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"POWER" IN MECHANICS.



HERE are a number of terms, which are not thoroughly understood by those who use them constantly, or about which misconceptions occur in the minds of those who understand their first meaning. Amongst them probably few give rise to a larger amount of loose and ill-defined expressions than the use of the word "Power." In the first place it is a not uncommon mistake with the younger members of the engineering or mechanical trades to speak as though power were in one way the product or outcome of certain machinery. So far from true it is that machinery of whatsoever kind can produce power, that all mechanical contrivances are directly absorptive of power. The mission of machinery is to direct the application of power, and aid it in performing a given work, but in doing so it necessarily absorbs a share of that power for the purpose of running the machinery itself. Thus, for example in the case of the ordinary engine employed to drive the machinery of a manufactory of any kind. Before the power which is generated in the boiler can expend itself upon the work which is eventually performed by it, probably in a distant part of the building, it has to employ a large proportion of its force in setting in motion various fly wheels, belts and shafting, and in overcoming the weight and friction of various materials. In all this, of course, power is expended, and only a proportion of the original power is ultimately applied to the work to be done. The so-called power of an engine is usually taken at a point between its generation and application, and measured by the pressure on the piston or pistons, and this is what is meant when we speak of the *indicated* power. There is, however, another term used, *viz.*, the *effective* power, which is the measure of power exerted upon the work, *i.e.*, the indicated power less the friction of the several parts of the intervening

machinery. Another difficulty yet, however, arises out of the well-known fact that machinery, like humanity, has its humors, or in plainer terms, that the same machine may give widely differing results under different circumstances. The fact makes it necessary for the purpose of ordinary calculation to adopt a theoretical standard of measurement, the power indicated by which is termed the *nominal* power. This is reckoned by the Admiralty rule on the assumption that engines with pistons moving at 226 feet per second work at a pressure of 7 lbs. to the square inch.

The next great engineering feat to be undertaken will probably be the long projected tunnel between Dover and the French coast. For ourselves we see no reason to doubt the success of the scheme under competent management. Although comparatively little has been done as yet to follow up the results obtained by the boring experiments which were made in mid-channel upwards of a year ago, yet the result of these borings was highly satisfactory so far. It has been demonstrated that grey chalk extends downwards, on the British shore, to a depth of 470 ft., whilst the French engineers tell us that on their side it reaches to the depth of 750 ft. below high water mark. Above the grey chalk is a stratum of white chalk, varying from about 270 ft. in thickness on the French coast to 170 feet on the English. If, as seems to be indicated by these figures, the grey and white chalks extend in continuous strata from one side of the Channel to the other, the work to be done will be greatly simplified, as tunnelling through the grey chalk would present fewer difficulties than in the case of even the white. Of the mechanical part of the work our engineers of to-day will have no reason to be afraid, and the ventilation may be easily secured by the use of compressed air. In short, says the *Building and Engineering Times*, "money is the only agency now requisite for the purpose of completing the Channel Tunnel."

A most important discovery has been recently made of a Phœnician inscription from the pool of Siloam, the deciphering and translation of which may be shortly expected, as a *fac simile* copy has just reached England. It was discovered a few months since by the Jerusalem