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THE SCIENTIFIC AMERICAN SUPPLEMENT

No. 380,

For the Week ending April 14, 1883.

Price 10 cents. For sale by all newsdealers.

PETER COOPER.

In the death of Peter Cooper New York loses a most valued citizen, whose noble life endeared him to every inhabitant almost as a personal friend. He was to this city what Benjamin Franklin was to Philadelphia; and there were various points of similarity in the general characteristics of these illustrious men.

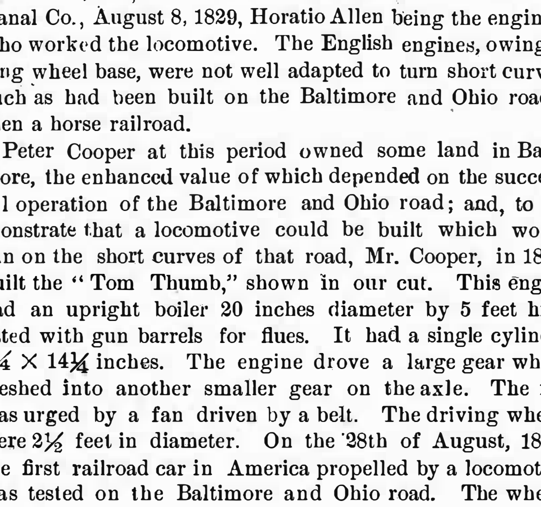
Peter Cooper was born on the 12th of February, 1791, in the city of New York, and died on the 4th of April, 1883, at his residence, No. 9 Lexington Avenue, in the 93d year of his age. He was a man of exemplary habits of life, to which is due, doubtless, the prolongation of his years. At the age of seventeen he was apprenticed to the business of coach making, for which, it is said, he received $25 a year. After that he worked for $1.50 a day at the business of making machines for shearing cloth. Having saved money enough to buy a right in the patent to manufacture these machines, he went into business on his own account, and was patronized by Mr. Vassar, the founder of Vassar College. From him Mr. Cooper received at one time $500 for machines that he had made, and this may be said to be the principal capital, financially, on which his subsequent operations were based. From an early age he developed a great taste for mechanics, and was constantly inventing something new. When a lad he made a machine to utilize the power of the rising and falling tides. In early life he was led into the purchase of a glue factory in this city, which he carried on with such success that in due time Cooper's name for supplying the best article of glue to be had in the market became quite widely known, and the business grew into one of great importance.

Another portion of his attention was directed to the manufacture of iron. He built a rolling mill and iron furnaces in Baltimore, and from these sprang several very large iron rolling establishments in different parts of the country. He was among the first to roll iron girders for fireproof buildings.

Many years ago he devised a method for propelling canal-boats by a series of endless chains laid in the water on the bottom of the canal. This method has since been brought into use, and is known as the Belgium system. He devised a method of transporting coal from the mines to his furnaces by means of traveling wires and buckets. This system has also come into very extensive use. In 1824 or 1825 he designed a torpedo boat, which was moved by a screw propeller guided by steel wires which were unwound from a reel.

Peter Cooper's name is associated with the early railway history of this country in a curious manner. He built the first locomotive ever made in this country, and he was the first to draw passenger cars by steam. The earliest locomotive operated in this country was an imported machine from England, called the "Stourbridge Lion." It was tried at Honesdale, Pa., on the road of the Delaware and Hudson Canal Co., August 8, 1829, Horatio Allen being the engineer who worked the locomotive. The English engines, owing to long wheel base, were not well adapted to turn short curves, such as had been built on the Baltimore and Ohio road—then a horse railroad.

Peter Cooper at this period owned some land in Baltimore, the enhanced value of which depended on the successful operation of the Baltimore and Ohio road; and, to demonstrate that a locomotive could be built which would run on the short curves of that road, Mr. Cooper, in 1829, built the "Tom Thumb," shown in our cut. This engine had an upright boiler 20 inches diameter by 5 feet high fitted with gun barrels for flues. It had a single cylinder $3\frac{1}{4} \times 14\frac{1}{4}$ inches. The engine drove a large gear which meshed into another smaller gear on the axle. The fire was urged by a fan driven by a belt. The driving wheels were $2\frac{1}{2}$ feet in diameter. On the 28th of August, 1830, the first railroad car in America propelled by a locomotive was tested on the Baltimore and Ohio road. The wheels



PETER COOPER'S LOCOMOTIVE, 1829.

were "coned," and this was the first use of this principle as applied to car wheels, and was suggested by Mr. Knight, chief engineer of the road.

