gives the total primary power owned by the establishments and excludes electric motors driven by that primary power.

The above particulars appear to indicate clearly that in ordinary miscellaneous industries the cost of power is a comparatively small consideration, that even in industries where the cost of power is a large proportion of the total costs, other considerations of raw material, distribution facilities and labor market are of even greater importance.

Table III.—Percentage Costs in Industries Using Large Amounts of Power.

	Interest and Depreciation at 12 % on Capital.	Salaries and Wages	Power. Per H.P. Year.	Power. Per Cent.	Raw Materials, etc.	Miscellaneous.
	%	%	$	%	%	%
Blast furnaces.	13.9	7.4	35	9.8	66.3	2.6
Chemicals	16.5	18.0	50	9.3	47.6	8.6
Cotton mills ...	13.8	20.5	50	9.0	51.7	5.0
Portland cement	30.2	25.4	35	17.4	21.9	5.1
Rolling mills ..	11.9	18.7	50	10.3	54.7	4.4
Wood pulp and paper	17.1	17.6	25	11.4	46.4	7.5

Table IV.—Class of Power Used in Large Industries.

Industry.	Canada, Census 1911. Water Power.	Canada, Census 1911. Other Power.	U. S. Census 1909. Water Power.	U. S. Census 1909. Other Power.
	%	%	%	%
Wood pulp and paper..	94.0	6.0	60.0	40.0
Portland cement	2.3	97.7	....	....
Carbide of calcium	3.2	96.8	....	....
Smelting	2.0	98.0	6.9	93.1
Iron and steel products	0.8	99.2	0.05	100
Cotton	48.5	51.5	24.4	75.6
Flour and grist mills...	52.0	48.0	31.0	69.0
Lumber products	19.3	80.7	5.0	95.0

There is no question that very cheap power has located industries at certain points *where the other conditions were also favorable*, but it is extremely doubtful whether the large sums spent by municipalities in competitive efforts to attract industries by the offer of cheap power produce any tangible results, except where the other essentials predominate and really form the deciding factors in locating the industry.

BRITISH LOCOMOTIVE EXPORTS.

Notwithstanding the war, the British locomotive shipments exhibit, upon the whole, satisfactory results for the nine months ended September 30th, the value of the engines exported to that date having been £2,929,502, as compared with £2,067,316 in the corresponding period of 1913, and £1,430,977 in the corresponding period of 1912. Argentina took British locomotives in the first nine months of this year to the value of £603,766, as compared with £499,254 and £313,432. This result must be regarded as favorable in view of the current disorganization of the Argentina railway interest. It is, however, in British India that the greatest progress in the demand is observable, the value of the Colonial imports having been as follows to September 30th, this year, as compared with the corresponding periods of 1913 and 1912:—

Colonial Group.	1914.	1913.	1912.
British South Africa	£ 64,099	£ 96,831	£148,442
British India	1,322,082	711,010	298,996
Australia	430,950	338,861	237,919

It will be seen that purchases of locomotives upon Australian account have been good this year. The war may exert an unfavorable influence upon Australian development, but thus far it has not had much effect.—Engineering, London.

THE ROYAL ENGINEERS OF THE BRITISH ARMY.

By Geo. Laidler.

FROM the earliest times, engineers have been employed in the field of war on the construction of fortifications, earthworks and batteries for besieging defences. In modern times, however, the application of scientific devices to warfare has given rise to many minor branches of military engineering in addition to the primary duties of fortification and siegecraft, such as the field telegraph service, the flying corps, the construction of temporary roads and bridges for the transport of an army; also works which more properly belong to the realm of civil engineering, such as surveying, the construction of permanent military buildings, railways, piers, etc. All these branches require special knowledge, and consequently the "field companies" and "fortress companies" represent the application of their arm to works of offence and defence in field and siege warfare.

It is difficult to distinguish between military and civil engineers in early modern history, for all engineers acted as builders of defensible strongholds, as well as makers and manipulators of engines of war for attacking and defending them. The annals of the science of glorification record artists, architects and soldiers as being responsible for the design and construction of the various systems. Artillery naturally became just one branch of military engineering; in fact, the word "engine" which, at the time of Chaucer meant "natural talent," or "invention," (corresponding to the latin "engenium" from which it is derived) was formerly used especially to denote a weapon of war, such as the catapult or battering-ram.

By the middle of the thirteenth century there was in England an organized military body of skilled workmen controlled by a "chief engineer." At the siege of Calais in 1347 this corps consisted of masons, carpenters, smiths, tentmakers, miners, armourers, gunners and artillerymen. When Harfleur was besieged in 1415 the chief engineer was designated "master of the King's works, guns and ordnance," and his men numbered 500, including 21 foot archers. About 1450 the engineer branch had developed into the Office of Ordnance, whose duty was to administer all matters connected with fortifications, artillery and ordnance stores.

Henry VIII. employed many engineers to construct coast defences around England, and also added to the organization a body of pioneers under trenchmasters, to clear and repair roads and to remove obstacles to the march of troops. Up to 1715 the commander of an ordnance train was nearly always an engineer, but after that date it was decided to separate the artillery from the engineers. It afterwards became common for the officers of engineers to hold commissions in foot regiments in addition to their rank in the corps of engineers.

In 1757 all engineer officers were gazetted to army as well as engineer rank—chief engineer as colonel of foot and so down the scale to practitioners as ensigns (second lieutenants). In 1782 the engineer grades except that of chief engineer were abolished. Ten years later a small corps was formed, and in 1787 the designation "Royal" was conferred upon it.

In 1802 the title of Chief Engineer was changed to Inspector-General of Fortifications, and from this time up to the conclusion of the Crimean War many augmentations took place on account of the widely increasing duties which devolved upon the officers.