

**INDUSTRIAL AND TECHNOLOGICAL  
MUSEUM. LECTURES DELIVERED IN  
THE LECTURE ROOM OF THE  
MUSEUM DURING THE SPRING  
SESSION OF 1870**

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INDUSTRIAL AND TECHNOLOGICAL MUSEUM.

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L E C T U R E S

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DURING THE

SPRING SESSION OF 1870.

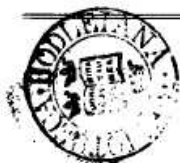
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## INTRODUCTION.

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THERE ought to be no necessity to set forth in a young community the advantages of Technological Instruction. On the Continent of Europe it has long ago been admitted that such a system of instruction is most desirable; and in England—thanks to the liberality of certain advanced thinkers—it has of late made rapid progress.\* I however believe that, were many asked to explain what they understood by a system of Technological Instruction, it would be found that their notions on the subject were hazy in the extreme. Technology is known to be something indefinitely connected with science and art; but where that connection begins or ends, and how the artistic or scientific knowledge gained under the proposed scheme is to be applied to the practical business of life, is most imperfectly understood. The word "Technology" has been objected to by many because of its "hardness." I think that the objection will be found to arise more properly from its "newness." When the meaning of the term is once clearly explained, the difficulty removes itself, and the working man—always cherishing a natural horror of fine words—will

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\* Sir Joseph Whitworth has given £100,000 for this purpose. In America Technology has made great and rapid strides, as may be seen by the following:—The Technological Institute of Boston has recently received the following munificent contributions—Mr. Huntington, £10,000; Mr. Thayer, £5000; Mr. Mason, £4000; Mr. Hayward, £4000; and Dr. Walker, no less than £40,000.



understand that the new movement has been set on foot for the purpose of making difficult things plain to him—not plain things difficult.

Technology means, simply, that branch of knowledge which teaches the application of science and art to industry, and Technological instruction, instead of being a terrible course of study, bristling with thorny thickets of intricate specialities and arid with sandy wastes of dryest learning, is but a plain setting-forth of the principles of science and art, and an explanation of the method by which the application of these principles has brought about practical results. The Technologically-instructed workman will be no longer the "hand," pouring this dye stuff into that trough, or mixing this compound of red stuff with that compound of blue stuff, simply because it is the custom in his factory to so mix and pour; but he will be the intelligent "head," understanding that the chemical changes, or the mechanical effects which he produces are not the result of accident or custom, but arrive by reason of the operation of certain chemical and mechanical laws, *which laws he fully comprehends, and can apply to the explanation of other trade processes.* And herein lies the difference which is not distinguished by many persons. Technological instruction does not aim at the mere furtherance of manipulative skill—that a stonemason shall become merely the best stonemason in the world—but it desires that the working man shall be an intelligent being, able to "substitute the sweat of the brow by the thought of the brain"—that the stonemason shall join with his manipulative skill an acquired capacity for understanding the principles, and possibly of improving upon the practice, of the work in which he is engaged. The old system of confining the exercise of an artisan's intellect to the sole consideration of that trade whereby he earns his

bread is, indeed, antagonistic to Technology. To limit education to mere instruction in manipulative skill is but to limit the sphere of usefulness of the person instructed. "If George "Stephenson," says Professor Lyon Playfair, "had only acquired the manipulative skill of shovelling coals adroitly into the furnace when he acted as stoker, we might still have "to go from London to Edinburgh in a four-horse coach. If "Wheatstone had limited his education to the manipulative "skill of making musical instruments, space would not have "been abridged or time abbreviated by the electric telegraph." The more a man knows, the more valuable does he become to society. The lower a man is placed on that social ladder which is reared against the wall of our Babel-tower of modern civilisation, the more necessary is it for him to receive such instruction as will not only fit him to hold his original position with comfort, but will help him to climb higher and higher, and draw others up after him.

In our contemporary civilisation, science is everywhere triumphant over mere brute force. The neatly-dangerous and prettily-destructive weapons of Snider and Chassepot are more to be feared than all the desperate heroism of Balaklava charges, or the terrible valour of Hougomont and Inkermann. A Krupp gun is a more dangerous adversary than a whole regiment of dragoons. The death-knell of the chivalry of the Second Empire was rung by the dink of hammers in the workshops of Prussia.

The triumph of intelligence over natural advantages has not, however, confined itself to the battle-field. Science has won far more glorious victories—bloodless though they may have been—in the training-schools and manufactories of Europe. The old fallacy of the necessity for employing labour because labourers would die without employment, was blown away in the smoke of the first locomotive.

Handicraftsmen suffer, not because one of their number invents a machine which does the work of fifty of them, but because the fifty are incapable of doing aught but that special handicraft which they have wearily spent their lives in learning, and whose laboriously performed function is at once usurped by the application of simple scientific principles. Technological instruction, properly applied, will familiarise our workmen with these scientific principles, and the artisan who is thrown out of work by the invention of labour-economising machinery will turn his attention, not to the hindering of the application of such invention to his trade, but to the best means of adapting his own trade-knowledge to the new condition of things. Our workmen will jump with the times, not lag behind them; and though it cannot be supposed that Technological instruction will create Stephenson or Brunels, it will enable artisans to comprehend how Stephenson and Brunel achieved their triumphs, and induce them to assist, instead of impeding, the progress of industrial science.

Intelligent labour is supplanting, and must supplant mere brute force of hod-carrying and barrow-wheeling, and that people will in the future be most prosperous who, so far from pampering the native indolence of its manual workmen by refusing to employ the inventions of more intelligent artisans, cultivates, by every means in its power, the intellect of its operatives, and raises its own average of intelligence to the level of that of competing nations. To do this with rapidity and completeness is the end of Technology, such is the object of the Parliamentary grant, and such the aim of the Committee who have issued this book. Under the superintendence of this Committee a Technological Museum, with laboratories and lecture rooms, has been established in