based—form the foundation for subsequent volumes. In computing these use was made, for the smaller values of x, of the ascending power series (more accurately the Horner process applied to the polynomial which is the series truncated at a suitable term); but a change to the asymptotic series was made when x became large enough for this to yield the desired accuracy. The 10-decimal values in volumes 5 and 6 have been computed by a straightforward application of the recurrence formula. Details of the formulæ used, and of the elaborate checks applied, are given in an interesting introduction to volume 3. The machine prints its results by means of an electromatic typewriter, and it is these printed results which have been reproduced by photo-lithography, so that it is extremely unlikely that any errors will be found.

No direct provision is made to facilitate interpolation, but formulæ involving differences, and their Lagrangian equivalents (same order, different arguments), are given in the introduction to volume 3, while formulæ depending on the Taylor series, again reduced to Lagrangian form (same argument, different orders), are given in the introduction to volume 5.

The intention is to proceed with the computation of $J_n(x)$ for the same range of x as in the present volumes, for integer values of n up to and including 100. When the project is complete, all reasonable demands for values of the J Bessel functions of integer order would seem to be met. The 18-decimal values of volumes 3 and 4 constitute in themselves a fundamental table of major importance. If the engineer or physicist considers the provision of 18 decimal places absurdly generous, at least three replies may be made. It is easier to discard unwanted figures than to supply any desired beyond those given in a table; it is relatively inefficient to use a complicated machine at less than full capacity; to complete the project by the proposed use of the recurrence formula needs in the fundamental tables more than twenty decimals (the machine computes twenty-three) in order to secure everywhere ten *reliable* decimals.

We must be grateful for an achievement of such magnitude and enduring permanence, although one cannot help endorsing Dr. Comrie's wish that the resources of this computing engine had been deployed in fields where it could make significant additions to our knowledge.

But these large volumes—the page size is $7\frac{1}{2}$ in. by $10\frac{1}{2}$ in., and the four occupy together $7\frac{1}{2}$ in. of bookshelf—inevitably bring to mind other questions. It is clear that in this machine we possess the means of 'mass-producing' the values of a class, limited but still very large, of mathematical functions. Computation, in this field, is no longer a crucial problem. It is now to the inter-related question of reproduction and accessibility of the results that some thought should be devoted. The volumes of the present project, when completed, will occupy some 5 ft. of bookshelf, but will cover only the J functions of integer order. Add also the I-, Y-, and K-functions, the Bessel functions of these types of half-odd-integral order, the *ber*, *bei*, and related functions in the Bessel family; then imagine the elementary functions, and the others which appear in, say, Whittaker and Watson's "Modern Analysis" treated equally generously. The size of the resulting library of mathematical tables becomes to a librarian frightening on the scores of both space and finance, and to the user embarrassing and forbidding.

Photographic reproduction from typescript, as used in these and other tables, has disadvantages which go some way to offset its evident advantages. Compared with good examples of tables printed from type the numerals are larger, but despite this are more fatiguing to use for any length of time. Most of the examples of mathematical tables photographically reproduced from typescript which the writer has seen are bulky owing to the use of relatively thick, absorbent paper; is this inevitable? Finally, is it impossible to harness modern computing machinery to some form of mechanical compositor, so that the advantages of appearance, legibility and compactness of the printed page may be combined with that saving of the labours of the compositor and the proof-reader which the method of reproduction of these volumes enjoys?

W. G. BICKLEY

SCHOOL BROADCASTING IN BRITAIN

School Broadcasting in Britain

By Richard Palmer. Pp. 144 + 27 plates. (London: British Broadcasting Corporation, 1947.) 3*s*. 6*d*. net.

AS Sir Henry Richards points out in a foreword to this volume, the publication of this "first considerable contribution" on the subject of school broadcasting requires neither apology nor explanation. Much has happened since the Carnegie Trustees undertook that pioneer investigation into the possibilities of broadcasts to schools, the results of which were made available in 1928 in "Educational Broadcasting: a Report of a Special Investigation in Kent". That progress should have been so rapid in the past twenty years is the more surprising when "the sceptical though benevolent neutrality" which characterized the attitude of educationists in the early twenties is recalled.

The task which Mr. Palmer has set himself is that of interpreting the work of his colleagues and himself; and it is one for which he is admirably equipped. A former lecturer in education in the University of Liverpool, he joined the staff of the School Broadcasting Department of the B.B.C. in 1940 and, in addition to a particular responsibility for science broadcasts, has had for seven years wide experience in the work of the department. His own contributions—which are made in ten chapters—are enriched by Miss Mary Somerville's account of "How School Broadcasting Grew Up", by Mr. John Horton's analysis of recent experiments in music, and by Mr. Edward Wall's discussion of modern language broadcasts.

Of particular interest to educational psychologists is the concluding chapter in which Mr. Palmer analyses "Some Problems for Study". It is, for example, assumed that school broadcasting can have a considerable influence on interests and attitudes. Of the short-term influence there is abundant evidence. But what of long-term interests? Do young people develop interests and hobbies in later life as a result of their introduction to such series as "General Science", "Science and Gardening", "Nature Study" and "How Things Began"? Interesting as this and other problems discussed by Mr. Palmer undoubtedly are, the most immediate need is, as he is well aware, for extensive research into the psychology of attention.