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Jakob Bielfeld (1717–1770) and the diffusion of statistical concepts in eighteenth century Europe

Bernard Ycart*

October 6, 2014

Abstract

Published between 1760 and 1770, Bielfeld's writings prove that scholars of the time were acquainted with the concepts of both political arithmetic and German statistik, long before they merged into a new discipline at the beginning the following century. It is argued here that these works may have been an important source of diffusion of statistical concepts at the end of the eighteenth century. Bielfeld is now almost completely forgotten, and the reasons for his lack of fame in posterity are examined.

Résumé

Publiés entre 1760 et 1770, les écrits de Bielfeld prouvent que les concepts de l'arithmétique politique et de la statistik allemande étaient largement répandus parmi les savants, longtemps avant que les deux ne fusionnent en une nouvelle discipline au début du siècle suivant. On soutient ici que ces publications peuvent avoir été une source importante de diffusion des concepts statistiques à la fin du dix-huitième siècle. Bielfeld est de nos jours presque complètement oublié, et les raisons de cet oubli sont examinées.

Keywords: History of statistics, Jakob Bielfeld

MSC 2010: 01A50, 62-03

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1 Introduction

In the autumn term of 1921, Karl Pearson (1857-1936) started a series of lectures on the history of statistics. In the introduction, he vividly described the origins of the discipline and its naming.

To this hybrid discipline of statecraft, constitutional history and description of state constitutions, Gottfried A. Achenwall in 1752, for the first time as I am aware, introduced the word ‘Statistik’ as the name of a distinct branch of knowledge. That branch was not concerned with numbers nor with mathematical theory.

Meanwhile in England there was an entirely different movement. Captain John Graunt [...], who lived from 1620 to 1674, a clear century before Achenwall (1719-1772) [... and his] friend Sir William Petty [...] founded the English school of what was called ‘Political Arithmetic’.

A hundred years and more later comes an extraordinary event. A Scotsman steals the words ‘Statistics’ and ‘Statistik’ and applies them to the data and methods of ‘political arithmetic’. It was certainly a bold, bare-faced act of robbery which Sir John Sinclair committed in 1798 [Pearson 1921:2].

We now know that viewing English political arithmetic and German statistik as ignorant from each other, before Sinclair “boldly” synthesized them into a new discipline at the end of the eighteenth century, is too schematic. In the first half of the eighteenth century, political arithmetic was a declining discipline in England [Studenski 1961:40; Deane 1987]; its revival in the second half of the century was largely continental [Todhunter 1865; Hacking 1984]. In Germany, even though the Göttingen school of statistik sometimes opposed mathematics [John 1883:670; Hacking 1990:24], political arithmetic was regarded as one methodological component in the very broad definition of statistik. It was actively developed in particular by Johan Peter Süßmilch (1707-1767) [Heuschling 1845:8; Hacking 1984:113]. John Sinclair’s monumental *Statistical Account of Scotland* ‘was not a work of statistics in the modern sense but it was one in a looser version of the old German sense’ [Cullen 1975:10]. Neither was it the first one of the sort in Great Britain. Translations of German statistik books were available in English before Sinclair, such as [Büsching 1762; Zimmermann 1787]. Arthur Young (1741-1820), who was perfectly acquainted with the techniques of political arithmetic, published his *Six month tour through the North of England* in 1770 [Young

1770, De Bruyn 2004], and it was recognized in Germany as a true work of statistik [Meusel 1790:24].

By the time Sinclair perpetrated his “bare-faced act of robbery”, the concepts, vocabulary, and methods of both political arithmetic and statistik had long pervaded the whole Europe of Enlightenment. Ample evidence can be found in the books of a popular-science writer of the time, Jakob Friedrich Bielfeld (Freiherr von) (1717-1770), who wrote in French and signed “Monsieur le Baron de Bielfeld”. In his *Institutions politiques* [Bielfeld 1760a, 1760b, 1772], and *Les premiers traits de l’érudition universelle* [Bielfeld 1767, 1770a,b], the following can be found.

- a history of political arithmetic up to his time,
- the main concepts of political arithmetic (mortality tables, insurance, life annuities, tontines),
- a methodology for data collection, similar to the one Sinclair would implement 30 years later,
- a statistik of Europe,
- the first use of the words *statistique* in French, and *statistic* in English.

The first objective of this article is to review Bielfeld’s works on political arithmetic and statistik. Bielfeld never viewed himself as a scholar, nore did he pretend to expose the result of his own research: his writings are just a clear and synthetic exposition of what was generally understood in his time.

Nowadays, Bielfeld’s name does not appear in authoritative histories of statistics, he is not among the “leading personalities in statistical sciences” [Johnson & Kotz 1997], and does not have an entry in Burns’ encyclopedia of science in the enlightenment [Burns 2003]. Few books cite him as being the first to use of the term ‘statistic’ [Cullen 1975:10; Nalimov 1981:208; Federer 1991:1; Headrick 2000:68; Agarwal 2009:1], whereas many more sources (e.g. [Hald 2003]) cite Pearson and/or reproduce Sinclair’s own version [Sinclair 1798:xiii]. As remarked by Reinert [2013], the man himself is by now almost completely forgotten. He has an entry in the *Allgemeine Deutsche Biographie* [Steffenhagen 1875] and in the German version of Wikipedia, but is scarcely found in any encyclopedia outside Germany, from 1850 on. However, historians of economy [Stangeland 1904:303, Tribe 1988:82, Reinert 2009] and politics [Bazzoli 1990, Sánchez-Blanco 2003, Cunha 2011] have long recognized the influence of Bielfeld’s writings on western European thinking. Here is for instance how Cunha describes it.

It is possible that the author who contributed the most, not to the formulation but to the diffusion of Cameralism, was Jakob Friedrich von Bielfeld (1717-70). His *Institutions politiques*, originally published in French in 1760, was reprinted 12 times, in addition to being translated into German, Russian, Spanish and Italian. This book became a kind of economics bestseller in its day, containing for example an extensive typology of the origins of the decadence of states. [Cunha 2011:68]

There is no reason to believe that Bielfeld's influence was smaller for statistics than it was for politics and economy, and the second objective of this article is to assess its importance. Evidence from various sources that Bielfeld was read, copied, commented, and sometimes hotly debated, will be presented. Particular emphasis will be put on Bielfeld's controversy with Süssmilch, which probably fueled Euler's interest in political arithmetic, entailing important consequences for the development of the discipline [Todhunter 1865:239-247; Klyve 2013].

Our third objective is an attempt at answering the question of fame in posterity: why did Bielfeld's name nearly disappear from the history of statistics? Several reasons will be identified: Bielfeld's mitigated eulogy by Formey at the Berlin academy [Formey 1770], was an easy argument for his detractors; his theatrical works were harshly criticised in his time, and his unreliable recollections from Frederick's court in Rheinberg were severely judged by nineteenth century historians; finally, his short life after the publication of his main works, and perhaps his own personality, may have prevented him from maintaining a dense network of correspondents, and ensuring his own publicity.

The article is divided into three sections, dealing with biography, political arithmetic, and statistik. Each of the three sections contains two subsections, the first one on primary sources, the second one on posterity.

2 Bielfeld and his fading fame

2.1 Who was Bielfeld?

Erik Reinert gives the following summary of Bielfeld's life and career.

Born into a family of merchants in Hamburg in 1717, Jakob Friedrich von Bielfeld's life was international already from an early age. In 1732 he started his university studies in Leyden, Holland. In 1735 he travelled in Holland, France, and England.



Figure 1: Portrait of Jakob Friedrich Bielfeld (Freiherr von) (1717-1770).
Source: Guido Schäferhoff (Wikipedia).

In 1738 he met and befriended then Crown Prince Fredrick of Prussia. Like Fredrick, Bielfeld was a freemason. With Fredrick's ascent to the Crown in 1740, Bielfeld started his diplomatic career as Counselor to the Prussian Consulates in Hannover, later in London and Berlin. In 1745 he became tutor to Prince August Ferdinand, in 1747 he became curator of Prussia's universities and director of Berlin's famous Charité hospital. In 1748 Bielfeld was ennobled as Baron, and after 15 years of service to Prussia—at the age of 38— he withdrew from a *vita attiva* to a *vita contemplativa* at his properties in Altenburg in the Eastern part of Germany in 1755. Due to the Seven Years' War Bielfeld had to leave Altenburg in 1757 for his native Hamburg, returning only in 1763. He died in Altenburg in 1770, at the age of 53 [Reinert

2013:7].

The primary source for Bielfeld's biography is the eulogy, read on May 30, 1770 at a public session of the Berlin Academy by the perpetual secretary Johann Heinrich Samuel Formey (1711-1797). This eulogy was reproduced as a preface to the posthumous edition of the third volume of the *Institutions politiques* [Bielfeld 1772:xi-xviii]. In their review of that volume, the authors of the *Bibliothèque des Sciences et des Beaux-Arts* remark:

Cet Eloge est tel que devoient être toutes les Pièces de ce genre. L'habile & judicieux Secrétaire y rend une exacte justice à l'Académicien dont il déplore la perte, il célèbre son mérite & ses talens, mais sans flatterie, sans enthousiasme; & en caractérisant, en appréciant ses Ouvrages, il ne dissimule pas ce qu'ils peuvent avoir de défectueux. [Chais and de Joncourt 1772:133]

[This eulogy is like all works of the kind should be. The deft and wise secretary, gives exact credit to the academician he laments the loss of, celebrates his merit and talents, though without flattery, without enthusiasm; and while characterizing, appreciating his works, he does not conceal their flaws.]

Indeed, Formey's review of Bielfeld's work is unusually critical.

