

it is 5,000 feet a second. In solids the velocity is generally much greater than in liquids. In fir-wood, for example, it is 15,000 feet a second; in iron it is 17,000; in lead, however, it is only 4,000 feet a second.

#### Conducting Power of Certain Substances.

The power of conducting heat of a piece of dried chalk was equal to '19, but became equal to '30 when the substance was very moist. That of a well-dried piece of new red sandstone was equal to '25, but became as much as '60 when saturated. For a block of dry clay the conductive power was '23, and became '37 when well moistened.

#### Iron in Brass.

Dr. Crace Calvert, in a recent lecture, said:— Without occupying your time with further instances, let us call your attention to an important fact that Dr. Matthiessen, Mr. Johnson, and myself have observed, viz., that the addition of a small quantity of metal, which may be considered as an impurity, completely modifies, in many instances, its properties; and the most important example that I am acquainted with is the influence which the addition of one or two per cent. of iron exercises on the properties of brass. If a brass be composed of sixty per cent. copper and forty per cent. zinc, it will be susceptible of being drawn or bent when cold, but cannot be forged or worked when heated; while if 1·75 or 2 per cent. of iron be substituted for the same quantity of zinc, then a most valuable brass is obtained, for not only is this brass capable of being forged at a red heat, like iron, but its tenacity is increased in an enormous proportion, for each square inch of surface is able to support a "breaking weight" of from twenty-seven to twenty-eight tons—a tenacity nearly equal to that of iron.

Messrs. Beyer & Peacock, of Manchester, who experimented with bolts made of this alloy, in the hope of substituting them for iron ones in the fire-boxes of locomotives, found that these bolts would support a strain equal to those of iron, and that the threads of the screw were not stripped with more facility than those of iron when exposed to the same strain.

#### Tenacity of Copper.

The tenacity of cast copper is sufficient to support a weight of 12,000 lbs. to the square inch, or rather more than half as much as good cast iron.

## Statistical Information.

#### American Railroads.

The number of railways in the United States and the number of miles in actual operation, have become immense. The States are now encircled with almost as numerous chains of iron as Great Britain, and the amount of capital invested therein has become enormous. Up to September last there were no less than five hundred and ninety-three companies, owning one or more lines. Pennsylvania leads all her sister States in the length of her railways, which cover three thousand three hundred

and fifty-nine miles. The following figures have been compiled to show the length and cost of the railways in the principal States:—

	Miles.		Total cost.
	1860.	1864.	
Pennsylvania.....	2,593	3,359	\$176,080,000
Ohio.....	2,045	3,010	117,583,000
Illinois.....	2,799	3,157	120,417,000
New York.....	2,682	2,820	135,877,000
Indiana.....	2,163	2,195	71,198,000
Georgia.....	1,419	1,419	39,389,000
Virginia.....	1,378	1,378	42,905,000
Massachusetts.....	1,264	1,285	59,051,000
North Carolina.....	938	938	19,180,000
South Carolina.....	673	913	22,000,580

Canada appears very favourably in the matter of railways. She would come next to Indiana in the above list. Statistics for 1860 set down the length of our railways at one thousand nine hundred and seventy-four miles; since that time there has been a moderate increase. In 1850 we had only twelve miles in operation. Our railway progress has been rapid and gratifying.—*Trade Review*.

#### The British Navy during 1865.

In 1865, the Royal Navy of Great Britain was composed of 765 ships of all classes, of which 193 were in actual commission (carrying 3,936 guns,) exclusive of royal yachts, tenders, gunboats cruisers, tug boats, etc., engaged in harbor duty. This list comprised 16 ships of from 70 to 104 guns, mounting 1,276 guns. 27 of from 30 to 67 guns, carrying 1,119 guns; 29 of from 20 to 29 guns, carrying 638 guns; 38 of from 10 to 19 guns, carrying 556 guns; and 83 of from 1 to 9 guns, carrying 347 guns. Of the above 11 were either all or partly iron-cased, and their joint armament represented 216 guns. In addition to this number there were then building 28 ships of all classes, viz.: four iron screw ships, one iron screw corvette, one hydraulic iron-cased vessel, two double-screw iron and wood gunboats, and 20 wooden screw ships, frigates, corvettes, etc. The ships paid out of commission since the commencement of the year 1865 are 36 in number, representing an armament of 670 guns. The ships commissioned since the 1st of January, 1865, are 32 in number, representing an armament of 509 guns.—*Army and Navy Gazette*.

#### British Steam Packet Companies.

There are now twenty-three steam packet companies in Great Britain, who own about 270 steamers, the tonnage of which is 560,000, the horsepower 110,000, and the value between £30,000,000 and £40,000,000 sterling.

#### Life-boats.

During the last twelve months the life-boats of the National Life-boat Institution have providentially been the means of rescuing 444 lives from shipwreck on the coasts of the United Kingdom. The institution has also granted rewards and several silver medals and other honorary acknowledgments, to the crews of fishing-boats and others for rescuing 182 persons from various wrecks on our coasts; giving altogether a grand total of 626 lives saved from death during the past year—mainly through the instrumentality and encour-