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English and Austrian Farming in the Second World War: 'Revolution' or what else?[1]

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I. Introduction

In the two World Wars, domestic agriculture became highly crucial for the provision of the population with food in Europe, particularly in countries heavily depending on food imports such as Britain in the interwar period. Therefore, rural society or, more precisely, agricultural factor and product markets became main issues of state regulation (Tracy, 1989; Trentmann and Just, 2006). While several studies have investigated food production and consumption in the two World Wars in considerable detail, the long-term conditions and consequences of wartime agriculture with regard to rural development in the twentieth century have been rarely discussed. Recently, this topic has been addressed by studies on rural society in Great Britain before, during and after the Second World War. On the one hand, these accounts have revised the official, somewhat mythical 'story of success' of British wartime agriculture (Murray, 1955; Hammond, 1951, 1954, 1956, 1962; Stamp, 1947) from a more differentiated viewpoint. On the other hand, they have claimed that Britain, at least partially, experienced a 'state-led agricultural revolution' from a long-term perspective. Accordingly, in the period 1939 to 1945, agriculture was transformed from a low-input low-output pastoral farming system to an arable 'national farm' with intensive application of land-saving (e.g. fertilizers) and labour-saving technology (e.g. machinery) acquired from outside the agricultural sector. The 'productivist' food regime which had been established in the Second World War and enshrined in the 1947 Agricultural Act was regulating the national agricultural sector at least until the 1970s when Great Britain joined the European Community (Martin, 2000; Short, Watkins and Martin, 2007).

How can the British 'agricultural revolution' 1939 to 1945 be interpreted with regard to rural development in the rest of Europe? Does it represent an overall development path or rather a national-specific route? In order to answer these questions, comparative approaches to wartime farming are needed. This paper aims to contribute to the discussion on the revolutionary character of European wartime farming 1939 to 1945 by comparing the British case with the case of another territory involved in the Second World War. Austria which was annexed by the German Reich in 1938 is an appropriate case of comparison with the UK. Both areas – the former as a part of Nazi Germany, the latter as a member of the Anti-Hitler-Coalition – were simultaneously involved in agricultural regulation with regard to wartime priorities (as opposed to the pre-1938 German Reich where the expansionist 1936 Four-Years-Plan was already in force for several years).

Drawing on the concept of ‘agricultural revolution’ as a mode of agrosystemic development in Europe in the Second World War (II.), this article focuses on upstream and downstream resource flows regulated by individual and collective actors at different levels. Despite the author’s principal commitment to actor-centred concepts of agrosystems (Langthaler, 2006), this article emphasises quantitative aspects due to pragmatic reasons; more qualitative aspects concerning the thoughts and actions of rural actors are explored elsewhere (Langthaler 2009a, 2009b, 2009c, 2009d). Initially, agrosystemic regulation at national, regional and local levels in the UK and Austria is examined (III.). Afterwards, agrosystemic resource flows, namely farm inputs, outputs and income, are compared on the basis of contemporary statistical data (IV.). Finally, the notion of ‘agricultural revolution’ is assessed from a comparative perspective (V.).

II. Conceptualising ‘agricultural revolution’

Although it has been argued to replace ‘agricultural revolution’ by ‘more or less rapid change’ (Thirsk, 1987: 59 f.), in this article it is proposed to make use of the concept more properly. One starting point is provided by the *agrosystem* approach which has again attracted the attention of rural historians in recent years (Bieleman, 1999; Thoen, 2004; Langthaler, 2006, 2009e). An agrosystem is ‘the theoretical expression of a historically constituted and geographically localized type of agriculture, composed of a characteristic cultivated ecosystem and a specific social production system’ (Mazoyer and Roudart, 2006: 51). Accordingly, the definition of ‘agricultural revolution’ applied in this article involves three aspects of agrosystemic transformation: extent, direction and speed. With regard to the *extent*, the transformation must be rather *fundamental* than gradual or, as some would say, rather ‘structural’ (Martin, 2007a: 16) than cyclical. With regard to the *direction*, the transformation must be rather *progressive* than regressive. With regard to the *speed*, the transformation must be rather *short- or medium-term* than long-term. Only if all of these aspects are given, an ‘agricultural revolution’ is indicated; otherwise, we rather speak of other kinds of – non-revolutionary – agrosystemic transformation.

Undoubtedly, this general definition as a solution to the conceptualisation problem is problematic in itself: What do ‘fundamental’, ‘progressive’ and ‘short- or medium-term’ exactly mean? Answers to this question depend on the respective historical and geographical context. With regard to Europe in the first half of the twentieth century, ‘agricultural revolution’ can be more specifically defined as follows: ‘Fundamental’ involves quantitative and qualitative transformations of, among others, farm inputs, farm outputs and farm income. ‘Progressive’ – which is used descriptively rather than normatively here – indicates transformations from

capital-extensive, diversified and dispersed integrated to capital-intensive, specialised and concentrated forms of agriculture, from subsistence, 'peasant-like' to commercial, 'farmer-like' farming, from relative local autonomy to overwhelming state-control (Ilbery and Bowler, 1998). 'Short- or medium-term' relates to transformations during a few decades.

Thus conceived, 'agricultural revolution' means a fundamental, progressive and short- or medium-term change of agrosystemic relations. For comparative purposes two further differentiations of the concept are proposed: First, agricultural development comprises *technical* as well as *institutional* aspects (Hayami and Ruttan, 1985). Accordingly, rather technical and institutional forms of 'agricultural revolution' can be differentiated. Whereas technical changes relate to quantifiable aspects such as factor substitution, productivity and production growth or rural exodus, institutional changes comprise aspects such as the institutionalisation of property rights, extension services or farmers' associations which can be captured only qualitatively. In case of a considerable lag of time between institutional and technical change, we can distinguish two phases: Second, the scope of an 'agricultural revolution' with regard to a given period and territory can be total or partial, depending on the prevailing development pattern: *general development*, i.e. each farming unit makes progress; *unequal development*, i.e. some farming units progress faster than others; *contradictory development*, i.e. some farming units progress while others are in crisis or even regress. If all farming units regress, there is, by definition, no 'agricultural revolution', but a *general crisis* (Mazoyer and Roudart, 2006: 50). Taken together, both differentiations constitute ideal-types of 'agricultural revolution' which provides a heuristic framework for exploring historical and geographical realities of agriculture (see Table 1).

