Obituary

PROF. J. C. FIELDS, F.R.S.

IN the death of Prof. John Charles Fields on August 9 the University of Toronto lost one of its most renowned members and probaby its most gifted mathematician. Prof. Fields was born on May 14 at Hamilton, Ontario, in the year 1863. When quite young he displayed unusual skill in mathematics and in his university course at Toronto his brilliancy attracted much attention. Though his doctorate was taken at Johns Hopkins University, Baltimore, it was to Germany that he, like many another student from the American continent in the early days, turned for stimulus to mathematical research. There it was that he found his chief inspiration for his subject. He studied at Paris for a time but it was at Göttingen and Berlin, where he came under the influence of such leaders as Wierstrass, Klein, Fuchs and Schwartz, that his imagination was fired and the foundations laid for the creative side of his life's work.

In 1906, Fields published his famous treatise on "Theory of the Algebraic Functions of a Complex Variable", a work which at once received world-wide acclaim and won for its author immediate recognition as a mathematician of the first rank. In his conversations with me he often spoke with pride and with deep affection of the friendly part played by the late Mittag-Leffler, the renowned Swedish mathematician, in the negotiations that led up to the publication of this work.

Prof. Fields was called to the University of Toronto in the opening year of the present century. Since that time his researches and those of workers associated with him have been among the outstanding contributions to knowledge made by that institution.

In all his academic relations Fields strenuously advocated and promoted in every way open to him the claims of research. Soon after his appointment to Toronto he openly expressed the view that students desiring to specialise in mathematics came to universities in America handicapped by defective mathematical training in the secondary schools. Another handicap to which he considered the students of a generation ago were subjected both in Canadian universities and in American universities generally was that involved in the use of defective mathematical texts, more particularly of texts on the calculus. It was his considered opinion that one would not be far wrong in attributing the almost complete sterility of the mathematicians of the last generation in America to inadequate and ineffective teaching of the calculus. But all this was gradually changed. Through the efforts of Fields and of those of other leaders holding similar opinions, new life was breathed into the teaching of mathematics in Canada and the United States, with the result that an ever-increasing stream of research achievement is becoming so great as to tax severely the facilities available for publication.

During the period of the War and for some time afterwards Prof. Fields was president of the Royal Canadian Institute of Toronto. Throughout his term of office he never ceased to advocate scientific research as the ideal of the Institute and to emphasise the opportunity its organisation afforded for the advancement of scientific thought. He initiated a movement in the direction of having research professorships attached to this institute similar to those now administered by the Royal Society, the Royal Institution and the Franklin Institute. From the way in which he laid his plans for the success of this project and from the manner in which he was quietly working them out I believe that had he lived but a few years longer he would have achieved his aim

Prof. Fields was president of the International Mathematical Congress held in Toronto in 1924. It was a very successful meeting and it was largely through the financial aid personally secured by him that it and the meeting of the British Association for the Advancement of Science held at the same time were made possible. The fact that the Press of the University of Toronto was able to handle such a difficult typographical task as that involved in the printing of the "Proceedings of the International Mathematical Congress" was somewhat of a surprise to foreign mathematicians. It was only made possible, however, through the close co-operation that was maintained between Mr. R. J. Hamilton, director of the Press, and his staff on one hand and Prof. Fields with his associate editors on the other.

What I consider to be Fields's greatest achievement in advancing the cause of research in Toronto was the institution of the special annual finance grant that is made by the Legislature of the Province to the University of Toronto and ear-marked for research. The first of these grants, which amounted to more than 75,000 dollars, was made on the recommendation to the Government of Ontario of the Hon. Dr. H. A. Cody, then Minister of Education and now president of the University. I do not think I am revealing any secret in stating that this grant was secured very largely as a result of the most earnest solicitation by Prof. Fields.

One of Prof. Fields's last activities was the establishment of a fund with which to provide two or more gold medals, to be awarded by a Committee of the International Mathematical Congress at stated intervals for outstanding achievements in mathematical research. The initial sources of the fund were the cash balances remaining in the hands of the organisation committees of the 1924 Toronto meetings of the British Association and the International Mathematical Congress. His great interest in this fund

is shown by the fact that according to the provisions of his will the residue of his estate after certain annuities are paid will pass to the medal fund, which it gave him such pleasure and satisfaction to inaugurate.

