FRIDAY, FEBRUARY 23, 1883.

THE BALFOUR MEMORIAL.

THE death of Francis Maitland Balfour last July was felt by many as a heavier blow to biological science than the loss of Darwin. The immortal master had nearly finished his work: Balfour's had but commenced. There was therefore added to the emotion of personal bereavement the perhaps less poignant but deeper grief due to the fact that science had sustained, through Balfour's early death, an almost irreparable loss. His work had already yielded such rich fruits that we hardly knew how to put a limit to what we might expect from him in the future. His genius, patience, knowledge, technical skill, and critical judgment were so apparent in his published works, that when he died aged but thirty-one years, he was already recognized throughout the civilized world as an eminent authority on morphological questions. All young English biologists looked upon him as the undisputed future leader of morphological science in their country. The feelings towards him of older men have been expressed by Professor Huxley: "It is no exaggeration to say, that to my eyes, and to those, I take it, of many of my age, Professor Balfour seemed to be like that Lycidas of whom Milton spoke: —

'Dead ere his prime,
Young Lycidas, and hath not left his peer.'"

Of the beauty of Balfour's character we cannot here speak: its remembrance will ever remain a cherished and inspiring possession of every one who knew him.

It was impossible that the death of such a man should not be followed by some effort on the part of his contemporaries and fellow-workers in science to express the esteem in which they held him and his work. We desire to call attention to the admirable form which the Balfour Memorial is to take; namely, the establishment of a permanent fund, the income of which is to be used exclusively for the promotion of biological research.

The Balfour Memorial took definite shape at a meeting held in the University of Cambridge last October, attended and addressed not only by the leading biologists of Great Britain, but by distinguished theologians, classical scholars, chemists, and mathematicians. This co-operation of leaders in so many lines of thought was a most striking testimony to the wide-spread regard felt for Balfour's personality, and to the value attached to his influence by many who were not able to appreciate the technical importance of his morphological discoveries.

At the meeting it was decided to found a Balfour Memorial, and that this should take the form of an endowment fund "for the promotion of biological research, especially in morphology:" also, that the income yielded by the 'Balfour Fund' should be employed, (1) in the payment of £200 a year to a young biologist for his support while engaged in morphological research; and (2) in occasional grants to the Balfour student, or other biologists, for the promotion of research, — as, for example, by providing the means of visiting parts of the world especially suited for the prosecution of investigations on hand, or by supplying expensive apparatus or rare specimens. It was also decided unanimously, that, though the fund should be in some way closely connected with Balfour's own university, yet others than members of the University of Cambridge should be eligible as Balfour students.

We can conceive of no more suitable form for the Balfour Memorial than that selected. As the work of him whom it commemorates was cosmopolitan, so are to be the benefits of the fund. By perpetuating Balfour's name through all future time in connection with biological research, it appeals to the sympathy of all who knew him or his work. By affording support for a year or two to young men qualified to advance knowledge, it will, through generations to come, save for science many, who, without such help while winning their spurs, would have been forced into a professional or business career. Thus not only will science be advanced, but Balfour's work passed on from hand to hand; so that the increase of knowledge which we had hoped for from him

will, in the course of time, come to us through the work of successive 'Balfour students.'

The sum already subscribed in England is more than sufficient to provide for the Balfour studentship: but a memorial to such a man and for such objects should be international; and we are glad to learn that a representative committee of American naturalists, with Mr. Alexander Agassiz at its head, is being organized for the purpose of obtaining subscriptions to the Balfour fund. Few scientific men in this country are in a position to contribute large sums; but we trust that all American biologists will give something, whether they be investigators, teachers, or students. A general subscription from naturalists on this side of the Atlantic would be a most graceful testimony to the esteem in which Balfour's character and work are held by us; and would at the same time express our approval of the idea to make the monument of an eminent scientist not a bronze or marble statue, but a permanent endowment for the advancement of knowledge.

REARING OYSTERS FROM ARTIFICIALLY IMPREGNATED EGGS.

DURING the past three years the writer has been engaged upon the investigation of this subject, with the view of reaching some practical results which would be available in the hands of oyster-culturists. Until last year his efforts under the auspices of the U.S. fish commission had been comparatively fruitless and unsatisfactory. In July and August last, in association with Col. M. McDonald, the experimental work was resumed at St. Jerome's Creek, St. Mary's County, Maryland. Col. McDonald devised a simple combination of glass apparatus, consisting of a series of jars connected together with rubber tubing, somewhat in the manner of a series of Wolff's bottles, with an open glass aquarium at a higher level as a feeder, or reservoir, while the last jar of the series discharged into a similar cylindrical aquarium standing on the floor. The sea-water introduced into this contrivance was carefully filtered through cotton-wool, to remove all sediment and foreign organisms. The circulation was maintained in this contrivance by baling the water from the lower into the upper aquarium; the water passing continually through the intervening series of jars, which were, in effect, simply enlarged portions of the siphon-tube passing from the upper to the lower aquarium. No difficulty was experienced in keeping the water in this apparatus fresh and sweet without renewal.

On the 23d of July a batch of oyster-eggs was introduced into this apparatus, impregnated by a method to be hereafter described. On the 24th, and just about twenty-four hours after impregnation had taken place, an inspection of the transparent sides of the jars and aquaria was made; and to our great surprise we found immense numbers of embryos with the valves of the larval shell covering the sides of the body, and adherent to the inner surfaces of the glass vessels. In some places upwards of twenty-five might have been counted to the square inch. Every available part of the surface of the vessels was, however, more or less affected by these affixed embryos. Some of the jars were then taken from the closed circuit, and a continuous current passed through them, which it was found did not dislodge the embryos; but in two to three days more it was found that most had died or been detached, even in the portion of the apparatus not affected by a continuous current of fresh sea-water. The gratifying result which we had anticipated at the beginning of our experiment was, however, not realized, except in so far as it determined that fixation of the embryos took place at an early period under favorable conditions, or in about twenty-four hours, and that they might be reared from artificially fertilized ova. Efforts to repeat our first successful experiment failed, owing, probably, to the high temperature then prevailing.

The next advance made was when the writer hit upon a physical test by means of which the sexes of the spawning adults can be instantly determined by the most ignorant person. It was found, that if the ova were squeezed from the ovary, and dropped into sea-water in a glass dish resting on a dark ground, they would break up into a distinctly granular cloud; while the milt would not so readily break up, but would tend to mix slowly with the water as a milky substance, the particles of which were not perceptible to the naked eye, and, if stirred about in the water, would not break up at once, but be drawn out into wisps and streaks resembling in miniature cirrus or mare's-tail clouds. This test was an infallible guide; so much so, that a pocket-lens was found to be of no advantage, as we had formerly supposed. We also found, that if the eggs did not separate at once, when dropped into the water, they were not so mature as they should be.

Another important improvement was also in-