

**The impact of technological Change on French and British food retailing in the  
twentieth Century  
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Barbara Orland

Melanie Du Puis, *Nature's Perfect Food. How Milk became America's Drink*, New York and London: New York University Press 2002

Why do the industrialised nations prefer cow's milk as a beverage? This question is by no means self-evident. Even if we all have learned that milk belongs to the eldest food of mankind, the story of an extensive consumption of sweet, fresh milk is a very young. In fact, it is rooted in the evolution of industrialised food systems. Daily fresh milk drinking as a new food habit began in the mid-nineteenth century and is connected to the development of urban living conditions - at first as a necessary nutrition for infants and children, but within a few decades it spread to the populace as a whole. Thus, the story of modern milk consumption was made possible only through the development of an industrial food system. It is a perfect example about the shift from family farming systems to industrialised farming systems with many new processing steps in between the farm on the one hand and the consumer on the other. And because fresh milk is a very sensitive product, the milk market belongs to the most regulated markets by the government. Even today, with deregulation a keyword in any political agenda, milk has continued to be one of the most heavily regulated commodities.

As Melanie Du Puis points out, there exists, however, one astonishing difference between this and other commodities. Unlike most other industrialised food systems, milk production still today seems to be impossible to be globalised. This is one of the main reasons, why milk is treated as a somewhat old-fashioned product that characterises local production forms processed near-by-metropolitan areas. Although fluid milk production in fact has remained relatively local, Du Puis' aim is to show that this character is in itself a product of history and

not a necessity of the nature of milk. The unwillingness to take some or all water out of fresh milk in order to sell it on global markets is a political phenomenon that has to be explained.

One of Du Puis' answers to explain this strange character of the milk production system lies in the power of the dairy lobby. Newly developed corporations, together with urban milk reformers, in the last decades of the 19<sup>th</sup> century took over the argument of nutritionists, who had described milk as the perfect food of mankind. Milk was proclaimed to be the only food that contained all elementary elements (albumen, oil and sugar) that should be essential to the support of all animal life. This idea was transformed into the industrial vision that every person – regardless to age or sex – should be enabled to consume this perfect food of nature and that it is the task of modernisation to produce enough of this food in a fresh, pure and undangerous manner.

Du Puis frames her path-breaking study in the rhetoric of “Nature’s Perfect Food” and shows how the working of this idea influenced different social and economic contexts. “Narratives of perfection, and their accompanying narratives of inevitability and enlightenment, throw a veil over social and political forces, the human choices, in history. The progress story is as apolitical as the notion of perfection itself.” (66) While illustrating the different debates and conflicts around the “nature” of milk, Du Puis enables us to understand how the genuinely character of a perfect food was constructed in particular ways.

Sally McMurry, *Transforming Rural Life. Dairying Families and Agricultural Change, 1820-1885*, Baltimore and London: John Hopkins University Press 1995.

The shift from home to factory butter and cheesemaking is explored in this study. To gain an appreciation of local conditions, McMurry concentrates on Oneida County in New York State. This decision is rooted in the observation that Oneida was a dairy county early on, ranking in home cheese production, but also the first cheese “factories” were built there. Thus, dairying was far more than an agricultural branch. It was a complex farming system with specific crop mixes and cultivation methods. Further on, it was a social system with its own values, ideas about the land, gender relations, household structures and even skills and artefacts. To characterise dairying as farming system permits several insights about the difference between premodern and modern forms of milk consumption.

At first, it becomes clear that dairying as well as crop farming was a strategy of land use. Today agriculture can orient its production more to the demand efforts than to landscapes and soil. This move from the soil enabled specialisation, and the concentration on single products was perhaps one of the most important causes of efficiency and overproduction. When the European settlers came to North America, they had other criteria in mind when making their decisions about agricultural production methods in order to cultivate the land. They classified production methods in respect to the soil.

Thus, the demise of arable farming in favour of dairying, which took place at several places in New York State around the 1820s, was influenced by ideas about the landscape and its potentialities. Farmers defined “Dairy Zones” as an optimistic revaluation of topography, herbage and climate, but also as a benign vision of a new society and culture. Topography, vegetation, climate, animals and their products seemed to be interrelated. Feeding regimens, longer housing in special barns, indoor milking in so called milking houses, and cheese making in single household structures, all components related to one another. In this sense, regional labour and commodity markets were connected. As McMurry points out, the relationship of mid-century cheesemaker families to the market captured a hybrid system of “subsistence” and “commercial” production – mediated by a specific brokerage system based on local exchange systems.

Thus, home cheese production was sustained by an intricate social organisation that possessed a distinctive age structure and a complex mix of family and hired work. Because cheese dairying required capital to purchase livestock and equipment, this farming system was a life-cycle phenomenon, so to say, families at an advanced stage in their life cycle were more likely than young families with little children and hired hands were bound into the web of mutual obligation. The work itself was “gendered” in several aspects, although not so extremely as in European countries. Because cheese dairying complemented the customary family economy, as a commodity-producing business work was associated with men as well as with women and it is impossible to draw a line between market and subsistence production that parallels a gender line. Nevertheless, cheese making in all its parts was an excessive labour mostly done by women. Trouble within the families was unavoidable and is one important explanation of the rapid rise of cheese factories that processed the milk of several farms in a central location.



Together with changes of market conditions in the period within and after the Civil War the reorganisation of the cheese production reduced the internal contradictions fostered under the home system and replaced the household business. In conclusion, McMurry's gender analysis illuminates in a fascinating way in which relations between the sexes functioned in the transformation of the rural society and family economy after the Civil War. Under a household system inequity in the status and power of the sexes carried over to an unequal sexual division of labour. Household tensions helped to give impetus to the factory system and an ideological masculinization of cheesemaking. Although many women accepted this tendency, on a long run women were increasingly marginalized as men came to command the language, resources, and processes involved.

Lysaght, Patricia (Ed.), *Milk and Milk Products from Medieval to Modern Times*, Proceedings of the Ninth International Conference on Ethnological Food Research, Ireland 1992, Edinburgh: Canongate Press 1994

One of the most important results about milk consumption in premodern times is that almost around the world dairy products were not consumed in fresh fluid forms. A series of historical studies on dairy food habits throughout Europe show that in some countries fresh milk was considered a luxury food, while in others it was thought to be unwholesome and unhealthy. Fluid milk processed from different animals was at best used to feed infants and children or it was drunk by pregnant women, but it was almost never used as an everyday life beverage for adults in general. In fact, it was an unquestioned custom that the drinking of fresh milk was the least important aspect of milk utilisation overall.

As contributions about the history of dairy product consumption from Netherlands, Scotland, Hungary and Germany show, in most of Europe people used animal's milk in different forms of fermented products, as soured milk, kinds of yoghurts, fresh cheeses and fat cheeses. And studies from Finland, Latvia, Norway, Iceland or Sweden supplement that most European regions preserved similar traditions in preparing milk products. Butter production too is a very old technique of milk conservation in several parts of Europe, with much of the resulting buttermilk and whey fed to other livestock (mostly pigs).

