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# Statistics and Politics in the 18th Century

*Lars Behrisch* *

**Abstract:** »*Statistik und Politik im 18. Jahrhundert*«. The article first gives an overview over the early history of statistics in politics, and then zooms in on the first attempts at establishing a nationwide agrarian statistics in pre-revolutionary France. Attention is given to the obstacles as well as to the long-term successes in standardizing and quantifying agrarian productivity. The corresponding learning experience, both in terms of concepts and practice, was a condition for the institutionalization of statistics in the early nineteenth century. It had its roots in the secular-utilitarian agenda of "enlightened absolutism" and its focus on a systematic and state-sponsored relaunch of the national economy.

**Keywords:** Agrarian statistics, Ancien Régime, enlightened absolutism, French Revolution, cameralism, physiocracy, political arithmetic, political economy, conventions of equivalence.

## 1. Introduction

The first uses of statistics in politics can be found in France and the German principalities, and they can be dated, quite precisely, to the last third of the eighteenth century – in other words, to the last decades of the Ancien Régime. It was the politics of "enlightened absolutism" that created the conditions for the breakthrough of statistics as a new form of perception, decision-making, and legitimation.

This apparently straightforward – or to some maybe almost obvious – narrative has only just been fully explored (Behrisch 2015). Until recently, the history of early statistics has been told in two divergent and unrelated ways, which blurred the story.

Historians of statistics have traced the invention of statistics or "political arithmetic" in the late seventeenth century and its subsequent theoretical development, especially in the form of demography. However, they largely skipped its practical implementation by late eighteenth-century governments and administrators and instead zoomed in on the opening of specialized statistical bureaus at the beginning of the nineteenth century, portraying this moment as the birth of "official statistics" or "state statistics," and discounting the decades

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before as "proto-statistical" at best. One reason for this periodization is the confusing semantics of "statistics," a term that, during most of the eighteenth century, referred to textual descriptions of states rather than to numerical statistics. The main reason for this approach, however, is the fact that only those bureaus started to produce printed material in some quantity, thus making their work more easily accessible not only for contemporaries but also for later historians of statistics. Official statistics and statistical reasoning *before* that time – during the last decades of the Ancien Régime – were generally documented in handwritten form only and have therefore largely been covered by the dust of the archives. Once dug out, they show that economic and demographic factors had become the object of systematic quantification on various political and administrative levels before the end of the Ancien Régime. This activity triggered a general spread of statistical reasoning that was, ultimately, to culminate in the creation of the statistical bureaus. And these beginnings of official statistics in the last decades of the Ancien Régime yield specific insights not only into eighteenth-century politics, but also into the historically conditioned nature of statistics.

To look beneath the printed surface of eighteenth-century demography and of nineteenth-century institutional statistics, and to explore the role of knowledge production in politics and administration, falls into the domain of early modern historians. Most early modernists, however, have *also* overlooked the onset of systematic and aggregative quantification during the late Ancien Régime – because *they* generally tend to subsume any kind of administrative data gathering under the heading "statistics," ignoring the fundamental epistemic novelty of statistical reasoning properly speaking. Thus, tax lists are regularly called statistics, although they did not provide any general form of quantitative knowledge – they were mere registers for local administrators to log individual households' tax loads. The same is true for military recruitment lists and parish registers: They too were used for very specific administrative purposes, and were only later discovered as potential sources for aggregated demographic figures.

Hence, the early modernist's experience of archival research and historical contextualization, on the one hand, needs to be combined with the analytically refined perspective of the historian of statistics, on the other, in order to unearth the beginnings of statistics as a specific medium of knowledge-generation, decision-making and communication in politics – in order to explore, in other words, when, and why figures and calculations started to reshape political perceptions, arguments, and actions.

The statistical interest of late Ancien Régime rulers and governments was geared especially towards demographics and towards agriculture, the basis of both popular subsistence and the economy at large. Vital statistics are comparatively better documented in printed accounts and treatises.[1] Agrarian statistics

[1] To the extent that eighteenth-century official statistics have been explored, this concerns mainly vital statistics; see esp. Rusnock (2002).

were much more intricate and therefore also less publicized – but they were arguably more relevant: First, they were closely linked to everyday political and administrative questions of popular subsistence and economic policies, both loaded by the fervent debate about free trade in grain. Second, they confronted almost all levels of Ancien Régime polity, administration, and society with the new challenge of statistical knowledge generation – from politicians and economic theorists through regional administrators and provincial elites to the peasants. Vital statistics could rely on parish records compiled by priests; data on agriculture had to be won at the basis – in the very course of agrarian production and with the support of those who performed it. At the same time, such data had to be distilled from a complex process involving diverse natural as well as cultural factors, and made compatible across different regional regimes of denominations and measurements.

For all these reasons, the slow but rigorous advances of agrarian statistics give particular insight into both the obstacles to be overcome and the changes in mentality and communication gradually wrought by them. They tell an important part of the story of when and how perceptions were beginning to be geared towards the notion of systematic measurement, standardization and quantification, and of their impact upon politics and society.