Table 1: Ideal types of 'agricultural revolution'

	general development (1)	unequal development (2)	contradictory development (3)
technical change only (A)	1A	2A	3A
institutional change only (B)	1B	2B	3B
both technical and institutional change (C)	1C	2C	3C

III. Agrosystemic regulation

III.1. State regulation

At the outbreak of the Second World War in 1939, the experiences of the First World War food production campaign prompted the British government to extend the state-controlled system of

administration and direction which was previously confined to domains such as the Milk Marketing Board. The Ministry of Agriculture's task was raising the domestic production of essential and high calorie food, especially carbohydrates such as wheat and potatoes, in order to alleviate Britain's abnormal dependence on imported food. Four years later, the 'miraculous result' was already praised: 'After four years of war the British farmer, who formerly produced less than 40 per cent for home consumption, is now providing 80 per cent of the country's rations […].' (Stamp, 1943: 523) The newly established Ministry of Food was given the responsibility for the distribution of food and feedingstuffs through rationing and price controls. The legal separation of powers between the production and distribution sides of the food regime fostered antagonism between the two Ministries. The price mechanism, driven partly by state interventions and partly by market forces, was the instrument to encourage the expansion of outputs in the national agrosystem: On the one hand, agricultural commodities were bought at relatively high fixed prices from the producers; on the other hand, they were sold at relatively low prices to the consumers. The differences between producer and consumer prices were subsidised by the state. This mechanism of price subsidisation was vulnerable to miscalculations, delayed adaptations and other forms of 'state failure'. The state's main aim was on expanding the output of arable farming such as grain, potatoes and sugar beet through the curtailment of livestock farming – except for milk production which was given priority over breeding. Accordingly, annual ploughing-up campaigns, driven by financial incentives and state coercion, were introduced to convert grassland into arable land. A separate policy for upland farmers was introduced to prevent them abandoning their enterprises (Martin 2000: 36 ff.; Pilfold, 2007; Whetham, 1952). In addition to the co-ordination of production, British wartime control encompassed also the allocation of scarce resources such as labour and capital. Restrictions on the labour market were introduced to contain the recruitment of farm labourers for non-agricultural occupations. Though agricultural wages were raised, they still lagged behind those in the industrial and service sectors. The supply of labour to agriculture was augmented by the contribution of the Women's Land Army, the Voluntary Land Club Movement, school children, prisoners of war (POWs) and other sources of labour for agriculture (Clarke, 2007; Moore-Colyer, 2007; Ward, 1988: 34 ff.; Grant and Maddren, 1975). Under the Lend-Lease agreement farm machinery were imported from the United States of America (Dewey, 2007). In short, 'in terms of provision of labour and machinery, agriculture received preferential treatment for the allocation of scarce resources at a crucial time' (Martin, 2000: 43).

Unlike the UK, Germany changed agricultural state regulation for war purposes rather gradually than fundamentally. In comparison with Britain, Germany was largely self sufficient in food;

hence, the directives could be less draconian. The promotion of state protection against the market forces according to the National-Socialist 'blood and soil' (*Blut und Boden*) ideology, codified by the 1933 Reich Hereditary Farm Law (REG), had already been subordinated to the expansionist 1936 Four-Years-Plan (Farquharson, 1976; Grundmann, 1979; Degler and Streb, 2008). The Ministry of Food and Agriculture in personal union with the Reich Food Estate (*Reichsnährstand*), the obligatory corporation of producers, manufacturers and distributors of agricultural goods, were tasked to raise the degree of self-sufficiency by expansion of domestic food production ('battles for production') in order to substitute food imports for imports of raw materials for the booming armament industry. At the beginning of war this regulatory framework was complemented at provincial and district levels by Food Agencies (*Ernährungsämter*), encompassing department A for production (i.e. Reich Food Estate) and department B for distribution and rationing of consumption (i.e. general administration). According to the First World War experience of food shortages, the stability of consumer prices was given priority over the rise of producer prices. Thus, the expansion of outputs was encouraged by state coercion rather than financial incentives. The conflict between the expansion of food grain production und the closing of the 'gap of fat' (*Fettlücke*) by dairy products and oil seeds could not be solved by domestic agriculture alone. Only through the exploitation of German occupied areas, especially in East Europe, the provision of German consumers – and, hence, the loyalty of the masses – could be ensured until 1944 (Strauss, 1941; Corni and Gies, 1997: 397 ff.). Ideological reserves against the massive recruitment of people belonging to 'inferior races' – prisoners of war and civil workers from the German occupied countries – were eclipsed in favour of the economic need to substitute farm workers conscripted to the army. Therefore, millions of foreign soldiers and civilians were directly or indirectly forced to work in German agriculture from 1939 onwards. Domestic labour was extensively recruited before 1942, when the official duty of Germans, especially youths and women, was enforced (Hornung, Langthaler and Schweitzer, 2004: 107 ff.). German agricultural economics shifted to the preference of labour to land productivity (Streb and Pyta, 2005). Despite the parole of the 'armament of the village' (*Aufrüstung des Dorfes*), the initial provision of farm technology and credit was reduced from 1942 onwards in favour of military armament. Only a few pioneering projects were implemented in mountainous areas (Langthaler, 2000).

III.2. Regional and local regulation

In order to set the state directives into practice, War Agricultural Executive Committees (WAECs) consisting of eight to ten members personally appointed by the Minister of Agriculture

were established in the UK in each county in 1939; these were complemented by sub committees addressing specific elements of the agrosystem (machinery, livestock, drainage etc.) and district committees (Short, 2007a: 159 ff., 2007b). This decision was, firstly, motivated by the opposition to 'farming from Whitehall' which had characterised the food production campaign of the First World War. Secondly, the decentralised system of administration with each county being run by WAEC of a paid small technical staff led by an Executive Officer with administrative experience with a number of unpaid volunteers from the respective county was a low cost system. Although at first glance the WAEC's framework appeared decentralised and democratic, in practice it ought to encourage farmers to implement the directives of central authorities: 'The real power in terms of decision making was held by the nucleus of the main WAECs and their Chief Executive Officers, who exhibited high levels of autonomy and discretion in the way they operated' (Martin, 2000: 45). The activities of the WAECs can be divided into general administration, technical advice and sanctions. The first group of activities encompassed the implementation of wartime regulations, the co-ordination of ploughing-up and drainage actions, raising the production cops and livestock and the supply fertilizers, feedingstuffs, machinery, implements and seeds. The second group of activities aimed at raising productivity by altering farming methods. The third group of activities concerned sanctions on farmers who failed to comply with the WAEC's directives to plough a proportion of their grassland for arable cropping and also to implement other changes designed to raise output. This was accompanied with a detailed assessment of the state of individual holdings undertaken by the 1941-43 National Farm Survey (MAF, 1946; Short et al., 2000). Farmers were graded according to their managerial performance into categories A (more than 80 percent of potential output), B (60 to 80 percent of potential output) and C (less than 60 percent of potential output). Though this classification varied considerably between counties, it revealed the positive correlation between size of holding and managerial performance (Martin, 2000, 43 ff.). The assessments sometimes reflected structural differences affecting productivity rather than managerial differences (Rawding, 2007: 191). The evaluation of the farmers' managerial capacities was deeply embedded in personal relations of rural communities, because local committee members had to grade also relatives, friends and neighbours (Short, 2007a: 176 ff., 2007b; Waymark, 2007).

