

THURSDAY, DECEMBER 17, 1908.

THE AUTOBIOGRAPHY OF A PRACTICAL PHILOSOPHER.

Memories of My Life. By Dr. Francis Galton, F.R.S. Pp. viii+339; with 7 illustrations. (London: Methuen and Co., n.d.) Price 10s. 6d. net.

THOSE who are interested in the history of the growth of science in this country and in the men who participated in its development will thank Dr. Galton for having provided them with a characteristic account of his own life and of his relations with three generations of men of thought and action. Although Dr. Galton has provided a *précis* wherein those who know something of the author and his deeds can read between the lines, a biographer is still needed who will portray to the world what manner of man he is. Probably many will feel that the autobiographer's "fear" is well grounded that he may "have failed through over omission."

That love of accuracy which runs through all his work appears on every page of the memories, dates are scattered with profusion, and the frequently recorded personal incidents will delight the heart of future biographers. The book contains two excellent portraits and a bibliography of the author's writings.

Very briefly, in a chapter on parentage, Dr. Galton indicates the origin of his hereditary tendencies, and the following four chapters narrate the influences of companions, school, and university which moulded his "status of pupilhood." His paternal grandfather was a statistician, and so was his father; as to his mother, it is only necessary to state she was a Darwin. To his progenitors he was indebted for "a considerable taste for science, for poetry, and for statistics; also, partly through the Barclay blood, a rather unusual power of enduring physical fatigue without harmful results," and, it may be added, certain of the qualities of the Quakers, though adhesion to the Society of Friends practically ceased with his grandfather's generation. On the whole he gained little from the schools he attended, and at the age of sixteen he took up his abode, as indoor pupil, in the Birmingham General Hospital; his early experiences and the ideas that occurred to him make interesting reading. Later he went to King's College, London, and enjoyed to the full the wider intellectual outlook and companionship of distinguished men. The passion for travel seized him in 1840, and he went to Giessen to study chemistry, but he played truant, and made an adventurous voyage down the Danube to the Black Sea. A visit to Constantinople and Smyrna fired his imagination. This little expedition proved to be an important factor in moulding his after-life; it vastly widened his views of humanity and civilisation, and confirmed his aspirations for travel. The first year at Trinity College, Cambridge, "was a period of general progress, without much of note." The reading parties in the long vacations and the later terms were full of the inspiring influence of older and younger men who

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have left their mark on the intellectual history of Britain, and he points out "the enormous advantages offered by a university to those who care to profit by them." His health broke down in his third year, and it comes as a shock to learn that he was obliged to content himself with a poll degree; but this has since been made up to him by his university giving him an honorary degree of doctor in science (1895), and his college electing him to an honorary fellowship (1902).

The following seven years fall into three periods. A visit to Egypt, when he visited Khartum, went some distance up the White Nile, and had several journeys across the desert, was not the pleasure trip it is to-day. This was followed by a tour in Syria. Some four years were then spent at home, reading, hunting, and sailing; it was at this time he invented an apparatus, the telotype, for printing telegraphic messages.

In 1850 he fitted out an expedition to a portion of south-west Africa which was then absolutely unexplored. The results of this noteworthy expedition were published in "Tropical South Africa" (1853), and laid the basis of our present knowledge of the country and people of Damaraland. Recognition followed this hazardous and fruitful enterprise in the bestowal of the gold medal of the Royal Geographical Society, the fellowship of the Royal Society, and the membership of the Athenæum Club. A further result of this experience was the publication of that eminently practical book, "The Art of Travel," which is replete with common sense. Dr. Galton for many years served on the council of the Royal Geographical Society, and was intimately connected with the expeditions of the great African travellers Burton, Speke, Grant, Baker, and Livingstone. It was due to his initiative that the society interested itself in geographical education at first in public schools and latterly in the Universities of Oxford and Cambridge.

In 1853 Dr. Galton married and settled in London. Then began a life full of intellectual activity which has persisted to the present moment; various tours were taken in Britain and on the Continent, and a passion for mountaineering was developed, but no extended expedition was attempted. Dr. Galton early became a member of the managing committee of the Kew Observatory, then the central magnetic observatory of the world; he became chairman in 1889, and held that post until 1901, when the observatory ceased to be an independent body; now it is merged into the National Physical Laboratory. The peculiar inventive genius of Dr. Galton here had full scope, and he busied himself with standardising sextants, thermometers, and other instruments of precision. His interest in the movements of the air led him to map out the data. He was the first to recognise the downrush of air associated with a high barometer and a clear sky, with an outflow having a clock-ways twist which is the exact opposite of a cyclone and supplementary to it. He named this system an "anti-cyclone."