In this article, I will try to give a sketch of the prehistory and early history of statistics in politics, zooming in, towards the end, on the concrete practices, obstacles, and successes of agrarian statistics in pre-revolutionary France. First, I will characterize what might rightfully be called proto-statistical data gatherings – namely, the creation of tax lists, cadastres, and other administrative registers in the early modern period (Chapter 2). While they helped to prepare the conceptualization of statistics in certain ways, they did not, in and by themselves, produce generalized forms of quantitative knowledge.[2] Rather, the decisive turning point from these administrative data gatherings to statistics came – in theory – with the genesis of the concepts of "political economy" in the second half of the seventeenth century (Chapter 3), and – in practice – with their political implementation a century later, especially in France and the German principalities (Chapter 4). Of central importance, as argued before, were agrarian statistics – and at their core, harvest statistics – particularly so as they were considered key for deciding the question whether or not to liberalize the grain trade (Chapter 5). By zooming in onto a more local level, the problems involved in the new statistical approach to agricultural production become visible – as do the advances in both the practices and the conceptions of quantification (Chapter 6).

[2] To use the terms coined by Alain Desrosières (Desrosières 2005a, 13-4), they did not yet produce "conventions of equivalence" or, as he and others also frame it, of "commensuration" (Espeland and Stevens 2008, 408).

## 2. Proto-Statistics and Cadastres (16th-18th Centuries)

By the sixteenth century, and even earlier in the case of late medieval city states, European governments had begun to register their core resources in the form of rent rolls, tax and customs lists, tariff registers, conscription records, and the like. The ever-increasing generation of such information was abetted by the growing demand for fiscal and military resources in a highly competitive state system and by the concomitant desire for a comprehensive and efficient system of taxation. However, such information gathering did not yet constitute statistics proper since the data collected were not summed up and generalized in order to buttress more abstract analyses or arguments for a political agenda. They were used for concrete administrative purposes in their specific local and factual contexts: It was the entries in the horizontal rows that interested the data-collector. How many people live in the household of peasant x, how much land does he own, how much does owe me this year? Of no or little interest was a vertical column, indicating such things as the sum of people living in the district or the total surface area of acres under cultivation.

Two modifications have to be brought to bear on this general rule. First, there were instances of proper statistics in the sense of numerical data gatherings with the purpose of gaining a more abstract and general knowledge – such as, in particular, population counts, carried out in Italian city states since the fourteenth century and later elsewhere. These occasional counts, however, in themselves served specific purposes and – in contrast to what we can observe in the late eighteenth century – did not lead to comparisons among different figures, let alone to continuous and ever growing series of data gatherings. They almost always contained only one single parameter – such as, notably, the number of inhabitants in a given place – that was not further correlated with other kinds of data to allow insights beyond the given purpose and thus stimulating further data collections. The same is true for what we may call fiscal statistics – calculations of income resulting from various kinds of taxation – as well as for their further elaboration by seventeenth-century descriptions-of-state: They often featured detailed enumerations and calculations of different sources of income – and occasionally population figures – but made little or no effort at relating such figures to each other and did not serve as tools for further analysis or planning.

The second modification concerns the creation of cadastres – systematic registers of (especially) the distribution and quality of rural property that were created from the late seventeenth century onwards in order to standardize taxation levels. Although cadastres potentially provided governments with an overview of territorial tax income, they too were designed primarily to serve as a practical administrative tool. On the other hand – and increasingly so towards the middle of the eighteenth century – cadastres and comparable systematic and centralized forms of fiscal data collection were employed as analytical instru-

ments to review the efficiency and equity of the taxation system as a whole and to adjust it to changing property and productivity structures. In this sense, they were indeed statistical tools creating a more general and abstract knowledge that reached beyond individual taxpayers' obligations and beyond the prospective income from a given form of taxation. However, not only was this kind of analysis and planning restricted to fiscality, but few cadastres actually came to completion before the end of the century.[3]

Nevertheless, the creation of cadastres constituted an important springboard for the genesis of statistics. On a practical level, it trained state officials and local administrators in the complex routines of information gathering. On a conceptual level, it nourished the idea of a homogeneous, or at least potentially homogeneous, state territory whose resources could be systematically monitored and quantified. Some eighteenth-century cadastral surveys also entailed ambitions beyond the strictly fiscal purpose by charting additional cartographic, infrastructural, or agronomic information alongside the data on property distribution. Although these ambitions were rarely satisfied, and although the material thus gathered was not designed for numerical compilation, such ventures did point towards a more systematic and aggregative quantification of a territory's economic and demographic resources, too. And yet, even by the middle of the eighteenth century, governments and administrators still lacked interest in such a general analysis.

## 3. "Political Economy" and "Political Arithmetic" (Late 17th Century)

The decisive leap from administrative data gatherings to statistics was brought about by a new desire for systematic and exhaustive knowledge of states' economic and demographic resources. This desire, in turn, was the direct corollary of the concepts of "political economy" – that is, the notion of a complex and dynamic territorial economy that could be and should be controlled and managed by the state (Perrot 1992; Simon 2004, 431-562; Plumpe 2009). This notion was born in the second half of the seventeenth century, elaborating on and expanding the older idea of "mercantilism."[4] This older concept had also

[3] During the first half of the eighteenth century, few countries produced accurately charted tax cadastres: Starting with West Pomerania, the Swedish province on the German Baltic coast (1691-1709), then the seminal Milanese cadastre (1719-1733, implemented around 1760), and later Castile, as well as a number of German principalities.