A second part of the book is addressed to the development of the urban milk trade. In the last decades of the 19<sup>th</sup> century marked the end of the pre-industrial processing of milk and it seems

to be clear that the challenges posed by growing urbanisation and industrialisation gave new impulses and direction to the milk production. However, the case studies from Scotland and Germany do not discuss in detail the causes of transition.

Hans-Jürgen Teuteberg, Anfänge des modernen Milchzeitalters in Deutschland, in: Hans-Jürgen Teuteberg and Günter Wiegelmann (eds.), *Unsere tägliche Kost* (Studien zur Geschichte des Alltags, no. 6), 2nd. ed. (Münster 1986), 163-184.

The modern age of milk consumption, as this author regards it, can be precisely dated around the decade of 1870. Several reasons caused this transition from milk as an agricultural by-product to the rise of the modern fresh milk system. As the author argues, it was the complex story of urbanisation and industrialisation with its class conflicts promoting urban reform movements that forced scholars of economics and agricultural sciences to improve the conditions of milk production and processing in Germany. New markets with a steady rise of demand set the conditions, including a need to increase the size of milk farms, the division of labour and the use of machinery.

In particular, a new generation of scientifically informed farmers grew up and established dairy sciences in order to raise productivity on all levels of dairy farming. Their main task was to increase milk yields. This required the innovation of specific feed habits for milk cows, a selective breeding of high-yield animals, improvement of milk sanitation and the development of effective dairy machinery for all stages of milk processing.

The problem with this paper is that changes are based on exogenous forces, mostly provided by modern science and neo-classical economics. Although the paper implies that processes of agricultural change have taken place earlier in the century and promoted by agricultural reformers, the main agents of change and progress are found outside agriculture in new scientific centres of research and innovation. As if practical value and efficiency are inherent properties of scientific knowledge, statistical data on a steady rise of milk production are read as a confirmation of scientific success.

Uwe Spiekermann, *Milchkleinhandel im Wandel. Eine Fallstudie zu München 1840-1913*, in: *Scripta Mercaturae*, 27. (1993), 91-145.

A more detailed analysis of the dynamics on the milk markets in 19<sup>th</sup> century can be found in this study. The author mainly concentrates on the changes of the business conditions of small milk traders, so-called “Milchmänner”, under the development of urbanisation. Before the freedom of trade in 1868 it were those small milk traders who served the need for milk in the city of Munich. Outside of the town they hold a few cows and sold their milk to an established clientele. Dairymaids brought the milk into town. Since the 1840s the profitable milk business promoted professionalization. More and more farmers concentrated on the production of milk in order to hand it over to saleswomen who specialised on selling milk within the city. These mostly unmarried women had no good reputation, because they were said to adulterate the milk. Permanent conflicts forced local authorities to attend to the milk business and to encourage urban food control. With the aid of professionalizing food chemistry they made great demands on the sales conditions. Long before 1900 milk control was a highly contested field that changed the structure of milk trade. Street trading more and more disappeared, salesrooms became widely accepted, with a prescribed assortment of goods.

Alexander Fenton, *Milk and milk products in Scotland: The role of the Milk Marketing Boards*, in: Adel P. den Hartog (ed.), *Food Technology, Science and Marketing, European Diet in the Twentieth Century*, East Linton: Tuckwell Press 1995, 89-102.

In Scotland as well as in other European countries liquid milk became a major item of trade near industrial centres not before the last decades of the 19<sup>th</sup> century. One of the interesting facts of this shift to fresh milk results in the question, how farmers changed their dairy strategies in order to serve new market interests. What kind of institutional consequences resulted from these new dairy strategies? It is obvious that zone differences began to be eroded with the spread of railways and transport improvements and it is often written that problems of milk sanitation required regulation of the collection and distribution of milk products. However, as it becomes clear from this article, State control of the milk market was also necessary in order to regulate the different branches of milk production itself.

The main problem was the milk that was a surplus to the needs of the liquid market. Sale of fresh milk was most profitable. When manufactured into butter and cheese, milk was easier to handle for storage and transport, however, it had to compete with foreign imports and fetched low prices. Already before and soon after the end of World War I, agricultural recessions ensued, because more and more farmers had turned to dairying. Thus, longstanding good prices on the liquid milk market resulted in a greater surplus to be sold, accompanied by a rapid fall in the average world price of cheese in 1920-1930. To prevent the collapse of the dairying industry, in Scotland - as well as in other countries – Milk Marketing Boards were set up since 1931. The powers of these Boards included control of milk marketing, the arranging of prices, the prevention of selling without Boards permission and the promotion of agricultural co-operation and advertising of food and diet. The basic idea was to mediate the interests of all related groups, and the Boards should be the instruments that facilitated the operation of numerous acts and orders.

M.S.C. Bakker, Boter, in: *Geschiedenis van de Techniek in Nederland. De wording van een moderne samenleving 1800-1890, Deel 1 Techniek en modernisering Landbouw en voeding*, Zutphen: Walburg Pers 1992, 103-277

The consequences of the creation of larger milk markets within Europe, especially the displacements on the butter and cheese market, are illuminated in this paper. Netherlands, one of the main butter and cheese exporters in premodern times, had to compete with Denmark, after the Danish had started to cultivate dairy farming and butter production since the 1860s. Yet in 1860 Netherlands had exported about thirty times as much butter to Great Britain than Denmark. Until 1890 these figures had been reversed completely. Now, the Danish exported 42.000 t to Great Britain, the Dutch only about 8.000 t.

Priester, P. R., *Boeren met machines. Het melkveehouderijbedrijf*, in: *Techniek in Nederland in de Twintigste Eeuw, vol. III Landbouw voeding*, ed. by J. Bieleman, Zutphen: Walburg Pers 2000, 99-125.

Up to now, there has not been done extensive research on the history of dairy technology. One of the rare exceptions is this article, part of a big volume on the history of technology in the Netherlands. However, it does not consider the story of all related technologies but concentrates on the farm work, the dairy animal husbandry. Thus, it starts with the development of milking machines and explains the development of stall barns, milk tank lorries, cooling technologies, automated milking plants in the period between 1950 – 1980. A second part of the paper deals with the changes of the fodder production (haymaking, mowing, silage etc.).

Frank Dittmann, Vom “Strippen”, Saugen und Drücken. Zur Geschichte des maschinellen Melkens, in: *Technikgeschichte* 66 (1999), 259-276

In particular, the development of the milking machine from its very beginning until its widely acceptance on farms was a long-winded story. It took nearly a hundred years of research and development until something approaching functioning milking machinery became available in the 1920s. First attempts to develop machines that relieved of the burdensome work of milking by hand can already be found in England in 1836, but not before the 1950s milking machines diffused through Germany.

Unni Kjærnes, Milk: nutritional science and agricultural development in Norway, 1890-1990, in: Adel P. den Hartog (ed.), *Food Technology, Science and Marketing, European Diet in the Twentieth Century*, East Linton: Tuckwell Press 1995, 103-116.

