The Statistician and the “Stats”—
R. A. Fisher and the RSS

John Aldrich University of Southampton

RSS February 2019
Obituary

SIR RONALD AYLMER FISHER, 1890–1962

INTRODUCTION

By J. O. Irwin

President, Royal Statistical Society

Sir Ronald Fisher was the most famous statistician and mathematical biologist in the world. The Council of the Royal Statistical Society feel that his work covered such a wide field that an adequate appreciation could be given only by a cooperative effort.

An obituary of unprecedented magnificence

- Celebrates a life in science/statistics not a life in the Society
- The two were different for so much of the life was outside the Society
- Celebration due because the Society largely remade itself in his image, e.g. by creating an Industrial and Agricultural Research Section in the 1930s and Research Section + theory journal, Series B, in the 40s
Outline of talk

- Background
- Fisher’s life with the RSS
  - 1920s joins, leaves, rejoins
  - 1930s uncomfortably present
  - 1940s usually absent
  - 1950s President & writing in the Society’s journals
- Being in a Society
Sources for the story

- Published
  - *JRSS* Articles and reports of meetings
- Archives
  - *RSS* Archives
  - Fisher Archives in Adelaide—mainly letters to him
- Books
1920  Ronald Fisher and mentor Leonard Darwin

Ronald Fisher (1890-1962)
Cambridge maths graduate
Interests—genetics, eugenics, stat. theory
Ag stats at Rothamsted from 1919

Leonard Darwin (1850-1943)
Son of Charles, President of Eugenics
Education Society + connections galore
Fisher’s patron + friend
1920  One journal/one editor to please
*Biometrika* and Karl Pearson

**BIOMETRIKA**

A JOURNAL FOR THE STATISTICAL STUDY OF
BILOGICAL PROBLEMS

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Fisher’s success rate with KP

- 1 publication (1915)

- 2 or 3 rejections

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**FREQUENCY DISTRIBUTION OF THE VALUES OF THE CORRELATION COEFFICIENT IN SAMPLES FROM AN INDEFINITELY LARGE POPULATION.**

BY R. A. FISHER.
1920 Fisher’s latest offering rejected—Darwin’s reaction

“On the ‘Probable Error’ of a Coefficient of Correlation deduced from a Small Sample”

- Extended Fisher (1915)
- Criticised Pearson’s “Appendix” to it for confusing ML with Bayes
Darwin’s connections

- Try JRSS
- Major Greenwood (editor) says no
- But—subject to softening—recommends it for Gini’s *Metron*
- Published as

**ON THE "PROBABLE ERROR" OF A COEFFICIENT OF CORRELATION DEDUCED FROM A SMALL SAMPLE**
1921 Another line to the RSS: Arthur Bowley (1869-1957)

Professor of Stats at LSE and Fisher’s neighbour in Harpenden

- Recommends to JRSS Fisher’s piece on $\chi^2$
- Reads Fisher’s “Mathematical Foundations of Theoretical Statistics”
- Cool about its criticism of Bayes
- Pearson on $\chi^2$ paper
1921 Fisher’s best ally among the Stats: Udny Yule (1871-1951) “kindly, gentle and genial”

Lecturer in Stats (joint between Ag and Eco) in Cambridge. Like Fisher, interested in stat theory, genetics and ag

- Supports Fisher’s fellowship application to RSS: “I have seen a good deal of Mr. Fisher’s work and cordially recommend him.”
- Favourably reviews Fisher’s “Mathematical Foundations of Theoretical Statistics”
- Agrees with Fisher’s criticism of Pearson on $\chi^2$
MISCELLANEA.

CONTENTS.
On the Interpretation of $\chi^2$ from Contingency Tables, and the Calculation of $P$. By R. A. Fisher, M.A. ..... ..... 
On the Application of the $\chi^2$ Method to Association and Contingency Tables, with Experimental Illustrations. By G. Udny Yule, C.B.E., M.A., F.R.S. ..... ..... ..... 

MISCELLANEA.
The Goodness of Fit of Regression Formulæ, and the Distribution of Regression Coefficients.

By R. A. Fisher, M.A.