[4] The term "mercantilism" was coined only much later (and derogatively) by Adam Smith, aiming precisely at its focus on the external trade balance. Evidently, there were many different strands of 'mercantilist' though and practice, some of which were closer in some respects to the new concepts of political economy than others.

conceived of a territorial economy, but in a much more static way and mainly in terms of its trade balance with other countries – rather than, as was the case with political economy, in terms of a complex economy driven by the dynamic interplay of production and consumption and capable of genuine, and maybe permanent, growth. For political economists, the population, too, was a both complex and dynamic factor of the economy, rather than just a basis of resource extraction. Last but not least, they considered it of paramount importance to create comprehensive data on such things as "population," "production," and "consumption" so as to analyze their functioning and interplay, to monitor the workings of the system as a whole, and to facilitate its management.

As a matter of fact, it was in direct conjunction with the earliest models of political economy that "political arithmetic" emerged – the idea of quantifying and calculating economic and social particulars. In 1662, the London merchant John Graunt extracted figures from the London "Bills of Mortality," weekly lists of the deceased in each parish, in order to compare them along various parameters such as district, month, or sex (Graunt 1665). He was fully aware of the novelty: Whereas his fellow Londoners took the Bills only "as a *Text* to talk upon in the next Company," he discovered their "other, and greater uses" and "reduced into Tables […] so as to have a view of the whole together, in order to the more ready comparing of one *Year*, *Season*, *Parish*, or other *Division* of the City, with another." From this bird's-eye perspective, he was able "not only to examine the Conceits, Opinions, and Conjectures [hitherto based] upon view of a few scattered *Bills*" but to find new insights and correlations "from my *Tables*," until now hidden among the heterogeneous, unaggregated information of the Bills (Graunt 1665, 1-3, italics in the original). Graunt was thus the proud first practitioner of the "alchemy" of statistics – to apply a wonderful metaphor by Alain Desrosières – "converting the stale lead of a myriad of individual bits of information into the pure gold of general knowledge" (Desrosières 2005b, 18).

Graunt called his tables and the conclusions drawn from them "Natural and Political Observations Made upon the Bills of Mortality," as he distinguished between the interest in "natural" demographics, on the one hand, and the interest in their political dimension, on the other. This "political" interest also included economic factors, such as the quantity of harvests and the numbers of cattle. Graunt conceived of the territorial economy as a complex system, and – just like other political economists – he conceived of it as a system capable of growth. Like them, he also associated politics with the task of coordinating that (demo-) economic system in a way to facilitate that growth.[5]

[5] "the Art of Governing, and the true *Politicks*, is how to preserve the Subject in *Peace* and *Plenty*; […] the Foundation […] is to understand the Land, and the hands of the Territory […]: As for example; It were good to know the *Geometrical* Content, Figure, and Situation of all the Lands of a *Kingdom* […]. It were good to know how much Hay an Acre of every sort

For his inspiration, Graunt referred to Francis Bacon, insisting on empiricism and methodology; but also to "the Mathematicks of my Shop-Arithmetick" (Graunt 1665, Epistle dedicatory to the Royal Society, 5.2.1662, n. p.). Here, as elsewhere, commercial accounting techniques were another important ingredient next to science – reflecting the parallel now drawn a private business and a state's economy, with the prince being its manager and his administrators its accountants.

A second important figure for the genesis of statistics was William Petty who, about ten years later, coined the very term "political arithmetic." Similar to Graunt, and influenced by him, Petty wanted "intellectual arguments" to be replaced by sheer "terms of number, weight, or measure" (Petty 1690, Preface, n. p.). And just like Graunt, he advised the government to collect and process data on population and economy, so as to comprehend their workings and to steer and optimize their dynamics through systematic state action.

This advice, however, fell on deaf ears. The title of Graunt's work of 1662, "Natural and Political Observations," also helps to understand the twofold reception of the method devised by him: The "natural observations," that is, the purely demographic calculations carried out by Graunt, were picked up and developed further by British, Dutch, German, and, later, Swedish and French scholars. They were successfully applied, among others, in the fields of medical and insurances statistics.[6] The "political observations," however, i.e. the political use of quantitative demographic and economic data and calculations advocated not only by Graunt and Petty, but also by Vauban, Leibniz, and others on the continent, were largely ignored. Although Charles II personally promoted Graunt to the Royal Society, neither he nor his successors showed any interest in his methods as a device of decision-making, planning, and legitimation. For some hundred years after its invention, political arithmetic was a private and academic venture that as yet failed to convince rulers and governments. As such, it also continued to rely on very rudimentary and incomplete data: Although Petty no less than Leibniz or Vauban – all of them high-ranking officials – used existing administrative registers, such as tax lists and parish registers, and ventured to create some additional sets of data, they all insisted

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of Meadow will bear; how many Cattel the same weight of each sort of Hay will feed and fatten; what quantity of Grain and other Commodities the same Acre will bear in one, three, or seven years, *communibus Annis*; unto what use each soil is most proper. It is no less necessary to know how many People there be of each Sex, State, Age, Religion, Trade, Rank, or Degree, &c. by the knowledge whereof, Trade and Government may be made more certain and Regular; for, if men knew the People, as aforesaid, they might know the consumption they would make [...] a clear knowledge of all these particulars, and many more, [...] is necessary, in order to good, certain, and easie Government." Graunt (1665, 146-51, italics in the original).

[6] See in particular (with ample further references) Rusnock (2002); Martin and Thierry, eds. (2003).

that without large-scale, state-sponsored data collections the true potential of quantitative analysis could not be exploited.