In contrast to the official view of the harmonious relationship between the WAECs and the farming communities, there is evidence on conflicts between committee members and individual farmers: 'Given the large number of farmers involved, the lack of formal training for WAEC officials and the individualistic spirit of farmers, a degree of friction was inevitable.' In addition

to this, ‘committee officials saw themselves as functionaries of the mandarins in Whitehall, and often sought to achieve their county targets in a regimented way with little regard for the interests of those farmers who did not comply with their directives.’ (Martin, 2000: 60 f.) Among the sanctions imposed by the WAECs, the eviction order was the most controversial. Through evictions tenancies were terminated and owner-occupiers were compelled to relinquish land and occasionally farmhouse to be farmed more productively. Although only a small a minority of the holdings was directly affected by evictions, the dispossessed area increased year by year. The majority of farmers were indirectly affected by the threat of eviction. In addition to eviction orders, the WAECs commanded an armoury of positive and negative sanctions, ranging from withholding grants and subsidies to controlling the allocation of scarce resources. Among the rare accounts on violent opposition against evictions are cases of farmers such as Geoge Walden who was shot by the police in the process of being evicted and a number who committed suicide (Martin, 2000: 63 f., 2007b; Short, 2007a). Neither the courts nor the mass media provided to farmers forums for challenging WAEC directives imposed on them. They could only appeal for assistance to the National Farmers Union (NFU) which played an ambivalent role in these negotiations: representing the interests of its members on the one hand, supporting the food-production campaign on the other hand. Thus, opposition was rather directed to ad hoc organisations such as the Farmers’ Rights Association (FRA) and the Farmers and Smallholders Association (FSA) (Martin, 2000: 60 ff.).

In Austria, the regulatory framework of German agriculture was established immediately after the 1938 *Anschluss*. The Reich Food Estate functioning as farmers’ organisation as well as state agency crucially linked state directives and farming practice at provincial, district and local levels. According to the principle of ‘leadership’, at each level honorary ‘peasant leaders’ were appointed. Unlike the Local Peasantries (*Ortsbauernschaften*), each District and Provincial Peasantry (*Kreis*- and *Landesbauernschaft*) additionally employed three divisions of professional staff: Division I ‘The Man’ (*Der Mensch*) was responsible for the mobilisation of the farming community according to the ideology of ‘blood and soil’ institutionalised by the REG. Division II ‘The Farm’ (*Der Hof*) provided material as well as immaterial assistance for arable and livestock production (machinery, fertilizer, seeds, credit, extension etc.). Division III ‘The Market’ (*Der Markt*) organised the obligatory delivery of all products not consumed on the farm for fixed prices in close cooperation with official marketing boards (*Wirtschaftsverbände*). Through the manipulation of production, manufacture and distribution as well as the fixation of prices, the Reich Food Estate had the means to control the main commodity flows between producer and consumer (Langthaler, 2000, 2008).

Despite the totalitarian character of the Reich Food Estate, its representatives were in practice embedded in complex negotiations as is shown by the most controversial sanction against farm holders: dispossession. According to the 1933 REG, two categories of farm holders existed: Peasants (*Bauern*) and Farmers (*Landwirte*). Being classified as a Peasant depended on the farm size as well as personal features, namely 'peasant ability' (*Bauernfähigkeit*). Farm holders who did not conform to these criteria remained Farmers or, in case they already had been entitled as Peasants, could be dispossessed of the farm. Although the Reich Food Estate disposed of an organisation for fiduciary farm management (*Landwirtschaftlicher Treuhandverband*), it could only apply for dispossession. It was the task of the courts – general District Courts in case of Farmers and special Heir Courts, consisting of professional as well as lay judges nominated by the Reich Food Estate, in case of Peasants – to decide about applications for disposition. In addition to farm mismanagement and other economic reasons for such applications, moral arguments concerning Peasants, e.g. bad payment behaviour, ideological opposition or illegitimate sexual relations, were also taken into account when making the assessment. Because farm holders could appeal against judgements, temporary or permanent dispossessions involved complex and, in many cases, long-lasting proceedings (Münkel, 1996; Hauch, 2006; Langthaler, 2009a).

Concerning the number and results of negotiations about farm management in Austria as part of the German Reich, a regional study in the province of Niederdonau reveals that only 5 percent of all farms owned by Peasants were involved in evaluations of 'peasant ability'. Among the arguments stressed 'economic ability' was much more important than 'honourable status'; this indicates the primacy of economy to morality in the context of the pragmatic war food economy, therefore postponing the 'blood and soil' dogma to the time after the propagandistically conjured 'final victory'. The majority (58 percent) of the proceedings concerning 'economic ability' led to the denial of 'peasant ability'; contrarily, only a minority (44 percent) of the proceedings resulted in the same judgement. Evaluations of 'economic ability' which were highly functional in the context of the state-led war economy dominated in absolute terms. Regarded relatively, they more often led to the dispossession of the farm holder. In contrast, evaluations of 'honourable status' characterised by less importance for the political economy of warfare represented only a minority of all cases; moreover, they less frequently resulted in dispossessions. To conclude, there is evidence that, beyond the REG's ideological intentions, the jurisdiction concerning 'peasant ability' was functional for regulating the war food economy. Though the direct effect of control by the hereditary courts was limited due to the small number of proceedings, it is likely

that the self-control of farm owners struck by exemplary judgements indirectly had a preventive effect (Langthaler, 2009d).

