

and Kavanagh of the simple system of a growing tobacco leaf, the regularities which appear are of purely descriptive value. To the reviewer, at least, it emerges from every example discussed that the next step in these studies waits on the formulation of a physiological theory of growth. In an organ which is changing its shape, we are confronted with an orderly arrangement of different rates of synthesis. We have at present almost no idea how these rates are controlled. It may be that comparatively simple general laws would emerge from a study of longer phases of development; most of the investigations deal only with an embryologically late stage in which the growth process is running down, and it is conceivable that, if earlier stages were studied, it would be found that the differences in rate of various parts are dependent on the time at which differentiation occurred or some other simple parameter. But it is perhaps more likely that no satisfactory formulation will be found until we understand more fully the mutual interactions between the processes by which the cytoplasm is synthesized and the genetic factors the doubling of which initiates cell-division.

The physiological approach has made more headway in relation to another of D'Arcy Thompson's legacies—the study of organic form as a resultant of physical forces. Whereas thirty years ago it was a revelation to see, in the pages of "On Growth and Form", the geometrical analogies between groups of cells and soap-bubbles, or hydroid polyps and water splashes, nowadays the appropriate physical theories are accepted tools in investigations which are firmly founded on thorough experimental study. Essays on such lines are contributed by Le Gros Clark ("Deformation Patterns in the Cerebral Cortex"), Wigglesworth ("Growth and Form in an Insect"), Young ("The History of the Shape of a Nerve-Fibre"), Berrill ("Size and Organisation in the Development of Ascidians"), Willmer ("Growth and Form in Tissue Cultures") and Danielli ("Some Reflections on the Forms of Simpler Cells").

The wide range of topics touched on in this volume of essays is appropriate in a tribute to so catholic a biologist as D'Arcy Thompson. But, diverse though their fields of study may be, all the authors show, not merely by expressions of gratitude but also in the actual methods of thought by which they are guided, the influence of the master to whom the book is dedicated; a fact which is not only a justification of the decision to prepare a *Festschrift*, but also a cause for congratulation to the editors.

C. H. WADDINGTON.

"On Growth and Form", 2nd ed., p. 159.

consistently put the scientific point of view, lucidly and forcefully, but never overstated. It would be difficult to determine how much scientific workers owe to his reasoned presentation of their case in such matters as the recent proposals for a Scientific Civil Service or the organization of science for war, but of all this there is little hint in these memoirs. There is a passing reference to his position as president of the Parliamentary and Scientific Committee, and there are accounts of the origins of his two books, "Belief and Action" and "An Unknown Land", which reveal his deep interest in both science and philosophy.

While there is little here that touches directly on scientific matters, the scientific outlook which pervades the book is unmistakable. Through the great events of which he writes, and on which he sometimes throws fresh light, Lord Samuel moves with ease and judgment. Here are displayed the qualities of mind demanded of anyone who would fill the post of Minister of Science for which Lord Samuel has pleaded so eloquently. He writes, moreover, with charm and dignity and the quiet intimacy of a fire-side talk. Pen pictures as delightful as his account of Barrie's luncheon party to Lord Grey and his own tribute to Grey are illuminated as by flashes of fire-light through his flair for the vivid and telling phrase. He can express Lloyd George's personality in his prime in one vivid sentence: "He seemed to be marching through life, head high, to the strains of 'The Men of Harlech'", but Lord Samuel is never betrayed by that gift into the superficial. In a brilliant chapter on the Cabinet of 1914, he gives us penetrating sketches of Lloyd George and of Churchill—to whom alone of the statesmen of our time he attributes the touch of genius—and others of his colleagues which make one wish that this Messel medallist might give us a like gallery of sketches of men of science.

In this volume there are indeed already sketches of Einstein and of Weizmann, and the man of science who stays to savour the quality and dignity of Lord Samuel's limpid prose can scarcely fail to appreciate also the whole philosophy and spirit of the book. Lord Samuel possesses the judicial temperament, and neither his loyalty to his colleagues nor his passion for impartiality blunts the edge of a discerning mind. He possesses in large measure that equanimity which he notes as Asquith's fundamental quality; and the sincerity and unflinching loyalty to the spirit of truth which illumine the pages of this book from first to last, with the quiet dignity of its style, should give it an assured place in literature.

R. BRIGHTMAN.

LORD SAMUEL'S MEMOIRS

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By the Rt. Hon. Viscount Samuel. Pp. viii+304. (London: Cresset Press, Ltd., 1945.) 15s. net.

AMONG that small band of statesmen, including Lord Balfour and Lord Haldane, through whose efforts and advocacy in the last thirty years science and scientific research have come to occupy in Great Britain a more fitting place in the life of the nation, Lord Samuel holds an assured place. In debates on scientific research, the organization of the war-effort, the planning of national resources, whether of land or of man-power or brain-power, Lord Samuel has

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