However, in a situation such as the relationship between a consigner and an independent transport provider, trust forms part of the bargaining power when the situation merits it – in the case of freight transport, the presence of an alternative or a direct competitor can be used as leverage to shift a position, such as obtaining investment in specialist equipment where needed. Over time, however, even where contracts are important, relationship-specific factors can influence trust. This has been noted by Brito *et al.* who observed that in some cases chain partners recognised the benefits of a trust-based relationship, with formal relationships being substituted for more trust-based ones that allowed better working through information and strategy sharing to achieve more positive outcomes.¹⁹

Trust-based relationships can offer the flexibility to adopt change, as was the case in the relationship between quail despatchers and transport providers, but in the case of milk, the long-term relationship was seemingly accompanied by inertia. Vertical integration was one way of overcoming this, as will be seen in the quail trade, but in the case of milk wholesalers supplying London, firms were locked-in to churn-based rail transport despite technological developments elsewhere and the road alternative.

Another theme emerging from the literature concerns the power relations that exist within supply chains, considered by Gereffi *et al.* This shapes their development and in the case of transport determines who decides its role and organisation.²⁰ Brito *et al.* have pointed to the fact that the dominant view within the literature is that “buyers [in

¹⁵ Brito and Miguel, “Power, Governance, and the Value in Collaboration”, 62; T Russell Crook and James G. Combs, “Sources and Consequences of Bargaining Power in Supply Chains”, *Journal of Operations Management* 25:2 (2007), 546–555.

¹⁶ Ghosh and A. Fedorowicz, “The Role of Trust in Supply Chain Governance”, 460.

¹⁷ Pilbeam, Alvarez and Wilson, “The governance of supply networks: a systematic literature review”, 373.

¹⁸ Ghosh and A. Fedorowicz, “The Role of Trust in Supply Chain Governance”, 156.

¹⁹ Brito and Miguel, “Power, Governance, and Value in Collaboration”, 71.

²⁰ Gereffi, Humphrey, and Sturgeon, “The governance of global value chains”, 78–104.

the global north] are responsible for coordinating and developing their suppliers”, however this coordinating influence can also be extended to their relationship with transport providers. As will be seen in the cases of the quail and milk trades, this was certainly so.

The final area that has been discussed is the principle that better supply chain governance can lower transaction costs in the chain for different participants, while better coordination within supply chains can improve efficiency.²¹ In the case of quails, better supply chain governance – at least within a more vertically integrated system – led to cost reductions that allowed one supply chain to become superior to another, shaping the global trade. Nonetheless, transaction cost reduction encompasses a range of contributing factors, while outcomes can vary according to the security and length of the relationship. To reduce transaction costs, formal mechanisms of governance may be implemented through reducing risk, opportunism and ensuring parties undertake their roles,²² while investment can help lower transaction costs between supplier and consumer, as the case of milk ultimately shows.

Such transaction-specific investment (TSI) – investment made specifically for a transaction with a buyer, therefore creating asset specificity, concerns “durable investments that are undertaken in support of particular transactions, the opportunistic cost of which investments is much lower in best alternative uses”, thereby providing a safety net in the event of failure.²³ In the case of transport, physical asset specificity might reflect “investments by a supplier in capital goods that are done specifically for the transaction (e.g. investments in equipment, tools)”, which could also lock the supplier into an activity for the long term.²⁴ The milk case study provides evidence that long-term business relationships might have a dampening effect upon innovation in the supply chain. Long-standing financial and resource-based interdependencies in supply chain relationships, such as that between milk wholesaler and railway company, potentially leads to an inertia that constrains an organisation’s scope for action and creativity.²⁵ Innovation, when it came, emerged through durable investments by both the large milk wholesalers and the British railway industry.

This returns us to freight transport and its role in the movement of food, as we demonstrate how this, possibly more than any other aspect of distribution, is shaped by the above concerns around SCG. On the one hand, infrastructural, technological and institutional path dependency amongst the agents using the services, or indeed the transport provider itself, have a bearing on how efficiently goods, and foodstuffs in particular, are

²¹ Dolci, Maçada and Ely Laureano Paiva, “Models for understanding the influence of Supply Chain Governance on Supply Chain Performance”, 437–8.

²² Kenneth H. Wathne and Jan B. Heide, “Relationship Governance in a Supply Chain Network”, *Journal of Marketing* 68:1 (2004), 75–76.

²³ Xiaoyong Zhang and Lusine H. Aramyan, “A Conceptual Framework for Supply Chain Governance: An Application to Agri-food Chains in China”, *China Agricultural Economic Review* 1:2 (2009), 136–154, here 144.

²⁴ Zhang and Aramyan, “A Conceptual Framework for Supply Chain Governance”, 144.

