

THE STATE STATISTICAL OFFICE AND THE FIRST CZECH TEXTBOOKS ON STATISTICAL METHODS

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Abstract

In 2019, Czech and Slovak statisticians commemorate the 100th anniversary of the founding of the State Statistical Office (SSO). During the inter-war period, the Office employed around 700 permanent employees. The conceptual officials were required with at least statistical education, publishing activity in the field respectively.

At the beginning of 20s of the 20th century, there was no textbook of statistical methods in the Czech language. First there were published two treatises on modern methods of statistics by V. Láska (1921) and J. Mráz (1922) in the scientific journal (published by the SSO) *Československý statistický věstník*. Then the SSO initiated the translation of an extensive publication by G. U. Yule, a representative of the English biometric school *Introduction to the Theory of Statistics* and published it at its own expense in 1926. The translators (Josef Mráz from the SSO and professor from Brno Vladimír Novák) thus contributed to creating of Czech statistical terminology. The first original Czech textbook on modern statistics was published by the SSO in 1929. It was *Základy teorie statistické metody* (The Basics of Theory of Statistical Methods) by Stanislav Kohn (born in Warsaw).

Key words: State Statistical Office, Statistical Methods, Statistical Textbooks

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Introduction

The history of statistics in our country is not yet comprehensively processed. The authors of this paper are trying to gradually contribute to the improvement of this state by a number of partial articles on the development of statistics in XIX. and XX. century – Závodský and Šimpach (2014, 2016, 2017, 2018), Kodera, Závodský and Šimpach (2015) etc.

The year 2019 is the jubilee year for Czech statistical office and the Statistical Office of the Slovak Republic, as exactly 100 years ago was founded in newly established Czechoslovakia the State Statistical Office, their direct predecessor. The establishment of the

Czechoslovak state statistical service in the last century concerned a number of authors (the latest publication was by Závodský and Šimpach (2019)) in scientific statistical literature, often on the occasion of individual round anniversaries. In this paper, we discuss the first Czech publications on statistical methods that were published, mostly by the State Statistical Office, in the first decade of its activities.

1 The beginnings of the state statistical service of Czechoslovakia

The need for a proper state statistical service in the newly established Czechoslovak state was widely recognized, but in the turbulent times of 1918–1919 its codification was often challenged and delayed. Thanks to a longtime head of Land Statistical Office in Prague Dobroslav Krejčí (1869–1936) and professor of national economy on Czech Technical University in Brno Karel Engliš (1880–1961) was managed to promote a framework Law on the organization of the statistical service (No. 49/1919 Coll.) in the Revolutionary National Assembly already on 28 January 1919. Both were the main authors of the law.

In contrast to the present state of the Austrian part of the Habsburg monarchy, official statistics in Czechoslovakia was centralized in the State Statistical Office (SSO). This office was subject directly to the Prime Minister and the law also set the reporting duty of natural and legal persons in the Republic (including possible sanctions in case of non-compliance). At the same time, consistent protection of provided individual data, which SSO was not allowed to provide to other state authorities, was also enacted. Quality data are today collected for example by Eurostat (Markowicz and Baran, 2019). On the fundamental issues of state statistics management, the Statistical State Council (SSC) decided to act as an advisory and quorum body. SSO was appointed by the law as executive body.

This Act on Czechoslovak state statistics resisted later criticisms and proposals for its revision and finally was applied throughout the interwar period. But it was very brief (only 10 paragraphs) and in specific cases referred to future government regulations. Given many internal political problems and the protracted conflict with the Hungary government (new since July 1919) constantly postponed the solution to this issue. Only on 28 November 1919 the statutes of the SSC and the statute of the SSO were approved by the government regulations, without which these bodies could not work.

Members of SSC were appointed from representatives of ministries and other central offices, representatives of universities and technical universities, local authorities, and statistical experts, including senior SSO representatives. Plenary meeting of SSC approved the

annual work plan of SSO, that was mandatory for all persons and institutions that were subject to reporting requirements. Only the government could abolish the SSC resolution.

The SSO, which basic became small Land Statistical Office, was gradually expanding under the leadership of D. Krejčí. The number of personnel was growing from 34 to 220 during year 1919. Long-term postponement of the resolution of the state statistical service has led to the resignation of Krejčí. Situation was solved only in February 1920 by the acceptance of his resignation.¹ Professor of Constitutional Law at University in Brno, František Weyr (1879–1951), was appointed to the management of the SSC and SSO. In March, the first meeting of the SSC took place, which approved the SSO's work plan for 1920 and elected members of the 14 SSC committees for various sectoral statistics. The number of SSO employees continued to increase, reaching 505 at the end of 1920.

