# J. N. MÜLLNER AND THE BEGINNINGS OF DEMOGRAPHIC STATISTICS IN THE CZECH LANDS

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**Abstract**

At the beginning of the last two decades of the 18th century there were developed the scientific and publishing activities in the field of new scientific discipline in the Czech Lands (especially in Bohemia) – the statistics. Great attention that most authors gave to the population statistics was not random. It was based on the former state ideology of the Habsburg monarchy. This ideology was the mercantilist populationism. While in the works and publications by J. A. Riegger and his colleagues there was presented the population optimism, in the following years we can also recognize the concerns about the excessive population growth, especially the growth of non-wealthy population. This paper mainly deals with the remarkable work of J. N. Müllner: "Versuch einer statistischen Geographie von Böhmen", (published in Prague, 1805), especially in applied statistical methods. These methods and approaches will be compared with the works of the author's predecessors and contemporaries.

**Key words:** demographical statistics, mercantilist populationism, historical demography, J. N. Müllner, population growth

**JEL Code:** B31, B41, J18

## Introduction

A remarkable contribution by J. N. Müllner about the initial development of statistical methods in the Czech Lands (Müllner, 1805) is not well known in the history of our statistical science. This is due to the fact that only few historians of statistics focused on the history of official statistics, (especially on its institutional development), and then to teaching statistics at the universities, (especially the department staffing)[1]. The amount of geographical information about the Bohemia, of course, did not escape the attention of the cultural historian and bibliographer Čeněk Zíbrt, who provided a detailed review about the Müllner's

[1] An exception is the work of co-author of this paper (Závodský, 1992). About the department stuffing and teaching statistics at the universities more talks e.g. Závodský, (2013), or Závodský, Šimpach (2013).

publications in the first part of his monumental bibliography (Zíbrt, 1900, p. 95). Similarly, the brief description of Müllner's work (in relation to the Czech homeland studies) was provided by historian and historical geographer František Roubík (Roubík, 1940, p. 41-42). Müllner's population opinions were periodically included into the historical context of historical demography by Alena Šubrtová (Šubrtová, 1985 and 1989). The aim of our paper is to describe Müllner's contribution to the development of statistical methods in the Czech Lands and include it into the context of the development of demographic statistics.

## 1 The beginnings of the demographic statistics in the Czech Lands

The oldest stage of the development of statistical theory in our country is associated with the university statistics - a direction that was especially in 18th century primarily distributed across the Central European Universities. Recall that this distribution was a systematic description of the different states and countries, especially in terms of the state law and geographic backgrounds. Initially there were used the verbal descriptions only, the numerical data were used at first to illustrate the text only. The "author of name" of this science - *statistics* (1749)[2] was "the father of statistics" Gottfried Achenwall (1719–1772), his successor at the University of Göttingen became August Ludwig Schlözer (1735–1809) later (Mader, 1793).

Entirely out of the university statistics were developed the methods of political arithmetic just from the 17th century. The author of the name of this discipline was an Englishman, William Petty (1623–1687), who followed the ideas and methods of John Graunt (1620–1674). They and their followers (especially in the Western European countries) tried to find the regularities particularly in the population reproduction, but unfortunately, often based on very incomplete and inaccurate data. After the abolition of censorship in our countries under the reign of Josef II become the most famous publication in the field of political arithmetic the book by J. P. Süssmilch: *Die Göttliche Ordnung* (1st edition, 1741) (see e.g. Maur, 1974). Political arithmetic was not constituted as a separate branch of science until their integration into the modern statistical science (about half of the 19th century), and it was not taught at the universities. It was developed by mathematicians as an application of probability theory, but mainly by amateur enthusiasts (Mr. Graunt was a businessman, Mr. Süssmilch was an evangelical priest).

[2] As an adjective ("statisticus") was used in Medieval Latin earlier.

