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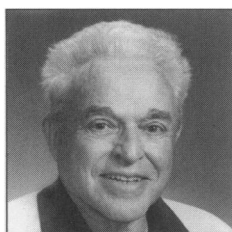


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## A Very Brief History of Statistics

Howard W. Eves



**Howard Eves** has spent his entire life teaching mathematics in various universities. His major interests lie in geometry, problem solving, and the history of mathematics. He has written more than twenty books on mathematics and approximately one hundred fifty articles. He has served as associate editor of various journals, among which are *The American Mathematical Monthly*, *The Mathematics Teacher*, *The Fibonacci Quarterly*, *The Mathematics Magazine*. For twenty-five years he served as a problems editor of *The American Mathematical Monthly*. He has received many awards, among which are two honorary doctorates and a George Polya Award.

Though most students of statistics become acquainted with much of the nomenclature and applications of the subject, few ever hear much about its history. The present paper is an attempt to remedy this deficiency.

We may briefly define statistics as the science that deals with the collection, tabulation, and presentation of numerical data, wherein the data exhibit a unity of kind, such as the weights of individuals in a group, or the ages of individuals in an organization. The beginnings of statistics go back to very early times. Thus the ancient Egyptians compiled data concerning population and wealth as early as 3050 B.C. There are accounts of statistical work in China as early as 2300 B.C. Two censuses of the Israelites are recorded in the Old Testament Book of Numbers. A census was taken in Greece in 594 B.C. for the purpose of levying taxes. Athens undertook a population census in 309 B.C. The Romans surpassed all other peoples of antiquity in making and collating collections of measurements, not only in enumerations of population and records of births and deaths, but in extensive surveys of the entire country and parts of the provinces.

It was many centuries after the fall of Rome before other comprehensive systems of governmental statistics were established. Very few statistical records were made during the Middle Ages, beyond some occasional investigations ordered by sovereigns. Thus Pepin the Short in 753 and Charlemagne in 762 ordered detailed descriptions of church lands, and there were land registrations in France taken at these and subsequent times. The best known census of this later period is the "Doomsday Book" prepared by order of William the Conqueror in 1088.

Sebastian Muenster, an early Heidelberg professor, foretold the field of comparative statistics by assembling an account of the organization, wealth, armies, commerce, laws, etc., of ancient countries. Francesco Sansovino shortly after published a similar work in 1502, and Giovanni Votero another in 1589. Pierre d'Avity, Seigneur de Montmarin, compiled a considerably more accurate and comprehensive study in the same field in 1614. The registration of deaths was commenced in London in 1532 and was followed by that of baptisms performed by parish clergymen. In 1662 a noteworthy statistical advance was made by the publication of Captain John Graunt's *Natural and Political Observations on the London Bills of Mortality*. He was the first to point out the regularity of social phenomena and the excess of male over female births. In 1693 Casper Heumann of Breslau compiled data relative to almost 6000 deaths. This

work attracted the attention of the astronomer Edmund Halley (1656–1742), who laid the foundations of scientific insurance by calculating a mortality table. Another significant contribution of this period was the work of Jakob Bernoulli (1654–1703) in probability theory.

The first one to employ the word *statistik* was Gottfried Achenwall (1719–1772), a professor of philosophy at Göttingen University. The word derives from the Italian word *statista*, which means “statesman.” The name *statistics* was introduced into English by Dr. E. A. W. Zimmerman about 1787, and then a few years later popularized by Sir John Sinclair in his *Statistical Account of Scotland*.

The close of the 18th and the beginning of the 19th centuries witnessed a revival of census taking. The United States took its first decennial census of population in 1790. England and France began periodic census taking in 1801. Belgium took its first census in 1829. The analysis of this census by L. A. J. Quetelet (1796–1874) contains noteworthy observations on the influence of age, sex, occupation, economic condition, and season of the year on mortality. Upon the organization of the Belgium Statistical Central Commission in 1841, Quetelet became its president and continued to hold this office until his death. Quetelet’s work not only elevated statistics in Belgium to a high plane, but it did much to raise statistical standards throughout the world.