Always interested in the problems of heredity, Dr. Galton has devoted the best years of his life to a study of heritability in man, as the following land-

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marks testify:—"Hereditary Genius" (1869), "English Men of Science" (1874), "Human Faculty" (1883), "Natural Inheritance" (1889), and his later writings on eugenics. Impressed with the necessity of obtaining a multitude of exact measurements relating to every measurable faculty of body or mind for two generations at least, he first stimulated schoolmasters to weigh and measure their boys, and established an anthropometric laboratory at the International Exhibition of 1884, and subsequently at South Kensington, several of the instruments employed being designed by him. These have formed the model of similar laboratories elsewhere. It was in this connection that he made an exhaustive study of fingerprints as a means of identifying persons, which led to the adoption of the system by the Criminal Departments of Britain, India, and many foreign countries; he also demonstrated that the patterns of the papillary ridges have no racial significance. Numerous experiments were made in composite photography, of which an interesting account is given. In order to ascertain the relative position of individuals, the well-known "centile" method was devised. As a side-issue he suggested the appropriateness of utilising the *median* vote in councils of juries. Being satisfied of the inheritance of mental qualities and that heredity was a far more powerful agent in human development than nurture, he endeavoured to ascertain the degree in which breeding might, at least theoretically, modify the human race. The general result of his inquiry was to support the view "that man is little more than a conscious machine, the slave of heredity and environment, the larger part, perhaps all, of whose actions are therefore predictable."

The strong practical bent that manifests itself in whatever Dr. Galton does constrained him to apply the conclusions to which his studies on human faculty and heredity had led him. Hence of late years he has occupied himself with eugenics, though so far back as 1865 he had formulated its leading principles, and he introduced the term in 1884. He thinks that "stern compulsion ought to be exerted to prevent the free propagation of the stock of those who are seriously afflicted by lunacy, feeble-mindedness, habitual criminality, and pauperism, but that is quite different from compulsory marriage. . . . A democracy cannot endure unless it be composed of able citizens; therefore it must in self-defence withstand the free introduction of degenerate stock. . . ."

The aim of eugenics is to check the birth-rate of the Unfit, and to promote the improvement of the race by furthering the productivity of the Fit by early marriages and healthful rearing of their children, and thereby "to replace Natural Selection by other processes that are more merciful and not less effective." In his last utterance on this subject (*cf.* NATURE, October 22, 1908, vol. lxxviii., p. 645) Dr. Galton gives practical suggestions for creating a public opinion; he rightly recognises the enormous influence wielded by social opinion among all races and classes of mankind, and he would direct this tremendous force towards a favourable consideration of eugenics, trusting that practical

results would ensue to the great betterment of man kind.

This bald, epitomised sketch of the life and activities of Dr. Galton indicates the wide range of his interests and powers. The practical application of scientific principles seems to be always in his mind, never from the point of view of the patentee or exploiter, but invariably disinterestedly, and his eugenic investigations were fired by a burning zeal for the well-being of his fellow-men. The transparent honesty and naïveté of the man are revealed in these straightforward memories. Perhaps we are too close to him to be able to judge how great his life's work will loom when the history of the science of our day comes to be written, but his energy, enthusiasm and character have stimulated many during the past and the present generation, and when these qualities are associated with sound work accomplished and the promulgation of larger views of life and duty, we can confidently await the verdict of posterity.

A. C. HADDON.

AN INTRODUCTION TO THE STUDY OF NATURAL HISTORY.

Animal Life. By Dr. F. W. Gamble, F.R.S.
Pp. xviii+305. (London: Smith, Elder and Co., 1908.) Price 6s. net.

THIS is a fascinating introduction to the study of animal life, marked by freshness of outlook, stimulating exposition, and vivid style. To Dr. Gamble—editor though he be of an austere "Practical Zoology"—animal life is "a pageant," "a moving spectacle," and his inquiry is kinetic throughout. What is all this bustle about, what are the leading motives, what are the ends achieved? In developing his subject he has proceeded by the use of three leading motives that differentiate animals from plants—movement, the acquisition of solid food, and the nervous control of response to changing order, and the three main problems the solutions of which he considers are the maintenance of self, the development of self, and the progress of the race, though he is careful to point out that the last is "rather a motive that possesses animals than is possessed by them." He begins by contrasting animal and plant life:—

"Mass, stationariness, and pliability—the notes of plant life—are replaced in animals by purposeful evasion, activity, and intractability."

Then the fulness of the earth and the abundance of the sea is his theme, and "the mighty gamut of the scale of being." But amid all the multitude of forms and endless variety of architecture there are only a few chief styles, the history of which is briefly sketched. The stage has not always had its present-day scenery and troupe of players. There has been a rise and fall of races.

"Wave after wave of life has risen from the inexhaustible depths of nature, towered to a great height, and has then fallen; yet undelayed the onward movement continues."

Nothing could be better than the chapter on animal