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## Abhandlungen

**Christine Strotmann, Laurent Herment and Arnaud Page: Fertilisers in the Long 19<sup>th</sup> Century and Beyond: Usage, Commercialisation and Production (c 1800–1939) / Düngemittel im langen 19. Jahrhundert und darüber hinaus: Nutzung, Vermarktung und Produktion (ca. 1800–1939)**

**Abstract:** The introduction to the volume provides an overview of processes in the industrialization of agriculture in the 19<sup>th</sup> and 20<sup>th</sup> centuries with regard to fertilisation. It explains the interplay between the intensification of fertiliser usage and agricultural output which enabled immense population growth. It shows how chemical discoveries surrounding nitrogen, potassium and phosphorus (NPK) eventually led to a diversification of markets and the formation of big fertiliser businesses. Indeed, every specific fertiliser chain was linked to a wide set of markets and institutions, as to stakeholders with various and potentially conflicting interests. This issue aims to shed light on this aspect within several regions across Europe and beyond.

**JEL-Codes:** N 00, N 10, N 50, O 13

**Keywords:** Düngemittel, Wirtschaftsgeschichte, Industrialisierung, Agrarwirtschaft, Chemie, fertiliser, economic history, industrialization, agriculture, chemistry

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**Beatriz Corbacho González\*, Roc Padró Caminal, David Soto Fernández and Lourenzo Fernández Prieto: Management of Soil Fertility and Agricultural Intensification in NW Iberia, 1750–1900 / Management von Bodenfruchtbarkeit und Agrarintensivierung im Nordwesten der iberischen Halbinsel, 1750–1900**

**Abstract:** This article describes agricultural practices of fertilization in the NW of the Iberian Peninsula between 1750 and 1900, where a leguminous plant called gorse (*Ulex Europaeus*) was used as bedding for livestock in order to produce manure. During the period examined, this whole region experienced a process of agricultural intensification which resulted in a net loss of nutrients in the soil. Peasants dealt with the increasing nutrient requirements by adapting land and livestock management in order to produce more manure during the second half of the 20<sup>th</sup> century. However, this was done at the expense of nutrient reserves in extensively managed areas, all of which resulted in an unsustainable agricultural pattern. Our data also suggest that the context of nutrient scarcity could be related to changes in the migration pattern, which started to be more intense after 1850 and preferred distant destinations (America), thus switching from seasonal to permanent stays.

**JEL-Codes:** N 53, N 93, Q 12, Q 13

**Keywords:** Environmental history, agricultural intensification, mixed farming, fertilization, social metabolism, nutrient balances, Umweltgeschichte, Agrarintensivierung, gemischte Landwirtschaft, Düngung, sozialer Stoffwechsel, Nährstoffhaushalt

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### **Arnaud Page and Laurent Herment: The Price of Nitrogen at the End of the Nineteenth Century / Der Stickstoffpreis am Ende des 19. Jahrhunderts**

**Abstract:** The second half of the nineteenth century was marked by the concomitant and entangled processes of the rise of agricultural chemistry and that of the fertiliser trade. Yet, while the two were undoubtedly related, the work of agricultural chemists was not necessarily characterized by the uniform and unequivocal promotion of fertilisers. This article looks at some of the complex ways in which chemists participated in the development of the fertiliser trade by studying how their work was used to ascribe a commercial price to a chemical element. It analyses the contested development of the idea that nitrogen, in particular, could be given a price, and shows how the rise of this quotation lay at the intersection of scientific and commercial considerations. More broadly, it argues that the importance of the new *artificial* fertilisers primarily lay not so much in yield increases as in inaugurating a new regime marked by a more comprehensive quantitative assessment of inputs and outputs, thereby playing a key role in the *industrialisation* of agriculture.

**JEL-Codes:** N 10, N 13, N 54, Q 11, Q 13

**Keywords:** fertilisers, nitrogen, chemistry, agriculture, nitrates, Düngemittel, Stickstoff, Chemie, Landwirtschaft, Nitrate

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### **Michael Moss: The British Fertiliser Manufacturers' Association: Struggle for Survival 1870–1930 / Die „British Fertiliser Manufacturers' Association“ und ihr Existenzkampf, 1870–1930**

**Abstract:** Most firms in the British fertiliser industry of the 19<sup>th</sup> century were small and combined other activities, such as seed merchants, millers, manufacturers of sulphuric acid and in one case explosives. In the heyday of high farming there was almost no co-operation and no attempt to achieve economy of scale through merger and amalgamation. In 1875 just before the onset of the depression the Chemical Manure Manufacturers' Association was

formed to fix prices and address the challenges posed by proposed Government regulation of what was after all a noxious industry. This story mirrors much of British industry, where implicit (price-fixing) cartels failed and individual firms rejected collaboration in favour of what seems an irrational commitment to a free market ideology that was transparently misplaced.