Some influence of the political arithmetic on the Achenwall's statistics can be seen in the direction of the "table statistics", that instead of extensive interpretations characterized the states and territorial units by short information (numerical or verbal), often clearly arranged in the tables. Statisticians also more often complemented the verbal descriptions by the numerical information[3] and even by the results of the calculations of political arithmeticians. Statisticians sometimes borrowed the methods from them (especially since the end of 18th century) – the first calculation of the relative numbers and later also the estimates of population growth, etc. These works produced the strong opposition by followers of traditional Achenwall's statisticians, their authors were called as "Tabellenknechte" (knaves or table slaves).

At the Prague Charles-Ferdinand University were included the statistical lectures according to Achenwall's influence in 1775. The solid level was reached after the onset of prof. Joseph Mader (1754–1815) in 1779. He lectured in German, by the living language of Enlightenment science, although the official language of teaching was Latin until the 1784. Mader also participated the ongoing polemic (especially German statisticians) about the theory and methods of statistics (Mader, 1793). Mader participated the work of the proceedings, which were published from 1787 by Josef Antonín, the Knight Riegger (1742–1795)[4] together with his circle of friends from the Masonic Lodge (Riegger, 1787 and 1792). A total of 15 volumes of almost four thousand pages contain nearly three hundred articles and small reports, related to the former state and to the history of Bohemia, and therefore, according to the contemporary notions it belongs to the Bohemian statistics[5]. Just from the 1st volume deal the series of contributions with the population statistics. From many articles is apparent the authors penchant in numerical information[6] and publishing data in sophisticated tables. From the elementary statistical methods we can mention except the relative numbers also the occasional usage of averages. The remarkable are e.g. the average prices of grains, recalculated for 48 market towns in the Czech Lands during the years 1774–1782[7].

The aim of Riegger's and his friends work was to publish the complete statistics about the Bohemia in the spirit of Achenwall's and Schlözer's learning. Unfortunately, it happened three decades later by the work of the next generation of statisticians. Riegger in the year of

[3] It was also related to the increasing availability of this data.
[4] He is often called the father of Czech Statistics.
[5] Today we should include them into the statistics, geography, history, as well as natural sciences, literary history, etc.
[6] E.g. the list of forbidden books by censorship is supplemented by data about the total weight of publications submitted for censorship.
[7] Compared by Riegger, *Materialien, VII*, p. 165-170.

his death published the unfinished attempt of the description of Bohemia statistics only (Riegger, 1795). The application of simple methods of political arithmetic was further improved, especially in the chapter about the population. Riegger his calculations accompanied by the commentary about the appropriateness of usage a political arithmetic (Politische Rechenkunst), because the political arithmetic "may make the information about the population reproduction and about the growth of state forces" (Riegger, 1795, p. 90-91). In addition to the frequent usage of averages in this chapter there also occurs the wide range of relative numbers[8] used not only to characterize the intensity of various phenomena (e.g. number of inhabitants or houses per square mile, etc.), but also for the spatial, material and most of for the time comparison of its intensity. There is compared over time (year 1793 to the year 1789) the proportion of males and females in the population, the ratio of nobility to the rest of the population, the ratio of Jews to Christians and also the ratio of "producers" to "consumers". The examples of substantive comparisons of the relative numbers is e.g. the comparison of male (1:31) and female (1:34) mortality, and various indicators of Christians and Jews (e.g. the ratio of births to the rest of the population, marital births to the population living in marriage, etc.). Although these calculations do not reach the level of analysis by leading European political arithmeticians, it is necessary to emphasize the pioneering character of Riegger's work and to include them among the founders of the demographic statistics in our country.

Interesting statistical tables, which characterized the agriculture conditions, forestry and food supplies in the Czech lands and which was also supplemented by the balance in this field, were published by František Fuss in 1797. At this time, the statistics using elementary methods of political arithmetic became the subject of interest by the wider intellectual circles, as is shown in the occasional publications by A. G. Meissner, J. Melič (more in Závodský, 1992, p. 38-41 or Závodský, 1995) and also by already mentioned J. N. Müllner.

