

IN MEMORIAM. ALLAN MACFADYEN.

THE regretted death of Dr Allan Macfadyen on March 1st, at the early age of 46, removes a name well known and justly honoured from the all too small band of British Bacteriologists. Born in Glasgow, he received his medical and scientific education at the University of Edinburgh, of which he was a distinguished student, gaining the gold medal at the M.D. examination in 1886 and taking the B.Sc. degree two years later. He subsequently studied in Germany at Berne, Göttingen and Munich, under such masters as Carl Flügge, Nencki and Pettenkoffer, gaining an intimate knowledge of chemical and bacteriological methods and a mastery of the German language. From 1889 to 1892 he was a Grocers' Company Research Scholar, and about this time became Professor of Bacteriology at the old College of State Medicine, subsequently amalgamated with the British Institute of Preventive Medicine. At the Institute he succeeded Dr Ruffer as Secretary and had a large share in the planning and organisation of the new building at Chelsea. Here, at the Jenner and Lister Institute, as it successively became, he acted as Secretary to the Governing Body and was head of the Bacteriological Department, and much of the work which emanated from there was inspired by him. He had been Examiner in Hygiene at the University of Edinburgh, and was Fullerian Professor of Physiology at the Royal Institution 1901-1904.

One of Dr Allan Macfadyen's earliest investigations was on the behaviour of bacteria in the digestive tract, in which he proved that in the gastric juice and intestinal secretion we have but little protection against the organisms that find their way into the alimentary canal. This was followed by a joint paper with Nencki and Sieber on the chemical processes in the small intestine of man, in which advantage was taken of a patient with faecal fistula, to make analyses of the intestinal contents under different conditions of diet and to study the share taken by the numerous bacteria present in the decomposition of food. He also

studied the action of bacteria on protein bodies, and, with Sir Lauder Brunton, the ferment action of bacteria, showing that peptonising and diastatic enzymes may be produced by micro-organisms, and this work was continued in a paper on the biology of the ringworm organism published in 1895. The thermophilic and photogenic bacteria also attracted his attention and important contributions to the biology of these organisms were published with Dr Blaxall and Mr Barnard respectively. About 1899 the researches of E. Buchner on the alcoholic ferment of yeast greatly interested Dr Macfadyen and probably had a good deal to do with directing his ideas into the lines to which during the last years of his life he devoted himself. With Mr Rowland and the late Dr Morris a paper was published on Buchner's zymase, and an apparatus for grinding yeast cells was devised which formed the starting point from which the machine for disintegrating bacterial cells in the presence of liquid air was ultimately evolved. By the year 1900 or thereabouts, the idea that antitoxic and anti-microbial sera would prove a panacea for all infective diseases had been proved to be fallacious, and an *impasse* had been reached owing to the difficulty of obtaining anti-sera for the endotoxins or intracellular poisons of bacteria. Macfadyen conceived that if bacteria could be disintegrated and their juices obtained in such a manner that chemical changes were inhibited it might be possible to obtain toxins which on injection would stimulate the formation of the proper anti-bodies. By a series of researches it was successively shown that the virulence of an organism varied directly with the amount of endotoxin that could be obtained from it; that an animal might be immunised by means of these endotoxins, and that the serum of such an animal possessed immunising and curative properties. The application of these principles to the typhoid bacillus, cholera vibrio, pneumococcus, and hog-cholera bacillus was described in a series of papers, and, latterly, the treatment of disease in man by means of anti-endotoxic sera had yielded encouraging prospects. Somewhat prior to this work the employment of liquid air in the various researches naturally directed Dr Macfadyen's attention to the influence of low temperatures on bacterial life, and in a series of papers it was shown that little or no deleterious action on vitality or on biological properties was suffered by bacteria exposed to liquid air and even to liquid hydrogen. A man of kindly nature and genial disposition, Dr Macfadyen's death, a result of accidental infection with typhoid and Malta fever, will leave a blank not easily filled.

R. T. H.