

ROTHAMSTED EXPERIMENTAL STATION  
(LAWES AGRICULTURAL TRUST)

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HARPENDEN

HERTS.

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My dear Ron,

I have signed Vessereau's certificate. I know the man and he is, I think, well worth supporting. I have returned the certificate to Darmois as I believe he will be sending it on to Julin and Linder.

I am enclosing a further two copies of the B.A. memorandum. If you require any further copies please let me or my secretary know.

I still haven't had time to do anything further about the Authorship and Acknowledgements memorandum. I think I will send it as it stands to Rothschild and get his reaction before attempting any further revision. It may be that he will not want it to go into "Nature".

Yours sincerely



Professor R.A. Fisher, F.R.S.

P.S. I had a note from Lowe this morning acknowledging the memorandum and asking if he might mention that the societies concerned would be willing to contribute something. I am telling him that he may do so in general terms. I am also mentioning that the A.R.C. would be willing to contribute.

Proposal to the British Association for the  
formation of a Section of Biometry

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In the last thirty years there has been a very great expansion in the use of statistical methods in scientific research, particularly in the biological field. This has been based on, and has stimulated, the development of the mathematical foundations of the subject, and the logic of inductive inference.

The result, particularly in applied biology, as, for example in agriculture, has been a great increase in the interest in quantitative problems. The complexity and range of the material that can be examined have also been greatly extended. Indeed, it would not be too much to say that the subject of experimental design has revolutionized biological experimental work, and its influence is now spreading rapidly to other fields, particularly those of engineering and industrial chemistry.

In spite of the profound influence that the new developments in statistical method have had on many diverse fields of science the subject has received inadequate treatment in British Association meetings. With the present sectional organisation this is almost inevitable, since the discussion of almost all the major developments is of interest to and requires the cooperation of several sections. Thus the subject of experimental design is the concern of the sections of mathematics, zoology, engineering, physiology, psychology, botany, forestry, education and agriculture. Multivariate analysis is the concern of mathematics, zoology, economics, anthropology, psychology, botany and education, and in connection with plant and animal improvement, of agriculture and forestry. Joint discussions between so many sections cannot easily be arranged, and a discussion organised by one or two sections tends to be limited in scope, and fails to attract workers in other fields who should be vitally concerned.

The number of discussions that have in fact been arranged in statistical and biometrical problems since the war is almost negligible. According to the Preliminary Programmes the only discussions which touched on these problems were:-

- 1947. Section J. Discussion on surveys of public opinion.
- 1948. Section G. Applications of statistics in engineering.
- 1951. Section A<sup>†</sup>. Probability.

In view of these facts five scientific societies, the Royal Anthropological Institute, the Biometric Society, the Genetical Society, the Pharmacological Society, and the Royal Statistical Society all of which are particularly concerned with statistical methodology and its applications, appointed representatives to consider the problem. The present memorandum has been drawn up and agreed by these societies.

It appears to them that the best way to overcome these difficulties and ensure adequate representation of the subject at British Association meetings is to set up a new section to deal specifically with statistical methodology and its applications to the various fields of science.

These new methods had their first development in the application of metrical methods to naturally occurring biological populations of various

kinds, particularly in the fields of genetics and anthropology. These data in many cases gave rise to problems of multivariate analysis, often of great complexity, which at that time were only very partially and incompletely solved. Contact with experimental biologists and agricultural scientists led to the clarification of the relatively simpler problems arising in the interpretation of the results of quantitative experiments on variable material and the inferences that could logically be drawn from small numbers of observations. The development of the subject of experimental design, which has exerted such a powerful influence on all experimental work on variable material, followed naturally. From these basic developments and the attendant developments in the mathematical theory of estimation and inductive inference has stemmed the whole of modern statistical theory and methodology. Experience has abundantly proved that close association between mathematicians and biologists has been a necessary condition for the evolution of methods of practical utility.

The representatives are confident that a new section, which might, in view of the close connection of the subject throughout its development with the biological sciences, be entitled "Biometry", would have the support not only of the societies here represented but also of the many other scientists who require statistical methods in the development of their subject. It would provide a forum where the application of biometric technique to various fields of science could be discussed in a more adequate fashion than as part of the programme of the more specialised sections, and before an audience more capable of criticising the methods concerned.

The section should also be of very great value in educating the general public in modern developments in quantitative biology and the logic of inductive inference. The basic ideas of the modern developments of statistical method are not of great difficulty, and the elements of the subject are already being introduced into school curricula. At present, however, the advanced study of mathematics is in many schools an alternative to biology, and the idea that mathematics has much to contribute to the development of biological science is penetrating very slowly. As the close relation between the two is recognised more biologists will understand the mathematical approach and more mathematicians will find new fields in biology.