²⁵ Thomas Y. Choi, Kevin J. Dooley, Manus Rungtusanatham, “Supply networks and complex adaptive systems: control versus emergence”, *Journal of Operations Management* 19:3 (2001), 351–66 (cited in Plibeam et al. “The governance of supply networks”, 368).

transported through the supply chain.²⁶ On the other hand are the socio-economic and political environments in which the operation takes place, which comprises – and is not limited to – issues of supply, food hygiene, government initiatives and interventions, and the consumer’s motivation to purchase certain categories of product in the first place.²⁷ All these elements can be seen in the milk and quail case studies that follow, and help to explain the character of distribution at certain points in time, placing it within the context of the various factors that underpin changes in transport. In other words, by considering the transport operation’s place within the wider context of historical change as well as its relationship with the distributors of specific commodities, it is possible to overcome the tendency for transport historians to consider transport in a vacuum.

A national case study: Milk distribution

How SCG played out on a national scale is seen in the long-distance trade that was developed to supply London with milk, a subject that spans a wide spectrum of historical disciplines ranging from agricultural, business and transport to consumption, economic and social history.²⁸ Rather than being simply a technological history of the transition from rail to road, this case study touches upon factors including consumer demand, trust between the participating organisations, and the politics of how market sectors are organised, regulated and controlled.

Before the 1860s, London’s growing urban population was principally supplied by town dairies, in which milking cows were stored on-site.²⁹ Whilst the preference of consumers was to purchase milk “warm from the cow” from these dairies, French and Phillips, Atkins and others emphasise that the quality of milk on sale in London during the nineteenth century was variable to the point of dangerous.³⁰ Nevertheless, consumer demand had already prompted some use of horse transport and the developing railway network to supplement local supplies with milk sourced from the surrounding countryside by the late 1850s. However, an outbreak of “cattle plague” in London between 1865 and 1868 and the consequent dramatic reduction in urban production spurred the development of a national long-distance trade based on the railways.

²⁶ For example: Peter Scott, “Path Dependence and Britain’s ‘Coal Wagon Problem’”, *Explorations in Economic History* 38 (2001), 366–385.

²⁷ For example: Scola, *Feeding the Victorian City*; Michael French and Jim Phillips, *Cheated, Not Poisoned? Food Regulation in the United Kingdom, 1875–1938* (Manchester: Manchester University Press, 2009).

²⁸ The basis for the following case study is a chapter written by the author in: Thomas J. Spain, “‘Food Miles’: Britain’s Transition from Rail to Road-based Food Distribution, 1919–1925”, PhD dissertation, University of York, 2016, 95–148.

²⁹ David Taylor, “The London Milk Trade, 1850–1900: A Reinterpretation”, *Agricultural History* 45:1 (1971), 33–38, here 33; John Burnett, *Plenty and Want: A Social History of Diet in England from 1815 to the Present Day* (London: Scolar Press, 1979), 201.

³⁰ French and Phillips, *Cheated, Not Poisoned?*, 159; Peter Atkins, “Sophistication Detected: Or, the Adulteration of the Milk Supply, 1850–1914”, *Social History* 16 (1991), 317–339, here 317; Edith Whetham, “The London Milk Trade, 1860–1900”, *The Economic History Review, New Series* 17 (1964), 369–380, here 370.

While the railways broadened the geography of supply for the London milk trade, it was another 50 years before atomistic and speculative wholesaling had consolidated into a supply chain governed by fewer, large-scale firms capable of controlling quality as well as quantity.³¹ Technological change in transporting the commodity during the nineteenth century was brought by necessity; the perishable nature of milk meant that basic technologies were developed by both dairy equipment firms and the railways to prevent spoilage and develop the traffic, namely the churn, cooling apparatus and the ventilated railway milk van. However, the churn and the ventilated van eventually became examples of labour-intensive technological path dependency in action, with Whetham noting that the railways “insisted on milk travelling in the old seventeen-gallon churns” well into the twentieth century.³² Emerging alternative technologies promised benefits in cost and efficiency.