How can one explain the role nutritional sciences played within the dramatic changes on the milk markets since the 19<sup>th</sup> century? The interesting observation of this paper is that nutritionists' views on milk have shifted several times. Milk has been deemed both “healthy” and a “health hazard” over the years. Thus, the rise of the milk consumption as well as the decline of milk consumption were explained by nutritional science arguments and took place in accordance with nutritional advice. While scientific findings stood more or less in alliance with the interests of the dairy industry and influenced public policy, in a long-term perspective, however, consumer's way of thinking also have acted in accordance with changes in the scientific understanding of the nutritional role of milk. As the author emphasises, this active role of consumers should not be disregarded in explaining the dramatic changes in milk consumption.

Helmut Ottenjann and Karl-Heinz Ziessow (eds.), *Die Milch*, (*Arbeit und Leben auf dem Land*, 4), Cloppenburg 1996

A collection of popular science papers on the milk production in the Northern part of Germany can be found in this volume. Articles, mostly written from a perspective of agricultural history, describe techniques of milk processing, milk food habits and forms of milk trade under pre-industrial conditions.

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Environment Conditions and Biological Innovations in the European Agrarian Growth,  
1819-1939

Josep Pujol

1. BEVILACQUA, P. (dir) (1990-1992): *Storia dell'agricoltura italiana in età contemporanea*. Venezia: Marsilio Editori.

Esta historia de la agricultura italiana dirigida por Piero Bevilacqua consta de tres volúmenes, en los que se tratan los distintos aspectos relacionados con el espacio y el paisaje, los cambios sociales y los conflictos de clase y el funcionamiento de los mercados y las instituciones, de influencia más directa en la evolución del sector. Las contribuciones que componen los tres volúmenes son muy numerosas y analizan, desde los aspectos más generales, a los procesos de cambio que se experimentaron en los diferentes ámbitos del mundo agrario. Es de destacar su vocación para integrar las variables ambientales, económicas e institucionales en el estudio del cambio agrario y por este motivo es un buen marco de referencia para contrastar las transformaciones experimentadas en el ámbito mediterráneo con las experimentadas en la Europa Atlántica.

2. BONJEAN A., ANGUS W.J. (eds) (2001): *The World Wheat Book: A History of Wheat Breeding*. Andover (UK) and Secaucus (USA): Intercept Ltd. and Lavoisier Publishing Inc.

En este texto se desarrolla un exhaustivo estudio sobre la evolución de las semillas de trigo, desde los orígenes de la agricultura hasta el momento actual. En sucesivos capítulos de otros tantos autores, el libro se organiza en tres grandes bloques. En el primero se analizan los orígenes del trigo cultivado y las bases de su diversidad. En el segundo se tratan los cambios experimentados en las semillas, para un elevado número de países de

todos los continentes, y sus consecuencias más importantes en la evolución del sector. En el tercero se analizan los diferentes sistemas de mejora y sus perspectivas futuras. Los distintos capítulos, 44 en total, aportan una extensa y precisa bibliografía, por países y temáticas.

3. FRIEDLAND, W.H. et altri (1991): *Towards a New Political Economy of Agriculture*. Oxford: Westview Press.

En este libro se analizan las raíces históricas del actual sistema alimentario mundial y su posterior evolución hasta el momento presente. Más concretamente, la evolución del sistema alimentario se enmarca en los procesos internacionales de división del trabajo y en el diverso conjunto de presiones que generó, especialmente durante el siglo XX, la expansión de un nuevo sector industrial en dos grandes ámbitos de los procesos agrarios de producción: la elaboración y comercialización de nuevos medios de producción (mecánicos, químicos y biológicos) y la fabricación final de distintas clases de alimentos. Las numerosas contribuciones que se incluyen en el texto proporcionan, además, una visión muy amplia de los distintos aspectos que han caracterizado los cambios en el sistema alimentario. Por ejemplo: 1) los cambios técnicos y empresariales que han acompañado aquellos procesos, 2) los cambios sociales experimentados en el sector agrario, 3) las consecuencias de todos estos cambios en el desarrollo del Tercer Mundo, o 4) en sus diferentes impactos ambientales. También se analiza la intervención de las mujeres en las transformaciones agrarias y la función del Estado en este proceso.

4. GOODMAN, D. and REDCLIFT, (1991): *Refashioning Nature, Food, Ecology & Culture*, London and NY: Routledge.

En este texto los autores reinterpretan la evolución del sector alimentario occidental desde finales del siglo XIX, a partir de los conceptos de apropiación y sustitución definidos en otra publicación anterior (Goodman, Sorj y Wilkinson, 199 ). Se analizan, de forma integrada, las transformaciones agrarias experimentadas durante aquel período, los cambios que se fueron sucediendo en la elaboración final de los alimentos y la transformación que experimentó, paralelamente, el sector doméstico. En este contexto,



también se presta especial atención a las consecuencias de las nuevas biotecnologías en el sector alimentario y a los impactos ambientales del modelo productivista del crecimiento agrario. Finalmente, el texto recupera los diferentes aspectos tratados, para discutir diversos problemas relacionados con el desarrollo de la actividad económica y la sostenibilidad de los actuales sistemas alimentarios.

5. HUFFMAN W.E. and EVENSON R.E. (1993): *Science for Agriculture. A long Term Perspective*, Iowa: Iowa State U.P.

Este texto contiene un extenso y preciso análisis sobre la evolución de la investigación agraria en Estados Unidos, en la perspectiva teórica de autores como Schultz o Ruttan. Supone por tanto un buen punto de referencia para comparar los procesos experimentados en aquel país con los europeos y, también, para contrastar las distintas concepciones teóricas con las que se estudian unos y otros. En el texto se proporciona así abundante información sobre los orígenes y evolución del sistema estadounidense de investigación agraria, sobre las actividades de formación de los científicos agrarios y, también, sobre las relaciones entre la investigación públicas y privadas y sus cambios en el tiempo. También se tratan con precisión las contribuciones de las investigaciones en los cambios biológicos de distintos cultivos y en la evolución de la productividad agraria.

6. KIPLE, K.F. and ORNELAS, K.C. (2000): *The Cambridge World History of Food*, Cambridge: Cambridge.U.P.

Los dos volúmenes que integran esta publicación son un excelente compendio de la historia de la alimentación mundial hasta nuestros días. En los dos textos y con numerosas aportaciones de especialistas, el libro proporciona abundante información sobre los diferentes aspectos relacionados con la evolución de la alimentación a escala mundial. Se tratan, por ejemplo: los cambios en las dietas a lo largo del tiempo en las distintas zonas geográficas, la evolución de los diferentes aprovechamientos, agrícolas y ganaderos, o, también, los cambios técnicos experimentados hasta hoy en la elaboración final de los diferentes productos alimentarios. En síntesis, es un libro de consulta de elevada utilidad por la información que contiene y los numerosos temas que considera.

7. KLOPPENBURG, J.R. (1988): *First the seed. The political economy of plant biotechnology, 1492-2000*, Cambridge: Cambridge U.P.