- JRSS published the occasional technical piece in Miscellanea
- In 1922 publishes 2 by Fisher
- More JRSS friendly than first

KP blasts $\chi^2$ paper

The above re-description of what seem to me very elementary considerations would be unnecessary had not a recent writer in the Journal of the Royal Statistical Society appeared to have wholly ignored them. He considers that I have made serious blunders in not limiting my degrees of freedom by the number of moments I have taken; for example he asserts (p. 93) that if a frequency curve be fitted by the use of four moments then the $\chi^2$ of the tables of goodness of fit should be reduced by 4. I hold that such a view is entirely erroneous, and that the writer has done no service to the science of statistics by giving it broadcast circulation in the pages of the Journal of the Royal Statistical Society.
The Stats reject 3rd Fisher paper—“they have treated you badly ... the dignified course ...”
Fisher did *not* take the dignified course

- Argued with the RSS
- Darwin took up his case
- No joy
- Fisher resigns
- The reputation of “being very touchy and easily put out” stuck—Yates and Mather (1963) recalled his “notoriously contentious spirit”
1923+ Fisher finds other outlets

- Book with new editions every few years
- Maths journals—Cambridge Philosophical Society and Royal Society
- Ag journals take work on Experiments
1929 Elected FRS

With support from

- Stats — Yule but not by Pearson and Greenwood
- Cambridge maths—Eddington, Fowler
- Genetics — Punnett
- Ag science — Russell and Hall
Now you’re FRS—why not FRSS?

Darwin mobilises

- Bernard Mallet (past President)
- Yule who wants assurance there will be no more resignations

Darwin locks Fisher in with a gift of a lifetime subscription
1933 All change

- **People**
  - Karl Pearson and Yule retire
  - At UC KP replaced by Fisher as Prof of Eugenics and Egon Pearson as Head of Stats
  - Yule replaced by John Wishart who teaches maths students—Bartlett, Daniels etc

- **Society**
  - Creates Industrial and Agricultural Section with its own journal—the *Supplement*.
  - Fisher not involved
Fisher’s main project in the Society was getting recognition for Student—a Guy medal in gold. He failed.
1934-5 Resisting Fisher and going beyond him

Bowley had followed Fisher’s work from the start and disagreed with the attack on Bayes

Jerzy Neyman (1894-1981)
Egon Pearson (1895-1983)
worked on a theory of testing from 1928
ON THE TWO DIFFERENT ASPECTS OF THE REPRESENTATIVE METHOD: 
THE METHOD OF STRATIFIED SAMPLING AND THE METHOD 
OF PURPOSIVE SELECTION.

By Jerzy Neyman

(Biometric Laboratory, Nencki Institute, Soc. Sci. Lit. 
Varsoviensis, Warsaw).

[Read before the Royal Statistical Society, June 19th, 1934, the President, 
the Rt. Hon. Lord Meston of Agra and Dunottar, K.C.S.I., LL.D., 
in the Chair.]

Bowley vote of thanks

After Dr. Neyman’s very courteous references to my work on the subject, it is somewhat ungrateful that I feel it my duty to criticize the theory of probabilities in Section II, part 1, and I am very glad Professor Fisher is present, as it is his work that Dr. Neyman has accepted and incorporated. I am not certain whether to ask for an explanation or to cast a doubt. It is suggested in the paper that the work is difficult to follow and I may be one of those who have been misled by it. I can only say I have read it at the time it appeared and since, and I read Dr. Neyman’s elucidation of it yesterday with great care. I am referring to Dr. Neyman’s confidence limits. I am not at all sure that the “confidence” is not a “confidence trick.” Put in a simple form I think the method is as follows: Given that in a sample of cases taken at random, these

Fisher discusses

It would be expected that he should comment on those applications of inductive logic which constituted so illuminating and refreshing an aspect of the evening’s paper. All realized that problems of mathematical logic underlay all inferences from observational material. They were widely conscious, too, that more than 150 years of disputation between the pros and cons of inverse probability had left the subject only more befogged by doubt and frustration. Recently, however, some research workers, working in the apparently abstract realms of the theory of estimation, and the logical bases of tests of significance, had become increasingly confident that, when properly stated, rigorously exact, though, of course, uncertain inferences might be drawn from observational or experimental data.

“confidence trick”

“illuminating and refreshing”
THE LOGIC OF INDUCTIVE INFERENCE.

By Professor R. A. Fisher, Sc.D., F.R.S.

[Read before the Royal Statistical Society on Tuesday, December 18th, 1934,]

Fisher went in came out

When the invitation of your Council was extended to me to address this Society on some of the theoretical researches with which I have been associated, I took it as an indication that the time was now thought ripe for a discussion, in summary, of the net effect of these researches upon our conception of what statistical methods are capable of doing, and upon the outlook and ideas which may usefully be acquired in the course of mathematical training for a statistical career. I welcomed also the invitation, personally, as affording an opportunity of putting forward the opinion to which I find myself more and more strongly drawn, that the essential effect of the general body of researches in mathematical statistics during the last fifteen years is fundamentally a reconstruction of logical rather than mathematical ideas, although the solution of mathematical problems has contributed essentially to this reconstruction.