## 2 The work of J. N. Müllner

The personality of J. N. Müllner is practically unknown, unclear is also his full name and in the title of our paper we introduced the shortcuts of first names only: J. N. We unsuccessfully searched after him in the renowned biographical dictionaries and encyclopaedias (Otto, Wurzbach, Österreichisches biographisches Lexikon 1815–1950 etc.). The only one exception

[8] If we have not overlooked something, the first usage of the relative numbers for data analysis can be already found in the chapter „Příspěvek k stanovení národního charakteru" – „Contribution to the determination of national character" in Archive I, p. 404-415, where is not only compared the criminality in particular years, but also there are counted the indicators such as "number of heads per 1 crime", etc.

is the 14th volume of monumental bibliography, established by Göttingen professor G. CH. Hamberger[9], which although does not provide life data and other information, commonly referred about the authors, but mentions his first name as Joseph Nepomuck. Various scientific libraries in Europe[10] have taken this first names into their catalogues probably from this source, some of them with a question mark.

Publication of J. N. Müllner: *Versuch einer statistischen Geographie von Böhmen* was published in 1805 (the preface is just dated on 27th June 1803). Before, in 1796 also in Prague, was published the remarkable guide to the conversion of money and other measurement units (Müllner, 1796), as the author of the book is written Joh(ann) Nikol(aus) Müllner, Ingenieur. The authors of both publications presented a good knowledge of the history of Bohemia and also realities of this country, they combined the historical interpretation with a number of arithmetic calculations (especially the various ratios and indices) and generalized considerations. This all leads us to the conclusion that it is probably the same person who could have any job in official position between the 18th and 19th century in Bohemia[11].

Let us return to Müllner's Statistical geography from 1805. Publications has a range of 14 + 385 pages and consists of three parts, only the first one (p. 1-78)[12] deals with demographic issues. Author discusses the long-term population development in the Czech Lands and expects the greater population density in earlier times (namely the late 16th century)[13]. He explains the importance of the census, established by Marie Terezie and reprints her patents. Let us also remember that the principle of state policy during the reign of Marie Terezie and Josef II was populacionism – the care about the quantitative growth of population as well as its quality, which should ensure the economic prosperity of the state (by the increasing labour supply and the number of consumers – "Ubi populus, ibi obulus"), and its defence (enough skilled recruits). As a preparation for further and deeper analysis, Müllner firstly shows the tables with results of the population census in 1798 – sorted by region,

[9] Hamberger, G. CH. *Das gelehrte Teutschland oder Lexikon der jetzt lebenden teutschen Schriftsteller … Fortgesetzt von J. G. Meusel, XIV*. Band, Lemgo 1810, p. 628.

[10] National Library refers in the historical card catalogue on the first names from the 14th volume of Hamberger's bibliography.

[11] Designation "Ingenieur" (and often more deeply into the 19th century) could mean many things at the time. The precise conditions for the usage of the Estate designation "engineer" determined in the Czech Lands just the emperor regulation in the 14th March 1917. *Gesamtverzeichnis des deutschsprachigen Schrifttums 1700-1910* knows the only one German writing author with name J. N. Müllner, presents him as Joseph Nepomuck and assigns to him the two above mentioned publications (volume 100, p 441).

[12] The second part focuses on cities, farms, etc., including also the historical development and the extensive lists, the third part focuses on the Churches. Statistical analysis are not included in these parts.

[13] The same opinion had F. Palacký a quarter of century later, particularly in article: *Gradation der Bevölkerung Böhmens seit den letzten 60 Jahren. Monatschrift der Gesellschaft des vaterländischen Museums in Böhmen, III*, 1829, p. 187-205.

gender and other criteria. This allowed the calculation of a significant amount of relative numbers: for example:

- the ratio of females on the rest of the population was $1:1\frac{11}{12}$,
- the ratio of females on males was $1:\frac{8}{9}$, which meant that there were 80 females on 71 males.
- The ratio of the most populous (Boleslavský) region on the total population was $1:10\frac{1}{9}$ or $\frac{31}{320}$ etc.[14]

The following is a calculation of the relative numbers which compare Bohemia with the countries of the Habsburg monarchy and the former German states according to size and number of inhabitants. Other Müllner's analysis are based on data about the natural population change within 10 years (1791–1800), which was a period without major epidemics and similar disasters. After justification for the usage of averages (Mittelzahle, Durchschnitte) to eliminate the fluctuations in data, author calculates the average population growth not only per year, but also per day, per hour and per generation (48 years, which is the average age, which according to author lived the inhabitants on the earth)[15].