After the First World War, bulk tank technology was being used by small dairy firms; *The Commercial Motor* reported that a Liverpool dairy firm was trialling a transfer of its short-distance rail traffic to a road-tank operation in 1923 to cut costs.³³ On rail, the *Locomotive Magazine and Railway Carriage and Wagon Review* reported in 1925 that tanks with cooling apparatus had been successfully introduced in the United States.³⁴ The following year, the same publication implied a lack of impetus in responding to road competition when it reported that a daily road-based service conveyed 2,500 gallons [over 11,365 L] of milk from the West Country to London.³⁵ A case for adoption was made through a comparison between the road tank operation and the “old-fashioned” method of “conveying [milk] in small capacity churns”, which were themselves un-remunerative deadweight requiring time to clean and process. The article’s analysis claimed clear benefits for adoption, as “allowing for depreciation ... the working cost works out at £1,600 [\$118,000 USD at 2019 prices] per annum, carrying over 2,000 tons [nearly 2,033 tonnes] of milk. This is said to be less than half the cost of transport by rail”.³⁶

While it can be argued that a churn service suited the farmer and small-scale wholesaler alike, the *Locomotive Magazine and Railway Carriage and Wagon Review* article highlighted scope for improvement. However, having provided a basic infrastructure, Britain’s railway industry had little incentive to innovate while the milk industry was itself locked-in to the status quo of churn traffic. Nevertheless, the initiative for change appears to have emerged from the large-scale wholesalers, which possessed both the

³¹ Atkins, “Sophistication Detected”, 320–322.

³² Edith H. Whetham, *The Agrarian History of England and Wales, Vol. VIII* (Cambridge: Cambridge University Press, 1978), 151.

³³ “Motor Tankers for Milk”, *The Commercial Motor* 37 (31 July 1923), 756–757.

³⁴ “Railway Milk Transport in Bulk”, *The Locomotive Magazine and Railway Carriage and Wagon Review* 31 (15 May 1925), 163.

³⁵ “The Transport of Milk”, *The Locomotive Magazine and Railway Carriage and Wagon Review* 32 (15 November 1926), 364.

³⁶ “The Transport of Milk”, 364; Currency conversion to USD for illustrative purposes only using: Lawrence H. Officer and Samuel H. Williamson, “Computing ‘Real Value’ Over Time With a Conversion Between U.K. Pounds and U.S. Dollars, 1791 to Present”, *MeasuringWorth*, 2022. <https://www.measuringworth.com/calculators/ukcompare/> (accessed February 23, 2022).

scale and resources, after the First World War. Indeed, something glossed over in academic histories of transport is the extent to which traders could help drive change in transport matters in the interwar years,³⁷ and this is where the wider concept of SCG emerges as a useful framework to consider why such changes took place.

Whetham notes that United Dairies was actively eliminating rail transport from some of its operations after the war.³⁸ This reveals something of the potential power rail users such as large milk wholesalers possessed in negotiations. The precise course of events leading to United Dairies, the Great Western (GWR) and the London, Midland & Scottish Railways (LMS) trialling rail-mounted tanks in late 1927 has yet to be ascertained, although one might assume the implied threat of traffic transfer provided some negotiating leverage. Nevertheless, the outcome – the rail-mounted bulk milk tank – suggests a compromise based upon a balance of risk between both parties.

Unusually for a British railway vehicle, the railway companies financed the chassis while the wholesaler supplied the tanks; they represent durable investments by both parties that mitigated risk in the event of failure.³⁹ However, acceptance was not universal on the railway side – the financially straitened London & North Eastern Railway was reticent in following suit. Indeed, a memorandum to the company's Traffic, Locomotives and Works Committees reveals that "... every effort [had] been made to induce the firm to bear the whole of this expenditure", and in this instance, the wholesaler's threat to transfer traffic appears to have borne fruit.⁴⁰

There was much to be gained by the wholesaler from adopting the tank on trunk hauls along the main lines. Firstly, the 3,000-gallon (13,638 L) capacity tank displaced 300 10-gallon (45.5 L) churns, and was despatched full of pre-cooled milk to prevent churning in transit.⁴¹ Secondly, the insulation between tank barrel and outer skin permitted transport for several hours with minimal temperature increase, while the use of vitreous enamel-lined, stainless steel or aluminium tanks eased the cleaning task after use.⁴² Thirdly, the risk of contamination was also reduced, while loading was expedited by pumping the milk into and out of the tank. However, it was not a complete paradigm shift; the twice-daily delivery of churns to stations and rail-linked country depots would remain an inconvenience for farmers until after the Second World War, although, in an example of the vertical integration of functions, larger organisations such as United Dairies could provide collection services from their own depots in dairy farming districts.⁴³

³⁷ Some business histories of major firms can offer glimpses beyond the supply-side of transport, for example: John Bradley, *Cadbury's Purple Reign: The Story behind Chocolate's Best-Loved Brand* (Chichester: John Wiley, 2008).

³⁸ Whetham, *The Agrarian History of England and Wales*, 151.

³⁹ "Milk Transport in Tank Wagons", *The Railway Magazine* 62 (February 1928), 120–122.