Professor Fisher replied in writing as follows:—
The acerbity, to use no stronger term, with which the customary vote of thanks has been moved and seconded, strange as it must seem to visitors not familiar with our Society, does not, I confess, surprise me. From the fact that thirteen years have elapsed between the publication, by the Royal Society, of my first rough outline of the developments, which are the subjects of to-day’s discussion, and the occurrence of that discussion itself, it is a fair inference that some at least of the Society’s authorities on matters theoretical viewed these developments with disfavour, and admitted them with reluctance. The choice of order in speaking, which

Fisher’s first address to an RSS meeting—expecting what—hail the conquering hero!?
Fisher vote of no thanks

Professor R. A. Fisher, in opening the discussion, said he had hoped that Dr. Neyman’s paper would be on a subject with which the author was fully acquainted, and on which he could speak with authority, as in the case of his address to the Society delivered last summer. Since seeing the paper, he had come to the conclusion that Dr. Neyman had been somewhat unwise in his choice of topics.

Egon Pearson comments

Dr. Pearson said that while he knew there was a widespread belief in Professor Fisher’s infallibility, he must, in the first place, beg leave to question the wisdom of accusing a fellow-worker of incompetence without, at the same time, showing that he had succeeded in mastering his argument. He felt sure that Dr. Neyman would be able himself to answer the criticisms that had been raised, but there was a rather more general point touching on the whole field of statistical enquiry on which he would like to comment. Professor Fisher had on more than one occasion thrown out the suggestion that while some other statisticians were academic he and his collaborators were practical men; Dr. Pearson believed that attempts to dub as academic enquiries into the underlying principles upon which practical tests were based, showed a serious loss of perspective.

Neyman’s paper criticised Fisher and Fisher reacted

Fisher had portrayed Neyman and Pearson “academic statisticians”
1935-50—quiet times for Fisher and the Stats

- 1935-9 Fisher takes part in meetings—usually to support Rothamsted friends
- Industrial and Agricultural closes down in 39
- Fisher receives awards from Society, joins Council and is President in 52
- Does not do anything in Society
War brings new people

- A lot of them!
- Some Cambridge maths graduates
- The more senior e.g. Barnard got jobs as statisticians
- The junior e.g. Lindley went back to Cambridge to learn more
- RSS their natural home

Some in 1968; a reunion of Ministry of Supply’s big SR17 unit. Dennis Lindley in centre—George Barnard absent.
1945: Research Section formed

Dear Professor Fisher,

As you probably know, a Research Section of the Royal Statistical Society has been formed, which, together with an Industrial Application Group, constitutes the new form of the pre-war Industrial and Agricultural Research Section.

At the inaugural meeting of the Research Section on December 4th, Mr. G.A. Barnard is reading a paper on Sequential Tests in Industrial Statistics. The committee feel that, in view of your interest in Mr. Barnard's work, it would be most valuable if you could contribute to the discussion on the paper, and very much hope that you will be able to accept this invitation to speak at the meeting.

Fisher didn’t go!

- Fisher was not involved in reform of the Society
- Nor in such intellectual developments as stochastic processes
- From 45 to 54 his stats papers went to Biometrics
George Barnard (1915-2002)

- Diverted by war from a career in mathematical logic
- Fisher’s only intellectual companion from that generation
- When Fisher was President chose him as VP
Looked 2 ways

- Back to controversies of 30s
- Forward to extensions of Fiducial inference
- Brought in a new critic D. V. Lindley
An echo of Greenwood inn 1920

JRSS publishes anyway

So at last RSS gives Fisher an outlet
Man and Society—quotes from Yates and Mather

his notoriously contentious spirit.

A great resigner
- in the 20s RSS
- In the 30s the Proceedings of the Cambridge Phil Soc
- in the 50s Biometrics

The RSS was never a place for meeting friends

Fisher had a likeable but difficult character. He had many friends, and was a charming and stimulating man to work with, and excellent company.

He liked the company of other scientists and was a familiar figure at scientific meetings and international gatherings; the latter he attended more for the opportunity of meeting his friends than to listen to scientific communications. He was largely instrumental in setting up the Biometric Society, and played a leading part in the affairs of many other societies.