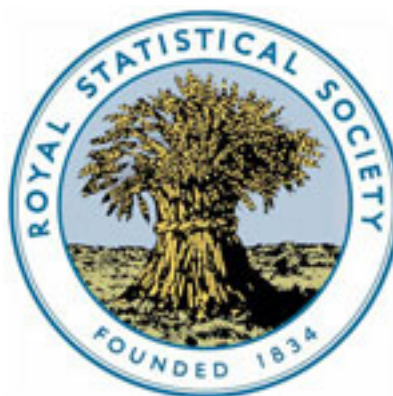


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The Life, Letters and Labours of Francis Galton by Karl Pearson

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REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*The Life, Letters and Labours of Francis Galton*. By Karl Pearson. Vol. I., *Birth, 1822, to Marriage, 1853*. 242 pp., 66 plates and 5 charts of pedigrees, la. 8vo. Price 21s. net.

The life of Francis Galton almost bridges the space between two crises in human affairs. When he was born, the settlement of 1815 was a recent event and the principles of which it was the expression were dominant; within four years of his death, Europe was again plunged in chaos. The story of so long a life, passed, as was that of Galton, in the thick of affairs must have many lessons to teach us in the case of an even moderately observant man. But Galton's powers of observation and reasoning were of a higher order than those of most of his contemporaries, so that the story of *his* life cannot fail to interest and instruct. It is fitting that the task of biographer should be performed by one who early grasped the significance of Galton's researches and upon whom his scientific mantle has fallen. Professor Pearson has, we think, planned the work on lines which Galton would have approved and, in particular, the elaborate pedigrees would have aroused the enthusiastic approval of him whose ancestors and collaterals they trace. It may be that, had Galton been able to read these pages, he would have wished passages which express the writer's contempt for those who may differ from him phrased with more urbanity, but this is only to say that Galton's nature was more tolerant than that of his disciple. There is some analogy between the relation of Huxley to Darwin and that of Professor Pearson to Galton, save that Huxley was mainly an apostle to the Gentiles while Professor Pearson should be regarded as a missionary to the unrepentant Jews. The present volume contains a full and interesting account of Galton's ancestors, a remarkable number of whom were distinguished in various ways,

including such different men as the learned Sir Henry Savile, the Restoration wit Sir Charles Sedley, Sir Ewen Cameron of Lochiel, one of the last of the Highland chieftains, and David Barclay the Quaker. The personal life of Galton is carried down to his marriage in 1853. The materials for a reconstruction of Galton's school and college life are fairly ample, but from the death of his father in 1844 to the end of 1849 a blank occurs, hardly any letters having survived. The story of school life is the old tale of a round peg in a square hole. The boy did not, perhaps, show signs of genius but he was intelligent and impressionable and, had the curriculum been more elastic, must have made rapid progress. Unfortunately he seems to have had little taste for the strictly classical studies which formed the staple of his diet and was, in his later years, as nearly unhappy as it is possible for a healthy and high-spirited boy to be. On leaving school he spent two years as a medical student, first at Birmingham, afterwards in London, and signs of the intellectual curiosity and restless energy which increasingly characterised him become manifest. The three following years cover his residence at Cambridge, which culminated in a serious breakdown of health, partly due to the strain of the competitive work for the mathematical tripos and partly to combining such studies with too wide a range of other interests and occupations. At the conclusion of his Cambridge course, Galton was to have continued his medical education in accordance with the earnest desire of his father, who wished to see him settled down to a definite occupation; but on the death of his father, Galton abandoned this programme and, possessed of ample means, spent some years in unscientific travel and the ordinary pursuits of a country gentleman with sporting instincts. At last in 1849 the dormant instincts of the scientific investigator are stirred into activity, and after a short period, occupied in designing a printing telegraph, an account of which appeared in 1850, we find him setting out on a serious exploration. This African journey led to Galton's first important contribution to general knowledge, and earned him recognition in geographical circles; shortly after his return to England he became engaged, and his marriage closed the first chapter of his career. Such are the events chronicled in the first volume of the biography. The story is of wonderful interest and suggests many problems to the reader. Judged by conventional standards, Galton's university career was a failure; he entered upon his life work without having mastered any one intellectual technic. Had he been an ordinary Englishman, this would doubtless have prejudiced his after career. Bagehot once said of the average Englishman: "His intelligence is slow and stubborn and sure; his memory, though retentive, is not facile; it is certain, therefore, that if you bother him with many things, he will learn none; if you do not allow him to become, as he thinks, *possessed* of some one acquisition, you will discontent him, and he will leave you." No description could be less fittingly applied to Galton. But even if Galton, able as he was, had intended to apply his powers to that form of original

