

THE INCREASE IN THE GRASSLAND AREA OF THE PAYS DE BRAY

With 8 figures

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Zusammenfassung: Die Zunahme der Grünflächen im Pays de Bray

Das Vorherrschen von Grünland im Pays de Bray ist nicht als unmittelbare Auswirkung der reichlichen Niederschläge anzusehen, die einer ackerbaulichen Nutzung abträglich sind, sondern als Endergebnis zahlreicher Wandlungen der Landnutzung. Eine allgemeine Vergrünlandung des Gebietes war bis nach 1793 von der Notwendigkeit zur Selbstversorgung mit Getreide und damit zusammenhängend vom Überdauern des herkömmlichen Brachlandes verhindert worden. Die Anlage der Chaussee von Paris nach Dieppe im Jahre 1754 hatte es einigen, mehr als 100 km von der Hauptstadt entfernt liegenden Teilgebieten des westlichen Bray ermöglicht, die 50 km breite „Mauer“ zu durchbrechen, die im allgemeinen eine Grenze für die Lieferung verderblicher Nahrungsmittel bildete. Im übrigen Gebiet trat eine Spezialisierung der Landwirtschaft erst nach 1850 ein, als das verbesserte Straßennetz und die Eisenbahn einen billigen und schnellen Transport der Molkeerzeugnisse in die Hauptstadt sicherstellten. Diese Entwicklung wurde durch die Folgen der landwirtschaftlichen Depression im letzten Viertel des 19. Jh. verstärkt. Hierdurch verbreitete sich die Grünlandwirtschaft, die meist auf kleine Gebiete an den nackten Steilhängen der Brayon beschränkt war, über die Ebene der Umgebung; die Eigentümlichkeit des Pays de Bray ging dadurch teilweise verloren.

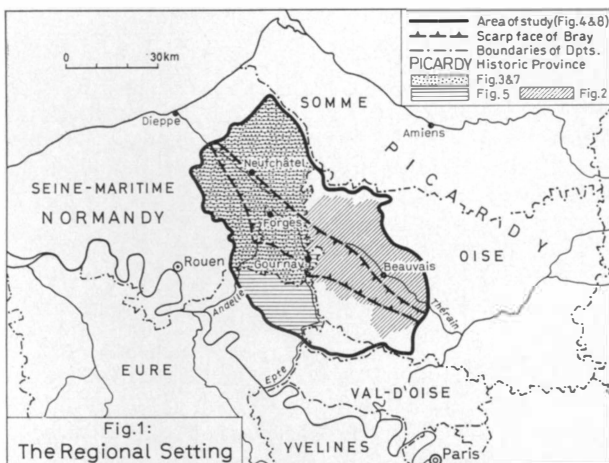
The present land-use pattern of the denuded anticline of Bray, in the midst of the chalk plateaux of northern France, is one of complete verdure, imparted by permanent pastures, hedgerows and woodlands (Fig. 1). Whilst areas of improved grass-

land existed in western Bray prior to 1750, they were of slight areal importance. The land-use pattern of the seventeenth century was far more diverse than now, with "... ploughland intermixed with pastures, which provide both corn and livestock." ¹⁾ Parishes in central western Bray were more than 50% under the plough during the sixteenth century ²⁾. Cereal self-sufficiency had to be attempted because of the execrable road conditions ³⁾. Perhaps the most distinctive historic land-use component was formed by the great wasteland areas which have now been removed entirely. The widespread substitution of grassland for an earlier 'mixed' land-use pattern dates back less than two hundred years. This paper attempts to trace the history of the process and to demonstrate that the present grassland specialisation of Bray is not a simple response to a well-watered environment of sands and clays but rather the end product of a series of cultural changes.

Few areas of grassland during the eighteenth century

As early as the 1680's DE MENAIS had contrasted the presence of enclosed pastures (*herbages*) in the western section of the pays de Bray with their absence in the east ⁴⁾. Unfortunately there is insufficient documentary evidence to reconstruct Brayon land-use in detail until the late eighteenth century. In the 1780's the *Plans d'Intendance*, which cover eastern Bray, provide information about two grassland "types"; first, the small enclosed pastures, planted with fruit trees, which surrounded settlements; second, the hay meadows aligned along watercourses, where cattle were permitted to graze during certain strictly

*) The author is indebted to Mr. H. C. Prince for his advice in the preparation of this paper.



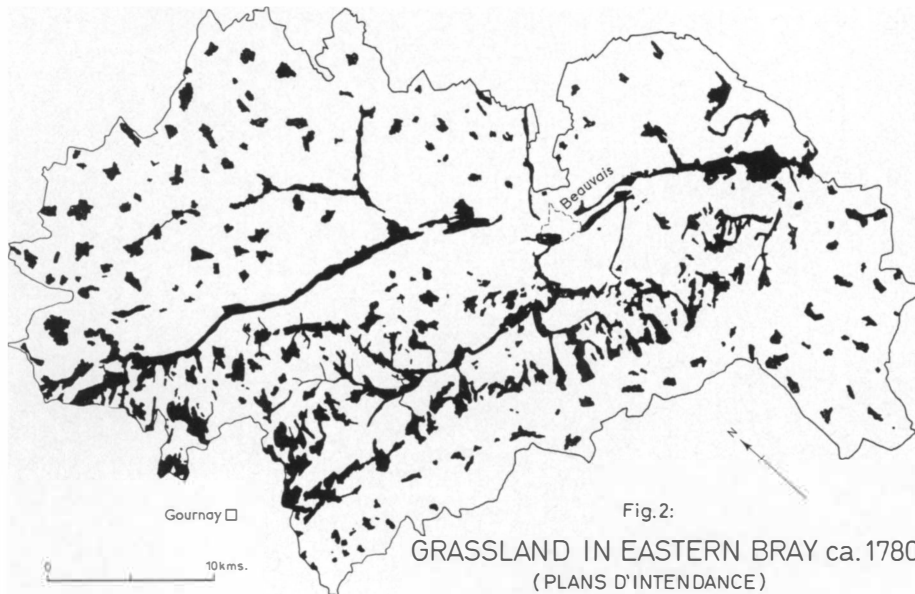
Archives Départementales has been abbreviated to A. D.; *Archives Nationales* to A. N. The term 'parish' has been used for the pre-Revolutionary smallest administrative unit (*paroisse*). This has been replaced by the term 'commune' for more recent references.