**JEL-Codes:** N 00, N 10, N 53, N 54, N 63, N 64

**Keywords:** Superphosphates, Fertilizer Trade, United Kingdom, Edward Packard, Superphosphate, Düngemittelhandel, Vereinigtes Königreich

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**Note:** Professor Michael Moss sadly died in January 2021. The editors would like to thank his former researcher Alison Turton and his assistant Rachel Rubin for their help in publishing this article. A few questions concerning footnotes remain.

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### **Derek Byerlee: The *Super* State: The Political Economy of Phosphate Fertilizer Use in South Australia, 1880–1940 / Der „Super“-Staat: Die politische Ökonomie der Nutzung von Phosphordünger in Südastralien, 1880–1940**

**Abstract:** From 1882 to 1910 superphosphate was almost universally adopted by wheat farmers in South Australia. A supply chain perspective is used to link the mining of phosphate rock in distant Pacific islands to the final application of superphosphate in the fields of Australian wheat farmers. Farmers and private manufacturers led the adoption stage in the context of a liberal market regime and the role of the state at this stage was limited although strategic. After 1920, the role of the state in the industry sharply increased in all phases of the industry. A political economy perspective is used to analyse state-ownership of raw material supplies and protectionist policies to manufacturers that resulted in high prices in Australia by 1930. Numerous government reviews pitted the interests of farmers and manufacturers leading to a complex system of tariffs and subsidies in efforts to serve all interests. Overall, the adoption of superphosphate was a critical factor in developing productive and sustainable farming systems in Australia, although at the expense of Pacific Islanders who prior to WWII received token benefits and were ultimately left with a highly degraded landscape.

**JEL-Codes:** N 17, N 47, N 57, Q 31

**Keywords:** fertilizer adoption, phosphorus, supply chains, subsidies, tariff protection, agricultural policy, South Australia, Einführung von Düngemitteln, Phosphor, Lieferketten, Subventionen, Zollschutz, Agrarpolitik, Südastralien

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**Luca Andreoni: Oilseed Cakes in Italy and France: Opportunities and Difficulties of a Market (late 19<sup>th</sup> and first half of the 20<sup>th</sup> Century) / Ölkuchen in Italien und Frankreich: Chancen und Schwierigkeiten eines Marktes (spätes 19. Jahrhundert und erste Hälfte des 20. Jahrhunderts)**

**Abstract:** This paper addresses the trade and commercialisation of oilseed cakes (residues from the extraction of oils) and press cakes in Italy and France during the last decades of the 19<sup>th</sup> century and in the first half of the 20<sup>th</sup> century. It tries to demonstrate that the diffusion of oilseed cakes for livestock, a distinctive sign of the intensification of breeding that involved all of Europe, or as organic fertilisers, took place at the crossroads of multiple dynamics. Trade policy of the states, industrial choices and development paths of the different rural worlds help to explain the variations in timing, spatial scale and methods used. The spread of oilseed cakes confirms that the modernisation of European agriculture happened on different and interrelated fronts.

**JEL-Codes:** N 53, N 54

**Keywords:** rural history, Italy, France, oilseed cakes, modernisation, countryside, livestock, feeding, fertilisers, Agrargeschichte, Italien, Frankreich, Ölkuchen, Modernisierung, Landwirtschaft, Viehbestand, Fütterung, Düngemittel

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**Christine Strotmann: Nitrogenous Fertilisers in Germany – Paths of Distribution from Chile Saltpetre to Haber-Bosch-Ammonia and Cyanamide (ca 1914–1930) / Stickstoffdüngemittel in Deutschland – Ihre Verbreitung von Chilesalpeter zu Haber-Bosch-Ammoniak und Kalkstickstoff (ca. 1914–1930)**

**Abstract:** This paper focusses on nitrogenous fertilisers in Germany and how they were distributed from the First World War into the 1930s. Since the availability of the fertilisers kept changing at a fast pace in the period under discussion here, the focus lies on policies concerning the production of nitrogen and the markets for nitrogenous fertilisers. The paper discusses the impact of the development of a (nearly) entirely new domestic nitrogen industry during the First

World War on the market for nitrogenous fertilisers during the war and interwar period, up until the foundation of an international nitrogen cartel in 1930.