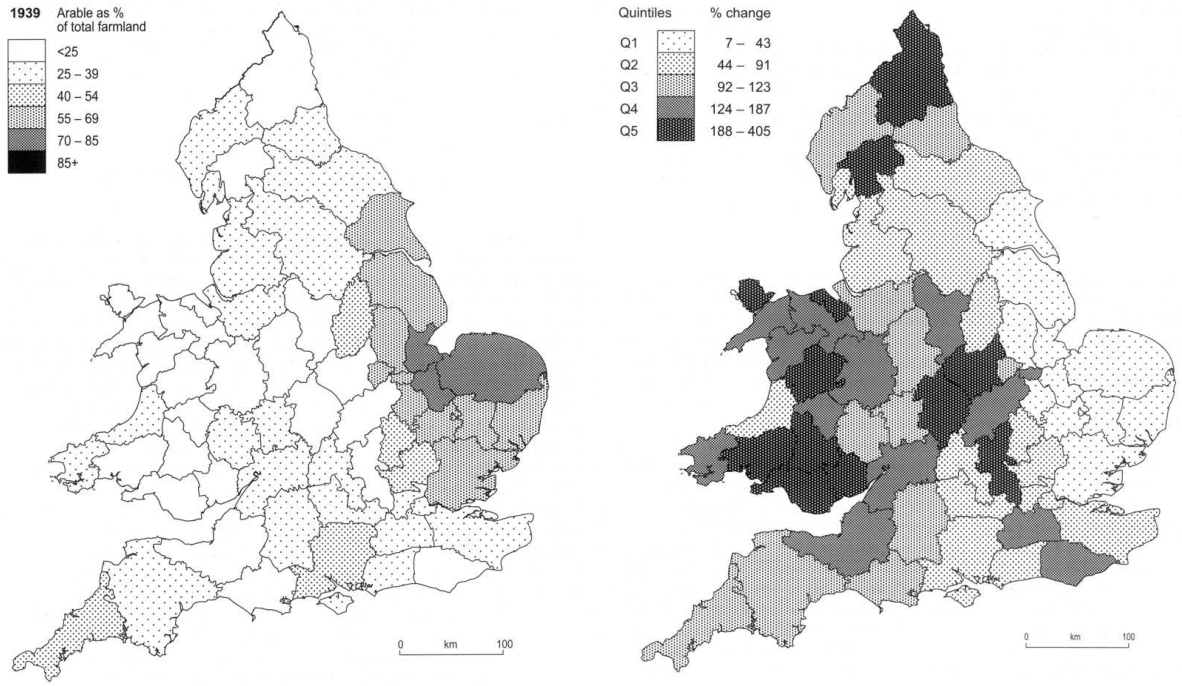
IV. Agrosystemic resource flows

IV.1. Farm inputs

IV.1.1. Land

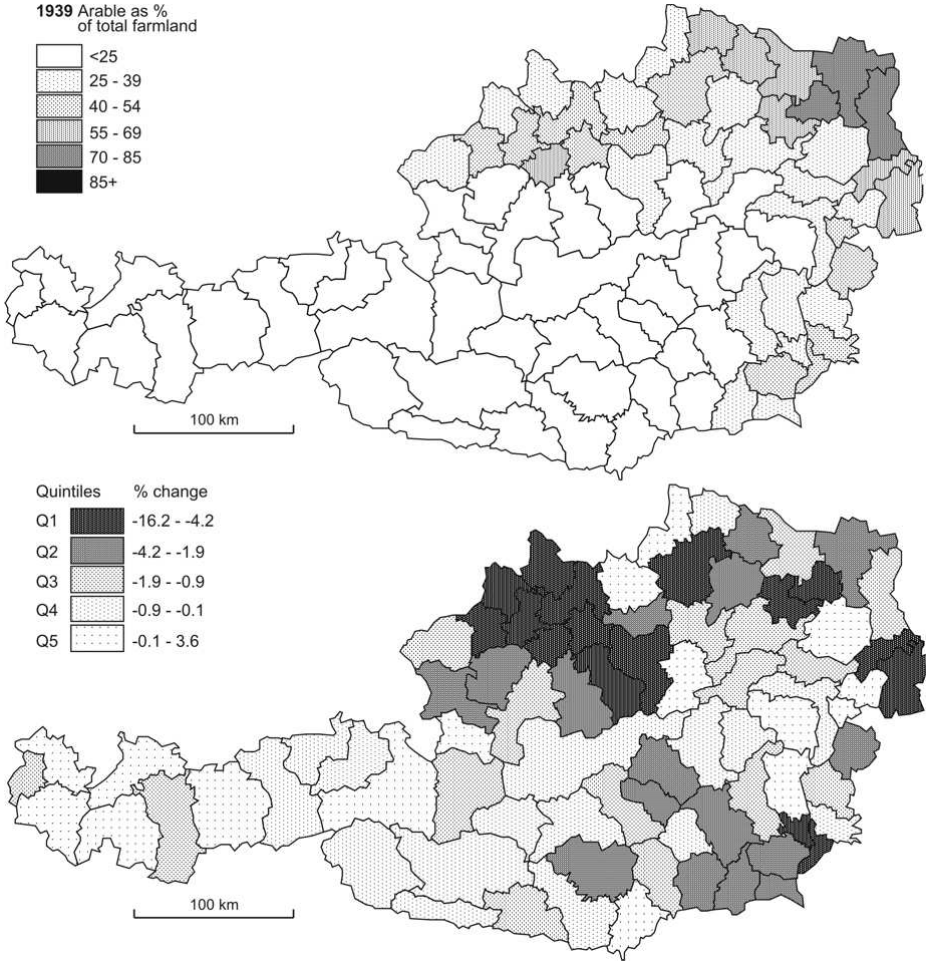
In most industrialised societies of modern Europe land becomes a scarce resource because agriculture competes for it with other sectors of the economy. The competition for land becomes even more intense during wartimes when the state lays its claims to land for military and industrial purposes (Foot, 2007). This is also true for the UK and Austria where the total agricultural area declined slightly by 2.1 respectively 0.6 percent from 1939 to 1944. However, these convergent trends were accompanied by divergent changes of the acreage: Whereas the proportion of arable land increased rapidly from 41 to 62 percent in the UK, it declined from 43 to 41 percent in Austria (see Table 2). An increasing proportion of the British countryside was ploughed up and, in combination with increased use of fertilizer and other inputs, land was farmed more intensively compared to the inter-war period (Stamp, 1947, 1948). Conversely, in Austria the relative decline of arable land led to extensification. Moreover, intensification and extensification were distributed unevenly over the countryside. In England and Wales there was a strong negative correlation between the proportion of arable land in 1939 and the changes of the acreage until 1944: The upland counties in the north, south and west, characterised by small percentages of arable land, had more significant increases than the lowland counties in the east. Austria shows a much weaker, but none the less negative correlation: The alpine districts in the south and the west covered mainly by grassland and forests were less affected by the relative decline of arable land than some regional clusters in the mainly flat and hilly land in the north-west, north-east and south-east. In short, both the UK and Austria were characterised by similar dynamics: the lower the relative acreage in 1939, the higher its increases respectively the lower its decreases until 1944 (see Figures 1 and 2).

Figure 1: Changes in the proportion of arable land in England and Wales, 1939-44



Sources: Short, Watkins and Martin, 2007: 7; Martin, 2007a: 29.

Figure 2: Changes in the proportion of arable land in Austria, 1939-44



Source: ÖStZA, 1948: 2 ff. GIS design by the author.

Table 2: Land use in the UK and Austria, 1939-44

	United Kingdom			Austria		
	total agricultural area		proportion of arable land	total agricultural area		proportion of arable land
	(1000 hectares)	(index)	(percent)	(1000 hectares)	(index)	(percent)
pre-war*	12884	100.5	41.1	4331	104.0	44.6
1939	12820	100.0	40.7	4163	100.0	43.2
1940	12719	99.2	45.6	4047	97.2	43.4
1941	12688	99.0	51.8	4179	100.4	41.9
1942	12628	98.5	56.1	4136	99.3	41.6
1943	12569	98.0	60.3	4135	99.3	41.2
1944	12548	97.9	62.2	4137	99.4	40.8

* UK: 1936-38, Austria: 1937-38
Sources: Murray, 1955: 373; ÖStZA, 1948: X.

The regionally uneven distribution of intensification and extensification might, at least partly, be explained by the 'law of diminishing returns' (Ellis, 1993: 18 ff.). Accordingly, each additional unit of variable input yields less and less additional output (such as in the British case) and, vice versa, each substracted unit of variable inputs causes more and more decline of output (such as in the Austrian case). Therefore, assigning additional units of labour and capital to rather extensively used land in the UK was rational in order to maximise output since some of the pasture land converted to arable farming was very fertile and capable of producing high yields. In the Austrian agrosystem the law's rationale suggested to reduce labour and capital assignment in rather intensively used regions. However, in Austria there were many exceptions to this rule indicating other influences such as the spatially uneven use of agricultural land for military or industrial purposes. A statistical analysis reveals that the primary – negative – influence on the change of the proportion of arable land 1939 to 1944 in the Austrian countryside was the percentage of the acreage in 1939 as indicated above. In addition, the chance of the total farmland during this period had a secondary – also negative – influence. This indicates that the designation of farmland for non-agricultural uses in Austria 1939 to 1944 concerned rather wasteland, grassland or forests than arable land.[2]

According to the maps above (see Figures 1 and 2), the proportion of arable land seems to be a crucial feature of British and Austrian agricultural development paths during wartime. In order to fully assess this feature we shall examine not only its quantity, but also its quality. Whereas the British agrosystem showed more relative acreage, the Austrian agrosystem was characterised by higher land use intensity. Though the proportions of grain and potatoes increased in the UK, they

[2] Multiple regression analysis of data of 80 Austrian districts. Source: ÖStZA, 1948: 2 ff.

never reached Austria's respective – and even declining – percentages. In spite of increasing rates of fallow and temporary grassland, during the war years arable land was farmed more intensively in Austria than in the UK where these forms of arable land use decreased considerably. However, from 1942 onwards the difference in arable land use intensity – which had equalled 101 in the UK and 118 in Austria in 1939 – became negligible and both agrosystems stagnated around the value[3] of 110 (see Table 3). In short, British and Austrian land use in general and arable land use in particular coming from divergent positions *converged* during the wartime period to a considerable degree.

