

The Revolving Heavens

Astronomy for Observers with the Naked Eye. By Reginald L. Waterfield. Pp. 206. (London: Gerald Duckworth and Co., Ltd., 1942.) 8s. 6d. net.

THE black-out during the War has increased the interest in naked-eye astronomy, and many people who previously gave little or no attention to the subject are now finding how fascinating the study of the heavens can be. Dr. Waterfield's work is primarily for naked-eye observers, and the explanations which are given about the movements of the heavenly bodies, their distribution on the celestial sphere, their relation to one another, etc., will be of immense advantage to the amateur who is so often puzzled to account for many celestial phenomena. A great part of the book is devoted to the solar system, and one chapter deals with the stars and nebulae, including double stars, variables, novae, the galaxy and other galactic systems. It seems incongruous to separate the last chapter, "Shooting Stars and Comets", from the other portion of the work which deals with the solar system, as meteors and comets are, of course, solar system bodies. The explanations with the aid of numerous diagrams are very clear, and the book should arouse keener interest in the study of the heavenly bodies.

A few points which may require modification in the next edition are noted. It is doubtful if the explanation on p. 95 of the large appearance of the moon near the horizon is the correct one. Prof. E. G. Boring's experiments at the Harvard Psychological Laboratory suggest that Ames's theory of ocular torsion may supply an explanation. When the eyes are raised, the right eye tends to rotate clockwise, as seen from behind, with respect to the left eye, and this may explain the moon illusion for binocular vision, though further research is necessary. More than two nebulae can be seen with the naked eye (p. 195) if observers in both hemispheres are assumed; the Magellanic Clouds should have been included. It is very improbable that many, if any, meteors move with a speed of sixty miles a second (p. 197). The high hyperbolic velocities found by the Arizona Expedition are not now generally accepted, and most meteors are members of the solar system, with a maximum velocity of forty-five miles a second. A terrestrial base line of more than a few miles is necessary to compute the real path of a meteor (p. 198); a minimum of twenty miles should be secured, if possible.

M. D.

Mathematics

Its Magic and Mastery. By Aaron Bakst. Pp. xiv+790. (London: Chapman and Hall, Ltd., 1941.) 21s. net.

MR. BAKST'S mathematics do not go beyond elementary trigonometry and kinetics, so his book is not likely to attract adult readers outside the teaching profession. But a good many children would find it a real help with their elementary arithmetic, algebra, and geometry, and would pick up a fair amount of elementary physics while doing so. Mr. Bakst reverses the usual order of presentation by beginning with an example and deducing the principle concerned. Thus geometric series are introduced by chain letters and Australian rabbits, kinetics by graphs of railway time-tables, and so on. The whole book is interlarded with jokes, a few of which are good. It would be a valuable addition to

most school libraries. But if I were a mathematical master I should recommend my brighter pupils to read Hogben's "Mathematics for the Million", and offer a prize for finding the largest number of mistakes in "Mathematics, its Magic and Mastery". I have detected them on pages 68, 327, and 638, and I expect there are plenty more. Perhaps there is a negative correlation between wisecracking and accuracy.

J. B. S. H.

Metallurgical Abstracts (General and Non-Ferrous) Vol. 8, 1941 (New Series). Edited by N. B. Vaughan. Pp. x+434. (London: Institute of Metals, 1942.)

FEW will dispute the value of a technical abstracting service, particularly under present conditions when every scrap of knowledge is a weapon of war and, like other weapons, useless unless available in the right place, on time. It may not be so generally realized, however, that there is a good deal of romance to be found in such a volume as this. Dipping into it without concentrating on technical topics, one finds many interesting questions posed.

From a rough count it would seem that there are nearly two hundred abstracts from German literature in this volume; about a similar number from the U.S.S.R.; not quite as many from Japan, and an odd one or two from Italy, France and other countries. This may, of course, mean little since it is impossible to judge what proportion these abstracts may be of the total amount of metallurgical research proceeding in the different countries. On the other hand, there is something to be learned from the quality and type of the work described and the reader may be left to spend an interesting, and maybe not unprofitable, evening, colouring the monochrome of "Met. Abs." with the pigments of his imagination.

H. W. G. H.

The Journal of the Institute of Metals

Vol. 67, 1941. Edited by N. B. Vaughan. Pp. xxxii+380+46 plates. (London: Institute of Metals, 1942.)

OF the twenty-five papers which comprise this volume at least half deal with matters of vital practical importance at the present time. Distinction would be invidious but a few titles may be mentioned as typical examples: "Sources of Inaccuracy in Spectrographic Analysis of Aluminium Alloys"; "Unsoundness in Gravity Die-Cast Silicon-Aluminium Alloy Pistons"; "The Rolling of the Magnesium Alloys"; "Causes of Porosity in Tin-Bronze Castings". These provide an adequate answer to those who plead for a more practical outlook on the part of the Institute of Metals.

In addition, two papers from the Research Laboratory of Imperial Chemical Industries (Metals) Ltd. show how fundamental research should be applied to practical problems. Of the remainder, more theoretical in objective, some describe work carried out in the main before the investigators became fully pre-occupied with *ad hoc* questions, and some report stages in long-range researches of a type which must not be subject to wars or rumours of war.

It is pleasing to note an interesting paper from Switzerland—and the references therein to the German work of a distinguished metallurgist now contributing to the war effort of American men of science.

H. W. G. H.