En este libro se destaca la importancia de las condiciones biológicas de producción en la evolución de la actividad económica y se realiza un estudio muy detallado sobre el sector productor de semillas en Estados Unidos desde el siglo XIX. Se centra particularmente la atención en los aspectos institucionales de este procesos y en los distintos conflictos de intereses que se fueron sucediendo entre productores, agricultores y técnicos. En el texto también se analiza el surgimiento de las nuevas biotecnologías y se estudian los cambios empresariales experimentados en el sector, alrededor de su desarrollo. El origen y expansión de este nuevo sector industrial es analizado tanto con respecto a sus características internas como respecto a sus estrechas relaciones con otros sectores industriales, cada vez más concentrados e integrados. Sobre esta cuestión se proporciona abundante información sobre las empresas más importantes, sus relaciones y sus líneas de actividad.

8. MAAT, H. (2001): *Science Cultivating Practice. A History of Agricultural Science in the Netherlands and its Colonies, 1863-1986*, Dordrecht/ Boston/ London, Kluwer Academic Publishers.

En este libro se analiza la evolución de las ciencias agrarias en Holanda y sus colonias desde la década de 1860, prestando especial atención a los aspectos institucionales que marcaron su desarrollo. En particular, el texto destaca la importancia que tuvieron las negociaciones y acuerdos entre agricultores, científicos y representantes del gobierno, en el nacimiento de los nuevos centros de experimentación y educación agraria, y las distintas consecuencias que tuvieron estos procesos en el mundo colonial y en la metrópoli. También se analiza cómo evolucionaron los aspectos organizativos de las actividades de investigación y educación agraria y se desarrolla un estudio detallado de las innovaciones de semillas de trigo y arroz. Aunque el texto concluye alrededor de 1986, el autor sintetiza, en las últimas páginas, los desarrollos más recientes de la investigación agraria durante la década de 1990.

9. OLMSTEAD, A.L., RHODE, P.W (2003): “The Red Queen and the Hard Reds: Productivity Growth in American Wheat, 1800-1940”. Cambridge: NBER Working Paper No. 8863.

En este reciente trabajo los autores proponen una nueva interpretación sobre el crecimiento de la productividad en el sector trigoero de Estados Unidos durante el siglo XIX y el primer tercio del XX. Si tradicionalmente se interpretaba que la expansión de esta variable había sido consecuencia, básicamente, de la mecanización del sector, estos autores sostienen que las innovaciones biológicas también fueron muy importantes. Destacan los efectos positivos que generó la difusión de nuevas semillas y estiman, a partir de un sencillo estudio econométrico, que la aportación de estas innovaciones al crecimiento de la productividad pudo situarse en cerca del 50 por ciento.

10. PORTER, V. (1992): *Cattle: A Handbook to the Breeds of the world*. London: A & C Black.

Libro de consulta en el que se puede encontrar abundante información sobre las razas de vacuno en el mundo y su evolución. La información se organiza por zonas geográficas, según la zona de origen de las distintas razas consideradas, y sobre cada una de ellas se indica su estado domesticado o no, su nivel de extinción y los principales cambios experimentados en su configuración. Aunque la información es muy desigual, el texto suministra numerosas referencias sobre el intenso dinamismo que acompañó la mejora de razas durante los siglos XIX y XX.

11. PUJOL, J., GONZÁLEZ DE MOLINA, M., FERNÁNDEZ PRIETO, L., GALLEGO, D. GARRABOU, R. (2001): *El pozo de todos los males. Sobre el atraso de la agricultura española contemporánea*. Barcelona: Crítica.

En este texto, los autores analizan críticamente el concepto de atraso que se ha acostumbrado a aplicar a la agricultura española, para explicar su evolución durante el

siglo XIX y el primer tercio del XX. Con este objetivo, sintetizan las principales aportaciones de la historiografía agraria española hasta el momento presente y destacan sus bases teóricas o sus supuestos más relevantes. Seguidamente analizan estos supuestos en sucesivos capítulos, dedicados a las condiciones ambientales, los cambios técnicos experimentados en el sector, el funcionamiento de los mercados agrarios y el marco institucional. En estos apartados se recogen las investigaciones realizadas para las distintas regiones y se sostienen dos conclusiones: en primer lugar, que el modelo de crecimiento agrario que se desarrolló en el caso español con la expansión de la economía de mercado tuvo que adaptarse a unas condiciones ambientales que limitaban sensiblemente los incrementos de productividad; en segundo lugar, que las condiciones sociales en las que este desarrollo se produjo fueron muy desiguales, lo que tampoco favorecían las elevadas inversiones que hubieran sido necesarias para transformar más intensamente el sector.

12. VAN BAVEL, B.J.P. and THOËN, E. (ed) (1999): *Land productivity and agro-systems in the North Sea area. Middle Ages-20th century*, Turnhout: Brepols Pbl.

En este texto, en el que participan diversos autores de reconocido prestigio, se analiza la evolución a largo plazo de los rendimientos agrarios en la Europa Atlántica. Previamente se discuten los problemas de diferentes clases a los que se enfrentan las investigaciones sobre la productividad de la tierra y seguidamente se exponen diversos trabajos que analizan la evolución de esta variable desde dos grandes perspectivas. Por un lado, estudios que sintetizan nuevos elementos de análisis sobre la evolución de la productividad a nivel agregado, para distintos países de la Europa del norte, y proponen, a partir de sus respectivas exposiciones, nuevas hipótesis de trabajo. Paralelamente, otro grupo de trabajos destaca el elevado interés que tienen las investigaciones más desagregadas, con respecto a explotaciones concretas y zonas geográficas más restringidas, al poner de relieve la diversidad de trayectorias seguidas en el mundo rural, para hacer frente a al crecimiento demográfico, la expansión de los mercados o los cambios institucionales. En síntesis, el texto actualiza las investigaciones realizadas sobre los cambios agrarios en la Europa Atlántica, aportando además nuevos materiales, y permite disponer de un sólido punto de referencia para contrastar los procesos seguidos paralelamente en la Europa Mediterránea.

13. WALTON, J.R. (1999): “Varietal innovation and the competitiveness of the British cereals sector, 1760-1930”. Agricultural History Review, 47, 1, pp. 29-57.

En este trabajo, Walton analiza las diferentes circunstancias que condicionaron las innovaciones biológicas en el sector triguero de Gran Bretaña durante la segunda mitad del siglo XVIII y el siglo XIX. El autor destaca, en particular, la influencia que tuvieron los sistemas de cultivo (mixed farming y high farming) y el marco institucional, y cómo, en este proceso, el sector triguero británico pasó a estar dominado por unas variedades de trigo muy diferentes a las de otras zonas del continente; unas variedades de trigo muy productivas en grano y paja y resistentes al encamado, pero poco apreciadas por el sector harinero a consecuencia de su reducido contenido en gluten. Un trabajo muy sugerente y bien documentado que abre nuevas posibilidades a las investigaciones sobre el cambio agrario.

