MA231 – Spring 2009 **Homework 6** **Due 3/18/2008**

a.k.a. Homework Fisher

Homework Policies: You should give a brief and concise explanation for each question. Just writing down an answer with no explanation is usually not sufficient. If the homework requires output from Stata, incorporate that output into your written assignments. Homework is due at the *beginning* of class on the day indicated.

(1) M & M 4.21, p. 255

(2) M & M 4.29, p. 256

(3) M & M 4.39, p. 257-258

(4) M & M 4.60, p. 269

(5) M & M 4.74, p. 286-287

(6) M & M 4.78, p. 287

(7) M & M 4.91, p. 289

(8) M&M 4.92, p. 289

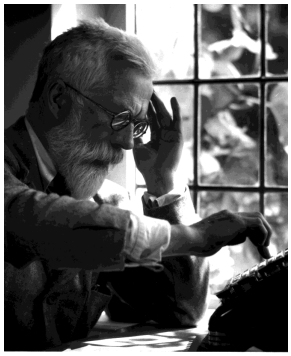
(9) M&M 4.127, p. 306

(10) M&M 4.128, p. 306

(11) M&M 5.14, p. 332

(12) M&M 5.48, p. 347

Famous Statistician of the Week



Who is this?
Sir Ronald Aylmer Fisher
1890-1962

Why is he cool?

Ronald Fisher received a B.A. in astronomy from Cambridge in 1912. There he studied the theory of errors under Stratton using Airy's manual on the *Theory of Errors*. It was Fisher's interest in the theory of errors in astronomical observations that eventually led him to investigate statistical problems.

Fisher gave up being a mathematics teacher in 1919 to work at the Rothamsted Agricultural Experiment Station where he worked as a biologist and made many contributions to both statistics and genetics. He had a long dispute with Pearson and he turned down a post under him, choosing to go to Rothamsted instead. There he studied the design of experiments by introducing the concept of randomisation and the analysis of variance, procedures now used throughout the world.

In 1921 he introduced the concept of likelihood. The likelihood of a parameter is proportional to the probability of the data and it gives a function which usually has a single maximum value, which he called the maximum likelihood.

In 1922 he gave a new definition of statistics. Its purpose was the reduction of data and he identified three fundamental problems. These are

(i) specification of the kind of population that the data came from
(ii) estimation and
(iii) distribution.

The contributions Fisher made included the development of methods suitable for small samples, like those of Gosset, the discovery of the precise distributions of many sample statistics and the invention of analysis of variance. He introduced the term maximum likelihood and studied hypothesis testing.

Fisher is considered one of the founders of modern statistics because of his many important contributions.

He was elected a Fellow of the Royal Society in 1929, was awarded the Royal Medal of the Society in 1938 and he was awarded the Darwin Medal of the Society in 1948:-

... in recognition of his distinguished contributions to the theory of natural selection, the concept of its gene complex and the evolution of dominance.

Then, in 1955, he was awarded the Copley Medal of the Royal Society:-

... in recognition of his numerous and distinguished contributions to developing the theory and application of statistics for making quantitative a vast field of biology.

Courtesy of *http://www-gap.dcs.st-and.ac.uk/~history/Mathematicians/Fisher.html*