

(b) Members of the Nobel Committees of the Physical and Chemical Sections.

(c) Men of science who have received a Nobel prize from the Academy.

(d) Professors of the physical and chemical sciences of the Universities of Uppsala, Lund, Oslo, Copenhagen, and Helsingfors, at the Caroline Institute, Stockholm, and the Royal Technical College, Stockholm, and also those teachers of the same subjects who are on the permanent staff of the Stockholm University College.

(e) Holders of similar chairs at other universities or university colleges, to the number of at least six, to be elected by the Academy of Science in the way most appropriate for the just representation of the various countries and their respective seats of learning.

(f) Other men of science whom the Academy of Science may see fit to select.

The members of the present Committee for Physics are—

Prof. Carl W. Oseen (Uppsala).

Prof. V. Carlheim-Gyllensköld (Stockholm).

Prof. Karl M. G. Siegbahn (Uppsala—Nobel prize, 1925).

Prof. Henning B. M. Pleijel (Stockholm).

Prof. Erik W. Hulthén (Stockholm).

The members of the present Committee for Chemistry are—

Prof. Henrik G. Söderbaum (Stockholm).

Prof. Theodor Svedberg (Uppsala—Nobel prize, 1926).

Prof. Knut W. Palmaer (Stockholm).

Prof. Ludwig Ramberg (Uppsala).

Prof. Hans Karl von Euler-Chelpin (Stockholm—Nobel prize, 1929).

Secretary to the above Committees—

Prof. Arne Fredrik Westgren (Stockholm).

2. *Physiology and Medicine Section.* The qualification for the right to nominate candidates is possessed by :

(a) Members of the professorial staff, Caroline Institute, Stockholm.

(b) Members of the medical class of the Royal Academy of Science, Stockholm.

(c) Nobel prize-winners in the section.

(d) Members of the medical faculties of the universities of Uppsala, Lund, Oslo, Copenhagen, and Helsingfors.

(e) Members of at least six other medical faculties, to be selected by the staff of the Caroline Institute in the way most appropriate for the just representation of the various countries and their respective seats of learning.

(f) Men of science whom the above staff may see fit to select.

The Nobel Committee of the section shall hand in its verdict and proposals for the prize award to the professorial staff of the Caroline Institute within the month of September.

The members of the present Committee for Physiology and Medicine are—

Prof. Gunnar Hedrén (Stockholm).

Dr. Hans Christian Jacobæus (Stockholm).

Dr. Hans Valdemar Gertz (Stockholm).

Dr. Einar Hammarsten (Stockholm).

Secretary to the Committee—

Dr. Göran Liljestrand (Stockholm).

Special Funds of the Sections.

The Statutes provide, within strictly defined limitations, for the establishment of Special Funds for each of the five sections of the Noble Foundation. The proceeds of any and every such fund may be employed, subject to the approval of the adjudicators concerned, to promote the objects which the testator ultimately had in view in making his bequest, *in other ways than by means of prizes.* In the domain of physical and chemical science, support in furtherance is consequently available, if judged to be of significance either in a scientific or a practical regard. Proposals for the awarding of assistance of this nature remain with the respective Nobel Committees. Similarly, such proceeds may be devoted to promoting research in medical science, and in rendering the results of that research of practical use to mankind. In this section a proposition may be made by a member either of the staff of the Caroline Institute, or of the Nobel Committee.

Obituary.

THE RIGHT HON. THE EARL OF BALFOUR,
K.G., O.M., F.R.S.

THE genuine statesman, so we read in the *Republic*, will be the man who, in contemplating the true good, makes it a pattern for ordering the State and individuals and his own conduct; who spends much of his time in philosophic reflection, and yet, when his turn comes, endures for the sake of the public welfare the toil of politics and ruling, not as though he were performing some meritorious deed but simply as a matter of duty. In writing of the great personality lost to the nation on Mar. 19 last, one can scarcely avoid recalling the well-known portraiture. For, if ever in the chequered course of human history Plato's ideal has been to some extent realised, it was in

Lord Balfour's case. Other political leaders have been classical scholars, men of letters, and even men of science. Who, however, among Prime Ministers, has ever before not only made philosophy his main pursuit as an undergraduate, but also at the age of thirty published in a technical journal an elaborate criticism of the transcendental theory of knowledge of sufficient importance to elicit replies from such eminent Kantian scholars as Edward Caird and John Watson? And, needless to add, this was the outcome not merely of a passing phase in the career of a distinguished public man; it was the prelude to a large number of subsequent efforts in the field of speculative thinking, interest in which was no less keen in the man of eighty than in the man of thirty.