¹⁾ A. N. H¹ 1588¹¹, *Mémoire concernant la généralité de Rouen en 1698*. A similar view was expressed in A. N. KK 1317, *Mémoires sur les généralités en 1695*.

²⁾ Quoted in J. MALICORNE, *Recherches historiques sur l'agriculture dans le pays de Bray* (1899), Vol. I. 22 & 38. Details refer to the three parishes of Cuy Saint Fiacre, Haucourt & Longmesnil each near Gournay.

³⁾ Such opinions were expressed in many of the *Cahiers de Doléances*; A. D. Seine-Maritime, B, *Cahiers de Doléances*, 1789; *Bailliage de Neufchâtel & Bailliage d'Arques*. A. D. Oise, B 57-58, *Cahiers de Doléances*, 1789; *Bailliage de Beauvais*.

⁴⁾ Quoted in A. DE BOISLISLE (ed), *Mémoires des Intendants sur l'état des généralités* (1881), Vol. I, 287.



defined periods of the year (Fig. 2)⁵). By contrast with the present, grassland occupied only a small part of eastern Bray in the late eighteenth century. It then contained more grassland than the surrounding plateaux but its grazing wealth was derived from its vast zone of rough pasture. GOUBERT stressed that "... the progressive putting down to grass of the whole of Bray did not commence before the nineteenth century" and he explained that "... no serious indication has been found to allow the supposition that any notable transformation modified the landscapes... between 1600 and 1800... The pays de Bray... was primarily a cereal producing area."⁶

Whilst little changed in eastern Bray, late eighteenth century documents show that a greater degree of localised conversion to grass had occurred already west of the River Epte. ARTHUR YOUNG was so impressed that he named the area near Neufchâtel "... the valley filled with dairies" and GOURNAY was described in 1789 as being "... set in a *canton* which has only pasturelands and no cornlands."⁷) The distinctive character of these pastures was outlined by the FRANÇOIS DE LA ROCHEFOUCAULD, describing the

bocage near Neufchâtel, where every property "is... separated from its neighbour by a thick hedge. When an individual has a certain quantity of meadows he divides them up with hedgerows which preserve their dampness and provide firewood. Around Neufchâtel ploughlands are found only in those areas which cannot be put down to grass."⁸)

The Land-use data derived from the *enquête agricole* of Year VI (1798) allow an elaboration of these statements (Fig. 3, Table 1)⁹). Few western *cantons* had as much as 30% of their surfaces under grass. A complete chorochromatic map cannot be drawn but Figure 4a has been compiled by combining the proportion of land under grass in a small number of parishes for which *enquêtes* survive, with information taken from the registers accompanying the *Plans d'Intendance*¹⁰). The areas around Gournay had the greatest extent of grassland. Two tiny parishes, now part of the commune of Gournay, were more than 80% grass-covered. At a larger scale an analysis of the *vingtième* registers for about 1780 indicates the importance of grass in the parishes which were to form the *canton* of Forges-les-Eaux, including sec-

⁵) A. D. Oise, C 1-153, *Plans d'Intendance*. H. D. CLOUT, 'Notice sur la valeur des Plans d'Intendance de la généralité de Paris à propos d'une étude des conditions de l'emploi du terrain c. 1780', *Acta Geographica* (1968, in press).

⁶) P. GOUBERT, *Beauvais et le Beauvaisis de 1600 à 1730* (1960), 114-115.

⁷) A. YOUNG, *Voyages en France, en 1787, 1788, 1789*, trans. H. Sée (1931), Vol. III, 1117. Bibliothèque Municipale de Rouen, Manuscript Nm m 618, *Extrait des registres des deliberations prises en l'assemblée des notables de la ville de Gournay* (1789), 5.

⁸) F. DE LA ROCHEFOUCAULD, *Voyages en France de François de la Rochefoucauld (1781-1783) publiés par Jean Marchand* (1933), Vol. I, 38.

⁹) A. D. Seine-Maritime, L 475¹, *Enquête agricole*, An. VI.

¹⁰) Information taken from: A. D. Seine-Maritime, L 3437-9, *Gournay - Agriculture*, An. VI. - L 3791, *Gournay - Agriculture, Etat de revenus par évaluation de fonds de terre*. - L 4323, *Neufchâtel - Subsistances*. - A. D. Oise, C 1-153, *Plans d'Intendance* & their associated registers.