2 Statistical theory in Czech literature

In the early years SSO had to deal with a number of problems. One of the greatest was the qualification of the workers. SSO took over only a small number of experienced employees from the Land Statistical Office, moreover, most of the statistical fields was a novelty for Czech experts, until then they were the responsibility of the Vienna authorities. Specialized statistical studies have not yet existed in our country. Most of the graduates of law faculties became SSO conceptual officials, where statistics were only a marginal subject and methods of statistical work were not taught at all. Management of SSO since 1921 has been conducting statistical methods courses in which lectured leading experts from the office. According to the Governmental regulation on practical statistics exams (from 9 February 1921, No. 55/1921 Coll.) the examining board was appointed in the same year by the prime minister under the leadership of SSO vice-head Jan Auerhan.

The great difficulty was the absence of Czech literature on statistical methods, in the world rapidly developing. There were only publications of "Father of Czechoslovak Statistics" D. Krejčí, mainly engaged in the popularization of statistics and the organization of statistical data collection, especially in agriculture.² A brief publication of a lawyer and author of numerous popularizing manuals František Kubec also does not include the explanation of statistical methods.³ Associate professor at Czech Technical University in Prague Josef Beneš, was then our leading expert in probability theory and in particular actuarial theory, but his brief

¹ Krejčí then lectured statistics at the Faculty of Law of the newly established Masaryk University in Brno.

² Primarily Krejčí (1920) and new, significantly extended edition of year 1923.

³ Kubec (1917).

booklet *O statistice a její teorii, o vědách a zájmech, s nimiž souvisí* (1920) is somewhat confusing and for the laymen little instructive.

SSO published already since year 1920 scientific journal *Československý statistický věstník*. Polyhistoric in the area of natural sciences, Václav Láska (1862–1943), published here an extensive article on the sequel,⁴ where he explained some problems of modern mathematical statistics. However, the article is incomprehensible to readers without mathematical education. The greatest interest in modern statistical methods among SSO executives expressed Josef Mráz (1882–1934).⁵ He presented to the Czech reader by an extensive paper an important theoretical work of Belgian statistician Armand Julin *Principes de statistique théorique et appliquée* (1921).⁶

Fig. 1: George Udny Yule



Source: Yule (1926), p. 0.

The great progress was the translation of extensive publications of the representative of the English biometric school into Czech G. Udny Yule *Introduction to the Theory of Statistics*

⁴ Láska (1921), also published as a separate publication.

⁵ In order to master the methods of mathematical statistics, he enrolled as a 40-year-old graduate in law to the course of higher mathematics at the University. In year 1929 he was appointed a vice-head of SSO.

⁶ Mráz (1922).

(7th edition from year 1924).⁷ Translators were: professor at Czech Technical University in Brno, Vladimír Novák (1869–1944), and Josef Mráz. Translation was initiated and issued by SSO. By translating this extensive book (over 500 pages), both named scientists have contributed to the creation of Czech statistical terminology,⁸ that is mainly used till nowadays. Let's state e.g. terms: *směrodatná odchylka* (standard deviation), *regrese* (regression), *korelace* (correlation), *kontingence* (contingence) and others.

Fig. 2: Josef Mráz (left picture) and Fig. 3: Vladimír Novák (right picture)



Source: Sekanina, F., ed. (1927). *Album representantů všech oborů veřejného života československého*. Prague: Umělecké nakladatelství Josef Zeibrdlich, pp. 182 and 352.

3 Stanislav Kohn and his textbooks

The first original Czech textbook of statistical methods was also published by SSO three years later. These are *Základy teorie statistické metody* (The Basics of Theory of Statistical Methods) by Stanislav Kohn.⁹ They are about the same size as Yule's work, but they are more modern, more understandable, better capture the latest developments in statistics around the world and include a wider range of statistical methods.

⁷ Yule (1926).

⁸ They could only partially follow up on the above-mentioned publications, especially on Mráz (1922).

⁹ Kohn (1929).

Stanislav Kohn was born on 2 September 1888 in Jewish family in Warsaw (then belonging to Tsarist Russia). He studied mainly at the Faculty of Economics of the Polytechnic in St. Petersburg, which was at the top level. He worked as a statistical expert in the Ministry of Agriculture and since 1918 as a lecturer in national economy and statistics in Tiflis (today Tbilisi). The liquidation of the Polytechnic and the Bolshevik regime forced Kohn to leave Russia. From January 1921 he lived in Paris, where he dealt with both the national economy and the demographic and social issues in Soviet Russia.

