

Carl Anton Bjerknæs: Gedächtnisrede. Von V. BJERKNÆS.

Leipzig, J. A. Barth, 1904. 31 pp. + photo.

To some it may appear strange that the son of C. A. Bjerknæs should have been chosen to deliver the commemorative address summing up the life-work of his father. As a matter of fact, however, no other choice could have been made. In his scientific research Bjerknæs worked apart from others. His only confidant and colleague was his son. So in the monograph before us the son, after sketching his father's early life, traces step by step the development of the Hydrodynamic Action at a Distance from the days when its author was a pupil under Cauchy, Lamé, and Dirichlet until the last manuscript, written two or three days before his sudden death by apoplexy. Bjerknæs left about 40,000 pages of closely written manuscript, accumulated since the early seventies. So great was his love of perfection, his striving for quality rather than quantity that little of all this had been published until the appearance of the *Hydrodynamische Fernkräfte** and that which remains is accompanied by a request that nothing be printed without the most careful revision. It is a rare and noble sight to see men like Gibbs and Bjerknæs who are possessed of a spirit of research apart from the common desire to rush into print.

E. B. WILSON.

Tablas de Multiplicar. By J. DE MENDIZÁBAL Y TAMBORREL. Mexico, Imprenta y eucuernacion de Mariano Nava, 1903.

SOME years ago the author of this volume published a set of 8-figure logarithm tables of the numbers up to 120,000. Curiously enough, similar tables were published by the French government in the same year, these two being the first complete 8-figure tables to appear. M. Tamborrel now makes a decided advance in one direction on Crelle's multiplication tables which gave the products of all numbers up to 1000 by numbers up to 1000. He has arranged in a handy form the products of all numbers from 1 to 10,000 by numbers from 1 to 100. To save space in printing, these are arranged in a novel manner. Down the centre column of each page run the numbers from 1 to 99. On the right in nine columns are shown the products of these by nine 3-figure numbers; on the left, also in nine col-

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umns, are shown the figures that must be substituted for the thousands, etc., when another digit is placed *in front* of the 3-figure number. Thus 63×137 is shown directly on the right to be 8631; the product of 63×5137 is obtained by extracting from the corresponding line on the left the number 323 which is to be substituted for the 8 of the previous product, thus giving 323,631. When an extra unit has to be added to the thousands, the last three figures in the product on the right are printed in smaller type with a bar placed over them. In this way it is possible to get a product of a 4-figure number by a 3- or 4-figure number with only one addition. Examples are added to show how longer multiplications, and also how divisions by 3-figure numbers are to be performed. These tables occupy $100 - 10 = 90$ pages, in each of which the printed matter takes up a space of $10\frac{1}{2}$ by $5\frac{1}{2}$ inches. In five additional pages of the same size and arranged in a similar manner are given the squares of all numbers up to 10,000 and the cubes to 1,000. For concentration of space combined with moderate convenience of use, it would be difficult to improve on these results. It would perhaps have been better, even at the cost of a somewhat longer page, to separate the lines a little more, as one has to exercise rather too much care in running the finger along a line.

Accompanying the tables is a slip containing 16 errata which from their nature appear to be mainly typographical. It is to be hoped that there are no others outstanding: no indication is given as to the means adopted to secure accuracy. The author is to be congratulated on the completion of a task which must have been exceedingly tedious and uninteresting, but which will undoubtedly be highly appreciated by those who have much to do with calculations in which these tables can be of service.

ERNEST W. BROWN.