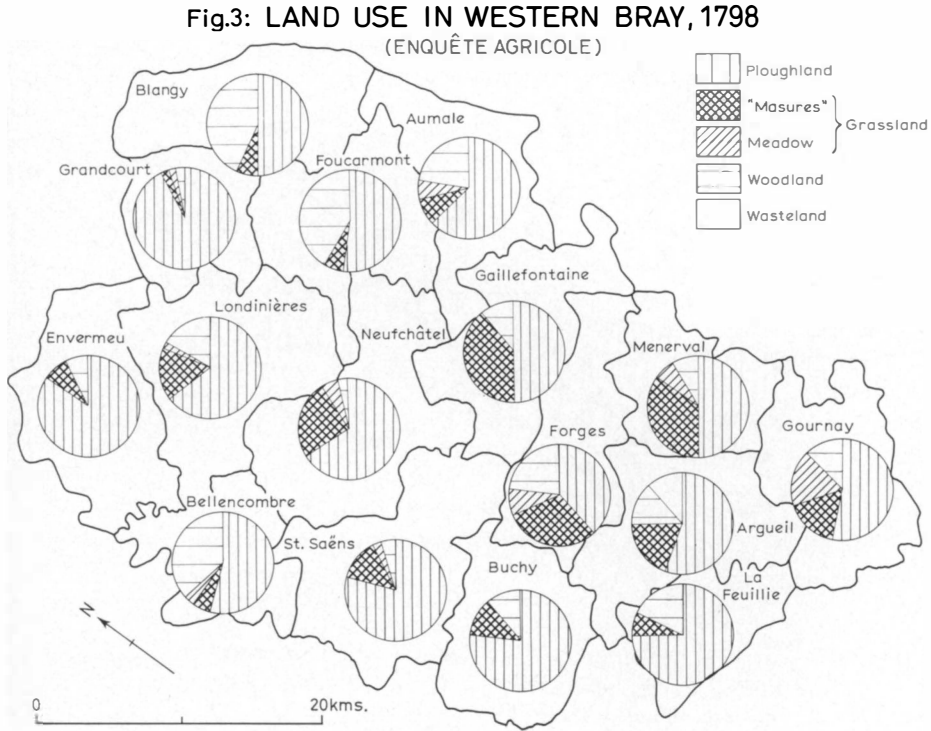


Table 1 : Percentage of Land occupied by each major category

Canton	Ploughlands	Enclosed Pastures	Meadows	Woodlands	Wasteland
*Argueil	55	20	1	15	8
Aumale	63	9	4	22	0
Bellencombre	57	4	2	37	0
Blangy	49	5	1	43	0
Buchy	77	12	0	11	0
Envermeu	82	8	1	7	0
La Feuillie	71	7	1	18	0
Foucarmont	51	5	1	42	0
*Forges-les-Eaux	36	31	8	23	0
*Gaillefontaine	50	36	1	11	0
*Gournay (I)	53	18	15	12	0
*Gournay (II)	51	20	17	12	0
Grandcourt	92	3	2	3	0
Londinières	64	17	2	17	0
*Menerval	50	35	7	8	0
*Neufchâtel	55	25	6	11	3
*Saint Saëns	78	14	3	5	0

Source : Archives Départementales de la Seine Maritime: L 475¹). Série de questions proposées aux administrations municipales de canton sur l'économie rurale.

* Cantons completely or in part in the geological pays de Bray. Gournay (II) Second document drawn up by M. D) à 24.

tions of the chalk plateau and the clays and sands of the geological pays de Bray¹¹). In this *canton* 35.4% of all properties contained no arable land. Such grassland 'monoculture' was particularly characteristic of small farms of less than 5 ha which formed almost four-fifths of the total enterprises but occupied only one quarter of the agricultural surface of the *canton*. These details of farm size suggest the importance of supplementary grazing facilities afforded to the small Brayon farmer by the wastelands of *le Bray*.

The results of the *enquête agricole* of Year VI (1798) indicate that the dominantly arable plateau *cantons* lacked adequate fodder supplies even through their valley meadows were irrigated in an attempt to increase yields¹²). The extreme dampness of many Brayon soils did not favour the growth of high quality grasses. This situation was exacerbated by the flooding of riverside meadows. Inefficient artificial drainage increased rather than diminished the risk of inundation, as at Alges-en-Bray where in 1789 newly-cut channels draining the Forêt de Bray raised the height of flooding in the Epte Valley downstream¹³). The problems of water control were clearly of paramount importance to the Brayon farmer. Some *seigneurs* stopped their parishioners irrigating meadowland thereby preventing the improvement of hay yields¹⁴). Even where irrigation was possible the costs of maintaining channels and manuring meadowland were extremely high. However costly schemes for draining excessively marshy sections of meadowland were being carried out at this time¹⁵). The general dampness of the soils of Bray afforded certain advantages to the grassland farmer since the clays rarely dried out, hence parched grass was rare. Seeding was unnecessary if a pasture was to be created or renewed¹⁶). The land was simply invaded by natural grassland. However the sandy zones suffered during periodic droughts for the meadows dried out and were rendered unproductive¹⁷).

A study of the levies noted in the *vingtième* registers for the late eighteenth century suggests that the

best quality pastures were located near Gournay¹⁸). This resulted from a combination of factors, not solely physical, but related to agricultural practices, such as irrigation, reseeding and manuring, and to such locational advantages as proximity to major highways and access to Gournay market. Thus to the eighteenth century Parisian, 'Bray' was synonymous with the dairy products, which were produced in abundance in western parts of the *pays*. Gournay was only 22 leagues (*lieues*) from the capital and with quick road transport, fresh butter could reach Paris even during the height of summer¹⁹). This gave the butter producers of Bray a very real advantage over their rivals at Isigny in remoter Lower Normandy²⁰). The market of Gournay was indeed "... an unfailing spring for the provisions of foodstuffs of all types."²¹)

The internal contrasts in land use between eastern and western Bray in the late eighteenth century resulted from the construction of the Paris/Dieppe highway through the west of the *pays* in 1754 opening up that area for dairying²²). Yet whilst this highway provided a vital link, the local roads remained poor and the scope for agricultural specialisation in remoter parishes, such as those near Argueil, was accordingly limited²³). The role of Forges-les-Eaux, Gournay and Neufchâtel as market centres for dairy products cannot be overstressed. Even those parishes east of the River Epte where dairying had already developed sent their goods westwards to Gournay whence they were transported to Paris²⁴).

The extent of wasteland must also be considered in an attempt to explain the grassland distribution. By contrast with the wasteland areas of eastern and central western Bray, the areas around Gournay and Neufchâtel offered reasonable conditions for grassland farming, although severe problems of inadequate water control persisted. Thus the distribution of *bocage* in the late eighteenth century was limited to a far smaller area than at present because of the survival of communal wasteland and forest, but certainly enclosed ploughlands and pastures existed around

¹¹) A. D. Seine-Maritime, C 550, *Vingtièmes*. Parish registers grouped according to the area of the post-Revolutionary *canton* of Forges-les-Eaux.

¹²) A. D. Seine-Maritime, L 475¹, *Enquête agricole*, An. VI.

A. YOUNG, *Travels during the years 1787, 1788, 1789* (1792), 364.

¹³) A. D. Seine-Maritime, B, *Cahiers de Doléances, Bailliage de Neufchâtel*.

¹⁴) A. D. Oise, B 57-58, *Cahiers de Doléances, Bailliage de Beauvais*, Songeons.

¹⁵) A. D. Seine-Maritime, L 475¹, *Enquête agricole*, An VI.

¹⁶) F. DE LA ROCHEFOUCAULD, *op. cit.* (1933), Vol. I, 38.

¹⁷) A. D. Oise, B 57-58, *Cahiers de Doléances, Bailliage de Beauvais*, Auchy.

¹⁸) A. D. Seine-Maritime, C 550, *Vingtièmes*, Forges-les-Eaux. - C 551, *Vingtièmes*, Gournay.

¹⁹) A. D. Seine-Maritime, c 118. *Mémoire sur les beurres d'Isigny et de Gournay*.

²⁰) J. SION, *Les Paysans de la Normandie orientale* (1909), 246.

