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Technical and Scientific Education.

A paper read before the Literary and Philosophical Society, Nottingham, by R. SYKES, Hyson Green.

Immediately facts and theories in science are fully known and established, efforts are made to render them of practical utility. Electricity, magnetism, mechanics, the sciences and arts generally, are sedulously put into requisition to minister to the comfort and wants of modern life. The greater the number of minds engaged in the wide field of scientific research, the greater will be the probability of benefit arising therefrom. The secrets and marvels of science are so interwoven with modern industries that neither employer nor labourer can hope to excel unless he familiarise himself with the truths that underlie his special craft. Machinery, since the invention of the steam engine, has assumed such delicate, intricate, and elaborate forms, that educated intelligence is fast becoming essentially necessary to

properly regulate it; and obtain from it its best and largest results. Not only is it necessary, therefore, that the employer should have a technical and scientific knowledge of his work, but also he who tends and guides the machinery should be acquainted with, at least, the scientific principles involved in its construction. Machinery, certainly, is made so true and perfect that little mental effort is required to control it. Still each machine has within it properties which may to an educated, active brain suggest the means by which other machines may be evolved, or improvements arise. Experience taught all the improvers and inventors of new machines that their ideas could not be properly utilised until they had devoted themselves to the acquisition of at least the rudiments of the scientific principles upon which their special work was based. Joseph Bramah, Henry Maudesley, Joseph Clement Brunel, and other inventors and improvers of machinery, were compelled to spend much of their valuable time in mastering these rudimentary principles of science before they could fully utilise the ideas teeming in their fertile brains. Their early life was spent in comparative poverty and obscurity. By dint of patient industry, self-denial and determination, they won for themselves fame and fortune. They overcame their difficulties by self-education. All men are not endowed with this courage, and patience,—which are rarely found except in men of genius. Obstacles, which baffle and discourage ordinary men, these triumph over. Toiling daily at difficult and laborious work to earn for themselves a maintenance; yet they toil not as simple machines, in a dull, monotonous routine. Their brains, as well as their hands, work. They think, plan, devise. Acquainted with the principles of mechanical science, the various processes and functions of machinery are intelligible to them. They perceive defects, and suggest remedies; they discard old machinery, and invent newer and better to supplant it. The life of such men, though engaged to mechanical labour, is satisfying. Their mental aspirations are quickened, their moral life is improved. Who, amongst the thousands hoping for an elevation of the masses, does not desire a general infusion of this spirit among our artisan population.