⁴⁰ "Conveyance of Milk in Bulk", *Great Western Railway Magazine* 39:12 (1927), 491; Editorial, *LMS Railway Magazine* 4:11 (1927), 361; The National Archives of the UK, Kew, (hereafter TNA), RAIL 390/708, 25 February 1928 Memorandum to the Traffic, Locomotive and Works Committees, 3.

⁴¹ "Conveyance of Milk in Bulk", 491; Editorial, *LMS Railway Magazine*, 361; William Clunie Harvey and Harry Hill, *Milk: Production and Control*, 2nd ed. (London: H. K. Lewis, 1946), 193–194 and *Milk: Production and Control*, 4th ed. (London: H. K. Lewis, 1967), 245.

⁴² Harvey and Hill, *Milk: Production and Control*, 193.

⁴³ For example, Captain Amor, "Road Motor Transport", *Our Notebook* 4 (September 1924), 80.

Another example of a shift in SCG influencing the nature of transport provision within the London milk trade occurred with the formation of the Milk Marketing Board (MMB) of England and Wales in the mid-1930s, a producer organisation that set minimum producer prices to help reduce risk within the trade.⁴⁴ The income received was fed into regional pools paid to producers on an average price per-gallon basis after various deductions for administration and other costs; transport costs were also paid by the producer through deductions made by the buyer where the latter arranged transport.⁴⁵ As over 88 per cent of milk sold under wholesaler contracts was delivered either to the buyer's railway stations or collected by the buyer in the year 1937–38,⁴⁶ the Board became involved in directing milk to specific markets to improve the producer's financial return.⁴⁷ An example was a reconfiguration of the milk market in Wensleydale to reduce transport costs accrued when it was sent to London,⁴⁸ indicating that even wholesaler-controlled operations had scope for improvement in rural districts.

The Second World War saw the Board become an executive agency of the Ministry of Food, giving it unprecedented control over the trade. In the case of farm collection, it acquired and developed its own fleet of road vehicles to gauge transport costs, the results of which could inform negotiations between producers, wholesalers and hauliers and improve trust between parties.⁴⁹ As such, it was well-placed to govern the supply chain by the 1950s; indeed, the separate Scottish Milk Marketing Board and the MMB used their influence to actively encourage the adoption of road-based bulk tanker technology in farm collection through a system of rebates, thereby reducing and ultimately eliminating the labour-intensive milk churn.⁵⁰ As a result, the whole industry began to reduce its reliance upon the railways as a bulk carrier of milk, with the road tanker providing a more direct mode of transport that could be closely monitored.

It is also possible to establish how a relative lack of overall governance within a specific part of the supply chain had a wider social consequence. Inefficient practises and processes that remained embedded for decades had a bearing upon access to fresh milk. Some segments of London's population remained unable to purchase more than small quantities of this most nourishing of food commodities well into the 1930s.⁵¹

⁴⁴ A separate scheme was established in Scotland.

⁴⁵ Stanley Baker, *Milk to Market* (London: Heinemann, 1973), 138; Milk Marketing Board, *Milk Marketing Scheme: Five Years Review, 1933–1938* (London: Milk Marketing Board, 1938), 29; Milk Marketing Board, *The Work of the Milk Marketing Board of England and Wales, 1933–1952* (Thames Ditton: Milk Marketing Board, 1952).

⁴⁶ *Milk Marketing Scheme: Five Years Review, 1933–1938*, 29.

⁴⁷ Jonathan Brown, *Agriculture in England: A Survey of Farming, 1870–1947* (Manchester: Manchester University Press, 1987), 113, 115–116; John Martin, *The Development of Modern Agriculture: British Farming Since 1931* (London: Palgrave Macmillan, 2000), 23–24; Baker, *Milk to Market* (London: Heinemann, 1973), 55–56, 62, 73; TNA: RAIL 396/2, 10 December 1937 London and North Eastern Railway Milk Traffic Received and Forwarded from Cow & Gate, Northallerton.

⁴⁸ TNA: RAIL 396/2, 10 December 1937 LNER Milk Traffic Received and Forwarded from Cow & Gate, Northallerton.

⁴⁹ "The Ways of the Milk Marketing Board", *The Commercial Motor* 91 (5 May 1950), 408.

⁵⁰ For example: "Scotland Pioneers Milk Transport Experiment", *The Commercial Motor* 98 (13 November 1953), 420.

⁵¹ L. J. Steck, *The Regulation of Milk Marketing in England and Wales* (Washington, DC: US Department of Agriculture, 1938), 7.

