

LECTURE.

Miramichi Mechanics' Institute.

The following Lectures delivered at the Mechanics' Institute in Chatham, on the evenings of the 7th and 14th April last, by JAMES A. PIERCE, are published in compliance with a Resolution unanimously passed at the Annual Meeting held on the 26th of that month.

Mr President, Ladies and Gentlemen,—

You have heard many Lectures in this room, the principal part of which have been on matters connected with science, literature, natural philosophy, and such like subjects; but I intend this evening to hold some intercourse with you on what has been done in the great world, during the last quarter of a century—to facilitate trade, commerce, and inter-communication, by the construction of Canals, the building of Railways and Oceanic Steamships, the establishment of Lines of Electric Telegraph, and some other matters of minor note, which have proved so advantageous to the present generation.

I also intend to address you on matters purely LOCAL, and to throw out some suggestions, which if acted upon and carried out with spirit, would remove many of the grievances under which we labor, and produce a more healthy state of society, than we at present enjoy.

Let me now turn your attention to the Land of our Forefathers, and see what she has done, and what is at present her master-spirit? To enable us to accomplish this more completely, let us turn for a few moments, into the Crystal Palace, and read the lesson it presents to our mental investigation, while we contemplate the appearance the Island put on at that peaceful reunion of nations. Is it Britannia, with her radiant and plumed helmet, and the lion recumbent at her feet—or John Bull's portly form, carrying weight in every limb, and determination, not unmingled with prejudice, from the crown of his broad-brimmed hat, to the soles of his huge top boots?

Far otherwise. Some traces of those popular types of our nationality may indeed be seen, but England has greatly changed. Her genius is to MECHANISM—her master-spirit—the CIVIL ENGINEER—her tendencies to relieve labor from its drudgery, and delegate to iron, to steam, and to the other powers of the inanimate world, as much as possible, of the burden of toil. If you have any doubts of this, go and examine for yourselves, as they are reported in the London Journals—the great department of MACHINERY in this most extraordinary building: ponder over that vast collection of interesting objects, every portion of which high ens immensurably the burdens of life, and release hundreds of hands from the most irksome forms of industry. You will there see how Mechanism is extending her dominion over the whole vast empire of labor; how she replaces in textile fabrics to the manufacture of the most delicate and intricate lace, how from wood she aspires to fashion iron into the most exact proportions, how, with steam as her hand-maid, she works the Printing Press, and navigates the mighty ocean, and outruns the swiftest animal in its course. Turn into the Agricultural Improvement Department, and you will find almost every thing done by machinery. By it the farmer sows not only sows and reaps, but he manures and hoes. By it he thrashes out and grinds his corn, and prepares his food for his cattle. He can even drain by machinery; and it is difficult to know to find a branch of his business into which it does not largely enter.

In Manufactures, the mechanical genius of the country reigns supreme. Those beautiful fabrics are nearly all the evidences of its power. Soft goods and hardware are equally indebted to it, and in its presence the unaided efforts of handicraftsmen appear small and insignificant. It travels everywhere, and invades every compartment, even that of the fine arts, in the court dedicated to which, some of the most conspicuous contributions are specimens of Painting in Oil, and attempts to reproduce by mechanical means, the sentiments and inspiration of the painter.

Look abroad and see what this master-spirit has done to facilitate intercommunication.—Cast your eyes around, and you will perceive that Railroad tracks run in all directions—from north to south—from east to west, so that the surface of the country is literally covered with them, and the Island resembles, to use the language of Punch—a huge Gridiron.

About thirty years ago if my memory serves me—the celebrated Engineer Mr Stevenson called a number of his friends together, and laid before them a project for applying Steam as a propelling power to cars on a railway. He stated to them that he was satisfied a Locomotive could be constructed, as to travel at the rate of 25 miles an hour, and that he proposed bringing the matter before Parliament. Many of those friends tried to dissuade him from such a project, but finding him resolute—induced him to reduce the speed of travelling to 10 or 15 miles as the members of Parliament, generally, would look upon the matter as a hoax. He accordingly laid the subject before them, and it was investigated by a Committee specially appointed, and even this reduced rate the majority expressed themselves doubtful could be acquired.—What do we now find? that forty miles an hour is the average of passenger trains—and the mails and express trains accomplish sixty miles an hour.