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Nitrogen in modern European agriculture. Some recent (post 1990) annotated references

Vaclav Smil

1/ COMPREHENSIVE SURVEYS

The entire topic of nitrogen in agriculture spans an enormous range of concerns, from appropriate fertilization practices to environmental effects of the nutrient that escapes from fields into the atmosphere and ground and surface waters. Only two recent books take a comprehensive look at all important aspects of nitrogen in agriculture. Smil (2001) treats the complete cycle of food production and consumption and includes all sources and pathways of the nutrient. Erisman (2000) takes a very similar approach but limits his scope to detailed treatment of ammonia from both organic sources and synthetic fertilizers.

Smil, V. 2001. *Enriching the Earth: Fritz Haber, Carl Bosch, and the Transformation of World Food Production*. The MIT Press, Cambridge, MA.

Erisman, J.W. 2000. *De Vliegende Geest: Ammoniak uit de landbouw en de gevolgen voor de natuur*. Beta Text, Bergen.

2/ DISCOVERY OF AMMONIA SYNTHESIS

Until the 1990s there was no comprehensive and thoroughly researched biography of Fritz Haber whose discovery of ammonia synthesis from its elements changed the course of global agriculture. Two German biographies now fill the gap. Stoltzenberg's (1994) book is written from a chemist's perspective, while Szöllösi-Janze (1998) offers a broader socio-economic and cultural point of view. The two volumes are thus complementary.

Stoltzenberg, D. 1994. Fritz Haber Chemiker, Nobelpreisträger, Deutscher, Jude. VCH, Weinheim.

Szöllösi-Janze, M. 1998. Fritz Haber 1868-1934 Eine Biographie. Verlag C.H. Beck, München.

### 3/ ADVANCES IN AMMONIA SYNTHESIS

Although the basics of Haber-Bosch process have remained unchanged for nearly a century, there have been many technical improvements that helped to raise efficiency and increase the volume of production. Jennings (1991) and Nielsen (1995) are detailed state-of-the-art reviews of the process, while the UNIDO (1998) volume contains latest technical surveys for all kinds of fertilizers, including P and K compounds.

Jennings, J.R. 1991. Catalytic Ammonia Synthesis: Fundamentals and Practice. Plenum Press, New York.

Nielsen, A., ed., 1995. Ammonia Catalysis and Manufacture. Springer Verlag, New York.

UNIDO. 1998. Fertilizer Manual. Kluwer Academic, Dordrecht.

### 4/ NITROGEN AND FOOD PRODUCTION

While agricultural studies go rarely beyond the farm gate, the nitrogen problem requires a critical assessment of the entire food chain. A detailed example of this approach is the work of Bleken and Bakken (1997) for Norway while Smil (2001 and 2002) treats the same challenge on a global scale.

Bleken, M.A. and L.R. Bakken. 1997. The nitrogen cost of food production: Norwegian society. *Ambio* 26:134-142.

Smil, V. 2001. *Enriching the Earth*. The MIT Press, Cambridge, MA.

Smil, V. 2002. Nitrogen and food production: proteins for human diets. *Ambio* 31:126-131.

## 5/ ENVIRONMENTAL CONSEQUENCES OF NITROGEN FERTILIZATION

European environmental focus turned the 1980s into the decade of acid rain, and 1990s into the decade of nitrogen in the environment. In 1991 came the EU nitrate directive limiting the releases of the nutrient and the subsequent years saw a veritable flood of publications concerning nitrogen pollution. Perhaps the best overviews of the problem are papers by van der Voet (1996), Archer and Marks (1997) and Van Egmond, Bresser and Bouwman (2002), and a special issue of *Ambio* published in August 1997. Nitrates in aquatic ecosystems are the most acute form of nitrogen pollution and Powlson (1991), Burt et al. (1993), Skei et al. (2000) provide comprehensive reviews of the concern while L'Hirondel (2002) offers the latest assessment of true health risks arising from the exposure to these compounds.

Council Directive 91/676/EEC of 12 December 1991 concerning the protection of waters against pollution caused by nitrates agricultural sources. Official Journal No. L 375, 31 December 1991:1-8.

van der Voet et al. 1996. Nitrogen pollution in the European Union -- origins and proposed solutions. *Ambio* 23:120-132.

Archer, J.R. and M.J. Marks. 1997. *Control of Nutrient Losses to Water from Agriculture in Europe*. The Fertiliser Society, York.

Van Egmond, K., T. Bresser and L. Bouwman. 2002. The European nitrogen case. *Ambio* 31:72-78.



Ambio. 1997. Special issue. Nitrogen: A Present and a Future Threat to the Environment.

Powlson, D.S. et al. 1991. Farming, Fertilizers and the Nitrate Problem. CAB International, Wallingford.

Burt, T.P. et al., eds. 1993. Nitrate: Processes, Patterns and Management, John Wiley, Chichester.

Skei, J. et al. 2000. Eutrophication and contaminants in aquatic ecosystems. *Ambio* 29:184-194.

L'Hirondel, J-L. 2002. Nitrate in Man: Toxic, Harmless or Beneficial? CAB International, Wallingford.

## 6/ MEASURES TO IMPROVE THE EFFICIENCY OF FERTILIZATION

Not surprisingly, concerns about nitrogen pollution have led to a growing number of publications that review and evaluate many agronomic measures designed to raise the uptake of applied fertilizers as well the improvements in crop storage, animal feeding and overall rationality of the entire food chain that could reduce both the demand and the losses of the nutrient. Smil (2000) treats these challenges as a part of his global review of the modern food system, while Bertilsson (1992), Fragoso (1993), Dudal and Roy (1995), Prasad and Power (1997) and Trenkel (1997) offer detailed summaries and assessments of individual techniques and procedures.

Smil, V. 2000. Feeding the World. MIT Press, Cambridge, MA.

Bertilsson, G. 1992. Environmental Consequences of Different Farming Systems Using Good Agricultural Practices. Peterborough, The Fertiliser Society.

Fragoso, M.A., ed. 1993. Optimization of Plant Nutrition. Kluwer, Amsterdam.

Dudal, R. and R.N. Roy, eds. 1995. Integrated Plant Nutrition Systems. FAO, Rome.

Prasad, R. and J.F. Power. 1997. Soil Fertility Management for Sustainable Agriculture. Lewis Publishing, Boca Raton, FL.

Trenkel, M.A. 1997. Improving Fertilizer Use Efficiency. IFA, Paris.

## AGRICULTURE AND FOOD ANNOTATED BIBLIOGRAPHY

### Industrialising Catering. Technological Developments and its effects in the 20th Century

Ulrike Thoms

Traditionally the history of technology has restricted itself to the history of inventions, inventors and diffusion of new techniques. But technology means much more: It embraces the knowledge, needed for the construction and service of the newly invented machines.<sup>1</sup> And as the idea has been accepted during the last years, that nature does not only simply exist somewhere outside there, but it constructed by humans, too, technology embraces the breeding of plants and animals as well.<sup>2</sup>

There are numerous studies on household technology, which deal with the modernisation of food production at home, which have left the traditional viewpoint since the early 1980ies. Enriched by social aspects, recent works on the development of modern household equipment concentrate on the point of women's work within the household and the change of attitudes towards the work of women and housewives<sup>3</sup> But this is not so much the case for the industrial production of food. There are numerous studies on the industrialisation of food production, which have discussed the change in the quality of products, too. Classical fields to study this have been beer, bread, milk, infant food, margarine and meat extract.<sup>4</sup> Some of

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<sup>1</sup> Hård, Mikael: Zur Kulturgeschichte der Naturwissenschaft, Technik und Medizin. Eine internationale Literaturübersicht, in: Technikgeschichte 70(2003), 23-45.