Variety of numerical calculations in the text are intertwined with the author's reflections on the regularities of population development. Contrary to the prevailing population optimism in all monarchy is Müllner more critical about the possibility of permanent population growth. "In the system of nature, created by power of God, there are enshrined certain restrictions to prevent the excessive growth. So usually once every 40–50 years there are the wars, epidemics and other disasters that removes the previous increase of population" (p. 32-34). Specific obstacles to population growth in the country Müllner sees in the concentration of population in large cities, where it is permanently passive population balance[16]. Author determines the possibilities of population growth (not unlimited) by the successful development of the economy (especially agriculture), he criticizes the current state (parcelling large estates, church tithes and especially "die Roboth") and he also proposes the

[14] Nowadays the reader may be surprised by unwieldy nature of the ratios, in which are normally compared the different values in the denominator. (Using of decimal numbers and percentages occurs in our statistics more than half a century later). The calculated ratios are often approximate and sometimes can be detected the numerical errors.

[15] Here we found the numerical error (instead of 1,653,536 should be 1,453,584) – p. 26-28.

[16] Author presents a number of causes, including higher child mortality in cities where breastfed nurses (numerical data from an unknown source), the bohemian life (including an exhausting dances) and "heavy air" due to the concentration of people, cattle, fires and rotting of corpses in the cemeteries (in Prague there was an average of 4,110 per year) - p. 28-32.

appropriate measures. Here he performs the calculations for ensuring food for the population with various scenarios of sown area and grain yield potential. Analyses concerning the Bohemia are compared with the situation in other European countries and he also deals with the international food trade and with the possibility to use the surplus of the European population (created by the colonization of overseas territories). Author alternates the optimism with pessimism when he provides the analysis and considerations. "Technological progress and industrial development are limited by a lack of capital and skilled people, who often support mainly luxury and unnecessary human needs and thus it leads to doom and destruction" (p. 38-39). Similarly, "new ideas often bring more evil than good and lead to the shedding of blood in wars", which Müllner demonstrates by example from the history of Hussites and also by reference to the recent development in France (p. 39).

Let us remind some other statistical calculations in this part of publication. The previously mentioned results of conscriptions from 1798 led the author to calculation various structural relative numbers and substantive and spatial indexes. So e.g. from the determined number of priests he calculated the number of souls per 1 priest (671–672), but also the ratio of priests on the total number of males (1:315–316) and also he examined that from 186 adult males (excluding Jews) is only one priest (p. 26-27). Similarly, there are compared with each other the annual data about the marriages, births and deaths, of course with a population in total and with a population in each particular groups. A curiosity is calculated ratio of deaths and marriages[17].

The last Müllner's more extensive calculations in his publication is to determine the approximate size of the regions in Bohemia based on geographical coordinates[18], which allowed him, among others, to calculate the proportion of individual regions in the area on the whole country and also the number of people per square mile (the highest population density was calculated for the Hradec Králové region, the smallest for Budějovický region - p. 67-68).

## Conclusion

Based on the foregoing discussion, we can include Müllner's publication and its author among the pioneers of statistical methods in the Czech Lands. He primarily continued and followed the work of Riegger and his colleagues. Methods which he used in the analysis of possibilities to provide nutrition of growing population seem like analysis by František Fuss (but Müllner his work did not cite).

[17] „4 Leichen auf eine Hochzeit", exactly 11:45 (p. 27).
[18] He was probably really "Ingenieur" (see also Footnote 11).

Müllner together with his work also influenced the history of demographic thought in our country. He is different from Riegger and from most of contemporary populacionists, he showed serious concerns about the negative consequences of the long-term population growth and came close to opinions of English population scientist Malthus, who was not ever cited by Müllner and probably was not by Müllner even known.

After two decades of a downturn raised the new generation of the remembered founders of the Czech statistics. It was represented by Schnabel, Stelzig, Czoernig and other.

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