But apart from a few sporadic, inchoate, and isolated attempts at such centralized data gathering for such statistical purposes around the middle of the century, notably in Prussia and Sweden, it was not until the 1760s that governments became interested in political arithmetic and began to put its ideas into practice on a broad, lasting, and growing scale. The reason: It was only now that the concepts of political economy, envisaging economic systems amenable to state-induced, long-term growth – and as such crucially underpinning political arithmetic – became popular with political elites.

## 4. The Breakthrough of Statistics in Politics (Late 18th Century)

Statistics was congenial to the specific political culture of the late Ancien Régime termed "enlightened absolutism" – a latently paradoxical combination of authoritarian rule with an "enlightened," that is, essentially secular and utilitarian agenda. The latter element brought forth the quest for a methodical – and if possible, mathematical – approach to nature as well as to human society.[7] Statistics incorporated both aspects: a focus on the material, secular und utilitarian aspects of society and politics, and a methodical approach based on quantification and calculation. The mathematics of late eighteenth-century official statistics were admittedly hardly sophisticated – they mostly relied on simple correlations such as the number of births compared to the number of deaths in a territory, the number of inhabitants compared to the amount of grain produced in a year, and so forth. But the massive deployment of such hitherto relatively unknown operations in turn strongly underscored the new secular-utilitarian perception of the objects and methods of politics.

The first breakthrough of systematic quantification, calculation and statistical reasoning in politics can be observed, from the 1760s onwards, in France and the principalities of the Holy Roman Empire.[8] These states featured a long-standing interventionist tradition in society and in the economy – hitherto still

[7] Diderot (1751) "did not doubt that [...] the world of politics, just as the world of physics, can be regulated in so many ways through weight, number, and measure" ("je ne doute point [...] que le monde politique, aussi bien que le monde physique, peut se régler à beaucoup d'égards par poids, nombre et mesure"). The last words echo William Petty (see above).

[8] The principalities of Northern Italy seem to have been the first ones to follow. Britain as the motherland of both Political Economy and Political Arithmetic had seen a Census Bill rejected by the House of Lords in 1753 and introduced officially government-sponsored statistics only at the beginning of the nineteenth century, but there was a similar upsurge in semi-official and notably parliament-sponsored statistical enquiries also since the 1760s: Hoppit (1996); Innes (2009).

in a more "mercantilist" mold – as a consequence, among other things, of authoritarian forms of governments, of a perception of economic backwardness, and of frequent involvement in (cost-)intensive warfare that consistently overstretched their fiscal and economic capacities. The rulers and administrative elites of these states also shared, from around mid-century, an "enlightened," i.e. more secular and utilitarian outlook on politics than their predecessors. At the same time there surfaced a growing bulk of publications on political economy in its (by now) more continental, state-centered form – in Germany mainly in the guise of cameralism, in France most famously, but by no means exclusively, in that of physiocracy.[9] The final catalyst for the breakthrough of the concepts of political economy, and consequently of statistics, was the Seven Years War (1756-1763): It plunged state budgets, economies and general subsistence into severe disarray on both sides of the Rhine[10] – and forced rulers to search for new ways of providing economic stability and growth, ways such as promised by cameralists and physiocrats.

Common to both concepts, once again, was a clear departure from the hitherto dominant theories and practices of "mercantilism": Instead of focusing on the external trade balance and on the flow of precious metal into and out of a state, physiocrats and cameralists concentrated on the economic mechanisms *within* it. They conceived of the economy as a complex and dynamic arrangement of agricultural, industrial, and other commercial factors and activities; they focused on production rather than on trade; and, as a consequence, they envisaged economic growth as possible independently of the trade balance. For physiocrats and cameralists alike, economic growth hinged on agricultural output as the ultimate basis for both industrial and commercial activities, as well as for a prosperous population. Furthermore, both systems stressed the importance of state action in order to promote economic growth, and more specifically, of state-induced *agrarian* innovation as the cornerstone of economic dynamism and competitiveness. *And* they both relied on the deployment of quantitative data on states' economies and potentials. Therefore, when governments and administrators seized upon their ideas in the early 1760s, they set out, too, to count and calculate the resources of their territories so as to analyze the factors determining their economic potentials, and to discern the best ways to stimulate and sustain their development.

To be sure, there were major differences in the ways that state intervention in the economy and, consequently, information policies were conceived. German

[9] On Cameralism, see Garner (2005); Simon (2004, 440-562); Sandl (1999). On Physiocracy, the most relevant title is still Weulersse (1910); on political economy in eighteenth-century France generally, see Perrot (1992).

[10] It should be added: And undermined the political legitimacy of those regimes that had to concede defeat, as was particularly the case with France which lost most of its colonial possessions to Britain.

cameralism was more conventional: It continued the tradition of "Gute Policey" (good policing) by favoring direct and, if necessary, detailed intervention as demanded by the particular circumstances of each time and place. To facilitate such well-designed intervention, cameralists admonished governments and administrators to count and measure the economic and demographic resources of their territories in all possible detail. This approach led to comprehensive censuses, carried out in numerous German principalities that counted and sorted not only the population by the categories of age, sex, and profession, but also collected data on their territories' agrarian and commercial economies. Based partly on such censuses, partly on older forms of administrative data collection – tax rolls, cadastres, parish registers – governments then proceeded to aggregate, compare, and calculate the data in order to analyze their states and to base any planning and decision-making on the figures obtained. Also notable in the German context is the active involvement of regional administrators in the rush to produce and interpret numerical data. This involvement, too, was encouraged by cameralist writers, and it was particularly pronounced in the smaller principalities.