²¹) A. N. F¹⁰, 221, *Extraits des rapports et mémoires des ingénieurs des départements*. Letter of 11.5. An. II.

²²) A. D. Seine-Maritime, C 118, Letter from Bodin, 4. 3. 1786.

²³) L. LEROUX, *Monographie générale du canton d'Argueil* (1910), 63.

²⁴) A. D. Oise, B 57-58, *Cahiers de Doléances. Bailliage de Beauvais* (Espaubourg, Saint Lucien de Fly et Notre Dame de Saint Germer, la Chapelle sous Gerberoy, Martincourt).

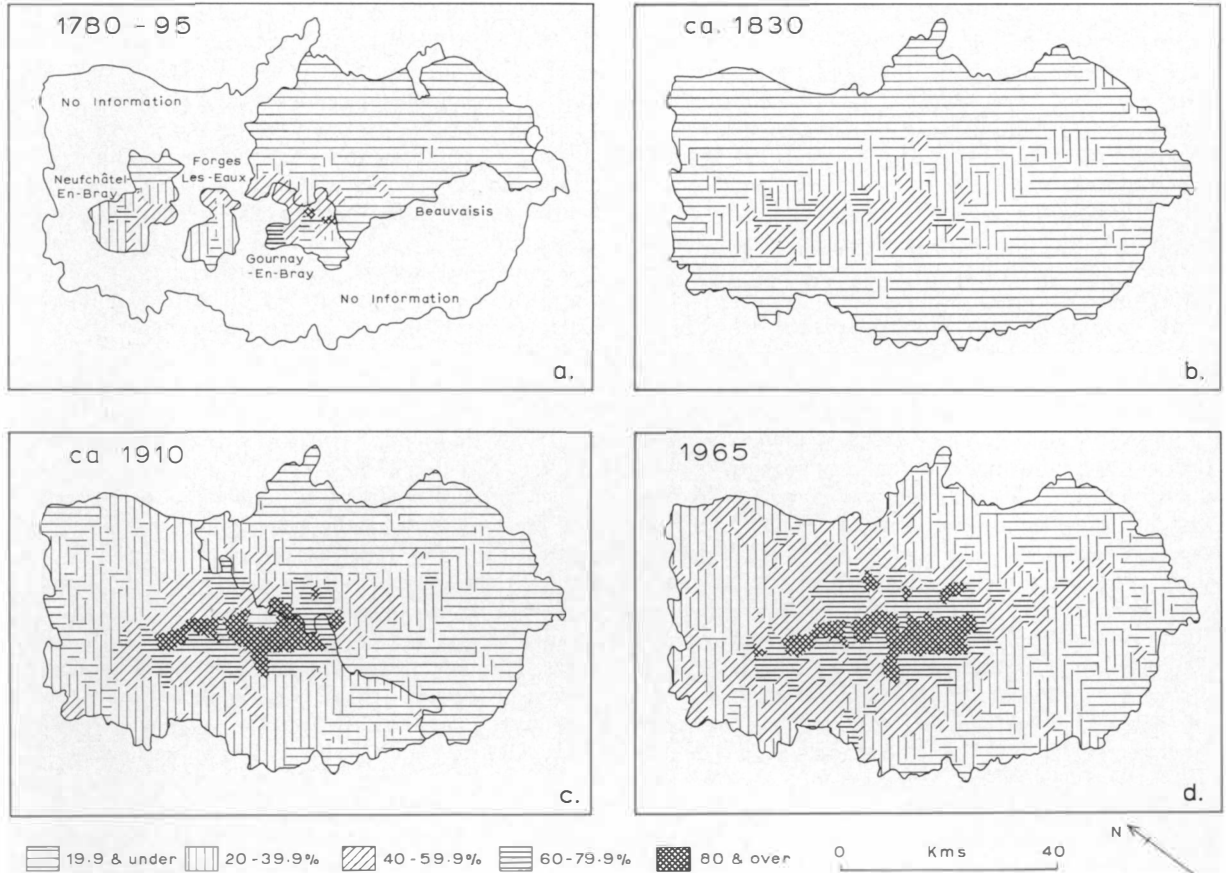


Fig. 4: Grassland in Bray

a) *Enquêtes*; b) *Ancien cadastre*; c) *Cadastre & Enquête agricole*; d) *Cadastre*

Neufchâtel and between Forges-les-Eaux and Gournay during the 1780's²⁵). But much of the present *bocage* is of more recent origin, dating from the enclosure of the wastelands after 1793 and the increasing abandonment of a mixed farming economy for a grass-based one during the nineteenth century. Widespread improvement of grassland quality was not possible without artificial fertilisers, efficient irrigation and land drainage. Further specialisation was dependent on better roads to allow cereals to be brought in to feed the local population and Brayon dairy goods to be moved to the expanding capital.

Enclosure and conversion to grass in the early nineteenth century

Following the Revolutionary legislation of 1793 on the future of communal lands, the waste in the centre of Bray was almost completely cleared and areas were fertilised and brought into cultivation for

the first time²⁶). There were few changes in communications during this period, although the final stretch of the Rouen/Rheims highway was constructed through eastern Bray and afforded easy access to Gournay market²⁷). The documents of the *ancien cadastre* show that much of the newly enclosed land was used for arable purposes, but even at this early period, with local roads still in a deplorable condition, grassland farming was extended by the creation of enclosed *herbages* both over the former wasteland and in the Normandy section of the surrounding plateaulands²⁸). On the Picard plateau margins of Normandy, *herbages* had already been

²⁶) Following the Law of 10th June 1793 giving communes the option to clear and cultivate their commonlands. For details see: H. D. CLOUT, 'The Pays de Bray – a study in land use change, 1760–1965' (Unpublished M. Phil. thesis, 1967, University of London).

²⁷) Anon., 'Précis statistique sur le canton d'Auneuil', *Annuaire de l'Oise* (1831), 63.

²⁸) Documents of the *ancien cadastre* consulted at the Archives de la Direction des Contributions Directes at Rouen and Beauvais and the A. D. de l'Eure at Evreux.

