

Gosset, William Sealy

ROGER THOMAS

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Brian S. Everitt & David C. Howell

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Gosset, William Sealy

Born: June 13, 1876, in Canterbury, England.

Died: October 16, 1937, in Beaconsfield, England.

William Sealy Gosset studied at Winchester College before enrolling at New College, Oxford, where he earned a first class in mathematical moderations (1887) and another in natural sciences, specializing in chemistry (1899). Also, in 1899, and in conjunction with the company's plan to hire university-trained scientists, Arthur Guinness, Son & Co, brewers in Dublin, hired Gosset. Thus began Gosset's career, one that culminated with his appointment in 1935 as head of Guinness's newly constructed brewery in London, a position he held until his death. '...all his most important statistical work was undertaken in order to throw light on problems which arose in the analysis of data connected in some way with the brewery' [2, p. 212]. Gosset was, perhaps, the first and the most important industrial statistician [4].

After familiarizing himself with the operations of the brewery, where he had access to data bearing on brewing methods as well as the production and combinations of the hops and barley used in brewing, Gosset realized the potential value of applying error theory to such data. His first report (November 3, 1904) titled, 'The Application of the "Law of Error" to the work of the Brewery', presented the case for introducing statistical methods to the industry's work. Gosset also observed, 'We have met with the difficulty that none of our books mentions the odds, which are conveniently accepted as being sufficient to establish any conclusion, and it might be of assistance to us to consult some mathematical physicist on the matter' [2, p. 215].

Instead, Gosset contacted **Karl Pearson** (1905), which led to Gosset's studies (1906–1907) with Pearson and W. F. R. Weldon in the Biometric School of the University College, London. Following Francis Galton's lead, Pearson and Weldon were keen on refining measures of variation and correlation, primarily for agricultural and biological purposes, and to do so, they relied on large statistical samples. Gosset had earlier noted that 'correlation coefficients are usually calculated from large numbers of cases, in fact I have found only one paper in

Biometrika of which the cases are as few in number as those at which I have been working lately' (quoted in [2, p. 217].

Thus, it fell to Gosset, who typically had much smaller samples from the brewery's work available to him, to adapt the large-sample statistical methods to small samples. To develop small-sample methods, he drew small samples from some of Pearson et al.'s large samples, and in so doing Gosset provided '...the first instance in statistical research of the random sampling experiment...' [2, p. 223].

Guinness had a policy of not publishing the results of company research, but Gosset was permitted to publish his research on statistical methods using the pseudonym, 'Student'. Student's article, 'The Probable Error of a Mean' (*Biometrika*, 1908), a classic in statistics, introduced the *t* Test for small-sample statistics, and it laid much of the groundwork for **Fisher's** development of **analysis of variance** ([5, p. 167–168]; and see [3]).

Two informative articles about Gosset are "Student" as a statistician' [2] and "Student" as a man' [1]. Of Student as a statistician, Pearson concluded: '[Gosset's]... investigation published in 1908 has done more than any other single paper to bring [chemical, biological, and agricultural] subjects within the range of statistical inquiry; as it stands it has provided an essential tool for the practical worker, while on the theoretical side it has proved to contain the seed of ideas which have since grown and multiplied in hundredfold' [2, p. 224]. Of Student as a man, McMullen [1], described Gosset as being a golfer and a builder and sailor of boats of unusual design, made by preference using simple tools. He was also an accomplished fly fisherman. 'In fishing he was an efficient performer; he used to hold that only the size and general lightness or darkness of a fly were important; the blue wings, red tail, and so on being only to attract the fisherman to the shop' [1 p. 209].

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