French physiocracy was more abstract, more original, and more ambitious than cameralism. Other than the heavily pragmatic German version of political economy, it was full of French esprit. But also unlike cameralism, it was arrogant and elitist: Convinced that they had analyzed the economic world once and for all, physiocrats instructed the government exactly what to do. Unlike cameralism, physiocracy broke with the tradition of "bonne police" (good policing) in that it despised the activity of local administrators. To stimulate agricultural production, physiocrats propagated a radical liberalization of commerce, especially of the commerce in grain, and an equally radical recast of the taxation system into a single tax on the net revenue of landowners. Yet, in order to assure the primacy of agriculture, physiocrats were ready to harness other branches of industry, check demographic mobility, and employ taxation as a means of indirect regulation. Rather than abandoning intervention altogether, they wanted it to be more consistent – and freed from the diversity of localities, from the arbitrariness of administrators, and from the back and forth of changing governments. And, in spite of what is often alleged by historians of economic theory eager to see the roots of market liberalism, their ultimate goal was not free trade and laissez-faire, but a sweeping revival of the monarchy's fiscal and military power.[11]

Nonetheless, physiocracy was more systematic than cameralism by setting a schedule for one-time government action rather than for the flexible day-to-day activities by provincial or even local administrators proposed by cameralists. This difference in the level of abstraction and, consequently, in the level of uniformity of political and administrative action, also led to a more abstract use of figures and calculations. Instead of encouraging administrators to quantify

[11] Apart from Weulersse (1910), see also Kaplan (1976), and the brilliant early analysis by Tocqueville (1856, part 3, ch. 3).

the objects of their activities, physiocrats created and propagated ready-made calculations proving – among other things – the relative backwardness of French agriculture in order to underscore the necessity to systematically relaunch it. They also purported to show – somewhat paradoxically, one might say – the surplus of grain production over consumption, so as to bolster the call for free trade. Mirroring their more abstract function to ground and defend their theory, rather than to assess particular situations and circumstances as was the case with the cameralists, the physiocrats' figures were not based on comprehensive data collections but mostly relied on rather selective data sets.

The same spirit of generalization, it should be added, obtained in French demographic data collection and calculation: They too were mainly driven, at least in the beginning, by a comparatively abstract (but nonetheless fervent) debate over the alleged long-term depopulation of France that Rousseau, among others, proclaimed to prove the decay of the monarchy (Rousseau 1762, 193-4).[12] This more generalized approach to economic and demographic issues was, at least partly, a reflection of the size and heterogeneity of France that made any kind of nationwide grass-roots data collection all but impossible.[13]

To sum up, inversely to the German development – from counting to calculating – one might say that the French proceeded from calculating to counting. But in both contexts alike, we witness a massive shift towards the quantification of facts and arguments – a shift fueled by the new desire of governments and administrators for systematic planning geared towards long-term economic expansion and growth. And in both the German and French contexts, the production and publication of ever more quantitative data stimulated discussions around them and brought them to the center of public attention as a measuring yard of political action, success and legitimacy. Only as statistics was implemented in actual political and administrative practice, so did the idea and, indeed, the imperative of demo-economic quantification impose themselves within and beyond politics.

## 5. Agrarian Statistics in France

It might not be surprising that the spirit of the scientific revolution, the rationalism of the Enlightenment, and a preoccupation with economic issues would merge at some point. And yet it is remarkable that, unlike the very similar efforts of Vauban half a century earlier, the physiocratic figures and calcula-

[12] On the *enquête Terray*, a demographic survey based on the birth rates from a number of selected parishes, carried out in 1770-1772 (and disproving the depopulation thesis), see Esmonin (1964). On industrial statistics, see Minard (2000).

[13] As a case in point, it proved to be beyond the monarchy's grasp to establish a nationwide cadastre.

tions were now so eagerly picked up. François Quesnay, the founder of physiocracy, relates a discussion he purportedly had with finance minister Henri Bertin in 1761. The minister doubted the physiocratic view that the luxury industry was harmful to the economy: "Expenses for luxury," he asserted, "are said to be nothing but a continuous exchange from the left pocket to the right and vice versa." Quesnay retorted that "there is no doubt about the exchange, but [there is] about the scale; and it is not by reasoning that we can decide this question, but by counting." When Bertin wondered whether calculation was not too hazardous, Quesnay replied: "This kind of hazard is very much relied upon for the prediction of eclipses" – a reply that "cut deep" (quoted after Weulersse 1910, vol. 1, 82).