²⁵) F. DE LA ROCHEFOUCAULD, *op. cit.* (1933), Vol. I, 38. A. D. Seine-Maritime, B, *Cahiers de Doléances, Bailiages de Neufchâtel, Saumont.*

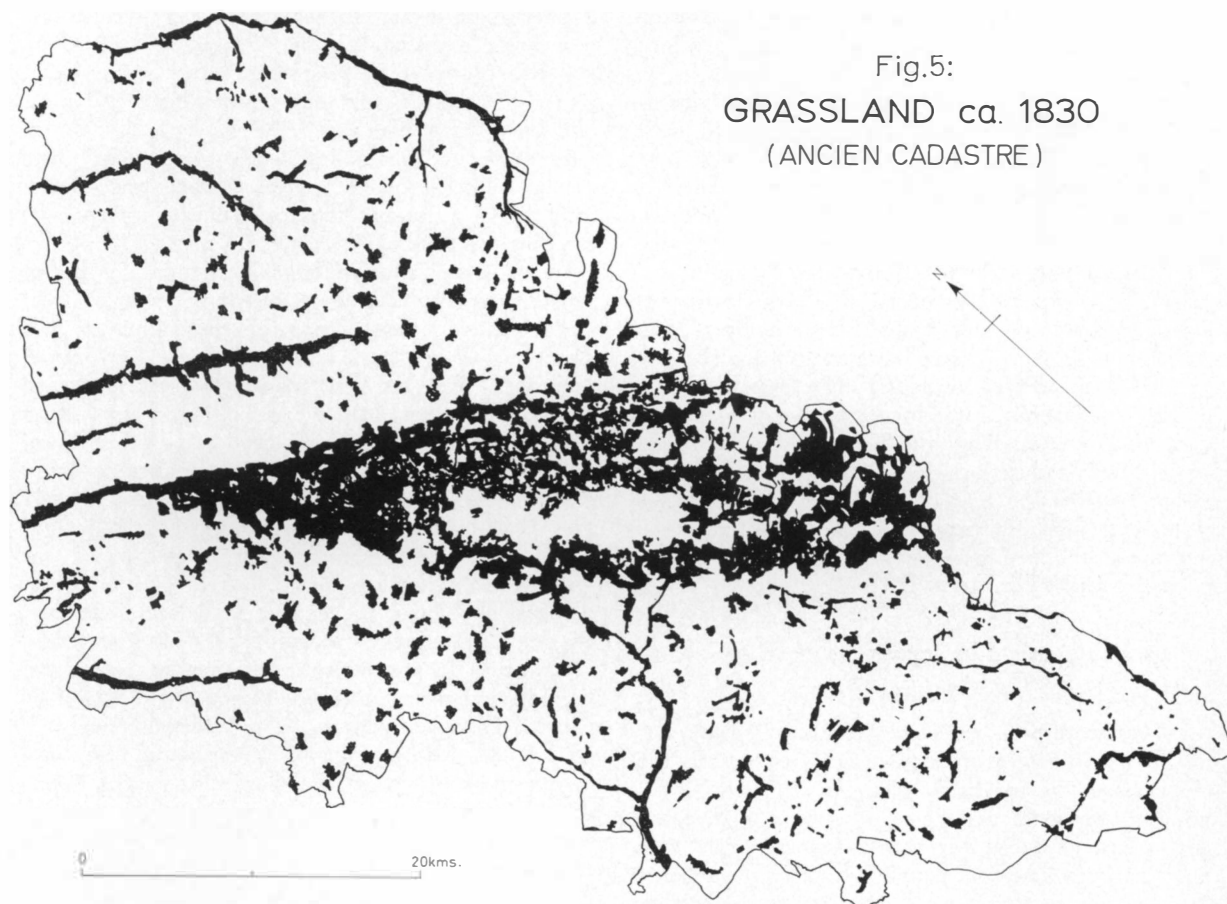


Fig.5:
GRASSLAND ca. 1830
(ANCIEN CADASTRE)

acclaimed for their high quality, this zone of clays being described as "... better suited to the production of grass than cereals."²⁹⁾ In the marshy, clayey centre of Bray, conditions were far from ideal for arable farming but well suited *herbages*. This form of enclosed pasture dealt with excessive soil moisture and ensured that livestock would not stray into the surrounding arable fields³⁰⁾. Channels were dug to drain portions of land where *herbages* were planned. The earth extracted from these drains was heaped into banks which were then planted with quick-set hedges. Thus the area of Brayon *bocage* was extended. Soil consolidation was achieved by grazing cattle in sections of the *herbage*. Pastures were divided by hurdles to concentrate the dunging and treading and to prevent damage to the newly-planted hedgerows. The agronomist MOLL, citing popular opinion, asserted that it was unnecessary to sow grass seed in the pays de Bray, for "... almost everywhere the soil is ideally suited to grass and it is sufficient to leave it un-

ploughed for a short time to obtain an excellent pasture."³¹⁾ Indeed areas of existing Brayon pasture were ploughed up periodically, cropped for a few years, then allowed to revert to grass, for "... this is one way to renew and remake an *herbage*."³²⁾ By contrast with the sands and clays of central Bray, the calcareous plateau soils required seeding to create *herbages*. Once an adequate grass cover was established the folding of cattle improved the pasture.

The grassland pattern of Bray may be plotted in detail from the registers and maps of the *ancien cadastre* (Fig. 4b & 5). Grassland was concentrated in three areas near Neufchâtel, Forges-les-Eaux and Gournay having more than 60 % of their total surface under grass. The village pasturelands on the surrounding plateaux and the meadows of the main valleys formed other important concentrations of grassland. The areas east of the River Epte possessed markedly less grassland than Norman Bray, largely because

²⁹⁾ Anon., 'Précis statistique sur le canton de Formerie', *Annuaire de l'Oise* (1850), 100.

³⁰⁾ Anon., 'Précis statistique sur le canton d'Auneuil', *Annuaire de l'Oise* (1831), 91.

³¹⁾ L. MOLL, 'Excursion agricole dans quelques départements du Nord. L'agriculture de la Seine-Inférieure'. *Extraits des Travaux de la Société Centrale d'Agriculture de la Seine-Inférieure* (1836), 94-95.

³²⁾ *Ibid.*

they lacked good highway communications before the 1820s and hence their potential for dairying could not be realised.

