19th. March 1936.

Dear Mr. Wickham Legg,

I have your latest version of my obituary of Pearson, with the further enquiries, most of which I can answer, though I think you should ask Professor E.S.Pearson about the second name of his father's second wife.

I do think that you have carried the process of transforming my original obituary rather far in this latest edition. After all, I suppose you do want a considered judgement so far as one can be obtained, tolerably free from ephemeral delusions, and which, in fifty years time, may show that contemporary judgement was not altogether superficial. The idea given in your last paragraph of Pearson as the "begetter" of modern statistics is, I am sure, a fallacy, which is not really strengthened by the fact that it was eagerly embraced and fostered by Pearson himself. Galton gets far less credit than is his due, and I am sorry that

Your last paragraph seems to me

you have cut out what I said about him. ~~It is~~ not fair to Edgeworth and Shephard, for example, who in their lives were overshadowed by Pearson, and to ignore their contributions in comparison with his. Nor, for that matter, is it fair to Gauss and Laplace, who provided the modern methods of regression analysis and characteristic function respectively, though Pearson seems to have had little knowledge of or use for them. Pearson was certainly a most energetic propagandist of his own points of view, but I do not think we ought to represent him as a towering genius.

Yours sincerely,

attached to last para. 1st draft.

I do not think that this is fair to the earlier and contemporary writers whom Pearson slighted and ignored. Modern methods go back to Laplace and Gauss, whom Pearson did not appreciate and purported to supersede. Edgeworth and Sheppard, overshadowed by Pearson in their lives, had probably more than he to contribute.

DNB amended copy.

PEARSON, KARL (1857-1936), mathematician and biologist, was born in London 27 March 1857, the second son and second child of William Pearson, Q.C., by his wife, Fanny Smith. He was educated at University College School and by private tuition and, in 1875, he obtained a scholarship at King's College, Cambridge; in the mathematical tripos of 1879 he was third wrangler and was elected to a fellowship at King's in the following year. Between the ages of 22 and 27 his predominant intention appears to have been to make a career at the bar and he was called by the Inner Temple in 1882. His studies other than legal were desultory, but he speaks of attending in Berlin lectures by Du Bois Raymond on Darwinism. He made some applications for academic posts, and in 1884 was appointed Goldsmid professor of applied mathematics and mechanics at University College, London. Here he remained, later (1911) as first ~~student~~ holder chair of ~~director~~ of the Francis Galton ~~Laboratory for~~ National Eugenics at the university of London, until his retirement as professor emeritus in 1933. In 1890 he married Maria, daughter of William Sharpe, solicitor, brother of Samuel and Daniel Sharpe [q.v.] and nephew of Samuel Rogers [q.v.]. By her he left a son, now Prof. Egon Pearson, and two daughters. The marriage was terminated by her death in 1928, and in 1929 he entered into a second marriage with one of his assistants at the laboratory, Margaret, daughter of John Child. Pearson died 27 April 1936 at Coldharbour, Surrey.

A kind of plan of Pearson's aims as a young man is found in his address on The Ethic of Freethought delivered in 1883, and published with other material under the same title in 1888. Religion is defined as "the relation of the finite to the infinite", with the

inferences that "the freethinker, in my sense of the term, possesses more real religion, more of the relation of the finite to the infinite than any mere believer in myth; his very knowledge makes him in the highest sense of the word a religious man". The scientific worker "may truly be termed a highpriest of freethought". "From this pursuit of religious truth ought to arise the enthusiasm of freethought".

The nature of "that truth.....which it is the principal duty of freethought to seek after" consists in the laws of material causation conceived on strictly determinist principles. How narrowly cramped and unreceptive was this phase of nineteenth century materialism appears from the assertion, which has not been borne out by the discoveries of the last fifty years, that "the only possible way in which you can think things is precisely identical with the actual way in which they do occur."

A better known work, which in the course of time passed into three editions, was the Grammar of Science (1892) a book, which, with rather extensive digressions, expounds the philosophical background, as Pearson conceived it, of the scientific method. The central doctrine is that "Science is the description in conceptual shorthand (never the explanation) of the routine of our perceptual experience". Clearly here a good deal depends on the meaning attached to the word "explanation" which is evidently intended to mean much more than merely making plain or simple. Although constraint or cogency is denied to scientific law, Pearson is equally explicit also in denying the popular concept of

~~voluntary action or choice as a real cause.~~

Judged by these early writings Pearson might have ~~applied~~ devoted his later years to any branch of applied mathematics, or even to popularising the philosophy of science in general, but his career was turned into other channels by the friendship and material support of Francis Galton [q.v.] whose 'Life and Letters' he published (1915, 1924 and 1930). Years before, in his Hereditary Genius, (1869) Galton had shown how vague and apparently intangible ideas could be made quantitative and precise by the collection and adequate presentation of statistical data. In a crude way he had attempted a collaboration in experimental research with his cousin Charles Darwin. He had tried his hand at the statistical expression of meteorological phenomena, always with a feeling for the power of the method to give unity and order to a mass of incoherent facts, and now, with wisdom and experience, but without adequate mathematical technique, he was strongly convinced that quantitative, and particularly statistical, methods were needed to consolidate Darwin's ideas, and give confidence to their practical application. With W.F.R. Weldon's [q.v.] wide biological interests, and Pearson's ambitious energy, Galton believed a solid foundation could be built for a timely advance in the method and theory of biological research.