C'est ici le lieu de parler de ses productions. Si elles ne sont pas de la première classe, on ne peut leur contester, au moins à la plupart d'entr'elles, un rang plus ou moins honorable dans la seconde. Il avoit fait son coup d'essai par une Traduction; c'est celle des *Considérations sur les causes de la grandeur & de la décadence des Romains*; elle fut imprimée & bien accueillie. Il donna ensuite les *Progrès des Allemans dans les Belles-Lettres*; Ouvrage intéressant, mais qui n'est pourtant qu'esquissé & assez incorrect. Je serois tenté de passer sous silence ses *Amusemens dramatiques*, qui n'amuserent jamais que lui. Mais ses *Institutions politiques*, comme je l'ai déjà insinué, sont un Livre véritablement estimable. Il n'y est pas créateur, mais il n'y est pas non plus simple compilateur. Il a fait un bon choix; il y a mis un bon ordre; & ce qui est de lui ne dépare pas ce que des Auteurs distingués peuvent lui avoir fourni. Un Critique des plus mordans voulut couler à fond ce Livre, mais il n'y réussit pas. Si ses censures étoient quelquefois fondées, leur aigreur gâtoit tout; M. de Bielfeld, naturellement doux & poli, se fit bien plus d'honneur encore par la modération de ses réponses que par leur solidité. Ses *Lettres familières* furent

un enfant de son loisir: mais un enfant gâté & beaucoup trop familier. Ses *Traits d'Érudition universelle* ne sont que des traits; l'ensemble y manque: les jeunes gens peuvent pourtant en tirer quelque parti. Enfin il fit une feuille périodique en Allemand, intitulée l'*Hermite*; elle s'est soutenue trois ans; c'est beaucoup pour ce genre d'Ouvrage, qui n'a pas la vie longue, pour peu qu'il soit foible. [Formey 1770:71]

[This is the place to speak about his productions. If they are not of the first class, one cannot deny them, or at least most of them, an honorable place in the second. He had made his trial run by a translation; that of the *Considérations sur les causes de la grandeur & de la décadence des Romains*; it was printed and well greeted. He then gave the *Progrès des Allemands dans les Belles-Lettres*; an interesting work, though it is only sketched, and rather incorrect. I should be tempted to keep quiet about his *Amusemens dramatiques*, that never amused anybody but himself. But his *Institutions politiques*, as I have already hinted, are a truly estimable book. He is not a creator there, but neither is he a mere compiler. He has made a good choice; he has put a good order; and what he does not spoil what more distinguished authors may have supplied to him. A most caustic critic wanted to bring down that book, but did not succeed. If his criticisms were sometimes well-founded, their sourness spoilt everything; M. de Bielfeld, naturally gentle and polite, did himself even more honor by the moderation of his answers than by their soundness. His *Lettres familières* were a child of his leisure time: but a spoiled child, much too familiar. His *Traits d'Érudition universelle* are nothing but strokes; a bird's-eye view is missing: yet young people may draw some benefit from it. Finally, he made a periodical in German, entitled the *Hermit*; it was maintained for three years; it is quite long for that kind of work, which is not long-lived, particularly if it is weak.]

Thus according to Formey, the *Institutions politiques* were the only one among Bielfeld's works to be "truly estimable". As we shall see, it enjoyed a considerable diffusion. Chapter XIV of volume II contains Bielfeld's view on political arithmetics, and volume III is a statistik of Europe. The *Traits d'érudition universelle*, were indeed meant as a textbook for young readers, and Bielfeld never pretended it to be more than "traits" (strokes).

Ye Studious Youth! do not repay me with ingratitude; do not accuse me of presumption, nor imagine that I regard this work

as a masterpiece of the human mind, that makes pretensions to immortality. No, my utmost ambition is to provide you with a useful work. If you shall interleave these sheets with blank paper; if you shall read them often, and mark down all the observations you will make on each subject, during the course of your studies, you can scarce possibly avoid acquiring a valuable portion of erudition. [Bielfeld 1970a]

The “traits” were translated as “elements” in English, and somewhat exaggeratedly as “curso completo” in Spanish. Chapter XIII of volume III is entitled “Statistique”, and this is the first occurrence of the word in French in 1767, then in English through Hooper’s translation [Bielfeld 1770b].

2.2 Bielfeld’s critics

This section focuses on the increasingly negative perception of Bielfeld and his work, from his death until the end of the nineteenth century. Critics of the *Amusemens dramatiques* and *Lettres familières* will be examined first, biographies of Bielfeld will come next.

Formey’s negative opinion of the *Amusements Dramatiques* (that “never amused anybody but himself”) was apparently shared at the publication time. Here is an excerpt from a letter sent by Friedrich Melchior Grimm (1723-1807) to Denis Diderot (1713-1784), on April 15, 1774.

J’ai lu, il n’y a pas long-temps, la préface que M. le baron de Bielfeld, Allemand, a mise à la tête d’un recueil de ses comédies. Après cette lecture, j’avoue que je n’ai as eu le courage de lire la moitié d’une scène d’une de ses pièces. Il est impossible de parler sur la matière que nous venons de traiter, avec plus de déraison que cet auteur n’a fait. [Grimm and Diderot 1829:133]

[I have read, not long ago, the preface that Baron Bielfeld, German, put as a header of a collection of his comedies. After that reading, I confess that I did not have the courage to read one half of a scene of one of his plays. It is impossible to talk about the matter we have just treated, with more folly than this author has done.]

In 1763, the English anonymous reviewer of the *Lettres Familières* does not hide his disappointment.

The reputation this noble Author hath acquired by his *Political Institutions*, very naturally excited our curiosity with regard

to his epistolary correspondence. After a very fair and candid perusal, however, of the Letters before us, we must confess ourselves to have been a little disappointed in the expectations we had formed of them. [Monthly Review, vol XXVIII, 1763:516]

His conclusion shows no mercy:

Matters of greater importance also, oblige us here to dismiss these Letters. [Monthly Review, vol XXVIII, 1763:523]

Yet, the *Lettres familières* had several editions. Their English translation was used by several historians as a source for the reign of Frederick the Great. Some, like Joseph Towers (1737-1799) or John Abbott (1805-1877), accept Bielfeld's Letters as a primary source coming from a direct witness, with no negative judgement [Towers 1788; Abbott 1871]. Others, like Thomas Carlyle (1795-1881), extend their appraisal to Bielfeld's personality.

Fantastic Bielfeld, in his semi-fabulous style, has a LETTER on this bombardment, attractive to Lovers of the Picturesque, (written long afterwards, and dated &c. WRONG). As Bielfeld is a rapid clever creature of the coxcomb sort, and doubtless did see Neisse Siege, and entertained seemingly a blazing incorrect recollection of it, his Pseudo-Neisse Letter may be worth giving, to represent approximately what kind of scene it was there at Neisse in the October nights. [Carlyle 1865]

Fifteen years later, Andrew Hamilton, in his history of the Rheinsberg court devotes chapter XVI of volume I to Bielfeld's letters. Not only does he dismiss them as a reliable source, but he goes even farther in caricature than Carlyle.

The man himself was certainly not a very nice sort of man, and the conditions of his life brought into play usually not the best of what was in him, but oftentimes rather the worst. He was a *parvenu*, but never quite succeeded in climbing to any of the heights the reaching of which makes *parvenu*/ship a safe and honourable calling.

[...]

Bielfeld was not found full grown in any post. About 1755, I think, after some *démêlés* with the King, he left Prussia altogether, and settled – having got married to a rich wife in the meanwhile – on an estate in Altenburg. There, and in Hamburg, he spent the rest of his life, writing books of no great value. He was estimable in private life; in the private life of the province

or of his native town all the more estimable no doubt because of his former greatness, or rather great expectations. [Hamilton 1880:211-219]

We shall now examine some of the biographical sketches that can be found in 18th- and 19th-century dictionaries. All rely on Formey's eulogy, whether explicitly cited or not. The earliest come from French dictionaries, that were later translated into other languages. The first one is the *Dictionnaire Universel des Sciences Morale, Économique, Politique* by Jean-Baptiste Robinet (1735-1820). There, Bielfeld has a laudatory forty-five pages entry where Formey's eulogy is almost completely copied out (except the criticisms on Bielfeld's works). The three volumes of the *Institutions politiques*, are extensively quoted [Robinet 1779:248-293]. The next dictionary is the *Biographie Universelle* by François-Xavier de Feller (1735-1802), which had many successive editions from 1781 on, and was continued until 1850, long after de Feller's death. Bielfeld is absent from the first edition in 1781; he is present in all successive editions from 1784 until 1850. The sketch is very critical, and strongly biased by de Feller's viewpoint as a catholic clergyman. For instance about [Bielfeld 1772]:

On y trouve une description géographique de l'Europe, mêlée de réflexions politiques; il est facile de voir, en lisant les articles qui concernent l'Espagne, le Portugal, l'Italie, etc., qu'il écrit en bon protestant. On y lit des choses d'une fausseté évidente, que la passion seule lui a dictées. [de Feller 1784:708]

[There can be found a geographic description of Europe, mixed with political reflections; it is easy to see, by reading the articles concerning Spain, Portugal, Italy, etc.; that he writes as a good Protestant. Obviously false things can be read there, that only passion has dictated to him.]

About *Progrès des Allemands dans les belles-lettres*, de Feller writes:

Mauvaise compilation où le fanatisme protestant tient souvent lieu de critique. Si on devait juger des progrès de la civilisation et des sciences chez les Allemands, par la manière dont son livre est rédigé, il n'y aurait point de nation en Europe moins avancée. [de Feller 1784:708]

[Bad compilation where Protestant fanaticism often serves as a criticism. If progress of civilization and science among the German had to be judged by the way his book is written, there would not be any less advanced nation in Europe.]

Rather hypocritically, in his first version, de Feller hides behind Formey's eulogy:

Ce que nous disons des ouvrages de Bielfeld est presque tiré mot à mot de son éloge, fait par un de ses intimes amis, & lû dans une assemblée publique de l'académie de Berlin, en 1770. [de Feller 1784:708].