Arthur Balfour came to Cambridge from Eton in

1866, and at once fell under the spell of Henry Sidgwick, his senior by about ten years. Of Sidgwick it has been said "he did not teach as a prophet, and he required of his pupils hard thought, without promising them that this would result in any revelation of the secret of the universe"; and Balfour himself wrote of him that "he never claimed authority; he never sought to impose his views; he never argued for victory; he never evaded an issue". That the pupil who was destined soon to become a warm personal friend was immensely influenced by his teacher there can be no doubt. In all Balfour's published work, characterised, indeed, by an ease and beauty of style and a wealth of epigram to which Sidgwick's can lay no claim, there is to be traced that critical habit of mind, that evenly balanced judgment, and that distrust of dogmatic systematising which, in his undergraduate years, he had seen so uniquely exemplified. In the year 1869, he took the Moral Sciences Tripos, one of the first to be examined under the new scheme, with the framing of which Sidgwick had been closely concerned.

Ten years intervened between his taking the degree and the appearance in 1879 of Balfour's first book, "A Defence of Philosophic Doubt", although he had previously published several philosophical articles in *Mind* and elsewhere; and meanwhile he had entered the House of Commons as member for Hertford. Fourteen more years elapsed before his second book, "The Foundations of Belief", saw the light in 1895; but, again, during the interval numerous articles of his had appeared in periodicals, amongst them a delightful essay on Berkeley, and two Lord Rector's addresses had been delivered, one at St. Andrews in 1887, and the other at Glasgow in 1891. Then followed in 1915 the first volume of Gifford Lectures on "Theism and Humanism", delivered in Glasgow just prior to the outbreak of the War, and which he managed to prepare for the press before joining the Coalition Cabinet; and finally, in 1923, there appeared the further volume on "Theism and Thought", containing the second series of Glasgow lectures, delivered in 1922-23, when the author was more than seventy-four years of age. Many smaller things ought to be mentioned, especially the striking presidential address to the British Association at the Cambridge meeting of 1904. It is an extraordinary record of independent and vigorous intellectual activity on the part of a man who was never free from the strenuous demands of political life, and was fulfilling various functions in the educational world and in many other spheres. "Literary composition", he once said, "I have always found laborious and slow, even in favourable conditions." Yet whatever he wrote is remarkable for its fresh, lucid, and graceful mode of expression; as Sir Frederick Pollock put it in 1895, he will have done much to bring back the good days of Berkeley and Hume when philosophy could speak English.

At the time when Balfour's first book was written, the dominating philosophical influences in England, both at the universities and perhaps more decidedly among the philosophically minded out-

side the universities, were J. S. Mill and Herbert Spencer—Mill more than Spencer, although it is true that in Oxford and Glasgow German idealism had powerful representatives. The philosophic doubt which Balfour defended was doubt as to the legitimacy of either of these ways of handling ultimate problems. In dealing with the former, which had culminated in an agnosticism the cardinal tenet of which was that knowledge is confined to phenomena and the laws of phenomena, he directed attention not upon what was alleged to be unknowable but upon what was alleged to be known. If we are to believe nothing but what we can prove, let us see, he urged, what it is that we *can* prove. He started by emphasising as fundamental the distinction between the causes or antecedents which produce a belief and the grounds or reasons which justify one,—a distinction which every competent thinker would acknowledge as vital now, but which was constantly being lost sight of then. Confining himself to logical grounds or reasons, Balfour tried to show, and certainly succeeded in showing, that, on the basis of an empirical theory such as was then current, the premises on which the system of modern science rests can neither be proved nor rendered even probable.

A philosophy which is to justify the procedure of science must be prepared to give a coherent account of two radical beliefs at least—the belief in the uniformity of Nature and the belief in a world of physical things existing independently of the individual mind that is apprehensive of them; and of neither could the current empiricism give a coherent account. As regards belief in an external world, Mill's doctrine of 'permanent possibilities of sensation' and Spencer's doctrine of 'transfigured realism' fell easy preys to Balfour's incisive dialect. Neither could afford the slightest warrant for asserting the existence of a material universe the objects of which are composed of atoms and molecules, vibrating with different degrees of rapidity, and in which modes of energy are everywhere operative. Spencer had himself admitted that if the theory of subjectivism were right the doctrine of evolution would be a dream; but the arguments which he brought to bear against what he called 'crude realism'—the "realism of the child and the rustic"—involved him in the very subjectivism he had attributed to the 'unimaginable blindness' of the 'metaphysicians'. As regards the uniformity of Nature, Balfour argued that not only is the statement of it as an inference from particulars 'by simple enumeration' incapable of proof, but that, when so interpreted, it cannot be thrown into any accurate form save at the expense of making it unmeaning. In dealing with transcendentalism, he maintained that, so far as causality is concerned, all that Kant, even on the most favourable view of his reasoning, can be said to have established is that the totality of phenomena at one instant is the effect of the totality of phenomena at the previous instant,—a general proposition which by itself is wholly inadequate to serve as a basis for scientific induction. For this general proposition might be quite true, and yet the course of Nature might be,

to all intents and purposes, absolutely irregular, unless a fixed relation subsist not merely between the totality of phenomena but likewise between extremely small portions of that totality, and not merely between individual concrete phenomena but between classes of phenomena.