In Pearson's work the immediate outcome was the appearance from 1894 onwards of a series of 26 extensive memoirs entitled Mathematical Contributions to the Theory of Evolution. Of those numbered the first 12 appeared in the Philosophical Transactions:

eight unnumbered are in the Proceedings of the Royal Society. To a biologist the ~~subject discussed~~ that chosen might well appear surprising, for Pearson was here exploring his own general concepts in mathematical statistics, skew frequency curves, contingency, and the correlation coefficient, and producing mathematical tables to facilitate their use. Mendel's laws are discussed in the twelfth memoir, but only to be dismissed as inadequate.

A more enduring consequence was the foundation in 1901 of Biometrika: A Journal for the Statistical Study of Biological Problems. For many years this beautifully produced quarterly was undoubtedly the focus of the development of mathematical statistics in this country. It attracted papers from outside Pearson's laboratory, and included some of the most important advances of a period of rapid progress. In building up the high reputation of this journal, Pearson's labours as editor were constant and indefatigable. It constituted the greater part of the scientific activity of his later life.

To Galton's influence must also be ascribed Pearson's series of statistical enquiries, ~~which~~ aimed at giving factual demonstration of the important truths that inheritance acts with equal force on man as on other animals, and on mental equally with bodily characteristics. If the data and methods may be criticized, the main conclusions of Pearson's work can now scarcely be questioned Another contribution to the study of inheritance in Man, the fine pedigree collections published as the Treasury of Human Inheritance (1909-) have made accessible the immense labours of such men as Nettleship and Usher, and provided invaluable material for the

study of rare anomalies.

Pearson's zest for polemics was unlimited. One of his series of publications was actually entitled Questions of the Day and of the Fray (1910-). In the introduction which he wrote for Biometrika he announced "We expect to receive stalwart blows as well as to give them". His controversial methods were overbearing and relentless, and accusations of ignorance and even of bad faith flowed too freely from his pen. In his long attack on Mendelism he encountered in William Bateson [q.v.] an opponent equally obstinate, and undoubtedly his master in sarcasm. The controversy proved nothing, but that Bateson did not know enough of mathematics, nor Pearson enough of biology. The great field of statistical investigation opened out by Mendel's theory was unrecognized by both. This inflation with unnecessary polemic, has diluted the interest to a later generation of a great deal of Pearson's statistical writings.

To statistical methods still in use Pearson's most important contribution lies in the "χ^2 test of Goodness of Fit". In a paper contributed to the Philosophical Magazine in 1900, Pearson considered the problem of the simultaneous departure from expectation of a number of normally distributed, but not necessarily independent variates. In χ^2 he found an admirably direct measure of joint departure from expectation. In the practical application of the method Pearson went astray, and the test was used erroneously for several years, but the test is so useful in all problems involving definite expectations of frequency that its initiation

must be reckoned a major contribution to the subject.

As a mathematician, Pearson can scarcely be classed with the founders of the theory of errors, Laplace and Gauss, nor as a logician with Thomas Bayes, G. Boole [q.v.] or John Venn [q.v.]. He could, indeed, have made far more use of these great predecessors. That Pearson did so much is due rather to his unbounded energy and to his determination to set before himself and his contemporaries a task of a magnitude and difficulty worthy of his powers.

Pearson was elected F.R.S. in 1896, and was awarded the Darwin medal in 1898. He was an honorary fellow of King's College, Cambridge, and of the Royal Society of Edinburgh, and of University College, London; he also received the honorary degrees of LL.D. from St. Andrew's University and of D.Sc. from the university of London.

SOURCES OF INFORMATION:

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E.S. Pearson. Karl Pearson: An Appreciation of Some Aspects of his Life and Work. Biometrika, Vol.28, pages 193-257 (1936) and Vol.29, pages 161-248 (1937).

G.M. Morant and B.L. Welch. Bibliography of the Statistical and other Writings of Karl Pearson. Biometrika Office, 1939, pp.119.

R.A. FISHER

A

Although Pearson is quite explicit in denying that what is known as Scientific Law imposes an iron necessity upon causation, he is equally clear in rejecting, what would seem the ~~practical~~ natural alternative, the popular concept of voluntary choice as a real cause.

B

The bitterness of Karl Pearson's statistical criticisms undoubtedly left for many years a legacy of prejudice which has retarded real progress in the subject he had at heart.