Twenty years ago the great body of the people could form no idea, neither could they correctly define the nature and benefit of a RAILWAY. Now there is about Seven Thousand Miles of Railway in active operation in Britain, which have been constructed at the enormous cost of nearly Three Hundred Millions. The dividends amount to about Ten Millions annually. The annual passenger traffic is computed at One Hundred Millions.

What a magnificent project is this—how illustrative of a great people.

The people of the Continent seeing the great advantages the inhabitants of Britain have derived from those great works, have recently engaged in their construction. By recent returns I find that Belgium has 532 miles, the expense of constructing which has been £9,576,000 sterling. In France there are 1,818 miles in operation, and 1,178 miles in progress of construction, and 577 miles projected. The estimated cost to complete the whole is £98,507,357

sterling. In Germany there are 5,342 miles in operation, and 700 projected. The expense of constructing those cost £12,500 per mile but they are only single tracks. In Russia the following lines have been opened—Warsaw to Cracow 168 miles; one connecting Warsaw with St. Petersburg, 683 miles in length; one to connect Moscow with St. Petersburg, 400 miles in length is in progress; and also one to connect Kief with Odessa has been surveyed.

I shall now turn your attention to what has been done in navigating the Ocean by STEAMERS. In 1820 England had 17 steamboats, Scotland 14, and Ireland 3. In 1840, twenty years later, the number were respectively 987, 244 and 79. In 1821 the mail service between Dublin and Holyhead, and between Calais and Dover was first performed by steam vessels. As steamers had crossed the Channel—why could they not cross the Atlantic, or any other Ocean, was asked by scientific men? But the project was deemed illusive, many men of science in Britain, among them Dr. Lardner arrayed themselves against it, with all the force of philosophy, backed by figures; while the opposite party contended—that there were steamboats employed on the Mediterranean and home stations, from which, data might be supplied to show the practicability of the project. The Atlantic had actually been already crossed by a steamer, showing, that what man had done might be done again, but as she had used sails as well as steam, and was a week longer on the voyage than the time usually occupied by the regular traders, the achievement was held worthless, either as a precedent or guide. This vessel was named the Savannah. Her arrival was thus noticed in Liverpool by a paper of July 21, 1819.

Among the arrivals yesterday at this port we were particularly gratified and astonished by the novel sight of a fine steamship, which came round at half past seven P. M., without the assistance of a single sheet, in a style that displayed the power and advantage of the application of steam to vessels of the largest size, being 350 tons burthen, she is called the Savannah, commanded by Captain Rogers, and sailed from Savannah, Georgia, United States, the 26th M. Y., and arrived in the channel five days since.—During her passage she worked the engine 18 days. This is the first vessel on this construction that has undertaken a voyage across the Atlantic.

This vessel subsequently visited Copenhagen, St. Petersburg, and Constantinople, and her Captain received munificent royal presents in recognition of his daring.

The opinion of Philosophers was still adverse to the success of the project, when it was resolved that it should be put to the test of a trial. Accordingly the hull of the Great Western was laid down at Bristol, and on the 8th April 1838, she was announced to start on her voyage. Her appearance, rather that of strength than of beauty, inspired confidence that she would successfully achieve the passage. Her engines were equal to that of 450 horse power, and her burthen 1,340 tons. On the appointed day she left Bristol, having on board 660 tons of coal and six passengers, to set the great question of steam navigation of the Atlantic at rest.

She was not alone—however; a smaller vessel—the Sirius, had started from Liverpool three days before her. Both vessels encountered heavy weather, and adverse winds, but they bore bravely on. The Sirius had a start of 500 miles, the Great Western's average speed was ten miles an hour, and it was thought she would quickly overtake her competitor. The former vessel, however, had too great a start, and reached New York the winner on the morning of the 23rd April, St. George's day, the Great Western coming in the afternoon of the same day. The excitement which prevailed in that city on the arrival of those vessels, was very great—immense multitudes turned out, and they were saluted by the battery with 26 guns.

Between 1838 and 1843 the Atlantic was navigated by several steamers—many of them larger than the Great Western, viz: the Royal William, the British Queen, the ill-fated President, and the Liverpool. The Great Western was built of wood, and when her proprietors became assured of her success, they determined to construct a larger ship of iron, to be propelled by the screw instead of the paddle-wheels. The keel of this mammoth vessel was accordingly laid down at Bristol in 1839, and when she was launched in 1843, she was named the Great Britain by Prince Albert. She cost £100,000. She made a few successful voyages in the years 1845-6, and was at last unfortunately thrown ashore in Dundrum Bay. She was subsequently got off, and has been refitted, and made a fair voyage to Australia.