[What we say about Bielfeld's works comes almost verbatim from his eulogy, made by one of his close friends, and read in a public assembly of the Academy of Berlin, in 1770.]

From 1795 on, the conclusion of the article has changed:

Un de ses intimes amis a lu son "Eloge" dans une assemblée publique de l'académie de Berlin, en 1770: on comprend bien que l'auteur et ses ouvrages n'y sont pas sévèrement jugés. [de Feller 1797:225]

[One of his close friends has read his "Eulogy" in a public assembly of the academy of Berlin, in 1770: it is easily understood that the author and his works are not severely judged.]

That version was translated into Spanish [Oliva 1830:537]. François Guizot (1787-1874) and Adrien Jean Quentin Beuchot (1773-1851) signed Bielfeld's sketch in Michaud's *Biographie Universelle* [1811]. Chalmers' biography is a translation, from which the following is quoted. It was also translated into Italian (page 122 of *Biografia universale antica e moderna*, volume VI, Venezia: Missaglia, 1822).

In a journey which he made to Brunswick, he became acquainted with Frederic II. then prince royal, who, on coming to the throne, took him into his service, and sent him, as secretary of legation, with count de Truchses, Prussian ambassador to the court of St. Jame's, but discovering that the baron's talents were not calculated for diplomatic affairs, he, in 1745, appointed him preceptor to prince Augustus Ferdinand his brother;

[...]

He wrote 1. "Institutions politiques," [...], the only work from his pen that retained its reputation on the continent. Even the empress Catherine II. of Russia, condescended to write notes on it. [Chalmers 1812:250]

Until 1830, substantial sketches of Bielfeld life and works can be found in most dictionaries of biography; after 1830 the entries become increasingly short,

neutral, and sometimes erroneous. Bielfeld is presented alternatively as a ‘celebrated modern writer’ [Maunder 1838:92], a ‘publicist’ [Hoefler 1853:29], or a ‘German statesman’ [Hyamson 1916:60]. His birth date is often cited as 1716, or even ‘around 1712’ [Thomas 1870:355].

3 Bielfeld and political arithmetic

3.1 Of political calculations

This section reviews Chapter XIV, Volume II of Bielfeld’s *Institutions politiques*, entitled “Des Calculs Politiques” [Bielfeld 1760b:263-309]. As Bielfeld precised in the introduction to Volume I, the *Institutions politiques* have no pretention to innovation.

[...] on ne doit pas s’attendre à trouver dans tout le cours de cet Ouvrage des idées nouvelles que personne n’a eues, des découvertes singulières qui sont le fruit d’une imagination brillante. [Bielfeld 1760a:6]

[One cannot expect to find in all this work new ideas that no one has had, singular discoveries springing from a brilliant imagination.]

The only data presented essentially come from the mortality tables of Wilhem Kerseboom (1691-1771) [1738-42]. In the first lines of Chapter XIV, Bielfeld clearly states his goals.

L’Arithmétique Politique a été réduite, depuis environ soixante & dix ans, en Science particulière. Des Calculateurs habiles & infatigables se sont fortement appliqués à la perfectionner; & leurs Ouvrages ont contribué à la rendre si célèbre, qu’aujourd’hui les grands Hommes d’Etat semblent être dans l’opinion qu’elle est indispensablement nécessaire pour régir un païs. Ces considérations nous obligent d’en faire quelque mention dans cet Ouvrage. Nous tâcherons d’indiquer (1) l’origine et l’histoire de cette Science (2) les objets sur lesquels elle peut porter (3) le degré de certitude dont elle est susceptible, (4) à quel point elle est applicable dans la pratique du Gouvernement, (5) les Principes sur lesquels elle se fonde & (6) les opérations qu’elle emploie pour découvrir ce qu’elle cherche: Car entrer dans les Calculs mêmes, ou les appliquer à divers païs de l’Europe, ce serait s’engager dans une entreprise trop vaste pour les bornes de notre Plan, & nous

ne pourrions que transcrire ce que tout Lecteur peut trouver dans les Auteurs qui ont traité Sistématiquement cette matiere, & que nous citerons chemin faisant. [Bielfeld 1760b:263]

[Political arithmetic has been reduced for about seventy years, into a particular science. Deft and tireless calculators have devoted themselves to improving it; and their works have contributed to making it so famous, that nowadays great statesmen seem to believe that it is indispensably necessary to rule a country. These considerations oblige us to mention it in this publication. We shall try to indicate (1) the origin and history of this science (2) the objects on which it can bear (3) the degree of certainty it can attain (4) up to which point it is applicable in the practice of government (5) the principles upon which it is grounded (6) the operations it uses to find what it looks for: because entering into the very calculations, or applying them to various countries of Europe, would be embarking into too vast an endeavor for the limits of our plan, and we could only transcribe what any reader can find in the authors that have systematically treated the matter, and that we shall cite along the way.]

As announced, the chapter begins with a historical review of the field, introduced by an emphatic tribute to the English forerunners.

L'Arithmétique Politique est née dans le terroir qui devoit naturellement la produire, c'est-à-dire en Angleterre. Un païs ou toutes les parties des Mathématiques sont cultivées avec tant de soin, qui a l'honneur de l'invention de tant de Calculs fameux, qui a produit le célèbre Newton, Pere de tous les Calculs; une Nation qui sçait peser jusqu'aux Astres, & qui joint à ce talent un goût décidé pour la Politique, ne pouvoit manquer de réduire aux Principes du Calcul les objets principaux du Gouvernement de l'Etat. [Bielfeld 1760b:263]

[Political arithmetic was born in the land that was naturally meant to produce it, *i.e.* in England. A country where all parts of Mathematics are cultivated with so much care; that has the honor of the invention of so many famous calculations, that has produced the celebrated Newton, father of all calculations; a nation who can weight up to the stars, and which joins to that talent a decided taste for politic, could not fail to reduce to principles of calculation, the main objects of the government of a state.]

The list of authors from all over Europe cited by Bielfeld, evidences his broad knowledge of the field: see Théré and Rohrbasser in [Martin 2003:304-7]. With Bielfeld's spelling, his sources come from England (Graunt, Petty, Derham, de Moivre, Halley, King, Arbuthnot, Hogdson, Maitland, Simpson, Hume), France (Vauban, de St Pierre, du Tot, Melon, Davenant, Desparcieux, Buffon), Holland (Nieuwenhyt, Struyk, Kersseboom, 's Gravesande), Germany (Susmilch, Justi, Kundmann), Switzerland (Bernouilli), Spain (de Uztaritz), Sweden (Fayot, Wargulin, Berch). Thorough accounts of the most important works, such as those of Petty, Süssmilch, Vauban, Kersseboom, etc. are given, and the text contains some personal appreciations:

En Suisse, l'infatigable *M. Bernouilli* a éclairci divers points relatifs au Calcul Politique, & l'on sçait quel est le juste cas que l'on doit faire de tout ce qui sort de la plume de ce grand homme en qui la Science des Mathématiques semble être innée. [Bielfeld 1760b:273]

[In Switzerland, the tireless Mr. Bernouilli has cleared up different points relative to political calculation, and one knows how important a case must be made of what comes from the pen of that great man in which the science of mathematics seems to be innate.]

After listing the type of data political arithmetic deals with (census, taxes, income, etc.), Bielfeld addresses the crucial issue of precision.

On serait trop heureux si tous les différens Calculs Politiques, dont nous avons parlé jusqu'ici, pouvoient se faire avec une précision parfaite; mais il s'en faut de beaucoup qu'ils soient susceptibles d'une certitude mathématique. [Bielfeld 1760b:282]

[One would be too fortunate if all political calculations, that have been spoken of so far, could be done with a perfect precision; but they are far from being subject to mathematical certainty.]

His argument is twofold. On the one hand, errors in counting are inevitable.

La même incertitude règne dans les Dénombrements. Quelque soin qu'on prenne, il est impossible de les faire avec une entière précision. On ne compte pas les hommes, non plus que les feuilles d'une Forêt, ou que tous les êtres qui se changent & se renouvellent sans cesse. Chaque Ville ressemble en cela à un Colombier, ou à une Ruche ouverte, dont les habitans toujours en mouvement entrent, sortent, s'agitent sans relâche, & confondroient

l'exactitude du Calculateur le plus infatigable qui voudroit déterminer leur nombre. [Bielfeld 1760b:287]

[The same uncertainty reigns in counting. Whatever care is taken, it is impossible to make them with a thorough precision. One cannot count men, no more than leaves in a forest, or all beings that change and renew themselves incessantly. Each city resembles in that respect a dovecot, or an open beehive, the inhabitants of which, always moving, go in and out, move relentlessly, and would confuse the accuracy of the most tireless calculator who would want to determine their number.]

On the other hand, absolute precision is a useless mathematical fantasy (see [Bru 1988:11; Feldman 2005:14]).

Mais la politique n'a pas besoin, dans cette affaire-ci, d'une pareille certitude. Elle peut se contenter très bien d'une théorie vraisemblable sur tous ces objets, pourvu que cette théorie soit aussi approchante de la vérité qu'il est possible; & c'est ce à quoi tendent tous les efforts des Calculateurs Politiques, qui devroient être secondés, dans les pays bien policés, par le Gouvernement même. Vouloir aller au-delà, & prétendre à la précision Mathématique dans cette matière, ce seroit chercher un objet de spéculation et de curiosité, comme la Quadrature du Cercle. [Bielfeld 1760b:288]

[However, politic does not need, in this matter, such a precision. It can make do with a likely theory on all these objects, provided that theory is as close to truth as possible; and this is what all efforts of political calculators tend to, and they should be assisted in all well civilized countries, by the government itself. Wanting to go beyond, and yearning for mathematical precision in that matter, would be like searching an object of speculation and curiosity, like squaring the circle.]

