many others without any invidious selection, that of tobacco, which being new to western Canada, giving employment to many operatives, and involving the circulation of a large amount of capital, promises to become of considerable importance to the country. The manufacture of wall-paper was also effectively represented, and the articles shown were equal to, if not in some respects superior to those of foreign production.

In carriages great improvement has taken place, but still it was evident that vehicles of superior construction and finish to those on exhibition, might have made their appearance at Kingston under more favourable circumstances.

Although woollen manufactures are fast becoming one of the staple industries of the province, yet some well known names were missing among the contributors. We have elsewhere in this number of the journal, alluded to the woollen manufactures of one enterprising firm near Toronto, from which some idea of the importance of encouraging this branch of industry may be gathered. The absence of steam-engines at Kingston, was generally recognized as a falling off in one department, in which an increase might reasonably have been expected.

The exhibition of specimens of flax was promising. Flax might become the ground work of the most important industrial interest in Canada. Efforts have been made by the Government, and by private individuals, to extend the culture of flax, and to introduce machines for its preparation. And although the progress is slow, yet it may be now asserted with confidence that it is sure; yet it has to be recorded that there were no flax dressing machines exhibited at Kingston. The total number of entries in the Arts and Manufactures department, did not exceed 1,200. We shall be able to give the exact number, with the corrected prize list, in the next number of the journal.

BRITISH ASSOCIATION, 1863.

The President's Address.

Gentlemen of the British Association,—I esteem it the greatest honour of my life that I am called upon to assume the office of your President. In that capacity, and as representing your body, I may be allowed to advert to the gratifying reception which the British Association met with on their former visit to this region of mining and manufacturing industry, and, as a member of the community which you have again honored with a visit, I undertake to convey to you the assurance of a renewed and hearty welcome. A quarter of a century has elapsed since the Association assembled in this town, and in no former period of equal duration has so great a progress been made in physical knowledge. In mechanical science, and especially in those branches of it which are concerned in the application of steam power to effect interchange between distant communities, the progress made since 1838 has no parallel in history. The railway system was then in its infancy and the great problem of trans-Atlantic steam navigation had only received its complete solution in the preceding year. Since that time railways have extended to every continent and steamships have covered the ocean. These reflections claim our attention on this occasion, because the locality in which we hold our present meeting is the birth place of railways, and because the coal mines of this district have contributed more largely than any others to supply the motive power by which steam communication by land and water has been established on so gigantic a scale.

The history of railways shows what grand results may have their origin in small beginnings. When coal was first conveyed in this neighbourhood from the pit to the shipping place on the Tyne, the pack-horse, carrying a burden of 3 cwt. was the only mode of transport employed. As soon as roads suitable for wheeled carriages were formed, carts were introduced, and this first step in mechanical appliance to facilitate transport had the effect of increasing the load which the horse was enabled to convey from 3 cwt. to 17 cwt. The next improvement consisted in laying wooden bars or rails for the wheels of the carts to run upon, and this was followed by the substitution of the four-wheeled waggon, for the two-wheeled cart. By this further application of mechanical principles the original horse load of 3 cwt. was augmented to 42 cwt. These were important results, and they were not obtained without the shipwreck of the fortunes of at least one adventurous man whose ideas were in advance of the times in which he lived. We read, in a record published in the year 1649, that "one Master Beaumont, a gentleman of great ingenuity and rare parts, adventured into the mines of Northumberland, with his £30,000, and brought with him many rare engines not then known in that shire, and waggons with one horse to carry down coal from the pits to the river, but within a few years he consumed all his money and rode home upon his light horse." The next step in the progress of railways was the attachment of slips of iron to the wooden rails. Then came the iron tramway, consisting of cast iron bars of an angular section: in this arrangement the upright flange of the bar acted as a guide to keep the wheel on the track. The next advance was an important one, and consisted in transferring the guiding flange from the rail to the wheel; this improvement enabled cast iron edge rails to be used. Finally, in 1820, after the lapse of about 200 years from the first employment of wooden bars, wrought-iron rails, rolled in long lengths, and of suitable section, were made in this neighbourhood, and eventually superseded all other forms of railway. Thus, the railway system, like all large inventions, has risen to its present importance by a series of steps; and so gradual has been its progress that Europe finds itself committed to a guage fortuitously determined by the distance between the wheels of the carts for which wooden rails were originally laid down.

Last of all came the locomotive engine, that crowning achievement of mechanical science,—