Your Daily Bread

By Doris Grant. Pp. 94. (London : Faber and Faber, Ltd., 1944.) 4s. 6d. net.

THIS little book covers a lot of ground. Essentially, Miss Grant sets out to prove that white bread—or "murdered bread" as she prefers to call it—is responsible for much of our poor and indifferent health, and she pleads the case for wholemeal bread as the remedy. The book contains much scientific material, and although some of it is not very critical, the case is skilfully presented. It is suggested, for example, that because nicotinic acid helps to create skin beauty, "one of the best and easiest ways of ensuring a flawless complexion is to eat whole-wheat bread".

A section of the book deals with the place of bread in a balanced diet and gives specimen menus. Miss Grant abhors imported or processed foods of any kind, and she is supported in this by Sir Albert Howard, who contributes a chapter on the importance of fertile soil for the production of best-quality wheat. Sir Albert includes all canned foods, chilled meat and frozen fish with white bread as "murdered foods", and claims that they are responsible for the poor physique of our urban population. Further, he condemns the use of artificial manures of all kinds. Another chapter reproduces the Cheshire memorandum, a statement by a number of medical practitioners from that county on some general aspects of nutrition including the arguments in favour of wholemeal bread.

The book concludes with a number of recipes for cakes, scones, biscuits, etc., using wholemeal flour. Perhaps the most important recipe is that for the 'Grant loaf'. A sample was made for the reviewer, strictly according to instructions but using ordinary salt and cane sugar, by a skilled baker. When eaten at tea by a family of four, two preferred it to National bread ; however, when two days old, one only was still enthusiastic. It is not easy to break dietary habits.

School Physics

By T. M. Yarwood. Part 2. Pp. x + 438. (London : Macmillan and Co., Ltd., 1945.) 7s. 6d.

THIS book includes all that is required for the various School Certificate examinations. Together with the previous more elementary part, it provides the basis for a sound school course in physics. Good features are the frequent references to the applications of science to everyday life ; the inclusion of a chapter on radio ; and the numerous problems solved in the text.

In the reviewer's opinion, however, it is a mistake to cover the whole of physics in two books. The inevitable result is that the presentation is not so attractive as in well-known series of books covering the same ground. Having attempted it, dullness might have been avoided by the lavish use of half-tones, but there are only half a dozen in the 400 pages.

There are a few slips and inadequacies : two may be mentioned. On p. 73 it is said that the gas ejected from a jet-propelled plane "presses on the air behind the aeroplane, and the machine is thus pushed forward". On p. 131, stress is laid on the thermal capacities of water and mercury, water and sand, etc. The effect of their relative densities should also be mentioned when comparing the thermal capacities of two bodies, for example, two thermometers.

J. P. STEPHENSON.

On a Class of Linear Transformations Connected with Group Representations

By Lars Gårding. (Meddelanden från Universitets Matematiska Seminarium, Band 6.) Pp. 125. (Lund : C. W. K. Gleerup, 1944.) n.p.

BASIC spinors are defined with reference to the equation $T^{-1}\gamma_i T = \Sigma a_{ij}\gamma_j$, where γ_i represents a set of anti-commuting matrices, $[a_{st}]$ is the matrix of an orthogonal transformation, and T is the matrix of transformation for basic spinors. Dirac's equation for the electron is of the form $\nabla^2\psi = k^2\psi$, where ψ is a basic spinor. The same equation, but with ψ representing quantities of other types, occurs in other contexts in quantum theory and nuclear physics.

Dr. Garding sets himself the problem of investigating the generalized equation $S^{-1}V_j T = \Sigma a_{jk}V_k$, where V_j represents a finite set of matrices, and S, T, and $[a_{st}]$ are any representations of a continuous group, in particular of the orthogonal group with $S = T$. His applications are concerned mainly with the solutions of $\nabla^2\psi = k^2\psi$ for different types of quantity ψ.

In many instances the constructions seem unnecessarily elaborate, and this makes the thesis difficult to read. It would appear very probable that the principal conclusions could be obtained in a more direct manner. Nevertheless, the thesis is very interesting and suggestive, and many detailed formulæ are obtained which in themselves have some value. It shows considerable mastery over many aspects of group representational theory, and many known results are recapitulated incidentally.

The work shows considerable promise, and future publications by the author will be awaited with interest. D. E. LITTLEWOOD.

Principles of Magnetic Crack Detection

A Practical Treatise specially written for those about to Operate the Process. By H. Bevan Swift. Pp. vi + 105. (London : E. and F. N. Spon, Ltd., 1944.) 10s. 6d.

MAGNETIC methods have proved useful in the detection of cracks, too inconspicuous to be seen without such aid, in steel. This handbook is in the main a description of the apparatus for carrying out such tests in the laboratory or workshop. Several commercial forms of instrument are described, with a general account of the principles of the method. In one type a direct current is passed through the object being tested, and the concentrated field at the edges of a crack is made visible by pouring on a suspension in light paraffin of a highly magnetic preparation of iron oxide. In the second type, suitable for steels with a higher retentivity, a heavy but very short electrical impulse is sent through the object, and the ink is applied afterwards. Only actual experience enables an observer to decide on the significance of the indications given by the magnetic ink, and to distinguish between cracks and accumulations of the magnetic material caused by sudden changes of section or by casual scratches. Methods of demagnetization have to be applied when, for example, parts for aircraft are being tested.

There is a short note on the testing of bars by comparison with a standard, using a null method. Actually, this plan has been used extensively in some works for the testing of small parts, such as chain links, for correct heat treatment, a definite relation being found between the hardness and the magnetic properties, so that a very rapid sorting of correctly from incorrectly treated parts is possible.