Fig. 4: Stanislav Kohn



Source: Mráz (1933), p. 162

In 1923 Kohn decided to move to Prague, which was the center of educated Russian and Ukrainian exile in the 1920s. In year 1922 there was founded Russian Law Faculty and Kohn here lectured the statistics as a private associate professor. He was also a longtime collaborator of the Economics Institute of the Russian professor S. N. Prokopovitsch and also of the Agricultural Institute of V. Brdlík, where he among other things, developed the theory and the practical side of sampling methods in agriculture.

Kohn lived in Prague the ten most fruitful years of his life. He has published a number of articles on theoretical and applied statistics and in the years 1924–1925 several contributions

to the scientific discipline that was in the world only in the beginning - to econometrics. About Kohn's international response ¹⁰ witnesses that he became in year 1930 a founding member of The Econometric Society in the USA. Kohn was elected as a member of other international scientific societies. He was also offered membership by the English Royal Economic Society. In spring 1931 Kohn fell seriously ill and on 3 February 1933 died at the age of almost 45. He is buried at the New Jewish Cemetery in Prague, near the grave of Franz Kafka (sector 22, row 6, grave 8).

Let's go back to Kohn's extensive textbook (17 + 483 pages). Its name is based on the fact that A. A. Tschuprov and his students declared statistics as a special methodological science – the theory of statistical method. The first part of the book is devoted to descriptive statistics, which includes the theory of indexes. The second, much larger part, entitled *Statistické badání o příčinných spojeních* (Statistical research on the causal relations) deals primarily with probability theory and regression analysis (including the examination of dependencies between qualitative characteristics) and also the analysis of time series.

The core of Kohn's textbooks were his lectures in Georgia, but he reworked and expanded them. A completely new chapter is the treatise on time series. Here Kohn draws on the latest works of the Harvard School, as well as its critics and discusses, among other things, the issues of time series correlation, delayed correlation, etc. It is the first systematic interpretation of this issue in Czech literature. Similar it is in the chapter on indexes, where Kohn's interpretation is based on the latest American, German, and other statisticians.

Especially in these original chapters, Kohn's textbooks contributed to the development of Czech statistical terminology. Of course, assoc. prof. Mráz and prof. Schoenbaum¹¹ (to a lesser extent, other persons, mostly from the SSO staff) have also the credit, as they helped Kohn with the preparation of the Czech text of the book.

Although Kohn's textbook was published in Czech and not in one of the languages of world science it attracted great attention abroad. For example, professor in Berlin L. v. Bortkiewicz (1868–1931), who, despite his enormous erudition, has never taken the decision to write a comprehensive work on statistics, expressed his astonishment at the amount of the subject matter and recommended to translate the work into German.

In answering the question of the great international response of Kohn's book, the following fact should be recalled: the individual statistical schools have traditionally developed quite separately in Europe - the fields in which the statistical methods have developed, as well

¹⁰ Kohn published in various European countries in Russian, Czech, German, French, English and Bulgarian.

¹¹ Emil Schoenbaum (1882-1967) lectured actuarial mathematics at the Faculty of Science of Charles University.

as the approaches to problem solving and the methods on which they focused. Also mutual knowledge of the work of English biometrics (K. Pearson, Yule and others), German social statisticians (Lexis, Bortkiewicz), French scientists (focusing on the philosophical and logical foundations of probability theory) and Russian mathematicians and statisticians (A. A. Markov, A. A. Tschuprov) was not usually high. The exception was Bortkiewicz and Tschuprov with their students. The great merit of cosmopolitan Kohn was not only the use of the latest knowledge of various statistical schools, but above all that he combined them into a unified modern statistics system.

Conclusion

Kohn's textbook stayed for more than two decades the only Czech publication of its kind. Josef Mráz was preparing to write a similar work, but premature death made it impossible to finish. In the 1930s, a number of outstanding statisticians and mathematicians were involved in probability theory and actuarial theory in Czechoslovakia, but none of them decided to create a comprehensive textbook of modern statistical methods. Such work would require a thorough study of the vast world literature of the field, which has developed vigorously in the 1920s and 1930s.

Later, during the Protectorate, the German occupiers did not allow the publication of any Czech publication that would resemble a college textbook. After February 1948 was modern statistical method ranked among the suppressed "mathematical formalisms", while econometrics has found itself in the category of totally rejected "bourgeois pseudoscience".

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