Apocryphal though this incident may be, it nevertheless illustrates the fact that, by the early 1760s, the physiocrats' abstract and figure-based promise of sustained economic and fiscal renewal coincided with the urgent desire for economic and especially agricultural reform – a desire boosted by military defeat, notably against Britain, by war-induced bankruptcy, and by the trauma of national decline. Thus, the same minister Bertin opened a department of agriculture within his ministry, inaugurated agricultural societies across the country, and adopted a central demand of physiocratic doctrine by beginning to liberalize the grain trade in 1763. The physiocrats were not the only ones clamoring for major economic and especially agricultural reforms, but with their clear-cut analyses and solutions, they spearheaded a general movement for state-induced economic growth.[14] At the same time, precisely because their analyses and solutions were so suspiciously clear-cut, because they were so arrogant, and because the policies they recommended failed to bear fruit – the liberalization of the grain trade ultimately had to be revoked in 1770 due to massive shortages, price rises and popular resistance – they also aroused a lot of antagonism. And yet, their opponents resorted to figures and calculations, too: There was a growing sense that arguments were convincing only to the extent that they rested on statistical evidence.[15] Both in politics and in the public debate, numerical arguments thus became increasingly important – and they triggered comprehensive data collections, especially on agriculture, across the country. This dynamic has often been overlooked because, again, it left its traces mostly in the archives.

Tackling the issue of agricultural growth and debating the ideas of physiocracy, especially its core dogma of the free trade in grain, the government wanted to obtain data on agricultural production. Seasonal harvest reports, so-called *états de récolte*, had been drawn up since the 1720s, but they were intended to

[14] There existed a vast bulk of literature on fiscal, economic, and agrarian reform that was not identical with and often hostile to Physiocracy. See Perrot (1992); Bourde (1967).

[15] See, for example, the protocols of the later governmental Agricultural Committee with Physiocratic outlook: Pigeonneau and Foville (1882).

foresee regional shortages and prevent dearths in due time by redistributing grain or imposing trade restrictions. In this function, they supplemented the local price indexes (*mercuriales*) sent to Paris. Those early reports were compiled in ways that essentially precluded comparison or aggregation. Only in the late 1750s did the government start to make serious efforts to improve the quality and regularity of the reports (Behrisch 2015, 404-46): *Printed* tables were produced to assure a higher degree of uniformity among the provinces, twelve different columns were to account for differentiated harvest reports, and the provincial governors (*intendants*) were to calculate total sums instead of simply listing the local data supplied to them. Accordingly, the *intendants* now urged their subordinates, the *subdélégués*, to fill in the tables accurately and uniformly and to send them in at the same time so that a general table of the province could be compiled.[16]

It quickly turned out, however, that the obstacles on the road towards clarity and uniformity of the data were massive and, indeed, insurmountable for decades. Until around 1760, the entries in the *états de récolte* were, more often than not, simple statements about harvest qualities without any attempt at quantification. From this time onwards, quantitative indications became the norm, albeit only in the form of proportions of a so-called *année commune* – a "standard" or "normal" year: The harvest was said, for example, to be "roughly a third" or "no more than half" of a "normal year." As a matter of fact, the reference value itself was almost entirely spurious – nobody really knew what a "normal year" referred to. If anything, as the comparative study of the reports strongly suggests, it referred to something like an *ideal* harvest: Owing to a long-standing practice of tax reductions conceded on the basis of damages to an otherwise supposedly "normal" harvest, for both peasants and local administrators a "normal year" was a harvest occurring only under ideal conditions – conditions that in fact rarely obtained. Little wonder, then, that the *états de récolte* rarely featured harvests that equaled, let alone surpassed, a "normal year" (Behrisch 2015, 407-13).

As they compared harvest reports from different quarters of the kingdom, the curious fact that *most* harvests counted only as a fraction of a "normal year" did not escape the attention of the government. Successive finance ministers asked for more precise indications and also inquired into the relationship between a "normal year" and the grain consumption. Joseph Marie Terray (1770-1774), in particular, demanded *absolute* figures instead of mere proportions of the elusive "normal year." In future, the harvest results were not to be "only vaguely indicated by approximate fractions [of the 'normal year'] […] devoid of any calculation; [rather] the real quantities will be determined by the precise

[16] In the theoretical terminology employed by Alain Desrosières (Desrosières 2005a, 12), this is a case of "investment in forms."

number of bushels [*boisseaux*] harvested from each type of grain."[17] Significantly, Terray was vigorously opposed to physiocracy: With the expected results, the minister hoped, among other things, to refute a core argument of physiocratic doctrine – the substantial surplus of grain production over consumption, a theoretical prerequisite for free trade and export. Clearly, thus, not only the desired content, precision, and standardization, but also the underlying purpose of the harvest reports changed: From instruments of short-term monitoring and local interference, they came to be seen as tools for the (in)validation of general assumptions about the economy and for decisions to be based upon them. This is further corroborated by the parallel effort of Terray to quantify the population of France, and thus its demand in grain, on the basis of church registers.[18]

The results of Terray's intensified initiative were, once again, mixed. The *intendants* urged their *subdélégués* to fill in the tables more precisely and promptly; the latter complied in the usual Ancien Régime mixture of temporary obedience, makeshift solutions and, occasionally, return to routine. And yet, there was a permanent progress in the long run: Merely qualitative statements disappeared, the proportions of *année commune* became more precise and were expressed more and more regularly in digits rather than in words. However, while in some provinces the harvest results were increasingly indicated in absolute figures, as Terray and many others wished, this was not or only partly the case in others, notably those – like the Auvergne or the Limousin – with weaker economies and infrastructures. As a result, the figures were not compatible and could not be added up for the kingdom as a whole. Nevertheless, before the Ancien Régime collapsed, administrators had gone a long way towards gathering and processing quantitative data. Even though physiocracy had not aimed at such administrative capacities, its calculating spirit had had a considerable influence on this outcome. Government officials and provincial *intendants*, seeking new ways of fostering economic and agricultural expansion and taking up the theoretical challenge posed by physiocracy and its figures and calculations, had developed an acute and sustained interest in the collection and examination of data on the monarchy's economic and, especially, agricultural potential. Slowly but surely, this interest generated new standards and practices of counting and calculating at grass-roots level as well. *Both* that desire for quantitative arguments *and* these practical capacities, developed in its wake, were preconditions for the application and professionalization of statistics in the next century.

