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Babbage's Calculating Engines

The famous and prolific nineteenth-century mathematician, engineer and inventor Charles Babbage (1791–1871) was an early pioneer of computing. He planned several calculating machines, but none was built in his lifetime. On his death his youngest son, Henry P. Babbage, was charged with the task of completing an unfinished volume of papers on the machines, which was finally published in 1889 and is reissued here. The papers, by a variety of authors, were collected from journals including *The Philosophical Magazine*, *The Edinburgh Review* and *Scientific Memoirs*. They relate to the construction and potential application of Charles Babbage's calculating engines, notably the Difference Engine and the more complex Analytical Engine, which was to be programmed using punched cards. The book also includes correspondence with members of scientific societies, as well as proceedings, catalogues and drawings. Included is a complete catalogue of the drawings of the Analytical Engine.

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Babbage's Calculating Engines

*Being a Collection of Papers Relating to Them;
Their History, and Construction*

CHARLES BABBAGE
EDITED BY HENRY P. BABBAGE



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*Ever Truly Yours
C. Babbage*

FROM A PHOTOGRAPH TAKEN IN 1850.

BABBAGE'S
CALCULATING ENGINES.

BEING

A COLLECTION OF PAPERS RELATING TO THEM;
THEIR HISTORY, AND CONSTRUCTION.

LONDON:
E. AND F. N. SPON, 125, STRAND.
1889.

P R E F A C E .

THIS volume is intended to bring together, as much as possible, the information scattered in various places, regarding the Calculating Machines of Charles Babbage, and to make it available for those interested in the subject, who may wish to pursue it further.

He has never himself written a full description of any of his machines. He preferred, while his energies lasted, to devote them to the actual progress and development of the design. As regards the Analytical Engine, he considered the sketch at the commencement of this volume by the Count Menabrea, and the translation of it with notes by Lady Lovelace, as entirely disposing of the mathematical aspect; proving "that the whole of the developments and operations of Analysis are now capable of being executed by machinery."

In the "*Passages from the Life of a Philosopher*," published in 1864, and written with the object of interesting the public in these machines, he mentions on the last page a forthcoming "History of the Analytical Engine." As materials towards it he had an Article from the "Philosophical Magazine" of September 1853, and Article XXIX. from Vol. III. of the "Scientific Memoirs," containing the translation and notes by Lady Lovelace above mentioned, reprinted; and added several chapters of "The Passages" and other papers. He also supplied a complete list of the drawings, notations and note books of the Analytical Engine. Thus the first 294 pages of this book were printed in his lifetime; but owing to the weariness and infirmities of age, he did nothing more, and the historical and descriptive part was never written.

A great deal has been written about the Difference Engine, but it is still to be regretted that he did not himself contribute more information about the expanded uses which he saw in the possible future for such an engine. As to his own contrivance, he was quite content to let it be judged by the beautiful fragment put together in 1833, which will for ever remain to answer all detractors. He died at his house No. 1, Dorset Street, London, on 18th October, 1871. By his Will he left the Calculating Machines and all that belonged to them at my absolute disposal, and so the materials of this unfinished volume came to me.

It is to this, and not to any special fitness for the task, that it has fallen to me to complete it. I

need not enter into the reasons which have impelled me to do the best I can unaided rather than to devolve the work on another.

Pages 295 to 322 have been added agreeably to a memorandum found among his papers.

The report of the Committee of the British Association 1878 has been reprinted by permission from the Proceedings of the Association 1878 (pp. 323 to 330). A Paper read by me at the recent meeting of the Association at Bath, slightly modified to suit its position in this book, has been added (pp. 331 to 338). Lithographed copies of the general plan No. 25, dated 6th August, 1840, of the Analytical Engine, and impressions from the Plates mentioned at page 6, have been supplied, and I have added a few concluding remarks.

The arrangement of the book is unavoidably faulty, but in what I have written I have given references to the preceding pages, which will, I hope, be of some use, and if ever a fresh edition is wanted, the whole will, of course, be recast.

HENRY P. BABBAGE.

October, 1888.

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