Three main "types" of grassland may be distinguished³³). Hay meadows (*prairies*) produced high yields because of careful irrigation, but they also suffered from flooding if industrial barrages impeded river flow. High hay meadows (*hauts prés*) did not endure this hazard. Enclosed pastures (*herbages*) were the most widespread. They had two main faults. Often their fruit trees were planted too closely for adequate penetration of sunlight to stimulate grass growth and the open channels were often too shallow for sufficient surface drainage. The best *herbages*, known as *bougeries*, were found close to the market towns of Forges-les-Eaux and Neufchâtel. These treeless pastures produced excellent grass for the fattening of beef cattle. In spite of earlier attempts at improvement unsatisfactory moisture conditions still prevented the development of grassland farming to its highest quality.

Land draining, transport improvement and the 'agricultural depression'

Soil moisture problems were overcome in two ways in the mid-nineteenth century. The first was the improvement of irrigation techniques. Virtually all the meadows in the plateau *cantons* were in irrigated valleys but relatively low irrigated proportions were found in Bray itself, although the absolute amounts of grassland were greater³⁴). The main problem in Bray was not to supply more water but rather to remove the surplus. This was achieved during the second half of the century by the process of piped underdraining which was diffused by the Société d'Agriculture de la Seine-Inférieure and the Association Agricole de Drainage pour l'Oise³⁵). The pays de Bray, with its variety of aqueous clays and sands, demanded this improvement. Flooded soils were difficult to cultivate and the existing waterlogged pastures were harmful to livestock. The poor grasses which they produced were believed to contribute to the cattle diseases rampant in Bray³⁶). The old-established Brayon pottery centres were equipped with pipe-making machinery and their products were put to use locally. Results were generally good. An area

of marshland near Gournay, where livestock had been stuck in the mud if they grazed after October, was so improved that, in spite of heavy spring rains, they were no more troubled by humidity than "... if they were on a highway."³⁷) The agricultural statistics of the 1850's and 1860's demonstrate that Bray formed a focus for both open-ditching and underdraining activities and thus contrasted with the surrounding plateaux of Picardy and Caux³⁸).

The most important factors in stimulating the increased grassland area were the improvement of local roads and the construction of the railways. The absence of cheap durable materials on the Brayon sands and clays kept local road improvements few in number until after 1836 when legislation drew up a new classification of roads and established local authority responsibility for raising finance to cover improvements³⁹). These did not come immediately after 1836 in Bray but rather from about 1850 onwards when stone chippings were introduced for resurfacing existing roads and making new ones, cut ruler-straight across the former roads and field patterns⁴⁰). Thus the dispersed farms of Bray were brought into contact with the local market towns and the grassland potential of the region could at last be realised. The construction of the railway through the pays de Bray during the 1870's bolstered road improvements and linked the market towns of Neufchâtel, Forges-les-Eaux and Gournay with "... the insatiable monster" which was Paris⁴¹). The cheap movement of grain from the New World led to a fall in cereal prices throughout western Europe from 1870 onwards. Pastoral production was less adversely affected and the 'agricultural depression' encouraged the extension of dairying in Bray (Fig. 6).

The chronology of grassland extension in western Bray can be traced in detail. From ca. 1830 to 1851 the grassland area increased by 2,487 ha. almost entirely at the expense of ploughland (Table 2, Fig. 7)⁴²). The major changes occurred in the centre

³³) F. CARTIER, *Etat de l'agriculture dans l'arrondissement de Neufchâtel* (1822), 21–22.

³⁴) A. N. F¹⁰ 572–3, *Statistique agricole*, 1855.

³⁵) See details in: H. D. CLOUT, 'Le Drainage souterrain dans le pays de Bray pendant le dix-neuvième siècle', *Bulletin de la Société d'Etudes de la région Parisienne* (1968, in press.).

³⁶) LE PREVOST, 'Rapport sur la maladie des vaches', *Extraits des Travaux de la Société Centrale d'Agriculture de la Seine-Inférieure* (1835), 229.

³⁷) MARCHAL, 'Rapport sur les communications au sujet du drainage', *Extraits des Travaux de la Société Centrale d'Agriculture de la Seine-Inférieure* (1854) 377.

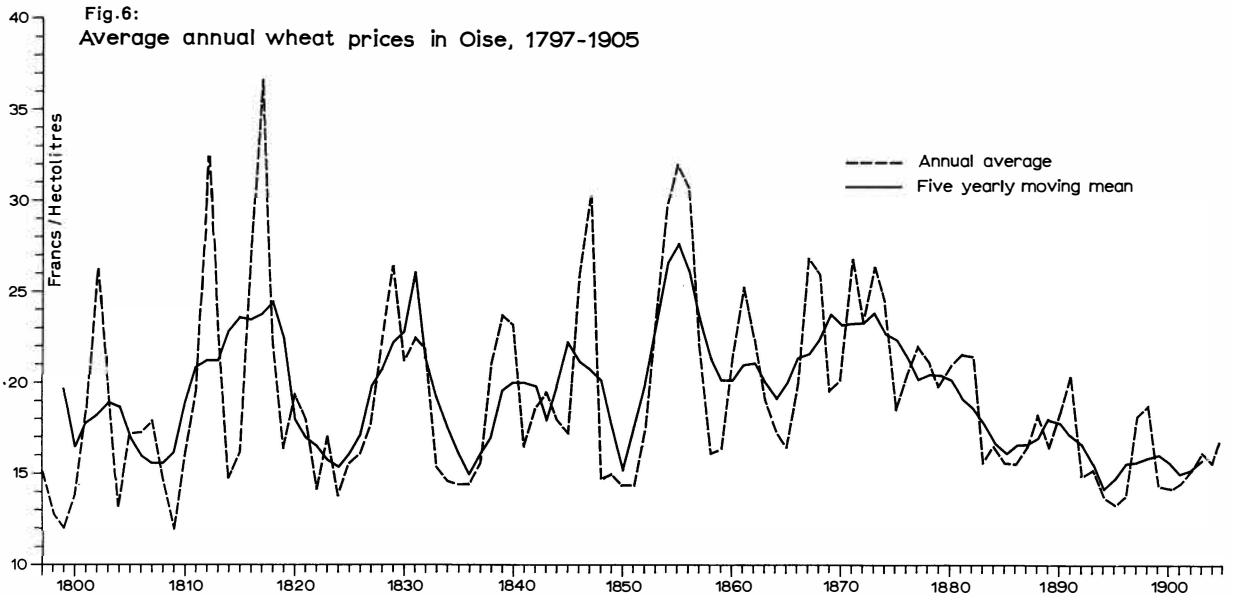
³⁸) A. N. F²⁰, 572–73, 596–97, 622–23. *Statistiques agricoles*.