The situation prompted reviews into milk distribution, with the Cutforth Report of 1938 suggesting that the inefficiency of retail practises in urban areas, such as the milk round by trolley, a form of service-based retail competition, was responsible for inflating the retail price of milk, and was therefore ripe for reorganization.⁵²

This suggests that while the MMB could exercise SCG over producers and wholesalers as well as the logistics of the London milk trade, inefficiencies at the atomistic retail end of the supply chain and the final mile to the consumer were difficult to address, at least before the emergence of self-service retail and the car. An example of the retail dairy problem was that while the MMB occupied a position that made it a crucial partner in social schemes such as the 1934 school milk initiative, Atkins notes that the retail dairy sector was a stumbling block because of the additional costs incurred in transporting the milk to schools.⁵³

All of this highlights the advantages of taking a broad view of the freight transport operation between, in this instance, farm gate and kitchen table. Approaches to food history – justly – focus upon specific sectors; for example, agricultural histories might broadly stop at the farm gate,⁵⁴ while consumption history is a strong strand relating to the retail end of the chain. However, the efforts undertaken to reduce inefficiencies within it, and who initiated the changes within a supply chain are often lost. This case study has therefore sought to consider the place of transport within the London milk supply chain with reference to SCG and the work of different academic disciplines to account for developments in freight transport on a national scale.

An international case study: Quail

SCG's ability to answer the 'how' and 'why' questions of supply chain development and its influence on transport over time are also exemplified by the trade in live quail to the United Kingdom between 1850 and 1914. This demonstrates how a supply chain was shaped by social, economic, political and biological contextual factors, but also the case explores the influence of matters of control of governance, supply chain resilience in the face of challenges, and inter-organisational relationships.

Coturnix coturnix, the European or Common Quail, is a small ground nesting game bird that lives amongst scrub and crops, eating insects and seeds. Unlike other game birds it migrates, summering in Northern Europe and then heads south to North Africa and Asia around October, returning around May. During migrations, millions of exhausted quails stop off at various points around the Mediterranean, from southern

⁵² Hermann Levy, *The Shops of Britain: A Study of Retail Distribution* (London: Routledge and Kegan Paul, 1948), 55.

⁵³ Peter Atkins, "The Milk in Schools Scheme, 1934–1945: 'Nationalization' and Resistance", *History of Education: Journal of the History of Education Society* 34:1 (2005), 1–21, here 12–13.

⁵⁴ For example: Martin, *The Development of Modern Agriculture*; J. Benson, *The Rise of the Consumer Society in Britain, 1880–1980* (Harlow: Longman, 1994); Kim Humphery, *Shelf-life: Supermarkets and the Changing Cultures of Consumption* (Cambridge: Cambridge University Press, 1998); John Benson and Laura Ugolini "Introduction", in John Benson and Laura Ugolini (eds), *Cultures of Selling* (Aldershot: Ashgate, 2006).

France to the Crimean Peninsula. In doing so before 1914, they were caught to supply the local and international quail trades.

Britain was the biggest importer of live quail by 1914, the result of growing demand over the previous 60 years. Before the 1860s, consumption mainly occurred amongst the elites and so the numbers imported were low. In 1847 a ship docked at Southampton with 5,000 live quails for fattening and sale from Malta.⁵⁵ Around this time the supply chain was generally short as local sites of origin could keep up with demand; in May 1854 it was stated that all the quail in London poulter shops came from France and the Netherlands.⁵⁶ Consumer demand however grew, especially amongst the affluent urban middle-classes. In 1910 *The Globe* asserted that "... the bird's appearance is no longer confined to the dinner-tables of the aristocracy, for at any little restaurant in Soho one may find them served in the course of a half-crown dinner".⁵⁷ More demand pushed the live imports much higher and lengthened the supply chain. Absolute numbers imported rose from approximately 200,000 in the spring of 1869 alone to over 2 million birds being exported from Egypt to London in 1897, with single deliveries of 100,000 being reported by 1909.⁵⁸ The result was a dramatic change in the governance of the supply chain.

For the most part, in a period when Western Europe dominated the trade before 1880, birds moved to London through disaggregated supply chains. London poulterers dealt with international dealers,⁵⁹ and in 1897 a large portion of the Southern Italian quail trade was apparently in the hands of three Paris merchants.⁶⁰ The evidence suggests that in this case birds would be shipped from Messina in Sicily or the surrounding area, and would arrive in Marseille in Southern France.⁶¹ Who sent the birds to Paris is unclear from the fragmentary evidence, but the whole system suggests no overarching coordination of the different elements, with orders likely to have been processed on request and transport arranged by the individual despatcher, with each participant extracting their share of the profit.

The trade was not benign or sustainable, and exemplifying how demand at one end of a supply chain can have environmental and social impacts at the other, feeding it became increasingly strained as the birds' reproductive cycles were unable to keep up with changing British tastes. As early as the 1870s concerns were voiced that quails were disappearing from northern European regions, allegedly in consequence of changes in farming practises – which led to the disappearance of quails' natural habitat – however over-capture in Mediterranean regions for local consumption and export was considered

⁵⁵ Editorial, *Tipperary Free Press* 5 June 1847, 5.