Shortly after the successful experiments of 1838 had demonstrated that a regular steam communication could be maintained between Great Britain and America, the British Government called for tenders to carry the mails in steamers across the Atlantic. Both companies to which the Sirius and Great Britain belonged, tendered for the service, but neither of them was accepted. A short time after the Hon. Samuel Cunard, who had for a number of years held a contract for the mail service between Bermuda and Halifax, proposed to take the contract. The Government did not accept his offer at first, but subsequently agreed to give the annual sum of £55,000, for carrying the mails twice a month between Liverpool, Halifax, Quebec and Boston; and on the 4th July 1840, the Britannia, a vessel of nearly the same tonnage as the Great Western, left Liverpool. This way formed the nucleus of the now famous Cunard line.

The Americans had not hitherto taken any part in conducting the steam navigation of the Atlantic, but the speedy formation of several companies with this object, made it evident that they would not continue to allow the traffic to rest with the British North American Company. Mr Cunard, therefore, applied for an extension of his contract, so as to carry the mails once a week, and thereby enable him to meet the expected competition. The proposal was felt to be reasonable—and the British and North American Company at length obtained a yearly grant of £145,000 for a service thus regulated—two departures a month from Liverpool and New York or Boston, during the months of December, January, February, March, and one departure a week during the other eight months of the year.

There was an alteration made last fall—the mails now leave Weekly during the whole year.

The Cunard line now comprises the following vessels, viz:—the Africa 230 feet in length, 800 horse power, 2,246 tons burthen; America, 249 feet in length, 650 horse power, 1,832 tons; Asia

280 feet 800 horse power, 2,266 tons; Cambria, 217 feet, 500 horse power, 1,423 tons; Canada, 249 feet, 650 horse power, 1,832 tons; Europa, 249 feet, 650 horse power, 1,832 tons; Niagara, 249 feet, 650 horse power, 1,832 tons. To this magnificent fleet, all of which were built on the Clyde, is to be added two other vessels of larger dimensions, the Persia and Arabia.

Late papers state that this company is building an iron paddle ship, which, when completed, will be the largest steamer in the world. She is to be named the Persia, will be of the burthen of 4,000 tons, and will be propelled by engines of 1,000 horse power. She is to ply between Liverpool and New York.

This company have recently opened up other lines of communication. A late Glasgow paper furnishes some interesting particulars.

On Saturday last the Taurus screw steamship, which has just been completed for Messrs. Burns and Co., of this city, and Mr. M'iver, of Liverpool, left the Clyde for Liverpool, whence she will sail for Constantinople on the 20th inst., on her first trip, as one of the regular liners on the new steam route between Liverpool and the Levant. Her dimensions are as follows:—Length over all, 210 feet 5 inches; breadth of beam, 29 feet 5 inches; depth of hold 24 feet; burthen, 1026 tons; power of engines, 180 horse power; diameter of screw, 12 feet. She is built in six water-tight compartments. The main cabin of the Taurus will accommodate 40 passengers. One important feature has been introduced into the Taurus, which is likely ere long to find its way into every ocean-going iron steamer. This is that a standard or regulating compass is fixed at the top of the main mast, at a height of thirty feet from the deck, and entirely isolated from any iron material; for the bolts, straps, rings, &c., upon the mast, which were formerly iron, are now made of copper. In this way the compass is quite beyond the influence of local attraction. This new steam line Levant was opened recently by the British Queen and the Balbec. The Taurus will now take her place on the same station, and she will be speedily joined by the Melita, of fully larger dimensions. Thus we will have four fine new steamers on the Turkish line. We may add that, in the course of the next month, Messrs Burns and M'iver will extend their operations in the Mediterranean by opening a line to Egypt, and for this two fine steamers of equal size and power, and similar construction with the Taurus, will be set apart. These will be the Teneriffe and the Karnac. There are also in course of construction two splendid steamers for the extension of the Cunard line from New York, via Chagres, into the Pacific, namely, the Etna and the Jura. Each will be fully 2000 tons burthen, and more than 400 horse power, and they will reinforce the Andes and Alas, which have been recently built expressly for this service. The Elk, Stag, and Lynx, iron paddle-steamers, each of 600 tons, are also being built for Messrs Burns, the two former for the Glasgow and Liverpool trade, and the last for the Belfast mail service.

