

Caspar NEUMANN

b. 14 September 1648 - d. 27 January 1715

Summary. The data of Pastor Caspar Neumann on births and funerals in Breslau were used in the preparation of the first mortality table.

Caspar Neumann was born shortly before the end of the Thirty Years' War in the Silesian town of Breslau (now Wrocław, in Poland), where his father was a merchant and, later on, tax collector. After his father's early death, Neumann first became an apprentice in a chemist's shop, but then enrolled at Jena University in the Autumn 1667, holding a scholarship from the city of Breslau for the study of Protestant theology, following his father's wish. In only three years he achieved an *Magister artum liberalium* degree, and gave lectures on philosophy and rhetoric. In accordance with the prevailing taste of the century, his funeral orations were in particular taken notice of, and later published in book form. Herzog (Duke) Ernest I the Pious of Sachsen-Gotha-Altenburg appointed him travelling preacher and attendant to Crown Prince Christian on a tour through Southern Germany, Switzerland, Upper Italy, and Southern France. In 1676 Neumann was appointed Court Chaplain of Altenburg. Two years later he married Johanne Susanne Adelheid Raabe, the daughter of the personal physician to the duke.

Out of gratitude to his native town he accepted a call as pastor at St Magdalen's church in Breslau. There his son and first wife died, and in May 1684 he married Christiane Greiff, a merchant's daughter who bore him eight children. The functions of the office of pastor at St Elisabeth's church, entrusted to him in 1697, included superintendence over all churches and schools of Breslau, as well as the first theological professorship at both municipal grammar schools. Neumann enjoyed high public esteem as the editor of a widely used prayer-book, as an author of religious hymns, and as a highly respected preacher and Hebrew scholar. Indeed, he is often described as an orientalist in library catalogues. As well as these accomplishments, he pursued mathematical, astronomical, and botanical studies. In 1706 he was elected to the Berlin Academy of Sciences. Highly honoured, he died in Breslau.

Caspar Neumann earned lasting recognition in the field of population statistics. He was the first to try to apply strict inductive analysis and exact observation to the phenomena of human life, in close analogy to the methodology of the emerging natural sciences. Being a theologian himself,

his ideas had religious roots. Above all, he objected to the prevailing opinion of his time that human birth and death are determined by the position of the planets and comets, or governed by magic numbers. His scientific interest was thus primarily aimed at finding predictable regularities in the deaths of human beings. For this reason he prepared in the years 1687 to 1691 elaborately compiled tables on births and funerals in the Protestant parishes of Breslau. In preparing this work he was supported by the physician Dr Gottfried Schultz and the mayor Johann Sigismund von Haunold, both of whom were interested in these statistical studies.

While still engaged in compiling the tables, Caspar Neumann sent a copy of his *Reflectiones über Leben und Tod bei denen in Breslau Geborenen und Gestorbenen (Reflections on Life and Death according to Births and Deaths in Breslau)* to the polymath and philosopher Gottfried Wilhelm Leibniz, with whom he had had a lively correspondence for some time. Referring to his own studies, Neumann remarked that he did not yet perceive their utility, but expected that “schöne Anmerkungen göttlicher Provenienz über unser Leben und Tod” (“a beautiful commentary on Divine Providence in our life and death”) could be made if such statistical data were generally collected.

The Royal Society of London, founded in 1660 for the development of science, was evidently informed by Leibniz of Neumann’s work. The need for such data had been seen in England by John Graunt (q.v.) and Sir William Petty (1623-1687). In a letter of invitation for correspondence the Society’s secretary Henry Justell, a religious refugee from France, asked Neumann to send him the tables of the births and funerals of the city of Breslau. Neumann granted his request by sending the tables for the years 1687 - 1690 in a letter on January 31, 1692. In response, Justell wrote a letter to Neumann dated October 7, 1692, in which Justell advised that he found the tables very useful, and that they accurately contained everything one wishes to find in them. A separate correspondence between Leibniz and Justell on Neumann’s work also took place between the dates of these letters.

The Pastor of Breslau wrote again to the Royal Society on December 9, 1692, and provided at the same time the data for the year 1691 that again were precisely detailed according to age, sex, cause of death, etc. Justell, who had had close contacts with the most distinguished scholars of his age, died on September 25, 1693, in London without having seen the further influence of Neumann’s statistical data. The letter of Caspar Neumann was read out at the session of the Royal Society on November 22, 1693, and the statistical material was committed for further analysis to its member, the astronomer

Edmond Halley (1656-1742), after whom the well-known comet is named.

Neumann's scientific attainments consisted in providing the empirical basis of population statistics that was later used by Halley for the preparation of the first scientific mortality tables. In 1694 Halley's work was published in volume 17 of the *Philosophical Transactions* for the year 1693, on page 596 with the title *An estimate of the degree of the Mortality of Mankind, drawn from curious Tables of the Births and Funerals of the city of Breslaw; with an attempt to ascertain the price of Annuities upon Lives*. In this treatise three mortality tables were presented, together with related calculations of the annuities upon lives. Table I contained the years of life the departed had reached in absolute figures, Table II the number of deaths reaching the age referred to, and Table III the number of living persons reaching this age. Halley considered Neumann's data particularly well suited for this purpose, because Breslau as a rural town with practically no immigration or emigration, had a statistically stationary population. Halley's mortality tables were a prerequisite for the development of modern life insurance on a mathematical/statistical basis in England. Neumann and Halley also corresponded directly. His letter to Halley of March 1, 1694, clearly indicates that he was aware of having delivered useful statistical material, and Halley himself wrote of the "doctus" ("learned") Dr Neumann with words of gratitude and appreciation calling him the collector of valuable statistical data. The efforts of Dr Johann Graetzer, physician in Breslau, supported by the professors Ferdinand Cohn and Burden Sanderson, finally led to the rediscovery of Neumann's letters in the archives of the Royal Society in London at the end of the 19th century. Some are reproduced in English in Pearson (1978).

References

- [1] Koch, P. (1998). *Geschichte der Versicherungswissenschaft in Deutschland*, Versicherungswirtschaft, Karlsruhe, pp. 30 - 32.
- [2] Koch, P. (1999). Neumann, Caspar, in: *Neue Deutsche Biographie*, vol. 19, Duncker und Humblot, Berlin, p.156.
- [3] Pearson, K. (1978). *The History of Statistics in the 17th and 18th Centuries*. Griffin, London, Chapter 3.

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