METHODS OF EUROPEAN PORTS.

Lecturing last week in New York on "Ports and Terminal Facilities," Professor MacElwee gave a comprehensive account of systems and methods in use at some of the best known European ports. The conclusion arrived at, however, was that it was foolish to imitate any particular method of freight handling, simply because it happened to be in use elsewhere. In part the professor said:

"The study of the peculiarities of a port's freight movement is essential to any real solution of the problem. At the Bush Terminals, for instance, the movement of freight is analyzed as follows: 30 per cent is destined for the warehouse by means of electric truck and muleburry; 25 per cent is carload railroad freight, usually car floated; 25 per cent is less than carload railroad freight, usually lightered or carfloated, and 20 per cent is dray freight for local delivery.

"At Hamburg, the half of the freight which does not go overside in stream for barge transportation on the interior waterways, but over the quays, has the following distribution: 18 per cent by rail, carload and less than carload lots; 20 per cent is dray freight to local consignee; 45 per cent is lightered to warehouses or to river express barges, and 17 per cent goes into barges over the quay after the ship has left or over the waterside of the ship at the quay.

"It must be plain that the belt line does not eliminate the lighter. The belt line simply takes care of freight moving to and from the interior by rail. Even in New York this is only one half the movement of the great Bush Terminals.

"Within the free zone of Hamburg, and likewise in the city, are to be seen on the map canal systems not of the usual harbor character. Those are industrial sections with waterside delivery. Mr. Lindley, an English engineer, built one section by the cut-and-fill system of swamp land reclamation. A private warehouse in Hamburg which has no canal side delivery is considered very inferior and commands only about half the usual rent.

"The advantages of receiving coal by barge or lighter, not to mention other materials, are a convenience and a large saving in expense. There is great economic advantage in locating large industrial plants, in particular heavy industries, where both water and rail connection is possible. The French have recently awakened to the advantage which such location has given the Germans in the past. Granted that water transportation is cheaper than rail, the principle underlying waterside location is that the low grade raw materials are less able to carry the freight charges and that their volume is greater than the finished product, which can bear the charges.

"In the case of Neuss, near Dusseldorf, on the Rhine, that progressive municipality built the river port purely as an industrial harbor. Among other industries, the town succeeded in getting the International Harvester Corporation to locate on 25 acres of this area. Municipal salesmanship is a fine art. Such a side-arm canal port costs so much to build that if the price asked be based on a calculation of the cost of construction, divided by the length of waterfront, and then the cost per unit of waterfront found by dividing the depth of the plot, the proportion of cost per square foot of factory land would be prohibitive. No business could stand it.

"The opportunity of side arm canals and waterside delivery by lighter is offered whenever low marshy ground is reclaimed for industrial uses. It is about as easy to dredge the canals and use the spoil as fill, as not to do so. A municipal port authority trust is the most satisfactory organization for land reclamation with an industrial and commercial port in view. The scattered efforts of individuals cannot accomplish this. This was proven at Rotterdam, Cuxhaven and elsewhere in the seventies.

"An industrial port can only be developed when the area and the number of tenants is large. Newark Bay or Jamaica Bay is such an opportunity. The Jamaica Bay is far larger than the entire harbor of Hamburg. The development is by nature doomed to lighterage connection with the great cargo ships at the port of New York. Therefore, why not provide for lighterage streets, alternating with the dray and railroad streets. This would give the connection which is the most economical.

"The one great point which I wish to leave with you is that a port is not only a harbor but includes terminal facilities. Teminal facilities include piers, warehouses, belt railway, lighters and industrial as well as commercial harbors. The truly co-ordinated port is one where every part is connected with every other part. Every pier with every trunk line; every warehouse with every pier; every ship in stream with every industrial plant in the port area."

LARGEST ENGINE IN WORLD.

The 60,000 horsepower engine and electric generator installed at the station of the Narragansett Electric Lighting Company, according to engineers, will be the means of saving thousands of tons of fuel annually. Over high tension lines current is to be transmitted to a large portion of southern New England.

The engine is the most powerful and most efficient in existence, so engineers say. It is the largest piece of machinery of its kind manufactured and is one-third larger than the present largest piece of the same kind in New England. The next largest turbine engine in the world is of 50,000 horsepower and is installed in the power house of the Duquesne Light and Power Company, Pittsburg, Pa.

The energy which the Narragansett engine will develop would be sufficient to illuminate at full candle power over 1,200,000 lamps of the ordinary size, which, if placed the regulation distance apart, would adequately illuminate six broad highways from the Atlantic coast to the Pacific.

If the entire output which this engine is capable of generating were utilized in the weaving of cotton cloth it would keep 125,960 looms busy and manufacture into fabric 574,692,000 pounds of cotton per year, making a roll of cloth of 1,300,000 miles in length, or 52 times the distance around the earth.