[17] Archives Départementales Puy-de-Dôme C 181, Circulaire Terray, 9 September 1773 (probably only later intitled "Mémoire méthodique adressé par M. l'Abbé Terray aux Intendants des Généralités"), 4.

[18] On the *enquête Terray* (1770-1772), see footnote 13.

## 6. Quantifying the Harvest

We will now zoom in on the actual practices applied to quantify the harvest, especially in grain. The peasants commanded two crucial sets of data which, assembled nationwide, could have furnished absolute figures on the yearly harvest: The amount of seeds sown for different products, and the ratio between them and the harvest, gauged approximately by the number of sheaves reaped on a given field and the amount of grain won from such a sheaf. Due to the lack of a competent local administration, however, this detailed peasant knowledge could only be very partially tapped. Therefore, the government experimented – ultimately unsuccessfully – with various kinds of indicators.

One option: Tenth collectors who kept good records (and were willing to do so) could indicate the number of sheaves on certain fields, as they used this figure for their own collections; once threshed, they could also quantify the average amount of grain won from a sheaf. It was hardly possible to make a projection from such samples onto whole provinces, as there were no reliable data on the surfaces of arable land. But the procedure, repeated over a number of years in a number of fields or villages, might at least have established a relative reference value for a *true* average or "normal" year: Although absolute figures could not be obtained in this way, the yearly harvest of a given region might, on the basis of certain sample fields, be quantified in its relation to an *actual* yearly average. This is what Anne Robert Jacques Turgot, *intendant* of the south-western province of Limousin during the 1760s and early 1770s – before becoming an acclaimed economist and, briefly, also a much deviled finance minister – set out to do, albeit unsuccessfully, in response to the first of a series of initiatives by above-mentioned minister Terray to improve the harvest reports.[19]

A few years later, minister Terray suggested using another potential indicator: the number of ploughs in a given community, a figure relatively easy to establish by local administrators.[20] It was also easy – or so thought the minister – to extrapolate from that number onto the size of fields harvested, or else to the amount of seeds sown (two figures that were homologous in most contexts). From a sample ratio between the seeds sown and the harvests reaped, the current harvest could be calculated. The specification of that same ratio for a "normal year" could also furnish absolute figures on the average harvest. At least the latter indication, however, would still rely on the peasants' notion of what a "normal" – i.e., supposedly average – harvest was. Other problems, as

[19] Archives Départementales Corrèze C 1, nr. 2: Lettre aux Subdélégués sur les recherches à faire concernant les variations annuelles des récoltes (print), 30 July 1771; Behrisch (2015, 414-8). Terray had also suggested to use decimators' figures on sheaves but had not been precise about how to do so.

[20] Archives Départementales Puy-de-Dôme C 181, Mémoire Terray, 1 August 1773; Behrisch (2015, 419-21).

some administrators pointed out, resided in the fact that the use of ploughs varied from place to place and that the same fields could be used for different products in different years. To tackle these obstacles, Terray then further suggested that the amount of seeds sown for each product, differentiated by soil qualities, ought to be measured as precisely as possible in every single village; likewise, the ratio between seeds and harvest was to be assessed according to each specific product and type of soil.[21]

It becomes clear at this point that there was a dilemma between, on the on hand, the representativeness of too simple indicators (such as sheaves or plows) and, on the other hand, the difficulty of obtaining more complex and differentiated indicators, such as the ratio between seeds and harvests of different products on different soils. The results were bound to be unreliable *either* because of the crudity of the indicators, *or* because peasants and local administrators would not, or truly could not, furnish the more detailed indications needed. Administrative personnel that could have collected more comprehensive data directly on the ground was lacking, as was a reliable extrapolation factor – notably, the existing arable surfaces, not to speak of their differentiation by crops, soils, and forms of cultivation. Such data could to some extent have been provided by cadastres, but only a few of them had been created in some provinces or regions, and even they differed in format (Blanchard 2001, Touzery 1994).

This latter fact is symptomatic for the heterogeneous makeup of the French monarchy on the eve of the Revolution, concerning almost everything beneath the level of central legislation and the provincial *intendants* – and including, very notably, the implementation of statistical efforts launched in Paris. While none of the *intendants* could afford to just ignore those efforts, they did so in varying degrees of enthusiasm, and they interpreted the often imprecise demands in different ways. This was necessary also in view of the divergent character of the provinces in terms of natural conditions, agrarian traditions and administrative structures, not to mention the variety of nomenclatures and measuring standards. Last but not least, they had to rely on the will and capacity of *subdélégués* and – on the local level – of tax administrators. The latter not only had their own interests and local affinities, but often challenged the very right of the *intendant*, and a fortiori of the *subdélégué*, to order them about to divulge any of their data, let alone to collect new ones.

