heavy inverts and sills, and having four great retaining walls from their corners, the structure being over sixty feet in height, will be one of the finest specimens of this class of hydraulic engineering in the world. The wooden gates, which are used to retain all but the upper fifteen feet of the spring tide, will themselves be among the largest lock gates, designed to stand the highest pressure, that were ever constructed. This is not due to the fact that they are the largest gates, but to the fact that they will retain the largest head of water of all tidal gates in the world. At no other point where gates are used to retain the higher level of the tide in basins is there a movement of the tides greater than fifteen feet. Here the tide has an extreme oscillation of practically fifty feet, and this gate will be bare of water from top to bottom on one side, while the water will be lapping over the top of the other at low water, necessitating enormous strength in its proportion, and calling for the employment of every protection against leakage under or around the walls. The excavations for the masonry of this great gate are completed. Some of the masonry is already laid, and the stone is rapidly being quarried and cut for its construction, much of it being already on the ground. The channel leading from this gate to the La Planch river requires the dredging of a large amount of earth. For that purpose a dredge is on the stocks at Fort Lawrence and will be shortly launched, the machinery for which has been manufactured by M. Beatty & Sons, of Welland, Ont., and will shortly be delivered. Hopper screws for receiving this dreged material and transporting it out into the Cumberland basin and dumping it through their bottoms, are also being built at the same point, one of them being now ready for launching. They are unique in design, and are the result of the experience of Dawson, Symes & Usser, of many years use of such vessels. It might also be said that the dredge now being used at Tidnish, and this one building for the Amherst terminus, are also largely their design, they having for years prosecuted such work on a large scale both in the Welland canal and in the great lakes. It may be stated that this firm enjoys resources and credit which would make easy for them the completion and equipment of the ship railway, they having already successfully financed, as well as constructed, much larger undertakings.—Halifax, N.S., *Herald.*

SOME INTERESTING DISTANCE STATISTICS.

THE remark is very trite that raw materials of manufacture are hauled enormous distances in this country. Everybody is familiar with this statement. In some of the most prominent manufacturing districts the item of freight in assembling raw materials is the most important element to deal with. Other costs are worked down by prudent management and systematic methods to a level with those obtaining in other sections, but in the matter of freights a set of circumstances comes into play which cannot be governed by those most interested in or affected by them. It is rare, however, to meet with a table of distances for any particular locality which will show its exact situation with reference to its supply of raw materials. Having recently had occasion to make some inquiry into the conditions affecting the trade of Chicago, some facts were obtained on this point which may be of interest to our readers, all of whom are aware of the rapidity with which manufacturing enterprises are growing in the vicinity of that city.

The longest all-rail haul of Lake Superior iron ore to Chicago blast furnaces is from the Vermilion range mines in Minnesota. The distance is 690 miles. Only a limited quantity of ore has taken that route, but the practicability of winter haulage has been demonstrated. The distance by lake and rail combined from the Minnesota mines to Chicago is about 1,020 miles, of which 70 miles comprises the rail haul to Two Harbors, and the remaining distance covers the lake haul across Lake Superior, through the Sault Ste. Marie and the Straits of Mackinac, and up Lake Michigan to Chicago. The Gogebic mines, in Northern Wisconsin and Michigan, whose shipping point is Ashland, on Lake Superior, are 939 miles from Chicago by rail and lake, but by all rail they are much nearer, say 400 miles in round numbers. The mines of the Marquette range, in Northern Michigan, whose shipping port is Marquette, are about 635 miles from Chicago by lake and rail, the rail haul to the port of Marquette running about 25 miles. The all-rail route to Chicago would only be about 400 miles, or the same distance as from the Gogebic mines. The Menominee range mines are situated nearer to Chicago than the mines of the other Lake Superior districts being only about 375 miles by rail and lake. Of this distance 75 miles covers the rail haul from the mines to Escanaba, on Lake Michigan. By the all-rail route the distance to Chicago would be about 360 miles. All these figures seem formidable, but lake freight rates are remarkably low for the distance covered, and rail rates are also very reasonable, on account of water competition, as well as competition between several lines of railroad traversing this section.