In all these vessels the greatest skill, ingenuity, and good taste have been exerted to afford passengers the utmost amount of luxury and comfortable accommodation. They have been more regular in their arrivals than mail coaches used to be passing from one town to the other, and what an improvement on the old packet system—one month, and they frequently occupying 50 days to perform the voyage and scarcely a year passed without one or two being lost.

I remember a captain Tilley, who for three successive years, commanded the January packet, and occupied ninety days in performing the voyage—coming in after the arrival of the March mail. On being questioned by the Captain of the March packet, on one occasion, where he had been all the time, he replied, snug in a warm latitude. I do not like your Novascotian winters, and on leaving Falmouth make for a comfortable southern position, and take things easy, and when the spring opens, steer my way to Halifax.

During this time the Americans were not idle. The Washington and Hermann were the first vessels they put on the Atlantic route: they made Bremen on the Weser, their European port of arrival, taking Southampton in their course; but Mr Collins, of New York, was the projector of the formidable line of ships in direct competition with the Cunard's. The Collins line consists of the Atlantic, Pacific, Arctic, Baltic and Adriatic, all fine ships of 3,000 tons register, 300 feet in length, and having engines of 1,000 horse power. The rivalry between those companies, has become invested with a national interest, but so far, there is nothing to fear for the meteor flag of Britain. It appears that these boats do not pay, and Mr Collins asked Congress to enlarge the yearly grant, otherwise he would be compelled to withdraw them. This has been granted him.

Since then the British government have been extending the mail service of steamers in every direction. Last year they paid £809,496 to this service, which extending from Liverpool to New York, from Southampton to Hong Kong, the Cape of Good Hope, Australia, the Brazils, and Chili, concentrate the whole sea borne correspondence of the globe in the hands of British agents. A portion of this large sum is divided among companies working short lines—from London to Ostend, Rotterdam, and Hamburg; Hull to Hamburg; and Russia; from Liverpool to Dublin; New Southampton to the Channel Islands; but nearly seven-eighths of the amount is shared between six companies, viz: Cunard's which receives, as we stated, £145,000; the West India Company £240,000; the Pacific Steam Navigation Company £240,000; Screw Steam Shipping Company, (which has recently taken the mail contract to the Cape of Good Hope,) £30,000; the Peninsular and Oriental Company, £220,000; and the East India Company, for performing the mail service between Suez and Bombay, £50,000. Mr Cunard also conveys the mails from Halifax to Bermuda and Newfoundland by Steamers.

I perceive by a late Review a project has been started for accomplishing the journey from London to Calcutta by Railways and Steamboats, in NINE DAYS, and the Reviewer says—"This would not be a very great undertaking after all, when we consider that this distance is not greater, in a straight line, from the great Metropolis than to New York."

I shall now call your attention to matters in the New World. In 1824, when I resided in New York, the Hon. Hugh De Witt Clinton, after much mental anxiety and bodily toil, had succeeded in completing the ERIE CANAL, the first work of the kind undertaken in the Union.

Its object was to open up the great interior lake country to Albany, on the river Hudson,

so that the farmers in this extensive and fertile region, would be enabled to bring their produce to market. When this great man first propounded his project, he was considered by a large majority of the people of the State of New York, as a dreamer, an enthusiast; and when he at last succeeded in enlisting the Legislature of the State in its construction, the wise ones knowingly shook their heads, and predicted a failure; the men of capital drew closer the strings of their money bags, and the people clamored against the parties in power, and complained that the finances of the state were expended on an enterprise that would never pay, or be of the slightest benefit to them. But no sooner was the work completed, than its beneficial effects were made apparent. The Hudson river was crowded with steamboats and barges; New York became the deposit for the immense produce of the upper country, and at once took her position as the greatest Commercial City of the Union. The man who was formerly considered a silly enthusiast was looked upon as a sage, the greatest honors were conferred upon him: he was elected, almost by acclamation, Governor of the State, and in the spring of 1824 when he first visited New York in that capacity, his reception was a perfect ovation.

