

SIR RONALD FISHER

AIDS TO AGRICULTURAL RESEARCH

Sir John Russell writes:—

It would be difficult to find a better example of the help that abstruse sciences, apparently wholly remote from reality, can give in solving important practical problems than is afforded by the work of Ronald Fisher at Rothamsted during his 14 years there.

I had long been anxious to have the masses of data relating to our unique field experiments examined by modern statistical methods to extract information which I felt sure they contained but which our crude methods had missed. Neither Oxford nor Cambridge could then supply a young mathematician able and willing to undertake the work, but I heard of Fisher and found him ready to do so. His tutor's rather lukewarm opinion of him was that "if he had stuck to the ropes he would have made a first-class mathematician, but he would not"—which suggested that he was the man we wanted, and so it soon appeared.

MONUMENTAL INVESTIGATION

He began with some theoretical studies bearing on the development of suitable methods of dealing with agricultural experiments, among them a monumental investigation on the mathematical foundations of theoretical statistics, which was published by the Royal Society and which quickly brought him scientific fame. He used his new methods for studying the field data, and also for improving various researches proceeding in the laboratories, including the estimation of numbers of micro-organisms in soils, the counting of aphids and others.

His new designs for field experiments have proved particularly helpful. It had always been a weakness of the old designs that no good estimate could be made of the validity of the results: no two plots of land provide identical conditions for plant growth, and it was always uncertain how much of a particular result was due to differences of this kind. In the earlier years this had not mattered much; qualitative effects were often of sufficient interest to justify the work. But by the 1920s, when these investigations were made, much more definite information was required, and the new methods provided it. Simple designs could be used if a moderate amount of uncertainty was permissible, and more complexions where higher accuracy was desired.

A NEW PRINCIPLE

Fisher also introduced a new principle. It had always been assumed that a field experiment should normally deal with one variant only. Fisher showed, however, that better results were obtained by combining two or more variants in the same experiment; this made the design more complex and practical considerations set limits to the extent to which this "confounding" could go.

Younger colleagues worked out practicable methods which are now widely used. They have led also to a marked improvement in the presentation of results not only in this country but in tropical Africa and elsewhere, and it was with a great thrill that we heard Sir Harold Jeffreys declare on an important occasion that, thanks to Fisher's work, "the standard of presentation of results in agriculture is better than in any of the so-called exact sciences . . . a state of affairs that physicists should cease to tolerate".

Fisher had a wide-ranging mind. He was equally at his ease in talking to my small son at tea in our house and in discussing highly abstruse genetical problems with a distinguished scientist.