<sup>2</sup> Heim, Susanne (Hg.): Autarkie und Ostexpansion. Pflanzenzüchtung und Agrarforschung im Nationalsozialismus, Göttingen: Wallstein Verlag 2002.

<sup>3</sup> Cowan, Ruth Schwartz: More Work for Mother: The Ironies of Household Technology from the Open Hearth to the Microwave, New York 1983; Orland, Barbara: Wäsche waschen. Technik- und Sozialgeschichte der häuslichen Wäschepflege, Reinbek bei Hamburg: Rowohlt 1991; Hessler, Martina: Mrs. Modern Woman. Zur Sozial - und Kulturgeschichte der Haushaltstechnisierung, Frankfurt/M.: Campus 2001.

<sup>4</sup> Pelzer, Birgit and Reinhold Reith: Die Karriere der Kunstbutter. Margarine, Berlin: Wagenbach 2001; Freund, Willi: Technologieentwicklung und Qualität im Bäckerhandwerk. Ein Vergleich von Standardwerken und Schulbüchern, Hildesheim 1986; Böth, Gitta (Red.): „Bayerisches Bier“ aus Westfalen. Zur Geschichte westfälischer Brauereien und Biere, Hagen 1998; Teuteberg, Hans J., Karl Ellerbrock, Uwe Spiekermann und Angela Zatsch: Die Rolle des Fleischextrakts für die Ernährungswissenschaften und den Aufstieg der Suppenindustrie. Kleine Geschichte der Fleischbrühe, Stuttgart: Franz Steiner Verlag 1990; Finlay, Mark R.: Early Marketing of the Theory of Nutrition: The Science and Culture of Liebig's

these works have been rather optimistic, as for example the works on the dairy industry, which stress the enormous progress in hygiene caused by the industrialisation.<sup>5</sup> Changes in production and processing of food have been discussed,<sup>6</sup> but only as an outcome of the industrialisation, of changing taste, of changing demands on certain food items,<sup>7</sup> as e.g. meat, or, as a result of official measures to increase food quality by control.

But changes of the raw material itself driven forward by the necessities of adopting it to the construction of machines or production procedures have so long only been touched upon.<sup>8</sup> Rather well known is the case of the sugar beet, which became a severe concurrent to cane sugar only after sweeter breeds with a higher sugar content were available.<sup>9</sup> This fact itself is

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Extract of Meat, in: Harmke Kamminga and Andrew Cunningham (Hg.): *The Science and Culture of Nutrition, 1840-1940*, Amsterdam/Atlanta 1995; Eekelen, Annemarie van: *Naar een rationele Zuigelingenvoeding. Voedingsleer en Kindergeneeskunde in Nederland (1840-1914)*, med. Diss., Nijmegen 1984; Apple, Rima D.: „How shall I feed my baby“. *Infant feeding in the United States 1870-1940*, Ph. D. thesis, University of Wisconsin-Madison 1981;

<sup>5</sup> Helmut Ottenjann und Karl-Heinz Ziessow (Hg.): *Die Milch. Geschichte und Zukunft eines Nahrungsmittels*, Cloppenburg 1996; Fink-Keßler, Andrea: *Von der Bauernmilch zur Industriemilch. Zur Entstehung und Funktion der Qualitätsnormen bei Milch*, Diss. Kassel 1991; Reif, Heinz und Rainer Pomp: *Milchproduktion und Milchvermarktung im Ruhrgebiet 1870-1930*, in: *Jahrbuch für Wirtschaftsgeschichte* 1996,1, S. 78-108; Spiekermann, Uwe: *Milchkleinhandel im Wandel. Eine Fallstudie zu München 1840-1913*, in: *Scripta Mercaturae* 27, 1993, S. 91-145; Teuteberg, Hans J[ürgen]: *Anfänge des modernen Milchzeitalters in Deutschland*, in: Ders. und Günter Wiegelmann (Hg.): *Unsere tägliche Kost. Geschichte und regionale Prägung*, Münster 1986, S. 163-184; Mephram, T. B.: „Humanizing“ Milk: *The Formulation of Artificial Feed for Infants (1850-1910)*, in: *Medical History* 37, 1993, S. 225-249.

<sup>6</sup> Giedion, Sigfried: *Die Herrschaft der Mechanisierung. Ein Beitrag zur anonymen Geschichte*, Frankfurt a.M. 1987; Hartog, Freund.

<sup>7</sup> Teuteberg, Hans J[ürgen]: *Zur Geschichte der Kühlkost und des Tiefgefrierens*, in: *Zeitschrift für Unternehmensgeschichte* 36, 1991, 139-155; Oddy, Derek J. and Judy R. Oddy: *The iceman cometh: the effect of low-temperature technology on the British diet*, in: Martin R. Schärer and Alexander Fenton (eds.): *Food and Material Culture*, East Linton: Tuckwell Press 1998, 287-307.; Hietala, Marjatta and Vuokko Lepistö: *Arctic Finland and the new technology of food preservation*, in: Martin R. Schärer and Alexander Fenton (eds.): *Food and Material Culture. Proceedings of the Fourth Symposium of the International Commission for Research into European Food History*, East Linton: Tuckwell Press 1998, 308-327; Ellerbrock, Karl-Peter: *Geschichte der deutschen Nahrungs- und Genussmittelindustrie 1750-1914*, Stuttgart: Franz Steiner Verlag 1993 (*Zeitschrift für Unternehmensgeschichte*, Beih. 7).

<sup>8</sup> An exception is: Sieglerschmidt, Jörn: *Die Mechanisierung der organischen Substanz*, in: Hans J. Teuteberg, Gerhard Neumann und Alois Wierlacher: *Essen und kulturelle Identität. Europäische Perspektiven*, Berlin: Akademie Verlag 1997, S. 336-355.