Such is human nature—and such was human nature in olden times—for in King David's time we learn, that when that monarch was compelled to leave his capital and seek shelter for a time in a distant part of his dominions, through the revolt of his son Absalom, who came out to meet him in his melancholy journey but Shimei and his followers, who reviled the monarch, cast dirt at him, and spat on him. But when the revolt was quelled, and David was returning home in state, who should turn out to do him honor but the aforementioned Shimei and his family. The witty Sterne, in commenting on this act of Shimei, remarks—"O Shimei, Shimei, would to Heaven when thou wast slain, that all thy family had been slain with thee, and not one of thy resemblance left, but ye have multiplied exceedingly and replenished the earth, and thy progeny is found in all parts of the habitable globe."

Nothing was then thought of but Canals, and there was scarcely a State in the Union that did not project a similar work. Last year this celebrated Canal was enlarged. It has not only paid off the debt contracted for its building, but the surplus it produced was nearly sufficient to defray all the expenses of their admirable School system, which provides for the free education of every child in the State.

It was in this year, if my memory serves me, that the practicability of travelling by Railway was tested, and the line commenced to connect Liverpool with Manchester. An English mechanic living in Jersey City, opposite New York, then a village not near as large as Chatham, but which now contains 30,000 inhabitants, wrote several communications in a paper I was conducting for a gentleman in New York, pointing out the advantages which Railways had over Canals—being cheaper to construct, affording greater facilities for transit, with far greater speed, &c. Those communications were copied into the New York papers, and the remarks of the author condemned and ridiculed. But what a change has come over the opinions of the people since then.

I shall now take a brief review of what has been done in that country, in the construction of RAILWAYS. The first railway made was one commenced 23 years ago, it was three miles long. It was called the Quincy road, situate in Massachusetts. The first built in New York state, was the Mohawk and Hudson, sixteen miles in length, and now called the Schenectady. It was commenced in 1830 and completed in 1833—only 18 years ago. On the 1st January 1851 there were in operation in the state of New York alone, 1,400 miles of railroad. There were nearly the same number of miles in Massachusetts, while in the entire New England States they amounted to 2,644. The total in operation was 8,797. The capital invested up to January 1852, amounted to the enormous sum of \$320,000,000.

The American Railway Guide of January 1, 1853, informs us, that there were in the different States 13,227 miles of completed railroad, 12,923 miles in various stages of progress, and about 7,000 miles in the hands of the engineers, which will be built within the next three or four years—making a total of 33,155 miles of railroad, which will soon traverse the country, and which at an average cost of \$30,000 (a well ascertained average) for each mile of road, including equipments, etc., will have consumed a capital amounting to \$994,650,000.

13,227 miles completed, \$306,810,000
12,923 miles in progress, 387,840,000
7,000 miles under survey, 210,000,000

33,155 Total, \$994,650,000

It appears from official statistics, that on the 10th January 1851, the extent of CANALS in actual operation amounted to 4,333 miles, and that there were then in progress 2,359 miles, a considerable portion of which has since been completed. It is computed that the actual extent of artificial water communication now in use in that country, exceeds 5,000, and has absorbed a capital of \$32,000,000.

Their PASSENGER STEAMERS on the great rivers call forth the admiration of strangers. Those running on the Sound, average 300 feet in length. In the accommodations afforded to passengers in them—no water communication in the world can compete. Nothing can exceed the splendor and luxury with which they are fitted up, furnished and decorated. All the largest class are capable of running from 20 to 22 miles an hour. The other class of steamers used for towing the commerce of the river, corresponds to the goods trains on railways. No spectacle can be more remarkable than this class of locomotive machines, dragging their enormous loads up the Hudson. They may be seen in the midst of that great river surrounded by a cluster of 20 or 30 loaded craft of various build and magnitude. Three or four tiers are lashed to them at each side, and as many more at their bow and stern. The propeller, or steam-er, is almost lost to view in the midst of this crowd of vessels, and the moving mass is seen to proceed up the river, no apparent agent of propulsion being visible, for the steamer is literally buried in the midst of the cluster which clings to it and floats round and near it. As this water goods train, (as it has been called,) ascends the river, it drops off its load—vessel by vessel—at the towns which it passes, and finally arrives at Albany, with the residuum of some half dozen vessels. The steamers on the Mississippi, form a striking contrast to those on the Hudson.

The principal object with the proprietors it appears is speed. They are made to go—but