Table 3: Arable land use intensity in the UK and Austria, 1939-44

	United Kingdom		Austria	
	(intensity value)	(index)	(intensity value)	(index)
pre-war*	100.3	99.6	117.0	99.2
1939	100.8	100.0	117.9	100.0
1940	103.3	102.5	116.4	98.7
1941	108.4	107.6	113.4	96.2
1942	110.0	109.1	111.4	94.5
1943	109.3	108.5	110.5	93.8
1944	108.3	107.4	110.8	94.0

* UK: 1936-38, Austria: 1937-38
intensity coefficients: grain = 1, potatoes = 3, sugar beet = 4, other crops = 1, temporary grass = 0.5, fallow = 0.25
Sources: Murray, 1955: 373; ÖStZA, 1948: X.

IV.1.2. Labour

Unlike land, labour is much more difficult to grasp in agricultural statistics. In both countries there is a lack of annual data on the agricultural workforce. This contrasts sharply with the importance of farm labour – 'perhaps the input to which most attention has been given' (Brassley, 2007: 42) – during the war. Though the available data are hardly comparable,[4] the main tendencies are evident: Whereas in the UK total workforce units per agricultural area increased between the pre-war years and 1943/44 by 11 percent, the Lower Austrian agrosystem faced a considerable decline in the number of rural workers per 100 hectares, depending on the type of farming, up to 47 percent during the same period (see Table 4). Conscripting rural dwellers to the armed forces as well as maximising farm outputs created a dilemma which could not be solved in principle, but only gradually. In both countries, rural men in uniform were, at least

[3] To calculate the arable land use intensity value the area of each crop must be multiplied by the following coefficients: grain = 1, potatoes = 3, sugar beet = 4, other crops = 1, temporary grass = 0.5, fallow = 0.25. The sum of these products is divided by the arable area and then multiplied with 100. See LBG, 1948: 88.

[4] British data come from a calculation on the basis of total numbers of different categories of workers. Lower Austrian data come from bookkeeping files of a small sample of middle and large peasant farms.

partly, substituted by both male and female human workforce as well as labour-saving machinery. A comparison of the percentage of domestic women from outside the agricultural sector and foreign workers in 1943 of all farm workers in 1939 in the UK and in the province of Niederdonau reveals similar results, namely 15.4 respectively 15.9 percent. However, the underlying substitution processes differed according to national modes of regulation. In the UK where the mobilisation of women was pioneered the main source of workforce was the Women's Land Army accounting for 10.8 percent (Clarke, 2007), complemented by the assignment of prisoners of war (POWs) accounting for 4.6 percent (Moore-Colyer, 2007). In Niederdonau, this proportion was the other way round: According to a compromise between pragmatic supporters and dogmatic opposers of foreign labour assignment in the Nazi regime, prisoners of war and civil workers from the German occupied countries of Europe were indirectly or directly forced to work in the territory of the Reich from 1939 onwards. Initially there was no extensive recruitment of domestic labour until 1942, when the official duty of Germans, especially youths and women, was enforced (Hornung, Langthaler and Schweitzer, 2004: 107 ff.; Langthaler, 2009b). However, in 1943 domestic women under official duty accounted only for 1.7 percent compared to 14.2 percent POWs and foreign civil workers, mainly from German occupied East Europe (see Table 5). Though our comparison rests upon questionable data, the overall difference is quite clear: In the UK, the substitution of farm workers subscripted to the army rested mainly on the shoulders of the – voluntary – members of the Women's Land Army; in Austria, it was mainly the burden of POWs and – mainly forced – civil workers from all over German occupied Europe.

Table 4: Agricultural labour intensity in the UK and Lower Austria, 1937-45

	UK	Lower Austria							
		grain-wine farms		grain farms		root crop farms		grass-forest farms	
	(index of workforce units per agricultu-ral area**)	(workers per 100 hectares)	(index)	(workers per 100 hectares)	(index)	(workers per 100 hectares)	(index)	(workers per 100 hectares)	(index)
pre-war*	100	31	100	21-38	100	19	100	24	100
1939/40	99	–	–	–	–	–	–	–	–
1940/41	102	–	–	–	–	–	–	–	–
1940/42	105	–	–	–	–	–	–	–	–
1942/43	109	–	–	–	–	–	–	–	–
1943/44	111	17	55	14-28	53-100	18	95	17	71
1944/45	112	–	–	–	–	–	–	–	–

* UK: 1937-39, Lower Austria: 1937

** Numbers of workers are weighted by coefficients ranging from 1 (regular males, 21 and over) to 0.4 (prisoners of war, not billeted).

Sources: Williams, 1954: 334; Murray, 1955: 273; LBG, 1949: 45.

Table 5: Agricultural labour substitution in the UK and Niederdonau, 1943

	agricultural workers 1939	domestic women 1943		foreign workers 1943	
	(number in 1000)	(number in 1000)	(percent of 1939)	(number in 1000)	(percent of 1939)
UK	803.0	87.0[*]	10.8	37.6[***]	4.6
Niederdonau	687.9	11.9[**]	1.7	97.5 (26.5)[***] (71.0)[****]	14.2 (3.9) (10.3)

[*] Women's Land Army, [**] women under obligatory service, [***] POWs, [****] civil workers
Sources: Murray, 1955: 85, 188 f.; Statistisches Amt für die Reichsgaue der Ostmark, 1941; Gauarbeitsamt Niederdonau, 1943.

IV.1.3. Livestock

Compared to labour, livestock is much better documented in agricultural statistics of the wartime years as is the case with land. Until the first half of the twentieth century land and livestock use were closely interrelated by nutrient transfers via fodder and manure. Given that both elements of this integrated agrosystem produced nutrition for human consumption, wartime shortages promoted the competition for cultivating either fodder or food plants. Both countries followed similar solutions to this problem: While more and more milk cows were fed (UK: +13 percent, Austria: +4 percent), the numbers of other livestock declined. The strongest decline affected pigs in the UK (-58 percent) as well as – though less dramatically according to the fear from the 'murder of pigs' (*Schweinemord*) experienced in the First World War (Corni and Gies, 1997: 402) – in Austria (-40 percent). In short, in both countries milk production was given priority over beef and pork production. Because one unit of animal meat requires five to ten units of fodder crops, this strategy promoted the shift to the production of food crops for human consumption. Total livestock numbers are not automatically accurate indicators of intensity; thus, they have to be related to the agricultural area. Because in both countries the agricultural area declined, increases in numbers resulted in stronger increases in intensity and, vice versa, decreases in numbers resulted in weaker decreases in intensity. Therefore, the boom of dairy cattle breeding equalled 15 respectively 5 percent gains of intensity; the downturn of pig breeding amounted to 47 respectively 40 percent losses of intensity (see Tables 6 and 7).