As a result of vastly diverging strategies and successes in overcoming these and other obstacles, some provinces – such as, for example, the Franche-Comté in the east – furnished absolute rather than just relative figures already by the early 1770s. Others, such as the northern Picardie, produced them for some regions, and yet others, none at all – notably those in the center of France, such as

[21] Archives Départementales Puy-de-Dôme C 181, Circulaire Terray, 9 September 1773 ("Mémoire méthodique adressé par M. l'Abbé Terray aux Intendants des Généralités").

the Limousin or the Auvergne, that suffered from poor transport connections and were weakly positioned economically, infrastructurally and administratively.[22]

In the Franche-Comté, in fact, already by the 1750s, some *subdélégués* collected yearly data from peasant communities pertaining both to the ratio between seeds and harvests and to the amount of surface sown in order to calculate the harvest of their regions in absolute figures (Behrisch 2015, 445-7). Some of these administrators went further and checked the traditional indications of *année commune* by comparing the number of sheaves reaped and their yield in grain in a "normal year" with the results of the current year. In one exceptional case, a *subdélégué* distinguished very meticulously between fourteen different products and specified the surfaces used for them in each village during the current year in order to precisely quantify the harvests.[23] Not incidentally, he had already tried to establish a cadastre of his district over a number of years.[24] In yet other cases, administrators even took different categories of soil quality into account, again in parallel to efforts at creating cadastres. Some, to be sure, were overambitious: The *subdélégué* of Amiens (Picardie) calculated the yearly production of wheat and rye of his district to be 240 million *setiers* – six times the estimate for the *whole* of France![25]

When in the first, enthusiastic months of the Revolution, the entangled and opaque administrative structures of the Ancien Régime had disappeared, peasant communities furnished much more detailed and differentiated figures on the harvest. This can be observed even in relatively backward provinces such as the Auvergne: Here, the results even exceeded the demands of the government (Behrisch 2015, 443-5). Peasant communities now suddenly cooperated with

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[22] A last major effort to create reliable harvest statistics for the entire realm came in 1778 from finance minister Jacques Necker (1776-1781), motivated at least in part – like Terray – by a desire to refute the physiocratic belief in a substantial production surplus. Necker tried to combine the methods sketched by Turgot and Terray described above: Yearly samples of the number of sheaves harvested in various places were to form *both* the basis of a 'true' average year *and* of absolute values by extrapolating the figures obtained to the total arable surface – a project doomed to fail. See Behrisch (2015, 435-7).

[23] Archives Départementales Doubs C 1162, subdélégation Lons-le-Saunier, 15 September 1771: Tableau ou État pour connaître le nombre des personnes [...] ainsi que la quantité des terres de chaque paroisse, et les productions que l'on en a tirées. As the title suggests, the table (with 34 columns and more than 50 rows) also included differentiated figures of inhabitants.

[24] In order to create a fairer tax evaluation or *taille tarifée*, as it existed in some other regions, too; see Brossault (1999, 240 et seq., 459), and on the *taille tarifée* generally Blanchard (2001), Touzery (1994).

[25] Archives Départementales Somme C 94, État du produit, Subdelegation Amiens 1778. The figure of 40 million *setiers* for France was François Quesnay's, taken up by many, and somewhere in the middle between other, often hugely diverging estimates. The discrepancies were due partly to different definitions of the *setier* (accounting in part also for the error of the *subdélégué*; his main blunder, however, was an absurd overcalculation of the surface of his district).

the new administrative and participatory bodies whose local members often had long-standing experience with the laborious issues of standardization and quantification. Their experience could now bear fruit – and encouraged hopes in Paris that comprehensive harvest statistics were finally within reach. These hopes, like so many others, were soon shattered, but the knowledge and skills underlying them stayed on.

## 7. Conclusion

From the 1760s onwards, there was a massive shift towards the quantification of facts and arguments both in France and Germany. This shift was fueled by a new desire of governments and administrators for systematic planning geared towards long-term economic expansion and growth, a desire concomitant with the secular and utilitarian agenda of "enlightened absolutism" and mediated by the concepts of political economy, notably in its recent guises of cameralism and physiocracy. In both France and Germany, the production and publication of ever more quantitative data further stimulated discussions around them, and ultimately brought them to the center of public attention as *the* measuring yard of political action, success and legitimacy.

As the example of agrarian statistics in pre-revolutionary France shows, of course, it took a long time before the concepts of standardisation and quantification took hold in the country at large. Nevertheless, the efforts to create reliable accounts of national grain production and consumption resulted in ever more comprehensive and detailed regional harvest reports from the 1760s onwards. And, as agrarian statistics involved so many different levels of Ancien Régime polity and society and had to go such a long way towards grasping, defining, and measuring its objects, its laborious implementation made statistical reasoning all the more pervasive: In the long run, it took the concepts of standardization and quantification into every corner of the state, from governmental offices to peasants' households. To witness this process, in turn, serves once again to understand the historically contingent dimension of defining and measuring the objects of (agrarian) statistics – the historically contingent dimension, in other words, of "commensuration" or of "conventions of equivalence" (Espeland and Stevens 2008, 408; Desrosières 2005a, 14). The efforts at standardisation involved here – different fruits had to be subsumed under one label, differences of soil quality and production method had to be ignored, the various techniques of measuring, weighing, and numbering had to be standardised and measuring units had to be unified nationwide – were fully implemented only in the nineteenth century, but they all stemmed from the first statistical endeavours of the late Ancien Régime.

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