³⁹) See: L. DE LAVERGNE, *L'Economie rurale de la France* (1861) 442. – J. CLAPHAM, *Economic Development of France and Germany, 1815–1914* (1921), 106.

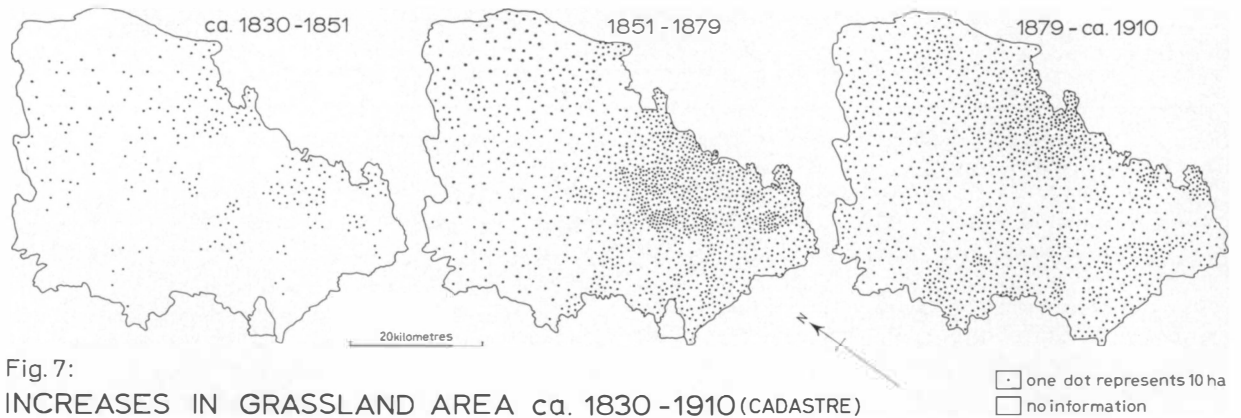
⁴⁰) J. BUNEL, *Géographie du département de la Seine-Inférieure* (1875), Vol. III, XVIII. – D. DERGNY, *Le Pays de Bray* (1869), 39–40.

⁴¹) L. DE LAVERGNE, *op. cit.* (1961), 95. – R. DUBUC, 'L'Approvisionnement de Paris en Lait', *Annales de Géographie* (1938), 213.

⁴²) Archives de la Direction des Contributions Directes de la Seine-Maritime (Rouen). Nouvelle évaluation des revenus territoriaux, 1850. Nouvelle évaluation du revenu foncier des propriétés non bâties, 1879.



(Archives Statistiques du Ministère des Travaux Publics, de l'Agriculture et du Commerce)



of Bray (*cantons* of Forges-les-Eaux and Gournay) and on the northern plateaux (Aumale and Londinières). Between 1851 and 1879 both local road and rail communications were established. The grassland area increased more rapidly, by some 14,909 ha. The next period, from 1880 to 1910, that of 'agricultural depression', witnessed an expansion of grassland from the geological *pays* to the surrounding plateaux (Fig. 7). Many communes in the centre of western Bray experienced increases of less than 50 ha. at this time. The cold clay areas of the historic cornlands of Picardy and Caux, on the borders of Bray, started to take on a new verdant appearance. Such a detailed analysis may not be attempted in eastern Bray because

of the destruction of comparable cadastral data. The remaining agricultural statistics show a marked increase in grassland from 1880 in eastern Bray and on the northern plateaux where damp and stony clay-with-flints soils prevented the cultivation of such industrial crops as sugar beet which flourished elsewhere in northern France⁴⁸). The southern and eastern plateaux did not witness such a change until World War I when the sudden decline in the agricultural labour force militated even further against arable farming.

⁴⁸) A. D. Oise, M, *Statistiques agricoles*.

Table 2: Changes in Grassland Areas in Western Bray 1830–1879 by Canton (hectares)

ca. 1830–1851	Argueil	Aumale	Bellencombre	Blangy	Buchy	Darnetal	Envermeu	Forges	Gournay	Londinières	Neufchâtel	St.-Saëns	Total	Percentage
To Ploughland				2							1		3	100.000
To Woodland														
To Wasteland														
				2							1		3	
From Ploughland	67	567		206				463	515	320	221	71	2430	97.70
From Woodland										36	14		50	2.01
From Wasteland		2		1						2	1		6	0.24
From Hop Gardens				1									1	0.06
	67	569		208				463	515	358	236	71	2487	
1851–1879														
To Ploughland		1			1		2	75	26			7	112	91.80
To Woodland									4				4	3.27
To Wasteland											6		6	4.91
		1			1		2	75	30		6	7	122	
From Ploughland	2184	855	209	706	484		25	3767	2321	628	1059	4351	2673	85.00
From Woodland	116	134	5	8	30			492	287	97	31	43	1243	8.33
From Wasteland	178	5	7	5	71			438	182		2	70	958	6.42
From Hop Gardens				35									35	0.23
	2478	994	221	754	585		25	4697	2790	725	1092	5481	4909	

Sources: Archives de la Direction des Contributions Directes, Rouen, *Ancien Cadastre*; *Nouvelle évaluation*, 1850; and *Nouvelle évaluation*, 1879.

Modifications in the arable/grass ratio since 1900

In the early twentieth century Bray could be described as "... an oasis of fresh pastures in the middle of an area devoted to ploughlands."⁴⁴ It is clear from literary and statistical evidence that grassland farming and *bocage* landscapes had spread away from the 'buttonhole' of Bray, enclosed by the two scarps, on to parts of the plateaux (Fig. 4c)⁴⁵. As the traveller moved southwards from Picardy "... the areas of open plain, where arable cultivation is dominant become more and more rare; in summer, when one is surrounded by pastures planted with fruit trees, one might well believe these plains to be no more than clearing in a forest."⁴⁶ DE MARTONNE expressed an identical opinion, for "... in the neighbourhood of Aumale, the valleys suddenly deepened,

woodlands, streams and meadows took the place of naked uplands devoted to the plough."⁴⁷

The main twentieth century land-use changes have involved the continuing decline of arable areas and the expansion of grass. However, since 1945, there has been a trend, albeit of limited areal importance, for ploughing up grassland and removing boundary hedges to allow the mechanised production of fodder cabbage and maize to provide cheap local supplies of winter feed. Indeed there has been a slight decrease in grassland areas in many west Brayon communes since 1935–1945. The present pattern of grassland in the 390,600 ha. study area from the documents of the modern cadastre (Figs. 4d & 8)⁴⁸. The pays de Bray, the main valleys and the northern plateaux of 'Green Picardy' stand out as dominantly grassland zones. The centre of the *pays*, around the Forêt de Bray, is almost entirely under grass. However there

⁴⁴ FEVRE & HAUSER, *Régions et Pays de France* (1909), 162.