Furthermore, Bielfeld repeatedly warns the reader against too strict an application of mathematics to human affairs, sometimes with a touch of humour.

Un Roi, par exemple, dans son Conseil, un Ministre, dans son Cabinet, qui calculeroit, comme on l'a dit, les affaires par $a + b \div c$ courroit risque de prendre à tout moment une résolution qui seroit égale à zéro. [Bielfeld 1760b:288]

[A king for instance, in his council, a minister, in his cabinet, who would calculate, as has been said, the affairs by $a + b \div c$

would be at risk to take at any time a resolution that would be equal to zero.]

Even though absolute precision is illusory, and not even necessary, Bielfeld still advocates accurate data collection.

Il faut le répéter encore ici, les Listes des Enfants bapés, des Mariages, & des Morts forment la baze de toute cette Arithmétique. Il est donc nécessaire que le Souverain ordonne à tous les Curés, tant des Villes que de la Campagne, sans exception, de tenir des Registres exacts de tout ce qui se passe relativement à cette matière dans l'étenduë de leurs Paroisses respectives. Une seule Paroisse qui manque rend tout le Calcul imparfait & faux. [Bielfeld 1760b:289]

[This must be repeated here again, the lists of baptised children, of marriages, and of deaths, form the basis of all this arithmetic. Thus it is necessary that the sovereign command all ministers, in cities as well as in the countryside, to keep exact registers of what happens in these matters in the whole extent of their respective parishes. A single parish missing makes all the calculation imperfect and false.]

After the data have been carefully collected, information must be extracted.

Lorsque le Souverain s'est procuré toutes ces Dates, le plus exactement qu'il est possible, il peut donner de l'occupation à ses Calculateurs Politiques, qui en font des résumés très instructifs en calculant. . . [Bielfeld 1760b:290]

[When the sovereign has obtained all these data, as exactly as possible, he can give occupation to his political calculators who will make very instructive summaries by calculating. . .]

Bielfeld is perfectly aware that data collection has a long tradition, yet he is not completely satisfied with the method.

Nous en trouvons des modèles dans celles qui ont été faites à Londres & à Vienne, & qui sont rapportées par M^{rs}. Graunt, Kundmann, Susmilch, &c. Mais ces modèles souffrent encore, ce me semble, des rectifications & des augmentations que les ordres du Souverain, ou de ses Ministres, peuvent leur donner très facilement. Il me paroît nécessaire de joindre à ce Paragraphe (Voyez à la fin du Chapitre), les modèles de quatre Tables qui renferment les parties de la Population, ou les Dates, les plus essentielles

pour l'Arithmétique Politique en général, & dont la seule inspection pourra fournir une idée un peu plus claire de ce genre de Calcul. [Bielfeld 1760b:291]

[Models can be found in those that have been done in London and Vienna, and that have been reported by Mr Graunt, Kundmann, Susmilch, etc. But these models are still missing, I think, some rectifications and expansions that orders of the sovereign or his ministers may easily give them. It seems necessary to me to append to this paragraph (see at the end of the chapter) the models of four tables which enclose the parts of the populattion, or the data, which are most essential for political arithmetic in general, and of which the mere inspection will give a clearer idea of that kind of calculation.]

Indeed, four models of tables are inserted at the end of the Chapter. The first three are at the province scale. The first one gives population counts according to categories, the second one is a mortality table (deaths per age group), the third one is a casualty table (deaths per cause), following the English model. The fourth and last table (Figure 2) is a recap chart for the whole country. It is interesting to notice that such models of tables, and their generalization to all sorts of data, were the basic tool of the “great avalanche of printed numbers”, half a century later [Hacking 1990:2]. Quite similar charts were submitted by Sinclair to the Scottish ministers and later helped him summarizing the wealth of data they had sent [Sinclair 1791:viii; 1798:xv ff.].

Thus, with the help of his tables, specialized calculators could provide the government with all sorts of usefull quantified information: Bielfeld anticipates on the “bureaus” that would later flourish all over Europe [Hacking 1990:27].

Il me semble que la chose vaudroit bien la peine que chaque Etat entretint un ou deux Calculateurs Politiques qui n'eussent qu'à s'appliquer uniquement à recueillir les Listes des Paroisses, & à en former des Tables telles que je viens de les proposer. Cette légère dépense seroit bientôt compensée par les avantages que l'Etat retireroit de la justesse de toutes les mesures qu'on pourroit prendre dans le Gouvernement. [Bielfeld 1760b:291]

[It seems to me that it would be worth the trouble for each state to maintain one or two political calculators whose only occupation would be to collect the lists from parishes, and build tables such as those proposed above. This slight expenditure, would be

T A B L E G E N E R A L E,

Pour la Population de tout un Royaume, ou autre Etat quelconque, tirée des Tables Provinciales faites sur le modèle de la Table N^o. 1. comme, par exemple, pour l'Année 1759.

L A F R A N C E.

Île de France	Normandie.	Picardie.	Bretagne.	Langue.	Provence.	Alsace.	Et ainsi pour toutes les autres Provinces, Colonies, &c.
Nés	Nés	Nés	Nés	Nés	Nés	Nés	
Morts	Morts	Morts	Morts	Morts	Morts	Morts	
Etrangers établis	Etrangers établis	Etrangers établis	Etrangers établis	Etrangers établis	Etrangers établis	Etrangers établis	
Naturals foris	Naturals foris	Naturals foris	Naturals foris	Naturals foris	Naturals foris	Naturals foris	
Somme	Somme	Somme	Somme	Somme	Somme	Somme	

R E C A P I T U L A T I O N.

Île de France	Augmentation	Diminution	Par conséquent plus de nés que de morts ou vice versa	Et ainsi, sous la proportion adouée dans la Table précédente, le nombre des Vivans le doit être	Nombre des Vivans
Normandie					
Picardie					
Bretagne					
Langue					
Provence					
Alsace, &c. &c.					
Tout le Royaume					Vivans en France

Tous les détails que l'on pourroit souhaiter dans cette Table se trouvant déjà dans les Tables N^o. 1, 2 & 3. le Souverain, ou les Ministres, peuvent y avoir recours au besoin.

Figure 2: Model of recap chart for the population of a country [Bielfeld 1760b:309].

compensated soon by the advantages that the state would get out from the accuracy of all measures that could be taken in the government.]

Thus the methodology of data collection that was to be generalized at the turn of the century, is clearly described. What about the theory? The analogy with games of chance is blatant to Bielfeld, as it must have been to his readers. About life insurance, he says:

Il est clair que cet établissement, ou ce Contrat, n'est dans le fond qu'un *Jeu de Hazard*, qui a ses chances comme tous les autres, & dont le profit, ou la perte, roule uniquement sur la durée, plus ou moins longue de la vie de de celui sur la tete duquel le fond perdu est placé. [Bielfeld 1760b:297]

[It is clear that this establishment, or this contract, is but a game, which has its chances as any other, and the profit or loss of which, depends only on the duration, more or less long, of the life of the person on which the unredeemable fund is placed.]

The obvious corollary is equity of expected profits.

Nous venons de remarquer que tout établissement de cette nature a ses chances; il doit donc avoir aussi ses justes *proportions*, si une des partie contractantes, ou, si vous voulez, des Joueurs, ne doit pas être une dupe manifeste. [Bielfeld 1760b:301]

[We have just remarked that any establishment of this nature has its chances; therefore it must have also its fair proportions, if one of the contracting parties, or of the gamblers if you want, is not to be a patent dupe.]

Bielfeld has read Bernoulli, and expresses his deepest admiration. Yet he does not make clear that he has fully grasped the law of large numbers, in which he professes an almost candid belief.

La fixation de toutes les proportions des différens âges de la vie humaine sert aussi de règle pour le Calcul des *Tontines*: Car, je l'ai dit plus d'une fois, il y a dans la Mortalité d'un grand nombre d'hommes, & dans une révolution considérable d'années, moins de hazard, moins d'irrégularité qu'on ne pense. Les mêmes chances, les mêmes proportions revienent toujours au bout de quelque tems. Il semble que tout ce qui est dans la Nature soit asservi à de certaines révolutions périodiques & presque uniformes dans un grand espace de tems. Dans les Jeux de hazard même, ce qu'on appelle proprement hazard, ou fortune, y entre pour beaucoup moins qu'on ne s'imagine, ou du moins cette fortune n'y est pas si bizarre, si constante, ni si inconstante, qu'elle paroît l'être au premier coup-d'œil, ainsi que l'a très bien démontré le célèbre Mr. Bernouilli, & quelques autres Calculateurs. Si l'on décompte de ces coups du hazard, les tours d'adresse, les tromperies, & les fautes de jugement qui se font à de pareils Jeux, on verra qu'au bout de quelques années des Joueurs qui luttent souvent l'un contre l'autre balanceront assez leur gain ou leur perte, ce qui prouve clairement l'équilibre dans les retours de la fortune. [Bielfeld 1760b:305]

[Fixing the proportions of the different ages of human life serves also as a rule for the calculation of tontines. Because, I have said it more than once, there is in the mortality of a large number of men, less hazard, less irregularity than one would think. The same chances, the same proportions, always come back after some time. It seems that all that exists in nature is subject to certain periodic revolutions, almost uniform in a large interval of time. In hazard games themselves, what is properly called hazard, or

fortune, enters for much less as one would imagine, or at least that fortune is not as bizarre, nor as constant, nor as inconstant, that it seems to be at first sight, as have so well shown the famous Mr. Bernouilli and some other calculators. If from those hazard strokes, the skilful tricks, frauds, or judgement mistakes that occur in such games are discounted, one will see that after some years, players that often gamble against each other, will rather balance their profit or loss, which clearly proves equilibrium in the fluctuations of fortune.]