The engine and generator weigh 1,380,000 pounds and are supported on a structural steel foundation weighing over 1,000,000 pounds which in turn rests on the concrete foundation that formerly carried the octagonal chimney so long a landmark in this part of the country.

The quantity of steam necessary for the operation of this powerful machine has been provided for by an increase in the equipment in other portions of the plant, including the erection of two additional stacks, making a total of six, each of which stands 217 feet above high water.

Two condensers of special design, the largest in existence, and built for this plant are connected with the engine. Salt water is used for condensing purposes and is taken from Providence River by means of a tunnel six feet in diameter. When operating at full capacity they will use 18,000,000 pounds per hour, an amount sufficient to fill the locks of the Panama Canal twice in 24 hours.

Steam is conducted at 200 pounds pressure and 100 degrees superheat to the throttle valve through a 24-inch steel pipe suspended in such a manner that it can be swayed by hand pressure, indicating the care in design to avoid injury to the machine by expansion. Two back pressure valves, weighing seven tons each, act as safety valves to the high pressure casting.

The machine is unique in many ways aside from its tremendous size. It is so arranged that either the high pressure or low pressure side of the turbine can be run separately — at half capacity, 30,000 horsepower, or they can be operated as a unit. The high pressure side of the turbine is known as the single flow type and the low pressure side, the double flow. It requires 4,500,000 cubic feet of air per hour for ventilation of the huge generator. This is supplied by two electrically driven fans coupled to three motors in such a way that any one, two or all can be used.

The floor space occupied by the engine is comparatively small, being only 50 by 37 feet. The engine stands 18 feet in the clear. Boilers of 1,500,000 cubic feet capacity furnish the steam. The current is generated at 11,000 volts, but part of the output is stepped up to a voltage of 33,000 volts through transformers for long distance transmission.

Westinghouse Manufacturing Company built the machine and Francis Hodgkinson, chief engineer of that concern, was the designer. He has superintended the work of erection and all final adjustments preparatory to putting it into service. Engineers say the operation of units of this size mark a new era in the history of engineering.

CANADIAN TRADE INDEX.

The Canadian Trade Index is designed to provide buyers of Canadian manufactured goods with a dependable list of articles made in Canada and the names of the makers. The contents include a directory of the manufacturers of Canada, classified according to articles made with an index in French, a list of Canadian trade commissioners and British consuls, and other information of interest to purchasers and shippers. The whole forms a volume of 560 pages. The Canadian Manufacturers' Association, incorporated, Mr. G. M. Murray, Traders' Bank Building, Toronto, being secretary, and Mr. Alex. Marshall, editor.

ASST. COMPTROLLER C. P. R.

Mr. W. J. Moule, auditor of disbursements on the C. P. R., has been appointed assistant comptroller. Mr. Moule has been in the service of the company over 25 years, beginning as a junior clerk in the stores department.

C. P. R. IN JANUARY.

Canadian Pacific gross earnings in January were $631,509, or 6.2 per cent., in excess of the previous record for the month, but the net profit showed a reduction of $1,263,485, a decrease of 51.9 per cent. from the high record of January a year ago.

The January figures compare with those of Jan- was added to other factors long operative in the mounting costs of railroad operation. January is notoriously an erratic month for the company; an open month, contrasting with a month of heavy snowfalls and zero weather in the year preceding, can result in startling increases in net profit. In 1916, for instance, the January return showed an expansion of about 84 per cent. in net profits, although the percentage gain in gross was less than half of that. The reverse of that situation is seen in the return now issued, the contrast being between a fairly open month a year ago and an abnormally severe month this year.

The January figures compare with those of January a year ago as follows:

	1918.	1917.	Inc.
Gross	$10,789,817	$10,158,307	$631,509
Exp.	9,621,824	7,726,829	1,894,995
Net	$1,167,993	$2,431,478	*$1,263,485

*Decrease.

While gross earnings are the largest ever reported for a January, net earnings have been exceeded in four years. Gross and net earnings for January in each of the past ten years follows:

	Gross.	Net.
1918	$10,789,817	$1,167,993
1917	10,158,307	2,431,478
1916	8,588,826	2,090,408
1915	6,109,026	1,140,233
1914	7,916,216	1,000,174
1913	9,679,607	1,662,378
1912	7,328,782	1,082,858
1911	5,740,206	656,118
1910	6,104,426	1,316,599
1909	4,761,860	389,750

"Is your husband much of a provider, Malindy?" "He jes' ain't nothin' else, ma'am. He gwine to get some new furniture providin' he gets de money; he gwine to git de money providin' he go to work; he go to work providin' de job suits him. I never see such a providin' man in all mah days."