**JEL-Codes:** N 14, N 44, N 54, N 74

**Keywords:** nitrogen, ammonia, agriculture, fertiliser, First World War, war economy, Stickstoff, Ammoniak, Landwirtschaft, Düngemittel, Erster Weltkrieg, Kriegswirtschaft

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**Michael Llopart: The French Nitrogen Industry during the Interwar Period: The Ambiguous Relationship between the State and Manufacturers / Die französische Stickstoffindustrie in der Zwischenkriegszeit: Die uneindeutige Beziehung zwischen dem Staat und den Herstellern**

**Abstract:** At the end of the First World War, the French government seized the opportunity to acquire the chemical processes of the German firm BASF, including the Haber-Bosch process. This patent made it possible to synthesize nitrogen from the air and thus produce nitrogen fertilizers in large quantities. French industrialists, however, refused to acquire these patents, and to make up for this lack of private sector involvement, the French Parliament decided in 1924 to create a national plant (ONIA), which became the first state-owned plant to be exposed to market competition. The intention was for the ONIA to supply the army with nitric acid in times of war, and, in peacetime, to sell fertilizers at the lowest possible prices in order to curb the monopoly of the private industry cartel. The purpose of this article is therefore to study the establishment and organisation of the French market for nitrogen fertilisers during the inter-war period by raising a number of questions about the ambiguous and complex relations between the state and private industry in this strategic sector. Why was the state policy initiated with the ONIA not successful at first? From 1927-1928, once the ONIA was operational, why and how did the public and private players jointly organise the marketing of fertilisers even though their interests were partially divergent? From the economic crisis of the 1930s onwards, how did the regulation of this mixed market evolve and how were public/private tensions overcome? In the French case, why did French producers leave the international cartel very early on in favour of state protectionism? And finally, to what extent can it be said that this “managed economy” framework succeeded in satisfying all the players in the French nitrogen industry?

**JEL-Codes:** N 14, N 44, N 54, Q 13

**Keywords:** chemical industry, ONIA, nitrogen fertilizer, state, mixed market, Chemische Industrie, Stickstoffdünger, Staat

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He is also working on the history of the chemical and fertilizer industry, on the changing role of the State in industry, and, more broadly, on the evolution of social relations in France in the 1960s.

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## **Forschungs- und Literaturberichte**

**Ralf Stremmel: Die Gauwirtschaftsberater der NSDAP / Zum Profil von Funktionsträgern zwischen Partei und Wirtschaft / The Gau Economic Advisers (Gauwirtschaftsberater) of the NSDAP. The Profile of Function Holders between Party and Economy**

**Abstract:** At least 129 Gau economic advisers of the NSDAP worked at the intersection of politics and economics, wielding a considerable amount of power. At the regional level, they were able to have a say in the success and existence of corporations. The article examines this group's organization and remit, as well as resources in power and capital. Along the lines of collective biographies, it covers the aspects of generation, origin, socioeconomic status, fluctuation, and entry into the Nazi party. While no homogenous type of Gau economic adviser or a pattern of action could be identified, the final part of the article outlines common aspects and presents five ideal types of Gau economic advisers.

**JEL-Codes:** N 440

**Keywords:** NSDAP, History of National Socialism, History of Government, Gauwirtschaftsberater, Biography, Kollektivbiographie

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**Andreas Friedolin Lingg: Schools of Empiricism. Perspectives on Central European Mining Regions of the Early Modern Age as Laboratories of Modern Knowledge Cultures / Schulen des Empirismus. Die frühneuzeitlichen Silberreviere Mitteleuropas und die Frage nach dem nützlichen Wissen**

**Abstract:** Recent research emphasizes that empiricist approaches already emerged long before the seventeenth and eighteenth century. While many of these contributions focus on specific professions, it is the aim of this article to supplement this discourse by describing certain social spaces that fostered empiricist attitudes. A particularly interesting example in this respect is the mining region of the Erzgebirge (Saxony) in the fifteenth and sixteenth century. The following article will use this mining district as a kind of historical laboratory, as a space not only for scientific observation but also as a structure within which specific forms of knowledge were socially tested, to show how the economic transformation of this region supported the rise of characteristic elements of empiricist thinking. It is common practice to link the appraisal of useful knowledge, (personal) experience and the distrust towards (scholastic) authorities in those days with only small minorities. By addressing not only the struggles of the commercial elites but also the challenges faced by the average resident of a

mining town, this paper tries to add to this view by demonstrating how entire masses of people inhabiting the late medieval Erzgebirge were affected by and schooled to think in empiricist ways.

**JEL-Codes:** A 12, A 14, B 10, B 11, B 40, B 52, B 55, D 80, D 83, D 84, L 10, L 19, L 26, L 72, N 01, N 33, N 53, N 93, O 10, P 10, Q 30, R 11, Z 13

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