⁵⁶ "The Quail", *Illustrated London News* 27 May 1854, 494.

⁵⁷ "Quails", editorial, *Globe* 20 October 1910, 1.

⁵⁸ "Importation of Ptarmigan and Quails", editorial, *Montrose, Arbroath and Brechin review and Forfar and Kincardineshire advertiser*, April 9, 1869, 2; Her Majesty's Government, *No.2197 Annual Series: Diplomatic and Consular Reports – Egypt – Report for the Year 1897 on the Trade and Commerce of Egypt* (London: HMSO, 1898); "100,000 Egyptian Quails for London", editorial, *Globe* 14 April 1909, 5.

⁵⁹ "Quail", *Saturday review of politics, literature, science and art* 87 (May 1889), 617–618.

⁶⁰ C.J. Cornish, "The London Gale Shops", *The Cornhill Magazine* 3:14 (August 1897), 173.

⁶¹ "Importation of Ptarmigan and Quails", editorial, *Montrose, Arbroath and Brechin review and Forfar and Kincardineshire advertiser* 9 April 1869, 2.

particularly to blame. With disaggregated, ungoverned supply chains and dealers throughout the Mediterranean sending quail to Britain, and without international regulation of the trade, reports suggest negative impacts on local food supplies throughout the region. In 1892, the “greed and gain of a few dealers in poultry” was cited as a cause for increasing plagues of locusts in Algeria – so destructive to local crop yields and thus food supply – as the quail trade had depleted the numbers of quail preying upon the insects.⁶² Whilst populations of locally nesting quail remained healthy all-year around, between the 1850s and 1904 the number captured on the Island of Capri during the migrations in Spring fell from, at maximum, 150,000 to 30,000.⁶³ Further evidence of the impact is a report from the Second International Sports Congress held in Vienna in 1910, which stated that declining numbers in France, Germany and Belgium was “due to netting of the birds in the Mediterranean Lands, for consumption in N. Europe”.⁶⁴

Faced with such a challenge to supplies, there was no attempt to regulate demand in Britain and ensure sustainability; instead, alternative sources of supply were sought. Evidencing how the geopolitics of empire impacted upon specific goods flows, a shift in the supply chain towards the eastern Mediterranean coincided with the growth of British influence there. In 1882 Britain occupied Egypt – what Osman called “the culmination of increasing British influence in the country”⁶⁵ – although it was still nominally part of the Ottoman Empire. Whilst the country had been supplying quails since the 1850s, the combination of reduced numbers in the Southern Mediterranean and Egypt being occupied by the British presented an opportunity for trade development,⁶⁶ especially as Jakes has suggested the new regime “elevated ‘economic development’ as its foremost priority”.⁶⁷

Trade development was supported by the establishment of the Egyptian Quail Syndicate (EQS) by three companies, c.1880. Its development before the 1900s is unclear, however unlike the established disaggregated supply chains, it fully controlled the transport of live quails from near their source to final distribution by 1910. The local population along the Nile Valley and Delta captured birds and handed them in at the Syndicate’s own trading stations. They were then despatched by camel to its central stations, and then forwarded by Egyptian State Railways (ESR) to a large Syndicate-controlled receiving house at Alexandria. Up to 100,000 birds were then loaded onto the fast Britain-bound steamers of the Prince Line.

They arrived in Britain via the Manchester Ship Canal, and special unloading practises were adopted under the supervision of Syndicate officials before they were transported to

⁶² “Quails and Locusts”, *Chambers’s Journal of Popular Literature, Science and Arts*, 23 April 1892, 9.

⁶³ Michael Shrubbs, *Feasting, Fowling and Feathers* (London: T & AD Poyser, 2013), 109.

⁶⁴ The National Archives, Kew, HO 45/17858, Wild Birds: Quail Protection Bill and Act, 1937, Report from Congress International de Chasse, Vienna 1910 (translation for UK Government).

⁶⁵ Tarek Osman, *Egypt on the Brink: From the Rise of Nasser to the Fall of Mubarak* (London: Yale University Press, 2011), 30.

⁶⁶ A.G. Hopkins, “The Victorians and Africa: A Reconsideration of the Occupation of Egypt, 1882”, *The Journal of African History* 27:2 (1986), 363–391, here 390–391. Norman L. Middlemiss, *Pride of the Princes: History of the Prince Line* (Newcastle: Shield, 1988).

