

taken not to compress it too violently; otherwise accidents may frequently occur. A blow with a hammer upon stone with some of the powder upon it explodes all samples that I have prepared.—*Chemical News.*

Manufacture of Malleable Horn.

A patent has been taken out in France, by Messrs. Boulet, Sarazin & Co., for a new process for making malleable horn. The horn, in chips and shavings, is boiled a long time in a caustic lye of strength of 25° of the alealimeter, by which it is entirely melted. This liquid is then reduced for evaporation to a plastic paste, which may be rolled into sheets, drawn into rods, or molded in any form.

This paste is rendered more strong and elastic by mixing it with india-rubber or gutta-percha. The substances are mixed together in a cast iron vessel, and passed between fluted revolving rollers, the vessel being heated by steam.

The inventors say that, by covering the fibers of cocoon or of aloes with this paste, they have obtained belts more solid than those of leather, and stronger than those of india-rubber.

Steam Shipping of Great Britain.

Mitchell's Steam Shipping Journal states that the Parliamentary returns have been published, giving the names of all steamships in Great Britain on Jan. 1 1861, with their tonnage.

The total number of steam vessels is 1,945. Gross tonnage, 686,417 tons; exhibiting an increase of 82 ships and 19,904 tons over 1860. Of the ships thus registered, there were—

Paddle wheels.....	1,342
Screw	601
Screw and paddle.....	1
Experimental propeller	1

Total..... 1,945

Again: specifying material there were—

Built of wood	860
Built of iron	1,080
Built of steel.....	5

Total..... 1,945

The distribution in some of the principal ports was as follows:—

	Steam vessels.	Tons.
London	525	276,133
Liverpool.....	214	91,662
Newcastle	116	19,445
Hull	66	26,007
Sunderland	71	18,304
Shields.....	132	8,830
Southampton.....	33	8,407
Bristol.....	66	7,416

Formation of Fumic Acid.

The formation of fumic acid, so important, apparently, to the nutrition of plants, has received a long investigation at the hands of M. Paul Thenard, the discoverer of it (*Bulletin de la Société Chimique de Paris*, No. ii. page 33), who has come to the conclusion that it is a compound of ammonia or certain ammoniacal salts with vegetable principles. He wetted straw, dry leaves and sawdust with ammonia, and the carbonate and sulphate, and found that it was formed in abundance. He found, also, that when glucose, or sugar, was heated in a tube nearly to the temperature at which it decomposes, and a current of ammoniacal gas was passed, a large quantity of the ammonia was absorbed, and substances produced greatly resembling

fumic acid. That formed from glucose was of a brown colour, was soluble in water, acids and alkaline solutions, but insoluble in alcohol. That formed from cane sugar was brown, uncrystallizable, soluble in alcohol and insoluble in water. Carbonic and the other acids dissolved it freely, and alkalies precipitated it from the solution. Another body formed with the last had similar properties, but was insoluble in alcohol. The analyses of these three bodies gave the following results:—

	I.	II.	III.
Carbon.....	52.28	65.66	54.26
Hydrogen	6.38	6.05	5.34
Nitrogen	9.94	19.36	18.78
Oxygen	31.40	8.93	21.61

Similar substances to the above were formed when starch, mannite, cane sugar, or sugar of milk, was heated with liquid ammonia in a sealed tube. When syrup was heated with liquid ammonia to 180° Centigrade, carbonate of ammonia, a black liquid and a black solid substance were formed, the two last of a very complex nature. The author speculates on the constitution of these bodies, admitting that he has but incompletely studied them. We do not, therefore, quote his speculations. He mentions a fact, however, which may be of value to some of our readers. A farmer, near Châlons, sprinkles his dung-heaps with ammoniacal gas liquor, and thereby obtains an excellent manure. The gas liquor used in this way producing a much better effect than when applied directly to the soil. M. Thenard examined the dung-heaps and found an abundance of fumic acid, or rather fumate of lime.—*Chemical News.*

Property of Rock Oil.

At a recent meeting of the American Photographical Society, Mr. Seely mentioned a remarkable property of rock oil, namely, its extraordinary power of penetrating capillary tubes. It surpasses in this respect both water and alcohol, and probably all other liquids. It will flow by the wick over a lamp and cover the outside, it will follow up the side of glass and thus escape from a bottle. If put into a wooden barrel it passes through the staves, covering the barrel upon the outside, and filling the air with its odor.

The Copper and Iron of Lake Superior, U. S. side.

The aggregate value of copper exported from the Lake Superior Mines in 1845 was but \$390; in 1850 it was \$266,000; in 1855 it was \$1,437,000, and in 1860 it had increased to \$2,944,000. The product of this region for 1860 may be stated as follows:

Copper shipped	\$2,944,000
Iron ore (150,373 tons)	400,000
Pig iron (5,650 tons).....	150,000
Whitefish and Mackinaw trout.....	50,000
Furs	20,000

\$3,564,000

To this may be added the trade in cedar posts, ship-timber, and firewood, which is quite extensive.

The three iron companies in operation at Marquette, quarried in 1860 the following amounts:—Jackson mine, 60,000 tons; Cleveland mine, 50,000 tons; and Lake Superior mine, 40,000—making 150,000 tons. The principal points to which the ore is shipped, are (in about the proportion named) Detroit and Wyandotte, Mich., one-twelfth; Cleveland, Ohio, one-half; Erie, Penn., one-third; and the balance to Buffalo, N.Y. Each of the above companies can quarry, with present facilities, 100,000 tons of ore annually. The capacity of the railroad and docks is also sufficient for transporting and shipping that amount.

The toll collected from the tonnage passing through the Sault Ste. Marie canal, the first year it was opened