Bielfeld's strong faith in the law of large numbers seems to announce the "Constants of Nature and Arts", dear to Babbage in the following century [Hacking 1990:52]. It is probably the cause of his erroneous conjecture about the stability of human population.

Enfin on serait tenté de croire que la quantité d'hommes répandus sur la surface de la Terre a presque toujours été la même, ainsi que celle des autres Créatures, & que ces choses pourroient bien se soutenir dans le même arrangement jusqu'à la fin des Siècles. [Bielfeld 1760b:285]

[At last, one would be tempted to believe that the number of men across the Earth, has almost always been the same, as well as that of other creatures, and that these things could well last in the same arrangement until the end of centuries.]

Spengler [1942:chapter III], has remarked that Bielfeld's belief in population stability somehow contradicts his repeated recommendation to take any measure susceptible to increase the population of a country, which he carefully lists [Bielfeld 1760b:294-296]. As it turned out, that mistake focused many of Süßmilch's attacks (Süßmilch is the 'most caustic critic' alluded to by Formey): see [Süßmilch 1741-77:129,377]

Overall, it can be observed that Bielfeld's views of political arithmetics appears quite coherent with other contemporaneous accounts, in particular those of Condorcet in the *Encyclopédie Méthodique* [Bru and Crépel 1994, Feldmann 2005].

3.2 Diffusion in Europe

This section firstly examines the diffusion of Bielfeld's *Institutions politiques*, then focuses on the impact of the chapter on political arithmetics. The controversy with Süßmilch and its indirect effect on the history of the discipline through the works of Euler is treated last.

Among the three volumes [Bielfeld 1760a; 1760b; 1772], the first two had an immediate impact, much larger than the posthumous third. They were the subject of two extensive and eulogious reviews in the *Bibliothèque des Sciences et des Arts* by Charles Chais and Élie de Joncourt [1760a:66-90; 1760b:267-288]. An interesting trace of personal diffusion can be found in the correspondence of Francesco Algarotti (1712-1764) with Voltaire.

Ho ricevuto jeri una lettera del nostro amico Formey; nella quale egli mi dice: *Que dites-vous de Bielfeld chevalier de s. Anne pour avoir fait des institutions politiques, qui effacent Montesquieu ?* [Algarotti 1764:172]

[I have received yesterday a letter from our friend Formey, in which he tells me: “what do say of Bielfeld, knighth of St. Ann, for having made political institutions that upstage Montesquieu?”]

The compliment is somewhat exaggerated, and it might be tainted with some trace of irony, the correspondent being Voltaire; yet as we have seen in his Eulogy, Formey had a sincere appreciation of the book. Moreover, the allusion to Bielfeld’s recent elevation to the order of St. Ann is a way of recalling the praise of the Empress Catherine II. of Russia. Some have said that she had “condescended to write notes on it” [Chalmers 1812:250], others that she had “placed them, covered with her own handwritten notes, in her library, next to the *Esprit des lois*” [Sayous 1861:361]. We now know that Catherine II. not only annotated the political institutions, she

consulted them extensively in preparing her *great Instruction*, especially in Chapter 21 on police which was only published in February 1768, the same year that the first volume of an official Russian translation of Bielfeld’s treatise appeared. [Alexander 1988:104]

Evidence for the success of the *Institutions politiques* also come from debates. Some pamphlets were written to refute one single point of Bielfeld: for instance Amorós [1777] on the paternal consent for marriage, or de Jócana y Madaria [1793] on the double-entry accounting system. Controversies, fueled by religious passions, sometimes raged accross borders [Muñoz 1778]. Bielfeld is extensively quoted from Portugal [da Cunha 1794] to Italy [Gautieri 1804]. In his treatise of 1823, Zambelli, an italian translator of Bentham, often cites Bielfeld of which he says:

Infatti il barone di *Bielfeld* nella sua grand’opera delle *Insti-tuzioni politiche* ha abbracciato tuttociò, che in latissimo sense può entrare nell’amministrazione di uno stato. [Zambelli 1823:317]

[Indeed, the Baron Bielfeld, in his great work *political institutions*, has embraced everything that, in the widest sense, can enter the administration of a state.]

Thus Carpenter's selection of the *Institutions politiques* as one of the forty 'economic bestsellers before 1850' [Carpenter 1975:17] is fully justified. Why then did they sink into oblivion after 1850? Pierre-André Sayous has a sensible explanation:

L'ouvrage qui est éclos sous cette influence, a familiarisé les souverains du Nord avec les idées de justice et d'administration bienfaisantes pour les peuples, et aujourd'hui encore que toutes ces idées, devenues des lieux communs ou plutôt des principes consacrés et pratiqués, ont rendu le livre inutile, les *Institutions politiques* du baron de Bielfeld conservent encore un grand mérite. [Sayous 1861:363]

[The work that was born under that influence, has familiarized the sovereigns of the North with the ideas of justice and administration beneficial to the peoples, and nowadays when all those ideas, having become commonplace or rather established and practical principles, have rendered the book useless, the *political institutions* of Baron Bielfeld, still retain a great merit.]

What about Chapter XIV? As remarked by Théré and Rohrbasser in [Martin 2003:304-307], Bielfeld is not cited in the rather comprehensive Italian review of political arithmetic by Gaeta and Fontana [Crépel 2003b]. Does this mean that his writings went completely unnoticed? Evidence of the contrary can be found in several editions of popular encyclopedias, mainly those of Robinet and Felice [Crépel 2003a]. We have seen that the first one has an extensive biographical entry for Bielfeld. Its article *Arithmétique Politique* [Robinet 1778:126-176] is copied from [Bielfeld 1760b]. So are the articles *Tontine* [Robinet 1783:180-182] and *Viagère (Rente)* [Robinet 1783:608-616]. Plagiarism was in the manners of the time, and the fact that Bielfeld [1760b] is explicitly cited at the end of the article *Tontine* [Crépel 2003a:63] is rather unusual. Fortunato Bartolommeo Felice (1723-1789) did not have the same scruple: he merely signed Bielfeld's writings with his own initials. The entry *Arithmétique Politique* of his *Code de l'Humanité* [Felice 1778:512-538] is an exact copy of [Bielfeld 1760b:263-297]. Crépel [2003a:62] cites Diderot about that article, but Hecht [1987:76] correctly attributes it to Bielfeld.

Bielfeld's chapter on political arithmetics was one of many contemporaneous texts on the subject, with no particular originality, except perhaps a clearness that might explain why it was preferred to others by Robinet

and Felice. It was certainly read, remarked, and circulated. One of the few histories of probability which cites Bielfeld, mentions it as follows:

Ils furent tous accueillis cependant avec une grande curiosité, et les principaux d'entre eux, ceux par exemple de Short et de Corbyn-Morris en Angleterre, de Kerseboom en Hollande, de Süssmilch et de Bielfeld en Prusse, et chez nous de Deparcieux et de Dupré de Saint-Maur, méritèrent véritablement cette faveur. [Gouraud 1848:42]

[They were all greeted with great curiosity, and the most important of them, for instance those of Short and Corbyn-Morris in England, Kerseboom in Holland, Süssmilch and Bielfeld in Prussia, and at home of Deparcieux and Dupré de Saint-maur, did indeed deserve that favor.]

Süssmilch would certainly not have liked being paired with Bielfeld as a political arithmetic author. Bielfeld's bold assertions on the stability of human population, added to some doubts he had cast on the accuracy of Süssmilch data collection, had infuriated the later: see Hecht's account in [Süssmilch 1741-77:129-130]. The controversy had an indirect, but long-lasting effect on the history of science. Probably not confident enough with his grasp of mathematics, Süssmilch sought for the help of Euler, who was generally regarded as the best mathematician of the time. Bielfeld, who had sitted with Euler at the foundation of the Academy of Berlin [Laudin 2009:31], would certainly not contest Euler's authority:

M. Euler, Mathématicien du premier ordre, & peut-être le plus grand calculateur qu'il y eut jamais, quitta St. Petersbourg pour venir s'établir à Berlin. [Bielfeld 1763:336]

[Mr. Euler, a mathematician of the first rank, and perhaps the greatest algebraist that ever existed, left St. Petersburg to reside in Berlin.]

It is generally considered that Euler is the author of the mathematical parts in the second edition of Süssmilch's *Göttliche Ordnung* [Smith 1977]. The series of papers that he wrote in the 1760's about population, life annuities, lotteries, tontines [Todhunter 1865:239-242, Euler 1923:xxiii-xxv], were probably sparked by his reading of Bielfeld and the discussions with Süssmilch. About mortality tables, the data that Euler uses are the same as in [Bielfeld 1760b]: they come from Kerseboom. The long term effect of Euler's papers is analyzed by Klyve as follows:

Regardless of whether Euler explicitly showed all his calculations in Süssmilch’s book, the claim that in the long run, an unchecked population will grow geometrically is of seminal importance. It was this idea about universal geometric population growth – hinted at by Wallace, discovered by Euler, circulated by Süssmilch, applied by Price, exploited by Malthus, and inspirational to Darwin – which led directly to Darwin’s concept of natural selection. [Klyve 2013:20]

4 Bielfeld and statistik

4.1 The elements of universal erudition

As already mentioned, the third volume of the *Institutions politiques* is a statistik of Europe [Bielfeld 1772]. Although cited as such by Meusel [1790:8] and Heuschling [1845:40], it did not have much impact. The probable explanation is that it lacked originality. The information essentially came from previous similar books by Anton Friedrich Büsching (1724-1793), and it was already outdated at the time of publication. The *Elements of universal erudition* had a more long-lasting effect. We shall mainly quote from Volume 3 of the English translation [Bielfeld 1770b].

