

THURSDAY, AUGUST 3, 1882

FRANCIS MAITLAND BALFOUR

DEATH has been striking heavy blows at Cambridge. Only a little while ago we were mourning the loss of Maxwell, taken from us, as it seemed, in his prime, when we were fondly hoping that for many years yet to come, the bounds of science would continue to be widened by the labours of his powerful mind; and now Balfour has been snatched from us in the very flush of youth, with his work only just begun, for what he had achieved, great as it was, seemed to his friends only an earnest of that which was yet to come.

The editor of NATURE has asked me to write a few words about my lost friend; and I obey, feeling it my duty not to refuse, painful as the task is.

Francis Maitland Balfour was born in 1851 or 1852 (I cannot at this moment find out which), and was therefore, at the time of his death, only about thirty years of age. After spending some years at Harrow, where he gained the reputation of being a bright, clever boy, but raised no adequate expectations of what he was about to become, he entered at Trinity College, Cambridge, in October, 1870. He had the good fortune to become at once the private pupil of Mr. Marlborough Pryor, who had just been elected the first Natural Science Fellow at Trinity, and though Balfour had already turned towards natural science, and indeed had gone pretty fully into the geology of his native county (Haddingtonshire), I cannot but think that the direction of his studies, and so of his future career, was largely determined by Pryor's admirable influence. I myself was called to Trinity College as Prælector at the same time that Balfour entered, and I believe he, in his second term, attended the lectures which I was then giving; but I did not distinctly make his acquaintance till March, 1871, when I took part in an examination at Trinity College, which resulted in Balfour being elected Natural Science Scholar. From that time onward we became more and more intimate, and I took an increasing share in the direction of his studies.

Discovering very early how great his powers of mind were, and learning that his private resources were such as to enable him to disregard the pecuniary advantages of academic success, I did, what seemed to some at the time, a rash thing: I counselled him to neglect the ordinary routine preparation for his degree, and to apply himself at once to original work. His mind from the first was drawn towards morphology rather than towards physiology; and, as I was then attempting to embody in a small volume some of the lectures on embryology which I had given in London and Cambridge, I proposed to him that he should associate himself with me in the work, and undertake at once the investigation of some of the many embryological problems which lay to hand. He did so, and the results of these, his early labours, are partly contained in the papers "On the Layers of the Blastoderm," "On the Primitive Streak," and "On the Development of the Blood-vessels," published in the *Quarterly Journal of Microscopical Science*, July, 1873, and are partly scattered and hidden in the little work "On the Development of the Chick," which bears his name and mine. The larger achievements of his succeeding years have of

VOL. XXVI.—No. 666

course overshadowed these works of his 'prentice hand; but while he was engaged on them, that power of acute observation, rapid grasp of the meaning of things, and strict faithfulness of statement, which all have since recognised in him, became evident to myself at least.

In December, 1873, after breaking off his original work for two or three months in order to prepare himself more definitely for the examination, he obtained his B.A. degree in the so-called Natural Sciences Tripos. Happily and wisely just then the University of Cambridge had secured two "tables" at the newly established zoological station at Naples, and in the early winter, Balfour, in company with Mr. A. G. Dew-Smith, started off to work there. His knowledge and insight had already led him to expect that much might be learnt from the investigation of the early history of the Elasmobranch Fishes, and that accordingly was the problem which he set before himself, and on which he worked during that and succeeding years.

The results of those labours, embodied in his Monograph on the Development of the Elasmobranch Fishes, published as a volume in 1878, but as separate papers in the *Journal of Anatomy and Physiology* from 1876 to 1878, and in the *Philosophical Transactions* for 1876, are known to all biologists. This is not the time to point out in detail their value, but this at least may be said that from the very beginning to the very end of the investigation almost every step serves to throw light on important biological problems. Every chapter from the first, which deals with the ovarian ovum, to the last, which treats of the urogenital organs, contains a record of inquiries which have left their stamp on morphological doctrines. When I remember what embryology was, when in 1871 Balfour learnt his first lessons in it from my imperfect lips, and reflect what it is now, the progress of ten years appears little short of marvellous: and how much of that progress is due to the hand and brain which a slip on the treacherous mountain path has snatched from our midst!

In October, 1874, an election to a Natural Science Fellowship, at Trinity College, took place. Happily the governing body of the College had previously determined to make a new departure, and to allow original work, as well as the results of an examination, to weigh in the decision of the electors. I believe I am betraying no secret in saying that had the election been determined by an examination alone, Balfour would never have been Fellow of Trinity, and Cambridge would probably have lost one of its brightest ornaments. Balfour was one of those able men who never "do themselves justice in an examination-room," and his performance in answering the set questions was inferior to that of his competitor. But the winter at Naples had already borne fruit; and Prof. Huxley, who kindly assisted in the examination, gave such testimony as to the value and promise of so much of the work on the Elasmobranchs as had already been done, that no hesitation as to choosing Balfour was possible.