Table 6: Livestock intensity in the UK 1939-44

	dairy cattle		other cattle		sheep		pigs		poultry	
	(number per 100 hectares)	(index)	(number per 100 hectares)	(index)	(number per 100 hectares)	(index)	(number per 100 hectares)	(index)	(number per 100 hectares)	(index)
pre-war (1936-38)	31	101	37	94	200	95	35	101	592	102
1939	30	100	39	100	210	100	34	100	580	100
1940	31	103	40	104	207	99	32	94	560	97
1941	31	104	39	100	175	84	20	59	489	84
1942	33	110	39	99	170	81	17	50	458	79
1943	34	113	39	101	162	77	15	42	404	70
1944	35	115	41	105	160	76	15	43	439	76

Source: Murray, 1955: 373.

Table 7: Livestock intensity in Austria 1939-44

	dairy cattle		other cattle		sheep		pigs		poultry	
	(number per 100 hectares)	(index)	(number per 100 hectares)	(index)	(number per 100 hectares)	(index)	(number per 100 hectares)	(index)	(number per 100 hectares)	(index)
pre-war (1938)	28	95	31	94	7	95	66	97	209	101
1939	30	100	33	100	8	100	68	100	206	100
1940	31	104	33	99	8	111	54	80	181	88
1941	30	102	30	89	8	111	49	72	158	77
1942	31	104	30	90	10	127	43	63	136	66
1943	31	106	30	90	11	141	45	67	139	67
1944	31	105	30	91	11	146	41	60	127	62

Source: ÖStZA, 1948: XIV.

IV.1.4. Technology

The data on technical inputs are as scarce as the labour data, especially for Austria. Despite the lack of data comparability, massive gains in technical farm inputs are indicated both for the UK (Short, Watkins and Martin, 2007; Martin, 2007a; Dewey, 2007) and Austria (Langthaler, 2000). Regarding mechanical technology, one of the few comparable indicators available for both countries is the change in farm power supplies. Accordingly, from 1939 to 1946 total horsepower increased by 154 percent in the UK and by 80 percent in Austria. Strikingly, total power per agricultural area in 1939 was similar in both countries, before the UK extended its lead until 1946. By comparing both agrosystems we should keep in mind that in Austria a considerable, but unquantifiable amount of machinery was lost due to damages and requisitions at the end of war (Sandner, 1947: 71). Tractors were the main source of power in the UK (1939: 56 percent, 1946: 81 percent) as opposed to Austria (1939: 9 percent, 1946: 16 percent). In both countries, their horse power more than tripled during this period (see Table 8). With regard to biological-chemical technology, data on the use of mineral fertilizer provide comparative insights. In both countries the application of nitrogen, phosphate and potash increased during the wartime era – even though these materials became more and more scarce due to the needs of the

armaments industry. Compared to Austria, the application of mineral fertilizer in Britain was more effective given that much of the grassland ploughed up had been laid down for a couple of generations. The application of mineral fertilizer continued in Britain, whereas it broke off in Austria after the war. The comparison of the amount of fertilizer use per agricultural area 1938 to 1945 leads to rather ambivalent results: Whereas the application of nitrogen and phosphate was higher in the UK, in Austria more potash was applied (see Table 9). All in all, this rough comparison indicates accelerated use of labour-saving and land-saving technology in both countries, thereby following a secular trend towards substitution of labour and land for capital (Hayami and Ruttan, 1985). Whereas the rates of technical change in Austria were considerably lower, the UK experienced the 'resurgence of progressive, high-input arable farming' (Martin, 2007a: 16) after the decline of 'high farming' in the late nineteenth century.

Table 8: Supply of mechanical power in agriculture in the UK and Austria 1939-44

	United Kingdom		Austria	
	1939	1946	1939	1946
stationary power (horsepower)	854	911	525	866
tractor power (horsepower)	1075	3995	49	165
total power (horsepower)	1929	4906	574	1031
proportion of stationary power (percent)	44.3	18.6	91.5	84.0
proportion of tractor power (percent)	55.7	81.4	8.5	16.0
index of stationary power	100	107	100	165
index of tractor power	100	372	100	337
index of total power	100	254	100	180
total power per agricultural area (horsepower per 100 hectares)*	15.0	39.1	13.8	24.9

* The value for 1946 is related to the agricultural area of 1944.
Sources: Murray, 1955: 274; Sandner, 1947: 72.

Table 9: Application of mineral fertilizer in the UK and Austria 1939-44

	United Kingdom			Austria		
	nitrogen	phosphate	potash	nitrogen	phosphate	potash
pre-war* (1000 tons)	–	–	–	5.9	12.8	7.5
1938-45 (1000 tons)	136.8	268.3	87.1	19.5	18.9	42.1
post-war** (1000 tons)	164.6	358.7	107.2	13.8	16.9	12.8
1938-45 (tons per hectare)	10.8	21.2	6.9	4.7	4.5	10.1

* Austria: 1930-38, ** UK: 1945-46, Austria: 1945-50.
Sources: Murray, 1955: 259; Meihsl, 1961: 744.

IV.2. Farm outputs

IV.2.1. Arable production

Due to the crucially important challenge about maintaining food supply during wartimes, there are rich data on farm outputs in both countries. However, they only indicate the official

commodity flows between producers and consumers; what was sold and bought privately on the 'black market', can hardly be measured. According to the official figures, neither the UK nor Austria achieved any significant increase in yields per hectare. In the UK grain yields oscillated by up to 10 percent in some years; but there was no marked trend towards higher yields. Potatoes and sugar beet yields even fell from year to year from 1940 onwards. In Austria all crop yields declined, except for 1943 which featured an above average grain harvest (see Tables 10 and 11). It might be worthwhile to note that the wartime changes were not indicative of the very rapid and unprecedented increases in crop yields which took place in the postwar period. The critical difference between both agrosystems prior to 1945 was not yields per hectare, but *total yields*. Ploughing up grassland and dedicating more acreage for grain and potatoes in the UK let total output of production climb up by 47 to 96 percent from 1939 to 1944; only sugar beet harvests stagnated. In contrast, the decline of arable land in general and of the planted area of most food crops caused considerable losses of total output by 30 to 53 percent (see Tables 12 and 13).

Table 10: Yield per hectare of selected crops in the UK, 1939-44

	wheat		barley		oats		potatoes		sugar beet	
	(tons per ha)	(index)	(tons per ha)	(index)	(tons per ha)	(index)	(tons per ha)	(index)	(tons per ha)	(index)
pre-war (1929-38)	2.26	97	2.06	93	2.03	98	16.56	91	21.25	83
1939	2.33	100	2.21	100	2.07	100	18.29	100	25.45	100
1940	2.27	97	2.07	94	2.13	103	19.03	104	23.97	94
1941	2.23	96	1.95	88	2.06	99	17.54	96	22.98	90
1942	2.56	110	2.37	107	2.16	104	17.79	97	22.98	90
1943	2.50	107	2.31	105	2.10	101	17.54	96	22.49	88
1944	2.45	105	2.23	101	2.03	98	15.81	86	19.03	75

Source: Murray, 1955: 374.