In volume I of the French edition [Bielfeld 1767a], chapter 49, from pages 425 to 518 is devoted to Mathematics, in a very broad acception: it covers not less than eighteen different sciences which “extend over all beings the magnitude of which can be determined by certain principes, and hence becomes very vast” (that chapter does not appear in the English translation). Similarly, chapter XIII of [Bielfeld 1770b:268-279] exposes a very general definition of statistics, consistent with other German definitions of the field (from 1784 on, existed a “Westphälisches Magazin zur Geographie, Historie und Statistik”; see also [Meusel 1790:Vorerinnerungen]).

The science, that is called *Statistics*, teaches us what is the political arrangement of all the modern states of the known world. [Bielfeld 1770b:269]

At the beginning of the chapter, Bielfeld takes good care to distinguish statistics from geography, which he treats in Chapter XV.

In geographical treatises, they placed, before the local description of each country, a sort of account of the principal objects that

composed its system. But these introductions were always imperfect, naturally very contracted, frequently dubious, and sometimes absolutely false or ill grounded. [Bielfeld 1770b:269]

Yet Bielfeld knows what is due to Büsching, even though the “founder of statistical geography” usually prefers to speak about geography rather than statistik [Büsching 1764:Vorbericht].

We must except some of them however, especially those which are to be found in the excellent geography of M. Busching, an author, whose assiduity, precision, and discernment, can never be sufficiently commended. [Bielfeld 1770b:269]

But of course, Bielfeld is aware of Achenwall’s founding role.

It would be far from just, in this place, to pass over in silence the obligations this science has to M. Godfrey Achenwal, professor at Gottingen, who has not only composed an Introduction to the political system of the modern states of Europe, and another work not less interesting, entitled Principles of the history of Europe, leading to the knowledge of the principal states of the present time, but has been also the first to reduce this important subject into a true system, and has made a separate science of it, under the title of Statistics, and which he professes with great reputation; a science from which history borrows great lights; which furnishes the best materials for the constitution of a state, which enriches politics, and which prepares those of the brightest genius among the studious youth, to become one day able ministers of the state. [Bielfeld 1770b:271]

The somewhat subtle difference between Büsching’s geography and Achenwall’s statistics is later swept over:

All that occurs in a state is not worthy of remark, but all that is worthy of remark in a state, enters necessarily into statistics. [Bielfeld 1770b:272]

Such a broad definition encompasses elements of geography, history, economics, politics and, almost marginally, political arithmetics.

With regards to the inhabitants, it inquires into their number and qualities: and for this purpose it makes, by the aid of political arithmetic, of registers of births and burials, &c. the most elaborate and accurate researches possible, into the number of the

inhabitants of a state, and into their genius; the prevailing character, the industry, the virtues and vices of a nation. [Bielfeld 1770b:273]

This reminds of the use that Büsching, even though he does not explicitly refers to statistics, makes of political arithmetic.

I have set down the probable number of inhabitants in several countries and great cities, or inserted an account of their births and burials from the annual Bills of Mortality; but this could not be done for all. [Büsching 1762:vi]

After enumerating all the objects of study, Bielfeld addresses the problem of updating information. He remarks that even the works “which approach nearest the exact truth, are made to recede from it by time”; the solution he proposes is the use of newspapers:

These daily and periodical publications afford a continual supplement to the best statistic authors, and form a kind of practical statistics.

So Bielfeld’s description of the discipline, though quite remote from the modern meaning, is consistent with the generally accepted German definitions of the time.

4.2 The term ‘statistics’

That the first use of the word ‘statistics’ in English appeared in [Bielfeld 1770b], is serendipitous: Achenwall’s courses could have been imported earlier; [Büsching 1764] could have been translated instead of [Büsching 1762]. Other German works containing the word were indeed translated between Bielfeld and Sinclair, such as [Zimmermann 1787]. The fact remains that the word had been used in England, more than twenty years before Sinclair. There is no reason to doubt that Sinclair discovered it in 1786 “in the course of a very extensive tour through the northern parts of Europe” [Sinclair 1798:xiii]. Yet, [Bielfeld 1770b] had not gone completely unnoticed. It had been extensively reviewed upon appearance in [Smollett 1770:262-270]. More significantly, the fourth Earl of Abingdon (1740-1799), in his 1780 *Dedication to the Collective Body of the People of England*, after an extensive citation of [Bielfeld 1770a], added as a footnote:

See Elements of Erudition, vol. 1. p.89, and 103. This Science, in order to its Attainment, is very judiciously treated of in the

third Volume of these Elements, under the Head of *Statistics*; and to which the Reader is not only referred in particular, but the *Elements* themselves in general, as well as *the Political Institutes* of Baron Bielfeld, are worthy the Perusal of every Lover of Learning and Science. [Abingdon 1780:lvii]

Even if they did not reach the popularity of the *Institutions politiques*, the *Elements of universal erudition* enjoyed a considerable success. For instance, it has been shown that they have been a constant source of inspiration to Edgar Allan Poe (1809-1849).

The evident popularity of the work in Europe led to a translation into English by William Hooper, published in London in 1770 in three volumes as *Elements of Universal Erudition* and pirated the next year in Dublin. Poe unquestionably used the English translation for all the items in “Pinakidia” except number 154, which reprints a stanza from a French “Vaudeville” that Hooper omitted from his version.

Bielfeld’s volumes were a major source for many of Poe’s learned allusions, curious bits of information, and even germinal ideas for tales, and Poe’s use of the Empedocles item is important enough, in Page’s treatment, to warrant a close examination of how he drew from Hooper’s translation. [Pollin 1980]

Writing a vibrant eulogy of his father, Sinclair’s son feels quite uneasy with the question of precedence. He cannot avoid citing Bielfeld.

The vast variety of subjects of which the attention of the statist should be given, is ably and comprehensively enumerated by Baron Bielfeld in his “*Elements of Universal Erudition*”. His work, however, contains speculations and directions only. He did not attempt to put his theory in practice by an actual enquiry into the circumstances of the German empire. [Sinclair 1837:6]

Then he reproduces his father’s argument of a semantic shift.

The terms *Statistics*, and *Statistical*, which occurred continually in this volume, were such novelties in the British *nomenclature* of economic science, that Sir John thought it necessary to apologize for their introduction. He explained that he had derived the term from the German, though he employed it in a sense somewhat different from its foreign acceptation. In Germany, a statistical enquiry related to the *political strength* of the country,

or to questions of state policy, whereas he employed the word to express an enquiry into the state of a country, for the purpose of ascertaining the amount of *happiness* enjoyed by its inhabitants, and the means of its future improvement. [Sinclair 1837:9]

Yet, he soon hides away behind the entry “Statistick” of Walker’s dictionary:

“*Statistick*. This word is not found in any of our Dictionaries. It seems to have been first used by Sir John Sinclair, in his plan for a statement of the trade, population, and productions of every parish in Scotland, with the food, diseases, and longevity of its inhabitants ; a lan which reflects the greatest credit on the understanding and benevolence of that gentleman, as it is big with advantages both to the philosopher and the politician” [Sinclair 1837:10]

He then acknowledges some early remarks about the fact that his father’s use of the word was not essentially different from the German acceptance.

German statistis, and in particular Professor Schlozer, in his *Theorie der Statistik*, insist that a distinction was all along sufficiently kept in view between politics and statistics, by the statistical writers of that country, and that Sir John Sinclair’s definition was identical with theirs. I may also here remark, that the Italians may fairly dispute with their German neighbours the appropriation of this term, which occurs in some of their writers soon after the revival of letters. [Sinclair 1837:10]

Let us briefly come back on Sinclair’s claim about changing the meaning of the word,

for by Statistical is meant in Germany, an inquiry for the purposes of ascertaining the political strength of a country or questions respecting *matters of state*; whereas the idea I annex to the term is an inquiry into the state of a country, for *the purpose of ascertaining the quantum of happiness enjoyed by its inhabitants, and the means of its future improvement* [Sinclair 1798:xiii]

Actually, the ‘pursuit of happiness’ was a recurrent theme in the philosophy of Enlightenment, long before Sinclair. As Ian Hacking [1991:194] puts it: “The fundamental principle of the original moral sciences was the Benthamite one: the greatest happiness to the greatest number”. The ‘happiness of peoples’ repeatedly appears in the works of Bielfeld, and heads the first page of the *Institutions politiques*.

Peut-on prétendre que, sans Préceptes, les Peuples puissent être constamment heureux dans le cours de plusieurs Siècles? [Bielfeld 1760a:1]

[Can it be claimed that without precepts, peoples can be constantly happy all along several centuries?]

Sinclair's feat lied in the unprecedented scale and accuracy of his survey; it was rightfully hailed and became an inspiration for the beginnings of the discipline [Cullen 1975; Hacking 1990]. However, his use of the "new word" statistic is quite far from the colorful "bare-faced act of robbery" described by Pearson [1921:2]. Before Pearson, some early historians of the discipline had given more balanced accounts of the merging of political arithmetics into statistics. Here is one by Walter F. Willcox (1861-1964).

For the historians of statistics are now well agreed that the study we cultivate sprang from two main roots, one in the German universities, the other in English studies of political arithmetic. The former developed, under the name of statistics, a descriptive political science almost devoid of figures but systematic and suitable for presentation in academic lectures or treatises. The latter developed, under the name of political arithmetic, a series of fragmentary and disconnected studies of available numerical data. Between 1730 and 1830 the English ideas slowly penetrated Germany, introducing numerical data and gaining especially from Süßmilch a systematic, orderly presentation quite alien to their original form.