This success encouraged him to even increase his activity. He continued to work either at Naples or in Cambridge, and in 1875, after delivering a short course on embryology for me, he began (upon the invitation of Prof. Alfred Newton and with the support of Mr. J

P

W. Clark) to give definite lectures upon animal morphology, at first in conjunction with Mr., now Prof. Milnes Marshall, but after two terms, by himself. From that time up to last Christmas his labours were enormous, and his energy untiring. His class grew rapidly in numbers; he had to separate the students into an elementary and advanced division, each with separate lectures, and courses of practical instruction; and though he soon gained the able assistance of Mr. Adam Sedgwick and others as demonstrators, all his pupils enjoyed the priceless advantages of close personal contact with himself. At the same time he carried on, either by himself, or through his pupils, a large number of independent investigations into various problems of embryology and morphology, and set himself to write that great work on "Comparative Embryology," every page, and indeed every line of which is marked at once by the widest knowledge and the clearest insight, and which will tell men in long years to come how great is our loss to day. And all the while he was most active in university and college matters; every syndicate almost was desirous to secure his services, and in the framing of the new statutes of Trinity College he took among the junior fellows a prominent part.

During all these exertions his friends, and I not less than any of them, watched him with anxious care. But he was wise as well as zealous, and never went too far; and when, the second volume of the big book being off his hands, he started last Christmas for a holiday to Messina, the prospects of his health seemed to me better than ever. On his journey outward, he found one of his pupils who had gone to study at Naples laid up with typhoid fever at Capri, and with characteristic kindness he halted to nurse the patient till friends could arrive from England. On his return home, he himself was struck down by an attack of the same fever, which at first threatened to be severe, but happily proved otherwise, and speedily left him; and soon after there came an event which was to him one of the greatest pleasures of his short life.

His fame was now spreading rapidly wherever science reaches, and honours were coming thick upon him. In 1878 he was elected Fellow of the Royal Society, and in 1881 was not only placed on the Council, but received the high distinction of a Royal Medal. In the same year the University of Glasgow conferred on him the degree of LL.D., the British Association, at the York meeting, chose him as one of the General Secretaries, in December last a brilliant company assembled at Cambridge to greet him as President of the Cambridge Philosophical Society, and while he was on his sick bed, the Committee of the Athenæum elected him, as a distinguished man of science, a Member of that Club. Moreover, other Universities were eager, if possible, to win him for themselves. I believe it is no secret that many efforts were made to induce him to become the successor at Oxford of the lamented Rolleston; and it is certainly no secret that the Government again and again pressed him to take the chair of Natural History at Edinburgh. He, however, remained faithful to his Alma Mater, and though, owing to difficulties arising out of impending changes, his merit, in spite of the esteem and pride with which all men at Cambridge regarded him, remained without adequate re-

cognition in his own University, he chose to remain with us, waiting till the future should bring him his dues.

Happily a special effort disclosed the fact that the difficulties were, after all, not unsurmountable; and at last, this spring, with the approbation, I believe, of the whole University, scientific or otherwise, and certainly to the great joy of his friends, a special chair of Animal Morphology was created for him, and he was placed in it.

With this recognition of his worth, which he, I believe, valued beyond even his weightier honours, with the prospect of the increased facilities which the new statutes would give in the coming session, and with his health becoming rapidly restored (for since his fever he had nursed himself, doing but little work, or what to him was little), all the future seemed brighter than it had ever seemed as yet. And when in early July I parted with him, and heard him promise that on those perilous Alpine tracks, he, remembering his past illness, would try nothing rash or likely to strain his powers, I looked forward to meeting him again, both of us perhaps fuller of hopes and plans than we had ever been before.

Of the details of his death, at the moment of writing, we as yet know very little, save that some fatal slip on the glacier of Fresney, above Courmayeur, hurried him and his guide to an instantaneous death.

And now comes the hardest part of my task. The world of science knew Francis Balfour as an investigator of the brightest promise, who, indeed, as a mere youth, had already solved morphological problems which had heretofore baffled the acutest minds, and of whom it seemed difficult to say how far he might not reach. A smaller circle in this country and in Europe knew him also as a man whose firm will and rapid but clear judgment were all the more effective, because his decisions and resolves were made known to others with a winning courtesy and with a kindly sensitive regard for the feelings of those from whom he might differ in opinion. But only those who had the privilege to be his friends knew his real worth, for they alone were aware how much the light of his personal character outshone even his scientific achievements and his administrative powers. It will need great knowledge and skill on the part of him who attempts to show exactly how much science owes to Francis Balfour as an inquirer, a teacher, and a counsellor; but that will be an easy task compared with the effort to tell to those who did not know him what he really was. Workers in biology all the world over will feel that a light has gone from the world when they hear the sad news that he is dead, Cambridge men who have watched events at Cambridge during the last ten years will know that a wholly irreparable loss has fallen upon their University, but their grief and their loss is a small thing put by the side of the emptiness which is left for them whose daily life was brightened by the light of his countenance. These mourn for Lycidas, and cannot be comforted.

M. FOSTER

THE MOUNT WHITNEY EXPEDITION

EXPERIMENTS^{*} at the Alleghany Observatory in 1879 and 1880, upon the selective absorption of the solar rays by the earth's atmosphere, having made it probable that the amount of heat the sun sends us (the