Table 11: Yield per hectare of selected crops in Austria, 1939-44

	wheat		barley		oats		potatoes		sugar beet	
	(tons per ha)	(index)	(tons per ha)	(index)	(tons per ha)	(index)	(tons per ha)	(index)	(tons per ha)	(index)
pre-war (1937-38)	1.76	101	1.82	103	1.64	113	16.00	112	25.85	89
1939	1.75	100	1.78	100	1.45	100	14.28	100	28.97	100
1940	1.34	77	1.54	86	1.39	96	13.68	96	21.29	73
1941	1.51	87	1.57	88	1.29	89	13.91	97	24.81	86
1942	1.32	76	1.46	82	1.26	87	12.87	90	23.46	81
1943	1.63	94	1.65	93	1.43	99	10.49	73	20.67	71
1944	1.41	81	1.41	80	1.23	85	10.06	70	19.33	67

Source: ÖStZA, 1948: 86 ff.

Table 12: Total output of selected crops in the UK, 1939-44

	wheat		barley		oats		potatoes		sugar beet	
	(1000 tons)	(index)	(1000 tons)	(index)	(1000 tons)	(index)	(1000 tons)	(index)	(1000 tons)	(index)
pre-war (1929-38)	1651	100	765	86	1940	97	4873	93	2741	78
1939	1645	100	892	100	2003	100	5218	100	3529	100
1940	1641	100	1104	124	2892	144	6405	123	3176	90
1941	2018	123	1144	128	3247	162	8004	153	3226	91
1942	2567	156	1446	162	3553	177	9393	180	3923	111
1943	3447	210	1645	184	3064	153	9822	188	3760	107
1944	3138	191	1752	196	2953	147	9096	174	3267	93

Source: Murray, 1955: 375.

Table 13: Total output of selected crops in Austria, 1939-44

	wheat		barley		oats		potatoes		sugar beet	
	(1000 tons)	(index)	(1000 tons)	(index)	(1000 tons)	(index)	(1000 tons)	(index)	(1000 tons)	(index)
pre-war (1937-38)	460	103	295	103	454	126	3356	121	1089	88
1939	447	100	286	100	360	100	2765	100	1235	100
1940	286	64	280	98	343	95	2605	94	875	71
1941	342	76	233	81	285	79	2602	94	832	67
1942	275	62	222	78	272	76	2252	81	744	60
1943	344	77	215	75	302	84	1772	64	666	54
1944	293	66	181	63	251	70	1751	63	576	47

Source: ÖStZA, 1948: 52 ff.

IV.2.2. Livestock production

What has been said about the segmentation of arable product markets between legal and illegal domains applies even more to livestock product markets. The official figures of milk production in both agrosystems differed only slightly. It is striking that in most years the Austrian performance regarding total output as well as output per milk cow was even better than the British which was adversely affected by the decline in imported feedingstuffs. Only the proportion of milk sold to manufacturers or consumers was much higher in the UK than in Austria (see Table 14). Official numbers of slaughters, which are comparable only under reserve,[5] developed differently: The indices of slaughters of cattle and calves in the UK exceeded those of Austria; in case of pigs the relation was reverse. In both agrosystems the figures of slaughtered calves – increasing in the UK by and stagnating in Austria – performed much better than those of pigs which fell at the lowest level (see Tables 15 and 16).

[5] British data concern only slaughters at the collecting centres. Austrian data encompass slaughters on and off farm.

Table 14: Milk production and marketing in the UK and Austria, 1939-44

	United Kingdom					Austria				
	total production		production per dairy cattle		proportion of milk sold	total production		production per dairy cattle		proportion of milk sold
	(1000 tons)	(index)	(kg)	(index)	(percent)	(1000 tons)	(index)	(kg)	(index)	(percent)
pre-war*	8323	101	2111	99	–	–	–	–	–	–
1939	8277	100	2130	100	72.8	1983	100	1604	100	49.9
1940	7515	91	1899	89	77.7	1925	97	1542	96	56.7
1941	7309	88	1833	86	81.7	1945	98	1551	97	59.6
1942	7744	94	1844	87	81.4	1947	98	1537	96	59.5
1943	8001	97	1851	87	81.3	2020	102	1570	98	61.5
1944	8071	98	1846	87	82.6	1888	95	1452	91	61.0

* UK: 1936-39, Austria: -
Sources: Murray, 1955: 375, 380; Hammond, 1956: 798; ÖStZA, 1948: 188.

Table 15: Registered slaughters* in the UK, 1940-44

	cattle		calves		sheep and lambs		pigs	
	(1000 heads)	(index)	(1000 heads)	(index)	(1000 heads)	(index)	(1000 heads)	(index)
1940	1889	100	861	100	10961	100	5331	100
1941	1863	99	1062	123	8452	77	3428	64
1942	1672	89	1126	131	8158	74	1752	33
1943	1744	92	1363	158	7665	70	1588	30
1944	1866	99	1357	158	6830	62	1316	25

* purchases for slaughter at collecting centres
Source: Hammond, 1962: 794.

Table 16: Registered slaughters* in Austria, 1940-44

	cattle		calves		sheep and lambs		pigs	
	(1000 heads)	(index)	(1000 heads)	(index)	(1000 heads)	(index)	(1000 heads)	(index)
1940	420	100	668	100	199	100	1361	100
1941	436	104	705	106	79	40	1497	110
1942	372	88	738	111	65	32	1311	96
1943	341	81	699	105	70	35	1146	84
1944	246	59	660	99	38	19	1042	77

* slaughters on and off farm
Source: ÖStZA, 1948: 174.

IV.3. Farm income

How did arable and livestock production affect the income of farmers? The answer to this question must, of course, take into account agricultural product prices. Obviously, in the UK prices rose considerably higher – up to 124 percent from 1939 to 1944 – than in Austria, where only sugar beet, cattle and pig prices increased by up to 31 percent during the same period. Thus, the incentive to produce for the official market was probably stronger in the UK than in Austria, where threatening sanctions did not prevent the emergence of a 'black market' (see Table 17). To what extent these different price levels affected farm incomes can be measured by the 'cash net income' for the UK and the 'net yield' (*Reinertrag*) for Austria. The British 'cash net

income' indicates the difference on a cash basis between gross income and gross expenditure, excluding adjustments for valuation differences between the beginning and end of the year. In the UK it was three to five times higher in 1943/44 compared to 1937/38. Though here were individual differences according to the type of farming and farm size, this figure is outstanding: 'Farmers collectively saw significantly greater increases in their disposable income than entrepreneurs or managers outside the agricultural sector.' (Martin, 2000: 58) The Austrian 'net yield' measures difference on a cash basis between gross yield (*Rohertrag*) and expenditure (*Aufwand*), including assumed family labour wages. In the province of Lower Austria the indices on the basis of 1937 were scattered over an extremely wide range in 1943/44. Though hardly comparable, the data point to the assumption that the vast majority of farmers in the UK benefited in economic terms during the war period, while Austrian farmers were rather split between winners and losers (see Tables 18 and 19).

