

strenuous race of men. The author's particular text is the function of the State in fostering agriculture; left to himself, the farmer is normally a strong individualist, who readily becomes isolated and hide-bound. His sole chance of success in modern life is collective action, and Prof. Bailey discusses in successive chapters the extent to which the State can profitably intervene in the organisation of rural life by education and by starting various forms of cooperative work which will lead the farming community to act together. Different as the agricultural conditions are in this country and in America, the problems are the same in both places, and Prof. Bailey's discussion of the subject gains a special interest for us at this moment, when the Chancellor of the Exchequer has just set aside a "development grant" to be devoted to the promotion of all agencies for encouraging rural life.

The Problem of the Feeble-minded. An Abstract of the Report of the Royal Commission on the Care and Control of the Feeble-minded. With an introduction by Sir Edward Fry, G.C.B. Pp. x+113. (London: P. S. King and Son, 1909.) Price 1s. net.

THE appearance of this abstract is most opportune. The small committee of persons interested in social problems which is responsible for its publication is anxious to bring before as large a section of the public as possible the urgency of the matters in question, and points out in the preface of the book that the Poor Law Commissioners have given it as their opinion that if the recommendations of the Commission on the Care of the Feeble-minded were carried into effect, a system of control over the feeble-minded would be initiated which would free the Poor Law administration from one of its greatest difficulties and, we may add, the country from a cause of enormous expenditure. In his introduction Sir Edward Fry quotes Bagehot's sad reflections upon the undue haste and benevolent thoughtlessness with which so much philanthropic effort is attended, and the terrible question which he poses as to whether the benevolence of mankind does not do more harm than good. Sir Edward Fry can, however, recommend the work of the Commission on the Feeble-minded as one done with deliberation and not with "a wild passion for instant action." The various problems which came before the Commission, such as mental defect and drink, mental defect and crime, and mental defect and illegitimacy, are adequately epitomised, and the far-reaching recommendations of the Commission duly considered as to the essential points. The book also contains some special articles, of which that upon segregation, by Mr. Galton, we can especially recommend to our readers.

The Economy and Training of Memory. By Henry J. Watt. Pp. viii+128. (London: Edward Arnold, 1909.) Price 1s. 6d. net.

THE training of the memory is undoubtedly a part of any good education, and it has hitherto been too much the peculiar field of the faddist and of ingenious but ignorant *a priori* system-makers. This little book, which aims at making of practical value to student and teacher the results of scientific experiment into the subject, is therefore to be welcomed. It is true that some of its precepts appear obvious, but where there are so many conflicting truisms the selection of the right obvious is not unimportant; and much definite information is given on particular points where the merely empirical adviser is quite at a loss, e.g. the advantages and disadvantages of specific types of mental imagery, and the variations of method corresponding to differences in the material to be memor-

ised. Moreover, if the book did no more than free the ordinary adult from that excessive distrust of his memory, which is so bad in effect, and is, perhaps, too optimistically believed by Mr. Watt to be quite ungrounded in fact, it would be abundantly justified.

Mr. Watt considers the mechanical memory of association to be, in a sense, more fundamental than the intelligent memory based on connection of thought, since the association between word and "meaning" is in itself mechanical. It seems doubtful if that ultimate "association" of meaning and imagery can be expressed so simply; but the point, though of great interest, is of minor importance in a confessedly practical book.

LETTERS TO THE EDITOR.

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Rate of Helium Production from the Complete Series of Uranium Products.

A KNOWLEDGE of this constant is essential to the estimation of the ages of minerals from their helium content. In a paper published in Proc. Roy. Soc., July 28, 1908, I gave the ages of some minerals provisionally on the assumption that the rate was 9.13×10^{-8} c.c. per gram U_3O_8 per annum. This rate was calculated from Rutherford's indirect data. It has received much support from Sir J. Dewar's determination of the rate of production by radium with its immediate products. I am now in a position to confirm it further by an experiment on the rate of growth of helium in a solution of pitchblende; I speak of a solution, but it has been found impracticable to take up all the constituents by one solvent. Two solutions were necessary.

The pitchblende solutions contained 115 grams of U_3O_8 , and yielded in sixty-one days a quantity of helium which was measured as 2×10^{-6} c.c. in the capillary of a McLeod gauge. This gives the rate as 10.4×10^{-8} c.c. per gram U_3O_8 per annum. No stress can be laid on the close agreement with Rutherford's estimate in view of the very small gas volume measured. The experiment proves, however, that that estimate is of the right order of magnitude. Larger scale experiments are in progress, and these, in conjunction with similar experiments on thorium, will, it is hoped, enable data on the quantity of helium in minerals to be translated into estimates of time with full confidence.

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July 27.

A Kinematic Illusion.

PEOPLE are sometimes amazed by noticing that in a motor-car seen through railings the wheels appear to revolve the wrong way. As the eye follows the moving objects it is convenient to imagine that the car, which may be actually running to the right, is stationary, while a vertical rail is moving past it to the left with an equal velocity. The apparent intersection of this rail with the upper edge of the wheel is a point running round in a contrary direction to that of the rotation of the wheel. This moving point suggests rotation of the wheel. When oblique lines swing in front of vertical lines the movement of the intersections is curious to watch. It is true that the lower half of the wheel goes against our theory, but at a given moment its effect may be less noticeable, either from being hidden in dust or because the eye has a very small range of close attention. I have seen the appearance, and have had reports of it from others, but cannot speak with precision as to the condition of seeing it effectively.

It is common to rotate vacuum tubes while a discontinuous spark illumines them. A spark may pass at the instant of starting one revolution, and the illumination