⁶⁷ Aaron G. Jakes, *Egypt’s Occupation: Colonial Economism and the Crises of Capitalism* (Stanford CA: Stanford University Press, 2020), 4.

London in specially outfitted Great Northern Railway (GNR) express freight trains. The birds were then moved to the Syndicate's warehouse for fattening and subsequent sale to retailers, locally and throughout the United Kingdom. Absolute governance was therefore exercised through the EQS owning its own facilities and making agreements with transport organisations whose actions it coordinated. This also allowed closer monitoring of the cargo to ensure its security and reduce the risk of loss, and as a by-product assuage public concerns over the health and well-being of the birds. The Syndicate employed attendants to accompany the birds all the way from Alexandria to London, and by 1913 also frequently arranged for representatives of the Royal Humane Society to board the boats and trains. This would have likely been impossible to organise within the established disaggregated supply chains.⁶⁸

The focusing and exercising of governance can therefore be identified as a crucial factor in the EQS's development of a more cost-effective, vertically integrated system. Removing intermediaries reduced transaction costs given they would have taken their cut of profits, allowed the EQS to reduce wastage, and allowed it to effectively negotiate with and coordinate transport providers.⁶⁹ Indeed, arrangements with the ESR, Prince Line, Manchester Ship Canal, and GNR formalised roles and responsibilities of partners, undergirding consistent supplies, and delivered TSI. How long such arrangements had been in effect is unclear by the time of the 1913 *Railway Magazine* article, but it suggests a system constituted of mature and potentially trust-based inter-organisational relationships where positive outcomes were achieved through effective communication and alignment of objectives.

Significantly, control of the chain also potentially impacted upon the entire trade and transport usage elsewhere. A British government report in 1912 stated that the Syndicate could keep the number of quail at a "low level with a view to maintaining prices", given its near domination of the trade at this point.⁷⁰ This strongly suggests that competing supply chains had been eliminated by this point, possibly because the EQS at an earlier stage was operating more cost-efficiently and had secured better supply.

It is nonetheless worth noting that the EQS's dominant position before the First World War may also partially have been the result of transport factors linked to regulatory change in both national and international spheres. As Darwin described, Marseilles – long the Southern European port receiving quail destined for Britain – did not grow like other major European ports; its rail connections remained poor, its export trade was not significant, the *Compagnie des chemins de fer de Paris à Lyon et à la Méditerranée* charged high rates for transit, and it captured little trade in transiting goods. Also, France's adoption of a high tariff regime in 1892 and the lack of resources directed towards the port by the French government meant it progressively focused on trade from French colonies, especially Algeria, perhaps to the detriment of the

⁶⁸ Charles Dix, "Railways and the Growth of Industries: The Egyptian Quail Traffic", *The Railway Magazine* (August 1913), 131–136.

⁶⁹ "Quails", *Hampshire Advertiser* 17 May 1889, 1.

⁷⁰ TNA, HO 45/17858, Wild Birds: Quail Protection Bill and Act, 1937, Letter from George J. Stanley (Board of Trade), 16 August 1912.

Britain-bound quail trade.⁷¹ Concerns over declining quail numbers amongst vocal French hunters also led in 1899 to the French authorities banning the movement of live quail through its territory. Two years later it also signed an entente with Germany to prohibit their sale and movement. The Swiss government did the same in 1904.⁷²

How long these movement bans lasted is unclear, but these factors initially militated against Britain-bound quail passing overland through Europe, at a time when faster and cheaper sea-borne routes were available. Here, therefore, governance arrangements, or lack thereof, can potentially be identified as diminishing the overland quail supply chain and associated transport usage. Without an overarching governing organisation able to lobby multiple governments or deal with different agencies, the factors outlined possibly broke the weak links between shippers, merchants and transport companies, neutralising the EQS's competition and cementing its dominance within the trade.

Its powerful position also allowed the EQS to negotiate and react effectively to changing localised regulatory regimes that sought to check for animal harm in ways that affected its operation. In 1903 the Society for the Prevention of Cruelty to Animals in Egypt urged the authorities to take action to "check the wholesale destruction of small insectivorous birds" ("beccafichi") and stem the quail trade. A consular report stated that "there can be no doubt that their destruction has been hurtful to agricultural interests". In response the capture of quail on government lands with nets within 1,000 miles of the shoreline was prohibited. This and other moves were initially successful in preserving bird populations. In 1902 1.5 million quails were exported, the number falling to 827,000 in 1903.⁷³ Seemingly this was only a short-term restriction; arguably the Syndicate used its control over the supply chain to source more birds further from the coast in the Nile Valley and Delta, using the ESR as a conduit. In this it was later supported by the British government. In 1912 it refused to participate in further international attempts to preserve quail stocks on the grounds that supply had not fallen off in Egypt, and so the British market could still be supplied.⁷⁴ The EQS therefore continued its environmental harms and resource exploitation; its power in governing the supply chain facilitated a quick response to challenges, supported by favourable regulatory and political regimes.