<sup>9</sup> Teuteberg; *Der Beitrag des Rübenzuckers zur „Ernährungsrevolution“ des 19. Jahrhunderts*, in: *ibid.* And Günter Wiegelmann: *Unsere tägliche Kost. Geschichte und regionale Prägung*, Münster: Coppenrath Verlag 1986, 153-162, 158.

well known and appears in almost every history of sugar or food. But as far as I know, no newer study, it has not been a topic for deeper research until now. Changes of the organic raw materials themselves, evoked by necessities of processing, have been discussed almost never in the meaning of the changes of “nature”, of organic itself by breeding or selection of certain sorts. Beside this, only the potato has been paid some attention so far.<sup>10</sup>

This is surprising, as a new conscience for this fact has raised by the ecological movement, the emergence of nutrition ecology and the discussion of gene food. And indeed, since some years the disappearance of old sorts of apples and potatoes is a highly debated topic in public.<sup>11</sup> New technologies have played a crucial role for the emergence of eating out.<sup>12</sup> There are a fair number of newer studies on Fast Food in the sense of a new social technology of serving the urban consumer.<sup>13</sup> Only some of them have discussed the point of technology in depth,<sup>14</sup> whereas works on the history of gastronomy concentrate more on cultural history and

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<sup>10</sup> Eckart, Otto: Pfanni: Das andere Wort für Kartoffel. Ein Unternehmen schreibt Kartoffelgeschichte, in: Helmut Ottenjann und Karl-Heinz Ziessow: Die Kartoffel. Geschichte und Zukunft einer Kartoffel, Cloppenburg: Museumsdorf Cloppenburg 1992, 339-345; Schnetkamp, Ernst: Die Entwicklung der Kartoffel-Veredelung zu tiefgefrorenen Nahrungsmitteln, in: Helmut Ottenjann und Karl-Heinz Ziessow: Die Kartoffel. Geschichte und Zukunft einer Kartoffel, Cloppenburg: : Museumsdorf Cloppenburg 1992, 331-338.

<sup>11</sup> See for example: Kartoffelliebe, in: Eve. Ernährung/vitalität/erleben No. 5, September/Okttober 2003, 7-11; Lorey, H.: Taruffli: Alter Kartoffelsorten neu entdeckt, Münster Landwirtschaftsverlag 2002.

<sup>12</sup> Hartog, Adel P. den: Adel den Hartog, Technological innovations and eating out as a mass phenomenon in Europe: a preamble, in Scholliers, Peter und Marc Jacobs (ed.): Eating out in Europe, Oxford: Berg Publishers 2003, 263-280; Drummer, Christian: Das sich ausbreitende Restaurant in deutschen Großstädten als Ausdruck bürgerlichen Repräsentationsstrebens, 1870-1930, Staatsexamensarbeit, ms. Münster 1994, abridged version in: Hans-Jürgen Teuteberg und Eva Barlösius (Hg.): Essen und kulturelle Identität. Europäische Perspektiven“, Berlin 1994, S. 303-321.

<sup>13</sup> Lohof, Bruce A.: Hamburger Stand: Industrialization and the American Fast-Food Phenomenon, in: Journal of American Culture 12, 1979, 519-533; Oddy, Derek: Eating without effort: the rise of the fast-food industry in Britain in the twentieth century, in: Scholliers, Peter und Marc Jacobs (ed.): Eating out in Europe, Oxford: Berg Publishers 2003, 301-316; Seidel-Pielen, Eberhard: Aufgespießt. Wie der Döner über die Deutschen kam, Hamburg: Rotbuch-Verlag 1996; Wagner, Christoph: Fast schon Food. Die Geschichte des schnellen Essens; Bergisch Gladbach: Bastei-Lübbe 2001; Knop, Birgit/Schmitz. Martin: Currywurst mit Fritten. Von der Kultur der Imbissbude, Zürich:Unionsverlag 1983.

<sup>14</sup> Allen, Keith R.: Hungrige Metropole. Essen, Wohlfahrt und Kommerz in Berlin, Hamburg: Ergebnisse Verlag 2002; Bruhèze, Adri Albert de la and Anneke Otterloo: The rise of eating out in the Netherlands in the Twentieth Century. Snacks, meal-patterns and the food-chain, in: Marc Jacobs and Peter Scholliers (Hg.): Eating out in Europe. Picnics, Gourmet Dining and Snacks since the Late Eighteenth Century, Oxford/New York: Berg Publishers 2003, 317-336.; Tanner, Jakob: Fabrikmahlzeit. Ernährungswissenschaft, Industriearbeit und Volksernährung in der Schweiz 1890-1950, Zürich: Chronos 1999; Thoms, Ulrike: Industrial canteens in Germany 1850-1950, in: Marc Jacobs and Peter Scholliers (Hg.): Eating out in

the new social role of eating out.<sup>15</sup> Only the history of fast food enterprises took a closer look to the links between consumption and production. They dealt with the problem of standardisation of food commodities as an effect of serving the special needs of catering and mass cooking with their very special preparation techniques and their striving for uniformity. Sometimes this effect has only been named, but studies of the history of fast food in the Netherlands published by Anneke van Otterloo and Adri la Bruhèze, a study of the emergence and distribution of the Döner Kebab in Germany from Burkhard Seidel-Pielen,<sup>16</sup> studies on the emergence of canteens, hospital and prison food<sup>17</sup> and case studies of McDonald investigated this somewhat deeper.<sup>18</sup>

Nevertheless, by concentrating on the private household the impact of eating out and catering facilities has been neglected and underestimated. The role of technology for the emergence of eating out facilities is hardly mentioned in these works, even if it can be clearly detected in the published photographs. On the whole the history of industrialised food concentrated on single food commodities, on single new technologies without considering the repercussions on the preceding or following steps of the nutrition chain. The histories of refrigeration,<sup>19</sup> for example, concentrated on the “pure” technological side of the development, on the invention, application and diffusion of new technical solutions. If they mentioned consumption and consumption figures, they concentrated on the role of the private household, stressing the point, that housewives learned to love the fresh and comfortable vegetables for example. The fact, that frozen food first failed in the shops and that the frozen food industry therefore itself turned to gastronomy and catering firms is well known.<sup>20</sup> But the consequences of this

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Europe. Picnics, Gourmet Dining and Snacks since the Late Eighteenth Century, Oxford/New York 2003, 351-372.

<sup>15</sup> Jacobs, Marc and Peter Scholliers (ed.): *Eating out in Europe*, Oxford: Berg Publishers 2003; See for example: Spang, Rebecca L.: *The Invention of the Restaurant. Paris and modern Gastronomic Culture*, Cambridge, Massachusetts and London: Harvard University Press 2001.

<sup>16</sup> Seidel-Pielen, Eberhard: *Aufgespießt. Wie der Döner über die Deutschen kam*, Hamburg: Rotbuch-Verlag 1996;

<sup>17</sup> Thoms, Ulrike: *Anstaltskost im Rationalisierungsprozeß. Gefängnis- und Krankenhausernährung im 18. und 19. Jahrhundert*, phil. Diss., Ms. Münster 2000; Thoms, Ulrike: Thoms, Ulrike: *Industrial canteens in Germany 1850-1950*, in: Marc Jacobs and Peter Scholliers (Hg.): *Eating out in Europe. Picnics, Gourmet Dining and Snacks since the Late Eighteenth Century*, Oxford/New York 2003, 351-372.

<sup>18</sup> Grefe, Christina et al.: *Das Brot des Siegers. Die Hamburger-Konzerne*. 2. Auflage, Göttingen: Lamuv Verlag 1989; Schlosser, Eric: *Fast food Nation. What the All-American Meal is Doing to the World*, London et al: Penguin Books 2002; Wagner, Christoph: *Fast schon Food. Die Geschichte des schnellen Essens*, Bergisch-Gladbach: Bastei Lübbe 2002.

<sup>19</sup> See footnote 7.

