

## Editorial

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### Remembering Sir Ronald Fisher (1890-1962)

In his classic, *The Design of Experiments*, Sir Ronald Fisher pointed out two broad grounds on which any research study may be criticised : faulty design or faulty interpretation (1). Fisher didn't stop at finding faults, however. He made monumental contributions to help scientists avoid both these pitfalls, and thereby promoted a general awareness as to how knowledge of statistics improves the quality of research. Since every research worker cannot be good at statistics, Fisher also indirectly established an honourable place for a statistician in every research team. The role of the statistician begins right at the beginning of a research project. He can provide invaluable help in determining the minimum sample size, in achieving the most logical grouping of subjects, in selection of adequate controls, and in determining the appropriate sequence of treatments. As a result of mistakes in these aspects of design, a study may cost much but mean little, and the realisation may come too late. Once the study gets going, the statistician can often advise on the best way to organize the data. But the crucial role of the statistician comes once again in avoiding the second pitfall of research pointed out by Fisher, i.e. faulty interpretation. Interpretation of data is subject to bias, no matter whether the interpreter is the experimenter himself, his friend or his foe, or a stranger, and no matter how sound the judgement of the interpreter is. The statistician helps us out by suggesting the most appropriate test to determine whether the data obtained support or refute our hypothesis. The test and the acceptable level of significance being predetermined, the prejudices of the interpreter do not affect the conclusions. Fisher made original contributions to this aspect of statistics as well. Fisher introduced analysis of variance (ANOVA); hence the variance ratio is also called the F ratio after him. Again Fisher suggested that if the probability of a difference being due to chance factors is less than 5% the difference is likely to be genuine. The figure of 5% is purely arbitrary, but since it came from a man of Fisher's eminence, it has acquired the status of a 'sacred writ', which determines (not always fairly) the fate of research publications, clinical trials and scientific reputations (2).

Sir Ronald Aylmer Fisher was indeed a phenomenon. Much of the basic progress in statistical theory in the recent past can be attributed directly to him. He was not only the greatest figure in the history of statistics, but one of the greatest figures in the history of scientific method generally (3). We feel honoured in paying him this tribute during his birth centenary year.

#### REFERENCES

1. Fisher RA. *The design of experiments*. Edinburgh : Oliver and Boyd, 6th edition, 1951 : 1-2.
2. Feinstein AR. *Clinical biostatistics*. St. Louis : The C. V. Mosby Co., 1977 : 317.
3. Wallis WA, Roberts HV. *Statistics : a new approach*. Glencoe IL : The Free Press, 1956:15-16.