The further progress of statistics was accelerated by the founding of the Société de Statistiques de Paris in 1803, the Royal Statistical Society of London in 1834, and the American Statistical Association in 1839. The initial meeting of the International Statistical Congress was held in Brussels in 1853, and in 1885 the Congress was succeeded by the International Statistical Institute. These societies have done much to promote uniformity into statistical practice, and otherwise to advance the science.

Since 1890 there has been a wide expansion in the field of statistics, and today essentially every civilized country makes continuous records of births, deaths, marriages, and divorces, and prepares elaborate statistical information concerning production, foreign and domestic commerce, finance, public utilities, labor, agriculture, education, and immigration. The United States took a great step in 1902 when it made the Census Bureau a permanent office. Population census continues to be the Bureau’s most important function, but from time to time other activities have been added to furnish information deemed of national value. While national statistics has been expanding, there has also been an equal extension of statistical work in the states and cities.

In recent years there has been great progress in both theoretical and practical statistics, and during the past few decades there has been a remarkable growth in the applications of statistics. As a result there is hardly a phase of the life and activities of people which has not received statistical attention, leading to an unparalleled growth in the number of statistical investigations and in the number of individuals devoting themselves to such investigations.

Statistics, especially as applied to a verification of the Darwinian theory of evolution, to applied mathematics, and to eugenics, was greatly affected by the work of Karl Pearson, an English scientist who was born in London in 1887 and died in Coldharbour in 1936. He was director of the Francis Galton Laboratory for National Eugenics at the University of London, and founder and editor of the Journal *Biometrics*, and editor of the *Annals of Eugenics*. He also wrote a number of influential books on eugenics. He conducted his work in such a highly professional manner that he is generally acknowledged as the founder of scientific statistics. His work was influenced by earlier work done by Sir Francis Galton (1822–1911), a British scientist and cousin of Charles Darwin, and who devised new statistical methods which he applied to the study of heredity. Galton was the first to call the science of human heredity *eugenics*, and it was after him whom the abovementioned Laboratory for National Eugenics was named.

There are today a number of journals devoted to statistics, one of the most noted being the Indian statistics journal, *Sankhyā*, which began publication in 1933.

The statistical method is no longer confined to investigations (such as the census) undertaken by governmental agencies for administrative and other purposes. Today every large corporation has its statisticians, and many policies of corporation concern are based upon analyses made by these statisticians. In both the physical and biological sciences, the statistical method has become of paramount importance. In the social sciences, especially in the field of economics, the statistical method is equally indispensable. It has also found valuable application in meteorology and in the analysis of pools. The statistical method has been greatly facilitated in modern times by present-day computers.

The subject of statistics is taught in essentially every college and university of our country, often by the mathematics department. In many institutions, however, statistics has emancipated itself from the mathematics department to form a department of its own, much as astronomy has similarly done. Students are becoming acquainted with such statistical concepts as the law of chance, error distribution, correlation, median, mode, the normal frequency curve, histograms, frequency polygons, sampling, and the statistical construction of charts and tables.

*Acknowledgment.* This paper was based in part on research by Horatio M. Pollack (ca. 1956).

### **Eternal Verities**

Louis Smogor (paradox@depauw.edu), who does not watch much television, sends the following, from a source to be named later:

The great body of physical science, a great deal of the essential facts of financial science, and endless social and political problems are only accessible and only thinkable to those who have a sound training in mathematical analysis, and the time may not be very remote when it will be understood that for complete initiation as an effective citizen of one of the new great complex worldwide states that are now developing, it is as necessary to be able to compute, to think in averages and maxima and minima, as it is now to be able to read and write.

The question is, when was that written? Before answering that, try this as a warm-up: when did a poet write "... things fall apart. The center cannot hold ..."? Here are the answers, given in base 8 so that, if your eye falls on them too soon you can still estimate the dates in base 10. The poetic quote is from W. B. Yeats, 3604, and the one in prose is by H. G. Wells (*Mankind in the Making*, Scribner's, p. 192), 3560.

Some things never change.