

## BOOK REVIEW

"*Student's*" *Collected Papers*. Edited by E. S. PEARSON and JOHN WISHART. Biometrika Office, London. pp. xiv + 224. 1942. 15 shillings.

Since the question is still asked from time to time, it may be well to state that 'Student' was the pen name of William Sealy Gosset. After taking his degree in mathematics and natural sciences at Oxford, Student worked as a brewer for the well-known firm of Messrs. Guinness—in Ireland from 1899 till 1935 and thereafter in London as head of the new Guinness brewery established there. He died in 1937 at the age of 61. Between 1907 and 1937 he published twenty-one papers and a few notes; these are issued in the present volume as a tribute from a group of his relatives and friends.

Student's name is almost universally attached to a single discovery, the  $t$ -test, which requires for a complete proof more powerful mathematical methods than he devised. These facts may cause his papers to be regarded as museum pieces by people who have not read them. Actually, in many respects no better model than Student could be suggested for a young statistician today. Since we sometimes speak derisively of courses of lectures in statistics where the methods and ideas are "20 years out of date", it is interesting to find that many of the fundamental ideas considered most in need of emphasis by forward-looking teachers today were in fact emphasized by Student in his writings over 30 years ago.

For example, his classical paper on the  $t$ -test, published in 1908, opens as follows: "Any experiment may be regarded as forming an individual of a 'population' of experiments which might be performed under the same conditions. A series of experiments is a sample drawn from this population.

Now any series of experiments is only of value in so far as it enables us to form a judgment as to the statistical constants of the population to which the experiments belong".

The idea is elaborated in a second paper published in the same year. "Note that the indefinitely large population need not actually exist. In Mr. Hooker's case his sample was 21 years of farming under modern conditions in England, and included all the years about which information was obtainable. Probably it could not actually have been made much larger without loss of homogeneity, due to the mixing with farming under conditions not modern; but one can imagine the population indefinitely increased and the 21 years to be a sample from this." We note here a further observation, not always appreciated, that in some lines of research samples which are both large and *homogeneous* do not exist. A clear conception of the relation between sample and population is evident in all his work: one further quotation, the summary from his 1926 paper, *Mathematics and Agronomy*, will suffice. "To sum up, in planning agronomic experiments use plenty of replications and make quite sure your results are capable of being considered to be a random sample of the population about which you wish to draw conclusions."