During the same period the German name *statistics* spread to England and this country. Probably the first writer to make it at home in English was Sir John Sinclair whose voluminous *Statistical Account of Scotland* exercised a traceable influence on both sides of the Atlantic. He wrote in 1798: "In the course of a very extensive tour through the northern parts of Europe which I happened to take in 1786 I found that in Germany they were engaged in a species of political inquiry to which they had given the name of Statistics and [...] as I thought that a new word might attract more public attention I resolved on adopting it and I hope that it is now completely naturalized." The earliest occurrence of *statistics* in English was in 1770 and thus more than fifteen years before Sinclair, when Dr. Hooker published a translation of Bielfeld's *Elements of Universal Erudition*. One of its chapters is entitled Statistics and contains a definition of the subject as

“The science that teaches us what is the political arrangement of all the modern states of the known world.” With this German name came also some of the German fondness for system and for breadth of treatment, and all these factors contributed to the establishment of English and American statistical societies. The statistics which were thus to be studied came much nearer to the German prototype than to the English political arithmetic. [Willcox 1914]

A vivid account of the struggles that accompanied the mutation from *statistik* to statistics is given by John [1883], an article that Pearson had read (cf. footnote by Pearson’s son in [Pearson 1921:3]). See also [Guy 1865; Hiltz 1978; Plackett 1986] for etymologies and ancient uses of the words ‘statist’ and ‘statism’ in English.

One question remains to be answered: why did Sinclair’s own version prevail up to this date [Johnson & Kotz 1993:70-72; Hald 2003:82]? Sinclair’s achievement had an immediate impact and was cited as a model outside England, in particular in France [Playfair 1802:157]. Beyond the impressive feat, Sinclair’s dense network of correspondents certainly played an important role in the diffusion. Traces can be found in part VII, volume 1 of Sinclair’s voluminous correspondence. For instance, here is a letter of Professor Zimmerman of Brunswick, dated 17th July 1792 (the author of [Zimmerman 1787]).

I shall not delay a moment to insert an ample extract, in the last number of my Geographical and Statistical Journal, which I have published for above two years. These sciences will gain much by your enterprise; and I feel the greatest anxiety to see a work, of such extent and utility, brought to a conclusion. [Sinclair 1831:288]

Another letter, from Dr Guthrie, dated at St Petersburg, 26th september 1792, well describes the early reception of the “statistical account of Scotland”.

Your Statistical Work is, in my opinion, the most perfect which has yet appeared, and will probably serve as a model to other countries, although few possess the same set of respectable pastors, to collect materials, living with their flock in habits of friendship and intimacy, the natural result of the sensible regime of the Scotch church. [Sinclair 1831:289]

Bielfeld does not seem to have maintained such an important correspondence, and his relatively short life did not leave him much time to ensure his own publicity; whereas Sinclair lived long enough to become the oldest active

member (at the age of eighty) of the newly founded Statistical Society of London in 1834.

References

- [1] Abbott, J. S. C. (1871): *History of Frederick the second, called Frederick the Great*, New York: Harper, 1871
- [2] Abingdon (earl of), W. B. (1780): *Dedication to the Collective Body of the People of England: In which the source of our present distractions are pointed out*, Oxford: Jackson, 1780
- [3] Agarwal, B. L. (2009): *Basic Statistics*, 3rd ed., New Delhi: New Age International, 2009
- [4] Alexander, J. T. (1988): *Catherine the Great: Life and Legend*, Oxford: Oxford University Press, 1988
- [5] Algarotti, F. (1764): *Opere del conte Algarotti, Tom. XVI* Venise: Carlo Palese, 1764
- [6] Amorós, J. (1777): *Discurso en que se manifiesta la necesidad y utilidad del consentimiento paterno para el matrimonio de los hijos y otros deudos*, Madrid: Blas Román, 1777
- [7] Bazzoli, M. (1990): *Il piccolo stati nell'età moderna; studi su un concetto della politica internazionale tra XVI e XVIII secolo*, Milan: Jaca, 1990
- [8] Bielfeld, J. F. (1760a): *Institutions politiques, Tome premier*, La Haye: Pierre Gosse, 1760
- [9] Bielfeld, J. F. (1760b): *Institutions politiques, Tome second*, La Haye: Pierre Gosse, 1760
- [10] Bielfeld, J. F. (1763): *Lettres familières, Tome second*, La Haye: Pierre Gosse, 1763
- [11] Bielfeld, J. F. (1767): *Les premiers traits de l'Erudition Universelle, ou analyse abrégée de toutes les sciences, des beaux-arts et des belles-lettres, Tome premier*, Leyde: Luchtmans, 1767
- [12] Bielfeld, J. F. (1770a): *The elements of universal erudition, containing an analytical abridgement of the sciences, polite arts and belles lettres, vol. I*, Hooper, W. transl., London: Scott, 1770

- [13] Bielfeld, J. F. (1770b): *The elements of universal erudition, containing an analytical abridgement of the sciences, polite arts and belles lettres, vol. III*, Hooper, W. transl., London: Scott, 1770
- [14] Bielfeld, J. F. (1772): *Institutions politiques, Tome troisième*, Leyde: Luchtmans, 1772
- [15] Bru, B. (1988): *Estimations laplaciennes*, *Statistique et Analyse des Données*, 13(2), 3-42, 1988
- [16] Bru, B., Crépel, P. (1994): *Arithmétique Politique: textes rares ou inédits 1767-1789* Paris: INED 1994
- [17] Burns, W. E. (2003): *Science in the Enlightenment, an encyclopedia*, Santa Barbara: ABC-CLIO, 2003
- [18] Büsching, A. F. (1762): *A new system of geography*, Murdoch, P. transl., London: Millar, 1762
- [19] Büsching, A. F. (1764): *Vorbereitung zur gründlichen und nützlichen Kenntniss der geographischen Beschaffenheit und Staatsverfassung der Europäischen reiche und Reubliken, welche zugleich ein allgemeiner Abriss von Europa ist*, Wien: Trattner, 1764
- [20] Carlyle, T. (1865): *History of Friedrich II. of Prussia called Frederick the great, volume XIII*, Leipzig: Tauchnitz, 1865, Project Gutenberg Release #2113, 2008
- [21] Carpenter, K. (1975): *The economic bestsellers before 1850*, Boston: Harvard Business School, 1975
- [22] Chais, C., de Joncourt, É (1760a): *Bibliothèque des Sciences et des Beaux-Arts pour les mois de Janvier, Février, Mars 1760, tome treizième, première partie*, La Haye: Pierre Gosse, 1760
- [23] Chais, C., de Joncourt, É (1760b): *Bibliothèque des Sciences et des Beaux-Arts pour les mois de Avril, Mai, Juin 1760, tome treizième, seconde partie*, La Haye: Pierre Gosse, 1760
- [24] Chais, C., de Joncourt, É (1772): *Bibliothèque des Sciences et des Beaux-Arts pour les mois de Juillet, Août, Septembre 1772 Tome trente et huitième, première partie* La Haye: Pierre Gosse, 1772
- [25] Chalmers, A. (1812): *The general biographical dictionary, Volume V.*, London: Nichols, 1812

- [26] Crépel, P. (2003a): *Arithmétique politique et population dans les métamorphoses de l'Encyclopédie* in Martin, Th. (dir.) *Arithmétique politique dans la France du XVIII^e siècle*, Paris: INED, 47-70, 2003
- [27] Crépel, P. (2003b): *Discours préliminaire en préface de la traduction italienne de Le Dottrina degli Azzardi applicata ai Problemi della Probabilità della Vita, delle Pensioni Vitalizie, Reversioni, Tontine, ec. d'Abraham de Moivre, par les pères Roberto Gaeta et Gregorio Fontana* in Martin, Th. (dir.) *Arithmétique politique dans la France du XVIII^e siècle*, Paris: INED, 262-304, 2003
- [28] Cullen, M. J. (1975): *The statistical movement in early Victorian Britain: the foundations of empirical social research*, New York, Barnes and Noble, 1975
- [29] Cunha, A. M. (2011): *Polizei and the system of public finance: tracing the impact of Cameralism in eighteenth-century Portugal* in *The dissemination of economic ideas*, Kurts, H.-D., Nishikawa, T., Tribe, K., eds., 65-86, Cheltenham: E. Elgar, 2011
- [30] Da Cunha de Azeredo Coutinho, J. J. (1794): *Ensaio económico sobre o comércio de Portugal e suas colónias*, Lisboa, Academia Real das Ciências, 1794
- [31] De Bruyn, F. (2004): *From Georgic poetry to statistics and graphs: eighteen-century representations and the "state" of British society*, *The Yale Journal of Criticism*, 17(1) 107-139, 2004
- [32] De Feller, F.-X. (1784): *Dictionnaire historique, tome sixième*, Ausbourg: Rieger, 1784
- [33] De Feller, F.-X. (1797): *Dictionnaire historique de Biographie universelle, tome second*, 2nd edition, Liège: Lemarié, 1795
- [34] De Jócana y Madaria S. (1793): *Disertación crítica y apologética del arte de llevar cuenta y razon contra la opinion del Baron de Bielfeld, acerca del arte en general y del metodo llamado de Partidas dobles en particular.*, Madrid: Ortega, 1793
- [35] Deane, P. (1987): *Political Arithmetic* in *The New Palgrave: a dictionary of Economics, volume 3*, Eatwell, J., Milgate, M., Newman, P., eds., 900-903, London: Macmillan, 1987

