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WONDERFUL MACHINERY.

The following account of a most extraordinary machine invented and constructed by Mr. Babbage, of London is given by the scientific Dr. Brewster, in his "Natural Magic." We could scarcely have credited it on any less competent authority.

"Of all the machines which have been constructed in modern times, the calculating machine is, doubtless the most extraordinary. Pieces of mechanism for performing particular arithmetical operations have been long ago constructed; but these bear no comparison, either in ingenuity or magnitude, to the grand design conceived, and nearly executed, by Mr. Babbage. — Great as the power of mechanism is known to be, yet we venture to say, that many of the most intelligent of our readers will scarcely admit it to be possible that astronomical and navigation tables can be accurately computed by machinery, that the machine can itself correct the errors which it may commit; and that the results of its calculations, when absolutely free from error, can be printed off without the aid of human hands, or the operation of human intelligence. All this, however, Mr. Babbage's machine can do, and I have had the advantage of seeing it actually calculate, and of studying its construction with Mr. Babbage himself, I am able to make the above statement on personal observation. The calculating machine, now constructing under the superintendence of the inventor, has been executed at the British Government, and is, of course their property. — It consists essentially of two parts, a calculating part and a printing part, both of which are necessary to the fulfilment of Mr. Babbage's views; for the whole advantages would be lost if the computation made by the machine were copied by human hands, and transferred to types by the common process. The greater part of the calculating machinery is already constructed, and exhibits workmanship of such extraordinary skill and beauty, that nothing approaching to it has been witnessed, — In order to execute it, particularly those parts of the apparatus which are dissimilar to any used in ordinary mechanical construction, tools and machinery of great expense and complexity have been invented and constructed, and, in many instances, contrivances of singular ingenuity have been resorted to, which cannot fail to prove extensively useful in various branches of the mechanical arts. The drawings of this machinery, which form a large part of the work, and on which all the contrivances has been bestowed, and all the alterations made, cover upwards of 400 square feet of surface, and are executed with extraordinary care and precision.

In so complete a piece of mechanism, in which interrupted motions are propagated simultaneously along a great variety of trains of mechanism, it might have been supposed that obstructions would arise, or incompatibilities occur, from the impracticability of foreseeing all the possible combinations of the parts; but this doubt has been entirely removed, by the constant employment of a system of mechanical rotation, invented by Mr. Babbage, which places distinctly in view at every instant, the progress of motion through all parts of this, or any machine; and, by writing down in tables, the time required for all the movements, this method renders it easy to avoid all risk of two opposite actions arriving at the same instant in any part of the engine. In the printing part of the machine, less progress has been made in the actual execution, than in the calculating part. The cause of this is, the greater difficulty of its contrivance, not for transferring the computations from the calculating part of the copper or other plate destined to receive it, but for giving to the plate itself that number and variety of movements, which the form adopted in printed tables may call for in practice. The practical object of the calculating engine is, to compute and print a great variety, and extent of astronomical and navigation tables, which could not be done without enormous intellectual and manual labor, and could not be calculated with the requisite accuracy.— Mathematicians, Astronomers, and Navigators, do not require to be informed of the real value of such tables, but it may be proper to state for the information of others, that 17 large folio volumes of logarithm tables alone, were calculated at an enormous expense by the French Government, and that the British Government regarded

these tables to be of such National value that they proposed to the French Board of Longitude to print an abridgement of them at the joint expense of the two nations, and offered to advance 5000*l* for that purpose. Besides logarithm tables, Mr. Babbage's machine will calculate tables of the powers and products of numbers, and all astronomical tables for determining the positions of the sun, moon, and planets; and the same mechanical principles have enabled him to integrate innumerable equations of finite difference; that is when the equation of difference is given, he can by setting an engine, produce at the end of the given time, any distant term which may be required, or any succession of terms commencing at a distant point.

Besides the cheapness and celerity with which this machine will perform its work, the absolute accuracy of the printed results deserves especial notice. By peculiar contrivances, any small error produced by accidental dust by any slight inaccuracy in one of the wheels, is corrected as soon as it is transmitted to the next; and this is done in such a manner as effectually to prevent accumulation of small errors for producing an enormous figure in the result."