The case of the quail trade demonstrates the importance of the contextual social, economic, diplomatic and, in this case, biological factors in shaping goods movement and the transport usage supporting it. Yet identifying how SCG emerges and changes in response to those factors has facilitated the emergence of a nuanced and well-rounded picture of goods movement, that identifies how and why frictions and bottlenecks in chains exist,

⁷¹ John Darwin, *Unlocking the World: Port Cities and Globalization in the age of Steam* (London: Allen Lane, 2020), 315–316.

⁷² *The Globe*, April 6, 1899, 1. TNA, HO 45/17858, Wild Birds: Quail Protection Bill and Act, 1937, File 198015, Memorandum: Protection of Quail, May 1912.

⁷³ Other measures instituted were the halting of the capture and transport of all small birds that passed under the heading 'beccafichi' and the banning of bird-lime. HM Government, *Finances, Administration, and Condition of Egypt and the Soudan in 1903* (London: HMSO, 1904), 41.

⁷⁴ The National Archives, Kew, HO 45/17858, Wild Birds: Quail Protection Bill and Act, 1937, Letter from George J. Stanley (Board of Trade), 16 August 1912.

how they were overcome, and the organisations that facilitated this, in many cases through new transport solutions. Recognising these factors is fundamental if we are to fully comprehend the complexity in goods movement in the past.

Conclusion

The cases of milk and quail both demonstrate goods – specifically food – transport’s place within a wider context. They reveal not only how transport facilitated the national and international reach of supply chains, but also the ability of organisations to use their scale and accumulated market dominance to govern how the supply chain functioned. This means that transport, rather than simply being an enabler, is moulded to the needs of such organisations – whether producer, wholesaler or international syndicate, to meet current and anticipated demands. As such, transport’s organisational, spatial and technological development can be viewed through the lens of the supply chain and its needs, while establishing the focus of governance can suggest how and why a change was initiated in distribution.

What the case studies in this article demonstrate is that far from being simply cast as management tools generated in management and business schools, and thus outside the current trajectory of the social science approaches to the movement of things, SCG can provide robust theoretical and conceptual frameworks for exploring and historicising supply chains. They set out the key players and the various processes taking place within the chains and present a means of charting how organisations and processes were connected, both with each other and to external factors such as legislation, bilateral and multilateral agreements, economic cycles, regulation, and consumer demand, as the development of both the milk and quail trades have demonstrated. All of this demonstrates that transport was and is just one part of a dynamic, rather than static process characterised by continuous change and development up to the present, in which even the threat of modal shift could be used as leverage in negotiating service improvements.

As important as establishing key stakeholders exercising control over the supply chain is, our evidence here has shown that ascertaining where there is a lack of obvious overall governance, such as the small retailer sector or in disaggregated international supply chains, is just as important. The example of milk deliveries being used as a form of service-based competition amongst retailers has touched upon the fact that a lack of governance, as well as market control, was believed to have the potential to affect the prices paid by consumers in the 1930s. Similarly, the supply chains that supplied Britain with quail before the 1900s were, because of their disaggregated nature and the territories through which they operated, perhaps more easily dissolved. The movement of things therefore has multiple layers of complexity; the notion of supply and demand has impacts on people and places at both ends of the supply chain, while transport choices are clearly susceptible to shifts in how the chain is controlled.

We also propose that the approach has utility beyond historical scholarship. History has the capacity to inform answers to modern questions articulated by supply chain, logistics and distribution scholars and practitioners, a field where the lack of temporal depth is increasingly recognised. Pilbeam *et al.* argued that “there is a dearth of longitudinal

studies” on the evolving nature of supply chains and networks, where “network outcomes become future network contexts in a dynamic cycle and by altering power and trust relationships”; this is hidden from the literature because of scholarly focus on what is going on now, rather than change over time.⁷⁵ Similarly, Roehrich *et al.* argued that in the case of inter-organisational relationships (IORs) “there has been limited attention on a longitudinal understanding of how governance mechanisms evolve over time in IORs”.⁷⁶

This article’s focus has nonetheless been the application of theories and concepts used in the fields of business and supply chain management *to* transport history for the elucidation and understanding of transport’s place within the food supply chain and the influences acting upon it. Such historical analysis has the potential to assist with a refinement of SCG theory, which has yet to consider transport within its remit. Engagement in such an iterative process ultimately has the potential to strengthen the theoretical underpinnings of transport history scholarship.

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