<sup>20</sup> Hilck, Erwin und Rudolf Auf dem Hövel: *Jenseits von minus Null. Die Geschichte der deutschen Tiefkühlindustrie*, Hamburg: Deutsches Tiefkühlinstitut 1979.

development have been underestimated: Half of the recent production of frozen food is sold to gastronomy in Germany.<sup>21</sup> From this point it becomes clear that the special demands and necessities of gastronomy deeply influenced the further development of products, packages and package sizes. And the implementation of the new technologically constructed foods had consequences: Enterprises producing frozen food had to look for the fruit, vegetables, and the meat sorts, which fitted the conditions of the production best and led to a result, accepted by the consumer's taste.<sup>22</sup> Complementary applications for heating the frozen dishes were developed and sold and the outer appearances of the caterer's kitchens changed decisively. Anticipating the development of private kitchens in which microwaves won a central position during the last 15-20 years no normal hearths and oven were to be found in some of the caterers kitchens as early as the 1970ies.<sup>23</sup> Recent books on the work in restaurant show, to which extent products of the food industry is used, even in high-class restaurants. But as the early convenience foods had and still have the taste of surrogates, of solutions for times of hunger or war, and later on as means for managing the lack of time and the trend goes fresh products. As has been shown, only some of them have discussed the point of technology in depth and the journal of agricultural and food sciences and of catering still wait to be used as sources for this question.

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<sup>21</sup> Cool facts 2002, Tiefkühlkost, Deutsches Tiefkühlinstitut, Köln 2002.

<sup>22</sup> This has been a rather terrific process for the potatoe, see Eckart (1996).

<sup>23</sup> Düsterberg, Karl: Tiefgekühlte Fertiggerichte - Möglichkeiten, Grenzen und Problematik, in: Forster, Fridolin: Die Tiefkühlung in der Großküche. Berichtsband IGEHO 71, Zürich/Schweiz: Forster-Verlag 1971/72, 15-19.

# **AGRICULTURE AND FOOD ANNOTATED BIBLIOGRAPHY**

## **Agricultural education in the 19th and 20th centuries: a short bibliographical comment**

Leen Van Molle

Agricultural education is a relatively recent affair, the first institutions engaging in it making their appearance in the early nineteenth century. It is also a notably complex and pluriform affair, as the training of farmers covers not only their formal education from primary school to university, but also the publication of books, journals and brochures, lectures, demonstrations, field tests, exhibitions and competitions, and radio and television broadcasts, not forgetting the publicity of manufacturers of agricultural machinery, fertilizers and animal feed.

Historiographical traditions have not been conducive to the study of agricultural education, which falls between several stools where historical research is concerned: it is not a central topic in the history of agriculture, the history of agricultural science or even the history of education and teaching. In published writings, moreover, the relationship between science, education and technological innovations in farming practice is dealt with more implicitly than explicitly as being self-evident.

The history of education as a separate field of research has undergone radical change. Initially predominant was the strongly fact-orientated institutional approach (history of schools), research into government educational policy and into new pedagogic theories. A couple of decades ago, however, this was superseded by the social approach, the study of the teaching profession and of particularly the entire 'educationalization' of society. This can enable research into agricultural education to offer a unique insight into the professional and socio-cultural process of providing training for farming people, into the construction of the landscape and into how the countryside acquires significance. Alas, though, this approach is only gradually gaining ground where agricultural history is concerned.



For a long time, agricultural history was regarded as being synonymous with the history of agricultural production. After the Second World War, the British agricultural history tradition, with the Leicester School and Reading, concentrated on research into farming practices and regional differences in agricultural systems. The orientation was demographic, technical and economic, with a bias towards quantification. The same can be said of the Dutch School of Wageningen, whose pioneers were B.H. Slicher van Bath and E.W. Hofstee. In recent years, especially in Great Britain, the Netherlands and Belgium, a great deal of time and energy has gone into the macroeconomic reconstruction of the agricultural product (Buyst *et al.*, 1995).

The social and institutional approach to the agricultural sector focused, in the Marxist tradition, on such themes as the loss of common rights and the enclosure process, on shifts in respect of private property and leasehold (cf. the role of the old aristocracy and the new capitalist bourgeoisie), farm size, the labour force (farmers, servants and day labourers), market organization and market regulation (sellers, buyers, traders, consumers, credit), and poverty.

Until recently, little thought was given to the role of teaching and education in the process of agrarian transformation. In *Histoire de la France rurale* (Duby, 1976), no perceptible place is given to nineteenth- and twentieth-century agricultural education, and that is even less the case in the eighth part, covering the 1914-1940 period, of *Agricultural History of England and Wales* (Wetham, 1978), where education is tucked away in the chapter on agricultural policy and in a few pages on science and farming practice (pp. 199-204, 282-284).

Where agricultural research and education gained explicit mention, it was separately, i.e. in books and articles on the history of agricultural science and agricultural engineering (including Russell, 1966; Rossiter, 1975; Schling-Brodersen, 1989), on the one hand, and histories of great men and of the various farm institutes, agricultural colleges and universities, on the other (for instance, Paping, 1996; *Geschiedenis van de Landbouwwuniversiteit Wageningen*, 1993).

The 'new agricultural history' that emerged during the past decade and that is influenced by the post-modern cultural turn offers a much wider perspective; it serves very much as a social history of the countryside and thereby acts as a counterpart to urban history. That wider perspective provides scope for interaction among economic, political, institutional, technical, social and cultural factors, besides giving attention to the peasantry, the village and the rural community as actors. This is clearly indicated in, for example, the most recently published part of *Agrarian History of England and Wales*, covering the 1850-1914 period (Collins, 2000). Two excellent chapters of this forty-five-chapter work give prominence to the scientific revolution, institutional organization and the broad educational offensive: more particularly, Chapter 8 "Agricultural Science and Education" (P. Brassley, pp. 594-649) and Chapter 9 "Agricultural Institutions: Societies, Associations and the Press" (N. Goddard, pp. 650-690). The new direction in research has been given clear emphasis in Great Britain with the journal *Rural History: Economy, Society, Culture* (1990-) and in France with the journal *Histoire et Sociétés Rurales* (1994-). In Germany, historical research into agriculture went into decline after Wilhelm Abel, Friedrich Lütge and Günther Franz, though there, too, the path of the 'new agricultural history' has now also been taken. Nevertheless, a recent historiographical survey (Trossbach and Zimmerman, 1998) could find no place for publications on the development of agricultural education.

Today, it is especially in France that provocative research is being undertaken into the question of agricultural education in its most divergent forms (schools, lectures, the media, etc.). The starting-point was the 150th anniversary in 1998 of the decree of 1848 concerning the establishment of agricultural colleges, which prompted two great colloquia on the theme of *les acteurs de l'agriculture*, the first covering the 1760-1945 period and the second the 1945-1985 period (*Les enjeux de la formation*, 2000, and *La formation*, 2001).

BUYST, E., SMITHS, J. and VAN ZANDEN, J.L., "National accounts for the Low Countries: the Netherlands and Belgium 1800-1990", *Scandinavian Economic History Review* XLIII (1995) 1, pp.53-76.

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