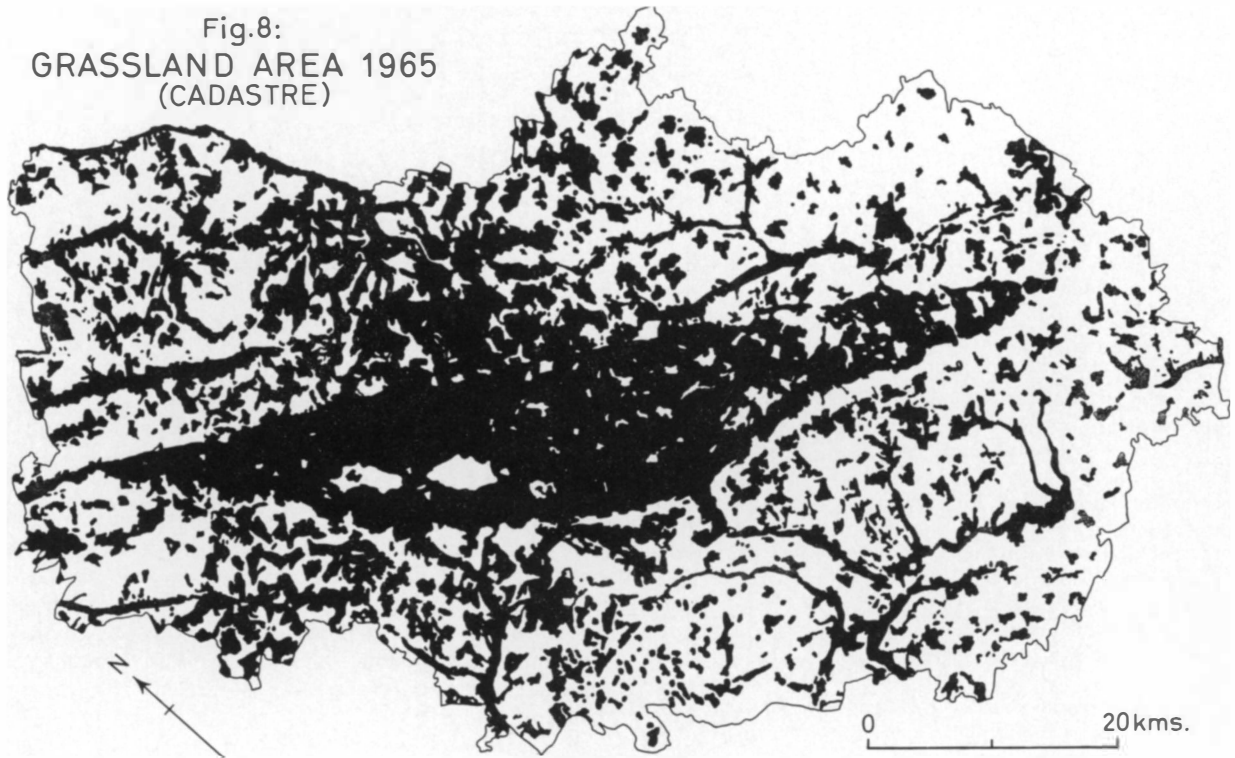
⁴⁵ J. SION, *op. cit.* (1909), 395. A. DEMANGEON, *Picardie et les régions voisines* (1905), 428–29.

⁴⁶ G. TURLOT, 'Les confins picards de la Normandie', *Annales de Géographie* (1929), 511.

⁴⁷ E. DE MARTONNE, *The Geographical Regions of France* (1933), 26.

⁴⁸ Archives de la Direction des Contributions Directes de L'Eure (Evreux), de l'Oise (Beauvais) & de la Seine-Maritime (Rouen).

Fig.8:
GRASSLAND AREA 1965
(CADASTRE)



are important variations in the ground plan of the *bocage*, with the small rectangular enclosures, created in the post-Revolutionary wasteland clearance phase, contrasting with the larger enclosed pastures dating from both earlier periods and the later nineteenth century⁴⁹). DE LAPPARENT's prophecy in 1879, that "... one can foresee the moment when the whole surface of Bray will be covered with pastures, which will offer the same aspect as the areas around Forges-les-Eaux, Gournay and Neufchâtel," has come true⁵⁰).

Conclusion

The present dominance of grass in the pays de Bray is clearly not a direct response to a well-watered physical environment, ill suited to arable farming, but is rather the end product of many phases of land-use change. The general conversion of the area to grass had been prevented by the need to make an

attempt at cereal self-sufficiency and the survival of the tradition-bound wastelands until after 1793. The construction of the Paris/Dieppe highway in 1754 had allowed parts of western Bray, more than 100 kilometers from the capital, to break through the 50 kilometers 'wall' of subsistence which normally formed a limit for the supply of perishable food-stuffs⁵¹). Agricultural specialisation was not accomplished in the remainder of the region until after 1850 when improved local roads and the railway guaranteed the cheap and rapid transportation of dairy goods to the capital. This trend was re-emphasised by the results of the 'agricultural depression' in the last quarter of the nineteenth century. Thus the economic and land-use distinctiveness of grassland, which had once been confined to small areas between the scarps of the Brayon denuded anticline, spread on to the surrounding plateaux. Something of the uniqueness of Bray was sacrificed⁵²).

⁴⁹) A. VIGARIÉ, *La Seine-Maritime* (1962), 43–44.

⁵⁰) A. DE LAPPARENT, *Le Pays de Bray* (1879), 30.

⁵¹) C. KINLEBERGER, *Economic Growth in France and Britain, 1851–1950* (1964), 213.

⁵²) A. DEMANGEON, *op. cit.* (1905), 12.