This engine (Cooper's) was coupled to a car in front of it containing a load of $4\frac{1}{2}$ tons, including 24 passengers. The trip of 13 miles was made in 1 hour and 15 minutes, the best time for a single mile being $3\frac{1}{4}$ minutes. The return trip of 13 miles was made in 57 minutes. While this engine of Mr. Cooper's was built for experiment solely, it was the first locomotive built in America.

Mr. Cooper's name is also prominently associated with the telegraphic history of this country. He had the foresight to discern the extraordinary importance of the electric telegraph to business and to all the concerns of life when but few could see it. He boldly advanced large sums in the establishment of telegraphic lines in the infancy of the business, when it was very difficult to find capitalists with sufficient confidence to take the risk. He was President of the North American Telegraph Company when it controlled more than half the lines in the country; as President of the New York, Newfoundland, and London Telegraph Company, he was associated with Marshal O. Roberts, Moses Taylor, Wilson G. Hunt, Cyrus W. Field, and others. They steadily paid out money for fourteen years, without return, in the confident hope of ultimately perfecting telegraphic communication between Europe and the United States. Peter Cooper was strong and ardent in his support of the enterprise, which was finally crowned with brilliant success.

One of the most prominent of the various benevolent enterprises with which Peter Cooper's name is associated is the institution known as the Cooper Union for the Advancement of Science and Art. The building occupies the whole of the small square at the junction of Fourth Avenue, Eighth Street, and Third Avenue. Mr. Cooper's avowed object in making this munificent gift was to supply to the industrious poor of New York what he had felt the need of himself—the opportunity for instruction in the industrial arts free of cost. He had attended school only half of each day in a single year, and he knew all the disadvantages under which the children of the poor are placed when they are kept out of school to assist in the support of the family by their labor. His plan, therefore, was to have an institution where most of the teaching should be done at night. He began the work when he was over sixty-four years old, and he lived to see many thousands of people filled with gratitude for his philanthropic efforts in their behalf. These efforts cost him about a million and a half of dollars. He was not unfamiliar with the educational needs of the city. He early became a trustee of the Public School Society, and was its Vice-President when it was merged in the Board of Education. He was subsequently a School Commissioner, and saw how often the promising children of the poor were launched into active life without the preparation which would enable them to use their powers to advantage.

The cost of the building was $630,000. The total cost of building and education has been about $2,000,000. The work accomplished by this institution is comprehensive. It comprises regular courses of instruction at night, free to all who choose to attend, on social and political science, on the application of science to the useful occupations of life, and on such other branches of knowledge as will tend to improve and elevate the working classes. It includes, also, a school of design for females, which is now attended by over 300 pupils, a free reading room and library, galleries of art, collections of models of inventions, and a polytechnic school. The evening schools are attended by thousands of young men, who are mostly mechanics. They study engineering, mining, metallurgy, analytic and synthetic chemistry, architecture, drawing, and practical building. The institution includes a school of art for women, a school of wood engraving, and a school of photography, all of which are free. There are thirty instructors employed. During the past year 3,334 pupils passed through the different classes, many of whom came to New York from distant parts of the United States for the purpose of attending the institution. The expenses of keeping up all the departments last year were $50,973.

MOSQUITOES VS. MALARIA.

In a paper read before the Philosophical Society of Washington, Feb. 10, 1883, Dr. A. F. A. King endeavored to sustain the thesis that malarial disease is produced by the bites of insects inoculating the body with malarial poison, the mosquito being considered in this country the most active agent.

Whatever value may be ascribed to mosquito bites as a cause of disease (and there are several very strong and, to our mind, fatal objections to the theory, and especially the fact that malaria prevails at seasons when no mosquitoes occur), it is interesting to observe how the properties and phenomena usually ascribed to malarial vapors become susceptible of explanation on the above insect theory, and how easily coincidences are made out. In the course of his remarks he presented the following series of twenty statements culled from leading medical authorities, in relation to malaria, and which, he maintained, are explicable on the mosquito theory.

1st. Malaria affects by preference low and moist localities. Such localities are the natural abode of mosquitoes.

2d. Malaria is seldom developed at a lower temperature than 60° F.; neither are mosquitoes.

3d. The active agency of malaria is checked by a temperature of 32° F. The same may be said of the mosquito.

4th. Malaria is most abundant and most virulent as we approach the equator and the seacoast. So, under specified conditions, are mosquitoes.

5th. Malaria has an affinity for dense foliage, which has the power of accumulating it, when lying in the course of winds blowing from malarious localities. Trees accumulate mosquitoes in the same manner.

6th. Forests and even woods have the power of obstructing malaria and of preventing its transmission under these circumstances. So of mosquitoes.

7th. By atmospheric currents, malaria may be transported to considerable distances, probably as far as five miles. Mosquitoes also.