The argument of the early work was, it is true, conducted with an *arrière pensée* in the shape of 'practical results' it was taken to yield, so far as a theistic view of the world is concerned. But, in his second book, Balfour attempted to develop the negative speculations of philosophic doubt into a constructive, if provisional, system of thought. As before, he proceeded by criticising what he here designates 'naturalism', meaning by that term virtually a purely mechanical theory of Nature, which "forces itself into the retinue of science", and "claims, as a kind of poor relation, to speak with her voice". With singular effectiveness, he sought to bring into the foreground the implications, in the spheres of ethics, aesthetics, and of rational thought generally, which this doctrine entails. In the first place, the consciousness of freedom, the sense of responsibility, the authority of conscience, —these, along with the train of beliefs and sentiments from which virtuous deeds and generous ambitions spring, evince themselves as mere devices for securing certain competitive advantages in the struggle for existence. In the second place, the persistent endeavours of æsthetic theory to show that the beautiful is a necessary and unchanging element in the general scheme of things indicate, at any rate, that mankind will not be easily reconciled to the view that beauty is but the chance occasion of a passing pleasure, and that, so far from disclosing hidden mysteries to us, poets and artists portray what, though it may be very agreeable, is seldom true and never important. "We cannot willingly assent to a theory which makes a good composer only differ from a good cook in that he deals in more complicated relations, moves in a wider circle of associations, and arouses our feelings through a different sense." In the third place, human reason, so far from being Nature's final product, is, according to the doctrine in question, no more than one of many expedients for increasing our chance of survival, and which, we may suppose, will be gradually superseded by the growth of instincts or inherited habits, by which such adjustments between the organism and its environment as now seem dependent on it will be more successfully effected.

Having thus exhibited the inherently irrational character of the naturalistic theory, Balfour attempted to sketch in outline a philosophic position which, while admittedly incomplete and suffering from gaps and rents, from loose ends and ragged edges, would yet do justice to the fact that in accepting science, as we all do, we are moved not merely by strictly logical considerations but also essentially by 'values'. A fearless examination of the grounds on which judgments about the physical world are founded will disclose, he argued, that they rest on postulates about which it is equally impossible to say that we can theoretically regard

them as self-evident, or practically treat them as doubtful. We can neither prove them nor can we give them up. Grant the same philosophic weight to values in those departments of speculation that look beyond the physical world, and naturalism will have to be abandoned once for all. The vast majority of our beliefs, of our ethical, social, and religious beliefs especially, have not been attained by any process of logical reasoning; they have been generated in us by custom, education, public opinion, by the contagious convictions of countrymen, family, and so on; and, not least, by "the 'spirit of the age', producing a certain psychological 'atmosphere' or 'climate' favourable to the life of certain modes of belief, unfavourable, and even fatal, to the life of others". Unfortunately Balfour used the misleading and inappropriate term 'authority' by which to denote the group of influences thus enumerated. But, as a discerning German critic has observed, what he really meant "may all be covered by the proposition that we men, in our higher spiritual life, are the products of history before we are its producers, and that in this double relation of ours to history the weight is permanently to be placed upon our dependence on the historical factors which surround and determine us." And it is, I take it, certain that, although he not seldom contrasted what he called 'authority' with reason, Balfour did not mean to imply that, in the last resort, the beliefs in question are 'irrational'. On the contrary, he insisted that we are driven to believe in a supreme Reason, in order to account for the presence of these factors in the human world at all. The presupposition that the world is "the work of a rational Being, who made it intelligible, and at the same time made us, in however feeble a fashion, able to understand it" is a presupposition "forced upon us by the single assumption that science is not an illusion".

I must not dwell upon Lord Balfour's further elaboration of these principles in the Gifford Lectures. Those of us who have been privileged to take part with him in philosophical discussion need not to be reminded of his invariable fairness and patience in listening to views that were opposed to his own, or of his wonderful power of quickly seizing the main points in a complicated argument, and of freeing it from irrelevancies. Nowhere will his presence be more sincerely missed than in the small gatherings of philosophic workers, where he was always so much at home.

G. DAWES HICKS.

From Sir J. J. THOMSON, O.M., F.R.S.,
Master of Trinity College, Cambridge.

It may fairly be said of Lord Balfour that no statesman ever did so much to promote the development of science or kept in closer touch with its progress. He was First Lord of the Treasury during the initial stages which led to the foundation of the National Physical Laboratory, and it was his sympathy and support which made the Laboratory possible. He was instrumental in founding the Department of Scientific and Industrial Research,