Coming next to coke, another set of long distance figures is encountered. Coke is hauled to Chicago entirely by rail. It is drawn from several sources of supply—namely, the Connellsville and Reynoldsville regions in Pennsylvania, and northern and southern districts of West Virginia. The shortest haul is from the Connellsville region, say 525 miles. The Reynoldsville, or Rochester and Pittsburgh, coke district is easily 625 miles from Chicago. The northern coke region of West Virginia is about 535 miles, and the southern district about 600 miles. A new coke region is being opened up in Southwestern Kentucky, about 525 miles from Chicago, or practically as close as the Connellsville region.

Anthracite coal from Pennsylvania is consumed in considerable quantities in Chicago, but not for manufacturing purposes. The usual route it takes is by rail from the mines to Buffalo, say 325 miles, and by lake thence to Chicago, say 900 miles. The bituminous coal used by manufacturers is obtained to a slight extent from Western Pennsylvania, to a greater extent from Ohio and Indiana, but principally from the coal fields of Illinois. When drawn from Western Pennsylvania it is hauled by rail at least 500 miles; when obtained from Ohio it is transported from 300 to 375 miles, and from Indiana about 175 miles. The coal fields of Illinois are only 50 to 75 miles from Chicago. Crude oil is now an important raw material to numerous Chicago manufacturers, who use it for fuel. The principal source of supply is the Lima district, in Ohio, whence a pipe line 200 miles long runs to the southern part of the city.

These figures are not given as absolute distances, but are approxmimately correct, inasmuch as the various districts tapped are themselves of large extent. They serve to show, however, that the manufacturers of Chicago have had to conquer formidable disadvantages in establishing their various enterprises. How well they have succeeded is known to the world. Notwithstanding their remoteness from essential raw materials, they have had countervailing advantages which have enabled them to build up enormous plants, with possibilities of great future growth.—*Iron Age.*

WHAT ARE RAW MATERIALS?

OF late years a great outcry has been raised against the tariff on raw materials, as they are delusively called; for, in the literal sense of the term, nothing is entitled to be considered a raw material to which any exchangeable value has been imparted by the hand of labor. Coal imbedded in the mine, living wood in the forest tree, and iron ore in its native deposit, are truly raw materials; but, so soon as the coal is quarried and reduced to assorted sizes, the tree is chopped down and converted into saw-logs, the iron ore is dug out and brought to the surface, each becomes an article of commerce and ceases to be a raw material. To then apply that designation to either is to create an artificial and unwarranted meaning which leads inevitably to a confusion of ideas. Indeed, the whole controversy has grown out of an exaggerated application of terms.

Henry C. Carey, in his great work, "Principles of Social Science," says on this subject what follows:—"All the products of the earth are, in their turn, finished commodity and raw material. Coal and ore are the finished commodity of the miner, and yet they are only the raw material of which pig iron is made. The latter is the finished commodity of the smelter, and yet it is but the raw material of the puddler, and of him who rolls the bar. The bar, again, is the raw material of sheet iron, and that, in turn, becomes the raw material of the nail and the spike. These, in time, become the raw material of the house, in the diminished cost of which are found concentrated all the changes that have been observed in the various stages of passage from the rude ore—lying useless in the earth—to the rail and the spike, the hammer and the saw, required for the completion of a modern dwelling."

Within the purview of these considerations, the only raw materials, in the absolute sense, are those furnished gratuitously by nature. In the strained or illegitimate sense, cloth, although the finished product of its manufacturer, is the raw material of the tailor. By the same rule, steel rails become the raw material of the railroad company, carpets the raw material of the housekeeper, and books the raw material of the pedagogue. If the pig-iron maker can properly and justly demand the free admission of foreign iron ore because it is his raw material, then it is quite as just and proper and logical for the bar-iron maker to demand the free admission of pig-iron because it is *his* raw material; and for the crucible steel-maker to demand the free admission of bar iron because it is *his* raw material; and for the cutlery-maker to demand the free