work which consists in extending a road, many miles of which have already been constructed, the desultory character of his education would have hampered him. But his nature was that of an intellectual pioneer in the fullest sense of the word; he did indeed construct roads, but his services to mankind were even greater in that he pointed out to others tracts of country across which roads might be and ought to be made, and gave hints as to how the work might be commenced. Such a nature as this derives more from contact with men of different intellectual and social types, from a slight acquaintance with many different branches of study, than it probably could do from intimate knowledge of any one subject. So treated the average man becomes a trifier, the extraordinary man becomes, like Galton, a pioneer. In other words, if we consider Galton's education in the light of his congenital endowments and subsequent career, we shall not regard it as a failure but rather as a happy accident. Had he concentrated his energies upon his tripos work, we might have had a few more elegant theorems in geometry, but we might have had no science of eugenics and little anthropometry.

The human interest of the volume is very great. One of the most charming features is the intimacy between father and son. At a period when the relation between parent and child was still often regulated in the spirit of the maxim "children should be seen and not heard," such a series of letters as those passing between the elder and younger Galton must have been very rare.

How many boys of 19, in the year 1841, would have ventured, in writing to their parents for some lecture notes left at home, to say, "Don't forget the MSS. papers; if you do, may the spirit of 'gout tweak your remembrance !!!'" How many boys of 18, sent to study chemistry under Liebig, would suddenly announce that they had started on a trip to Constantinople with full (and completely justified) confidence that the home authorities would not be seriously displeased?

We do not remember to have come across in any biography a more amiable, we might almost say a more beautiful, picture of the intimacy between father and son. To the ceremonial forms of respect on the one side and of authority upon the other, scant attention is paid while the substance of these virtues is everywhere apparent.

In his preface Professor Pearson surmises that his material will "be strained of its more solid content" and presented to an indolent reader in a light and cheap form after the lapse of a few years. We hope that all the letters to and from Galton's father will pass through the strainer.

We have only noted one statement which seems to need correction. In speaking of Robert Waring Darwin's thesis on "ocular spectra," Professor Pearson writes (footnote, p. 16): "The paper dealing with 'ocular spectra' is an interesting one, the earliest as far as I know 'which drew attention to the 'contrast colour' seen by an eye

“fatigued by looking at a given colour.” The bibliography appended by Koenig to the second edition of v. Helmholtz’s treatise on physiological optics, includes the titles of several papers which appeared before 1786. All of these probably did not refer to colour contrast, but Scherffer (1765) in the course of his investigations copied a picture painting it with a green face, shaded with yellow, white hair and eyebrows, black eyeballs with white pupils, and green lips, so that the after image might have the colours of the original. Scherffer may not have been acquainted with positive after images, but these were familiar to Jurin (1734), who propounded a fairly complete theory of both positive and negative after images.

The second and third volumes of the biography will be excellent indeed if they maintain the level reached by the first. M.G.

2.—*Economic Cycles: Their Law and Cause.* By Professor H. L. Moore. viii + 149 pp., 8vo. New York: The Macmillan Co.; London: Macmillan and Co., Ltd., 1914. Price 8s. 6d. net.

To the statistician, especially to one equipped with some knowledge of mathematical methods, as well as to the economist, the economic cycle affords an extraordinarily attractive field for investigation. The form of the cycle itself, the relation between the cycles in different forms of economic and industrial activity and in different countries, the relation between cycles in supply and in prices, and above all the origin of this curious periodic or approximately periodic movement itself, are all problems which are not likely to be exhausted by the investigator for some time to come. In the present monograph Professor Moore has developed a sustained argument ending in the conclusion (p. 149) that “The fundamental, persistent cause of the cycles in the yield of the crops is the cyclical movement in the weather conditions represented by the rhythmically changing amount of rainfall; the cyclical movement in the yield of crops is the fundamental persistent cause of Economic Cycles.”

In itself there is, of course, nothing essentially new in this conclusion, to which more than one investigator has come. What is novel in Professor Moore’s work is the mode of development of the statistical argument. In a brief introduction it is argued that cyclical economic movements are very widely diffused all over the world, and it seems likely, consequently, that there must be a definite physical cause: that the need for food is the most widely diffused need, and it seems probable that the observed cycles may be produced by the physical cause through its effect on the food supply, and that the physical cause may be the weather.

Taking the rainfall as an important characteristic of the weather, Professor Moore first proceeds to show, accordingly, that there are significant cycles in the weather. He draws the periodogram for rainfall in the Ohio valley on the basis of data for 1839–1910, and finds principal periods of 33 and 8 years respectively: these and their semi-harmonics are taken as the more important. The same