Of late years Prof. Fields's life was more strenuous than the state of his health warranted. He frequently related with evident pleasure how he had just caught a tram, or train, and he often travelled by aeroplane in order to economise his time. Some twenty years ago an attack of rheumatic fever left him with health impaired, and in 1924, through carrying his luggage to the station on one of the numerous journeys made in organising the 1924 meetings, he overstrained his heart. In spite of this disability the last eight years of his life were crowded with activities. Two years ago he suffered a slight cerebral hæmorrhage and in May of this year he had a violent heart attack. He recovered sufficiently to sit up at times in a reclining chair from which he dictated letters at intervals to some of his intimate friends.

Prof. Fields was the recipient of numerous honours, but the one he valued most was his fellowship in the Royal Society of London. Quite recently the Italian Government expressed a desire to confer upon him an honour of rare distinction but this he was compelled to decline through the existence of self-denying legislation enacted in Canada at the close of the War. I should like to mention one outstanding mental gift possessed by him. It was his remarkable memory. It was my privilege to be present at a lecture given by him some years ago on "The Evaluation of π". To my astonishment he went to the blackboard in the course of the lecture and without hesitation wrote out the value of π correct to 200 decimal places.

Prof. Fields's life was spent in the cause of research. He was devoted to his friends, and I never knew anyone more pure in heart and thought or more generous in his judgments of others. With the words of one of his admirers I agree: "He has, I am sure, left behind him sweet memories with people the world over, and lucky, I think, are those who passed his way." I was fortunate in being one of that happy band.

J. C. McLENNAN.

MRS. G. P. BIDDER

THE life of Mrs. Bidder, who died on September 25 at seventy years of age, was full of beneficient activities—scientific, social and domestic. I am competent to touch only upon the earlier scientific period before her marriage when, as Marion Greenwood, she was well known to many scientific colleagues. She went to Girton from Bradford Girls' Grammar School with an entrance scholarship in 1879, when she was seventeen years old. She obtained a first class in both parts of the Natural Sciences Tripos for 1882 and 1883 and was at once appointed demonstrator in physiology to the science students of Newnham. In those days there were no lecturers in science at that college. In 1888 she was awarded by Girton College the Gamble prize for a dissertation.

In 1890 she was appointed the head of the Balfour Laboratory in Downing Place—a queer, ugly block of a building, once a chapel. How it came by so surprising a change I never heard. Some contraction in the spiritual life of Cambridge must have thrown it, a spiritual derelict, on to the market. At any rate it became the laboratory for women science students and, as Cambridge was still stirred by the genius and the tragic death of Francis Maitland the most brilliant of the Balfour brothers, it bore his name. There, until her marriage to Mr. George Bidder in 1899, Marion Greenwood was responsible for the teaching of the women science students, and herself taught.

Her research work, however, was carried out in Foster's laboratory, where physiologists and biochemists, still undivorced, habited adjacent rooms to their mutual comfort and benefit. The rooms, in order, down the little dark passage, were the homes of Sheridan, Lea, Walter Gaskell, Marion Greenwood, and beyond and through her room, in a cupboard of a place, Langley. Miss Greenwood was in a small passage room, and I shared the one bench with her. No modern Ph.D. aspirant could or would compress his or her activities into the space we were contented with in those days.

At that time women were rare in scientific laboratories and their presence by no means generally acceptable—indeed, that is too mild a phrase. Those whose memories go back so far will recollect how unacceptability not infrequently flamed into hostility. The woman student was rather expected to be eccentric in dress and manner; she was still unplaced, so far as the male in possession was concerned. Miss Greenwood, it so happened, was not only a woman of quite unusual intellectual distinction but she had also great personal charm and a great gift of comradeship. Science by no means absorbed all her interest which covered a wide knowledge of literature. She worshipped Meredith, and was a lover of Jane Austen and Peacock.

She took her share, and it was a large one, in the government of Newnham and Girton, but I am inclined to think that the best she did for women was just being her gracious and kindly self in those early days of hostility, touched as it was sometimes by a spice of active persecution.

Miss Greenwood made solid contributions to science. Her first scientific paper was on the gastric glands. The amazing story of the secretory granules, which revealed so much of the inner working of the living cell, was then being deciphered by Langley. Miss Greenwood was a histologist, and it was natural for her to join in that quest. Her paper of 1890 on the action of nicotin upon certain invertebrates also reflected