Table 17: Agricultural price index in the UK and Austria, 1939-44

	United Kingdom							Austria						
	wheat	oats	potatoes	sugar beet	cattle	pigs	milk	wheat	oats	potatoes	sugar beet	cattle	pigs	milk
pre-war*	100	100	100	100	100	100	100	100	100	100	100	100	100	100
1939	111	159	93	118	125	130	120	95	98	95	94	98	106	100
1940	148	195	131	154	138	139	154	92	101	88	91	98	103	100
1941	154	195	149	161	145	150	173	92	101	100	100	98	111	100
1942	171	208	148	204	154	154	180	92	105	103	105	98	123	100
1943	189	211	148	201	154	154	188	93	105	107	114	109	130	100
1944	198	224	152	192	159	155	193	92	100	107	114	128	131	100

* UK: 1936-38, Austria: 1938
Sources: Murray, 1955: 381; LBG, 1949: 16 f.

Table 18: Cash net income* per farm by farming type in England and Wales, 1937/38-1943/44

	1937/38 pounds	1943/44 pounds	index 1937-38 = 100
arable farming types	285	1545	542
intermediate farming types	252	1086	431
grassland farming types	196	661	337

* Cash net income: difference on a cash basis between gross income and gross expenditure, excluding adjustments for valuation differences between the beginning and end of the year
Source: Murray, 1955: 382 f.

Table 19: Net yield (*Reinertrag*)* per hectare by farming type in Lower Austria, 1937-1943/44

	1937	1943/44	
	Schilling	Schilling	index 1937-38 = 100
wine farms	196	5077	2586
grain-wine farms	109	135	123
grain farms	95	87	91
root crop farms	158	60	38
grass-forest farms	67	4	6

* Net yield (*Reinertrag*): difference on a cash basis between gross yield (*Rohertrag*) and expenditure (*Aufwand*), including assumed family labour wages
Source: LBG, 1949: 140.

V. Conclusion

Do agrosystemic development paths in the UK and Austria 1939 to 1945 deserve the attribute 'revolutionary' in the sense of a fundamental, progressive and short- or medium-term transformation? For the British case, an answer to this question was recently given: 'In terms of both internal and external changes, the rapidity of land use change, the degree and lasting duration of state support and control, the adoption of mechanization, and the resultant impact of farming communities, it was undoubtedly revolutionary. And since the outcome was to establish agriculture thereafter as a key element in receipt of preferential treatment within national strategic planning, it could also be seen as the most important turning-point of the twentieth century. In these terms, it was an agricultural revolution.' (Short, Watkins and Martin, 2007: 15) For the Austrian case, much more ambivalent accounts such as 'regressive modernisation', 'forced modernisation' or 'proto-modernisation' were given. My own claim of a 'selective modernisation' points to the ambivalent transformation of Austrian rural society during the Nazi era (Langthaler, 2000: 372). Can these evaluations be validated from a comparative perspective?

Due to different criteria of data generation or lack of information referring to this, some of the statistical comparisons in this article pose unsolvable problems; nevertheless, in most cases they make sense in the context of additional evidence.[6] To begin with indicators of agrosystemic resource flows, there is evidence of revolutionary changes of British agriculture 1939 to 1945: A large proportion of grassland was converted into arable land, therefore increasing land use intensity; the intensity of dairy cattle was raised considerably; land-saving and labour-saving technologies were widely applied; total arable output was raised, particularly in monetary terms; agricultural prices and incomes were strongly boosted. These changes were fundamental, i.e. they proceeded in the post-war era, progressive, i.e. they raised the intensity of farming, and

[6] For an overview of British and Austrian agricultural statistics see Britton and Hunt, 1951; ÖStZA, 1979.

short-term, i.e. they occurred during half a decade (Brassley, 2000; Short, Watkins and Martin, 2007; Martin, 2000). The 'revolutionary' effect of wartime farming on further agricultural development was discussed already one year after the end of war: 'I venture to suggest that the farming community has emerged from the war a far more efficient force in a competitive world than it was in I939' (Stamp, 1947: 53). However, not all indicators point to an 'agricultural revolution' in the UK, therefore revising the official history of wartime heroism (Murray, 1955). Among these, the most obvious is crop yields per hectare which stagnated during the wartime period and began to rise only from the post-war era onwards. A non-revolutionary, even regressive tendency is indicated by milk production per cow as well. Concerning Austrian agriculture, there are only few indicators which might be labelled 'revolutionary' or at least progressive: increasing use of mechanical and biological-chemical technology, which were sustained from the 1950s onwards (Sandgruber, 2002: 204 ff., 323 ff.), and contradictory changes of farm income, which refer to socio-economic differentiation in post-war rural society (Krammer and Scheer, 1978). With reference to the mainly regressive changes of farm inputs and outputs, there was definitely no overall 'agricultural revolution' in Austria 1939 to 1945.

In addition to these quantifiable indicators, more qualitative aspects concerning agrosystemic regulation must also be considered. In addition to indirect links via a few pioneering farmers, in both cases farming communities and the state were interlinked more directly via dense relations of support and control, therefore institutionalising planning procedures at national and regional levels. In the UK, the WAECs served as the crucial link between state agricultural planning and the farming communities. In Austria, the Reich Food Estate as a hybrid of state agency and farmers' organisation fulfilled a similar intermediate function. The differences between the two political-economic systems – liberal democracy in case of the UK, fascist dictatorship in case of German annexed Austria – became blurred due to similar measures of agricultural regulation. The example of dispossession in case of farm mismanagement also reveals system-specific differences: Whereas in Britain farmers' movements such as FRA and FSA provided formal and collective expressions of rural unrest, under the Nazi regime this occurred rather informally and individually by everyday forms of peasant resistance beyond the domain of the Reich Food Estate (Hanisch, 1990). However, in both countries mechanisms of state regulation promoting more productive farming styles – a 'new morality' oriented towards 'short term economic advantages and unquestioning compliance' (Martin, 2000: 61) – were institutionalised in rural society. The question to what extent the wartime institutions set the scene for the post-war formation of the 'productivist' food regime is to be answered by further research.

According to the typology outlined above (see Table 1), in the Second World War the British agrosystem experienced considerable, in part 'revolutionary' changes of institutions and technology, mainly characterised by general and unequal modes of development. In contrast, 'revolutionary' changes of the Austrian agrosystem were confined to the institutional framework. Regarding technology, only mechanical and chemical inputs reveal unequal and contradictory progress, whereas most other indicators point to a general crisis. To cut a long story short: The so-called 'agricultural revolution' in Britain 1939 to 1945 was both institutional and technical to a considerable – but by no means total – degree (types 1C and 2C). In German annexed Austria, several institutional, but hardly any technical changes occurred which deserve to be labelled 'revolutionary' (types 2B and 3B). If we stick to the general concept 'agricultural revolution', we should properly differentiate between its context-specific varieties.

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