- [36] Euler, L. (1923): *Opera Omnia, series prima, opera mathematica, vol. 7*. L. G. du Pasquier ed., Berlin, Teubner, 1923.
- [37] Federer, W.T. (1991): *Statistics and Society: Data Collection and Interpretation*, 2nd ed., New York: Dekker, 1991
- [38] Feldman, J. (2005): *Condorcet et la mathématique sociale. Enthousiasmes et bémols*, Math. Sci. Humaines 43(172) 7-41, 2005
- [39] Felice, F. B. (1778): *Arithmétique Politique* in *Code de l'humanité ou la législation universelle, naturelle, civile et politique, Tome I* 512-538, Yverdon: De Felice, 1778
- [40] Formey, (1770): *Éloge de M. de Bielfeld* in *Histoire de l'Académie royale des sciences et des belles-lettres pour l'année MDCCLXX* 68-74, Berlin: Voss, 1772.
- [41] Gautieri, G. (1804): *Sulla necessità di stabilire una direzione generale per lo scavo delle miniere, e de' fossili et per le manifatture loro relative*, Milano: Agnello, 1804
- [42] Gouraud, C. (1848): *Histoire du calcul des probabilités depuis ses origines jusqu'à nos jours*, Paris: Durand, 1848
- [43] Grimm, F. M., Diderot, D. (1829): *Correspondance philosophique et critique de Grimm et de Diderot depuis 1753 jusqu'en 1790, volume 1*, Paris: Furne, 1829
- [44] Guizot, F., Beuchot, A. J. Q. (1811): *Bielfeld (Jacques-Frédéric, Baron de)*, in *Biographie Universelle ancienne et moderne, tome quatrième*, Michaud, J. F. ed., 473, Paris: Michaud
- [45] Guy, W. A. (1865): *On the original and acquired meaning of the term "Statistics," and on the proper functions of a statistical society: also on the question on whether there be a science of statistics; and if so, what are its nature and objects, and what is its relation to political economy and "social science"*, J. Statist. Soc. London, 28(4), 478-493, 1865
- [46] Hacking, I. (1984): *The Emergence of Probability: A Philosophical Study of Early Ideas about Probability, Induction and Statistical Inference*, Cambridge: Cambridge University Press, 1984
- [47] Hacking, I. (1990): *The taming of chance*, Cambridge: Cambridge University Press, 1990

- [48] Hacking, I. (1991): *How should we do the history of statistics?*, in Burchell, G., Gordon, C., Miller, P. eds. *The Foucault effect*, 181-195 Chicago: University of Chicago Press, 1991
- [49] Hald, A. (2003) : *A history of probability and statistics and their applications before 1750*, New York: Wiley, 2003
- [50] Hamilton, A. (1880): *Rheinsberg: memorials of Frederick the Great and Prince Henry of Prussia, volume I.*, London: Murray, 1880
- [51] Headrick, D. R. (2000): *When information came of age; Technologies of Knowledge in the Age of Reason and Revolution 1700-1850*, Oxford: Oxford University Press, 2000
- [52] Hecht, J. (1987): *L'idée de dénombrement jusqu'à la Révolution* in *Pour une histoire de la statistique, Tome I: contributions*, Affichard, J. and Bédarida, F., eds., Paris: Insee/Economica, 1987
- [53] Heuschling, X. (1845): *Bibliographie historique de la statistique en Allemagne*, Bruxelles: Decq, 1845
- [54] Hilts, V. L. (1978): *Aliis exteendum, or, the origins of the Statistical Society of London*, Isis 69(1), 21-43, 1978
- [55] Hoefler, F. (1853): *Nouvelle biographie universelle*, tome sixième, Paris: Didot, 1853
- [56] Hyamson, A. M. (1916): *A dictionary of universal biography of all ages and of all peoples*, London: Routledge, 1916
- [57] John, V. (1883): *The term "Statistics"*, J. Statist. Soc. London, 46(4), 656-679, 1883
- [58] Johnson, N. L., Kotz, S. (1997): *Leading personalities in statistical sciences: from the seventeenth century to the present*, New York, Wiley, 1997
- [59] Kersseboom, W. (1738-42): *Essais d'arithmétique politique*, Paris: INED, 1970
- [60] Klyve, D. (2013) *Darwin, Malthus, Süßmilch and Euler: the ultimate origin of the motivation for the theory of natural selection*, J. Hist. Biol. doi:10.1007/s10739-013-9366-8, 2013

- [61] Laudin, G. (2009): *Berlin 1700-1929: Sociabilités et espace urbain*, Paris: l'Harmattan, 2009
- [62] Martin, Th. (2003): *Arithmétique politique dans la France du XVIII^e siècle*, Paris: INED, 2003
- [63] Maunder, S. (1838) *A dictionary of universal biography*, London: Longman, 1838
- [64] Meusel, J. G. (1790): *Litteratur der Statistik*, Leipzig: Fritich, 1790
- [65] Muñoz, J. B. (1778): *Juicio del tratado de educacion del M.R.P.D. Cesareo Pozzi*, Madrid: Ibarra, 1778
- [66] Nalimov, V. V. (1981): *In the labyrinths of language: a mathematician's journey* Philadelphia: ISI Press, 1981
- [67] Oliva, N. (ed.) (1830) *Historia universal o Biografia universal compendiada, tomo segundo* Barcelona: Oliva, 1830
- [68] Pearson, K. (1921): *The History of Statistics in the 17th & 18th Centuries against the changing background of intellectual, scientific and religious thought*, Pearson, E. S. ed., London: Griffin, 1978
- [69] Plackett, R. L. (1986): *The old statistical account*, J. R. Statist. Soc. A, 149(3), 247-251, 1986
- [70] Playfair, W. (1802) *Élemens de Statistique*, D. F. Donnant trad., Paris: Batillot, 1802
- [71] Pollin, B. R. (1980): *Empedocles in Poe: A Contribution of Biefeld*, Poe Studies, 13(1), 8-9, 1980
- [72] Reinert, E. S. (2009): *Emulating success: contemporary views of the Dutch economy before 1800*, in Gelderboom, O. *The political economy of the Dutch republic*, Farnham: Ashgate, 19-40, 2009
- [73] Reinert, E. S. (2013): *Jacob Bielfeld's "On the decline of states" (1760) and its relevance for today*, Working Papers in Technology Governance and Economic Dynamics no. 47, 2013
- [74] Robinet, J.-B. (1778): *Dictionnaire universel des sciences morale, économique, politique et diplomatique ou Bibliothèque de l'homme-d'état et du citoyen, Tome sixième*, Londres: Libraires associés, 1778

- [75] Robinet, J.-B. (1779): *Dictionnaire universel des sciences morale, économique, politique et diplomatique ou Bibliothèque de l'homme-d'état et du citoyen, Tome huitième*, Londres: Libraires associés, 1779
- [76] Robinet, J.-B. (1783): *Dictionnaire universel des sciences morale, économique, politique et diplomatique ou Bibliothèque de l'homme-d'état et du citoyen, Tome vingt-neuvième*, Londres: Libraires associés, 1783
- [77] Sánchez-Blanco, F. (2003): *El barón de Bielfeld. Absolutismo prusiano y absolutismo español*, in *Von Spanien nach Deutschland und Weimar-Jena Verdichtung der Kulturbeziehungen in der Goethezeit*, Briesesmeister; D., Wentzlaff-Eggebert, H. eds., Heidelberg: Universitätsverlag, 17-34, 2003
- [78] Sayous, P. A. (1861): *Le dix-huitième siècle à l'étranger: histoire de la littérature française dans les divers pays de l'Europe depuis la mort de Louis XIV jusqu'à la Révolution française, Tome second*, Paris: Amyot, 1861
- [79] Sinclair, J. (1791): *The statistical account of Scotland, volume first*, Edinburgh: Creech, 1791
- [80] Sinclair, J. (1798): *The statistical account of Scotland, volume twentieth*, Edinburgh: Creech, 1798
- [81] Sinclair, J. (1831): *The correspondence of the right honourable Sir John Sinclair, Bart., volume I*, London: Coburn and Bentley, 1831
- [82] Sinclair, J. (1837): *Memoirs of the life and works of the late Right Honourable Sir John Sinclair, bart., volume II*, Edinburgh: Blackwood, 1837
- [83] Spengler, J. J. (1942): *French predecessors of Malthus; a study in eighteenth-century wage and population theory*, Durham: Duke University Press, 1942
- [84] Smith, D. P. (1977): *An Euler contribution to stable theory from Süßmilch's Göttliche Ordnung*, *Theor. Pop. Biology* 12, 246-252, 1977
- [85] Smollett, T. G. (1770): *The Critical Review, Or, Annals of Literature*, Vol. 30, London: Hamilton 1770
- [86] Stangeland, C. E. (1904): *Pre-Malthusian doctrines of population: a study in the history of economic theory*, New York: Columbia University Press, 1904

- [87] Steffenhagen, E. J. H. (1875): *Bielfeld, Jakob Frierich Freiherr von*, in *Allgemeine Deutsche Biographie Bd.: 2*, Leipzig: Balde-Bode, 624, 1875
- [88] Studenski, P. (1961): *The income of nations, part one: history*, New York: New York University Press, 1961
- [89] Süßmilch, J. P. (1741-77): *L'ordre divin, aux origines de la démographie, volume I*, translated and annotated by Hecht, J., Paris, INED, 1979
- [90] Thomas, J. (1870) *Universal pronouncing dictionary of biography and mythology*, Philadelphia: Lippincott, 1870
- [91] Todhunter, I. (1865): *A history of the mathematical theory of probability from the time of Pascal to that of Laplace*, Cambridge: Macmillan, 1865
- [92] Towers, J. (1788): *Memoirs of the life and reign of Frederick the Third, king of Prussia* Two volumes, London: Dilly, 1788
- [93] Tribe, K. (1988): *Governing Economy: the reformation of German economic discourse, 1750-1840*, Cambridge: Cambridge University Press, 1988
- [94] Willcox, W. F. (1914): *Cooperation between academic and official statisticians*, Publications of the American Statistical Association, 14(108), 281-293, 1914
- [95] Young, A. (1770): *A six month tour through the North of England*, London: Strahan, 1770
- [96] Zambelli, B. V. (1823): *Saggio sulla introduzione enciclopedica allo studio politico-legale Vol. I*, Bergamo: Mazzoleni, 1823
- [97] Zimmerman, E. A. W. (1787): *A political survey of the present state of Europe, in sixteen tables*, London: Dilly, 1787