AMERICAN GLEANINGS.

FROST TIMBER.—According to calculation the forests of the United States will hold out but seventy years longer, if nothing is done to renew the natural resources.

SHRINKAGE OF CASTINGS.—In locomotive cylinders 1-16 inch in a foot; in pipes ⅛ in a foot; girders, beams, &c., ⅛ inch in 15 inches; engine beams, connecting rods, &c., ¼ inch in 16; thin brass, ¼ in 9; thick brass, ⅛ inch in 10; in zinc, 5-16 inch in a foot; in lead, same; in copper, 3-16 inch in a foot; in bismuth, 5-32 inch in a foot; in tin, ¼ inch in a foot.

RENDLE'S PATENT SYSTEM OF GLAZING.—In the beginning of the week a party of gentlemen interested in building matters inspected some new ridge and furrow roofs lately erected on this principle at the terminus of the Great Western Railway. By Mr. Rendle's invention all woodwork is covered by the metal and glass; no putty is used in glazing, and bent glass is entirely dispensed with. The ribs have also the peculiarity that they will carry away, not only the rain-water which falls on the roof, but also that which arises from the condensation of vapour within the building.

JUMPING THE TRACK.—To prevent the accident to which railroad trains are liable from one car jumping the track, the plan has been devised of applying to cars a kind of shoe, consisting of a clamp-like arrangement which is affixed between the wheels of each truck. This runs about 2 inches from the rail, and if anything happens tending to throw the wheels from the track, the clamp at once grasps the rails, holds the car on the track, and brings the train to a speedy halt. Such a shoe will, it is claimed, prove a great saving of railroad rolling stock, and add greatly to the strength of the truck, it being constructed of iron, and weighing some 500 lb. Experiments made with cars provided with this device, show that the arrangement accomplishes very effectively the object in view, and it is estimated that on account of the additional strength thus imparted to the car, it must last much longer.

PATENT ROADWAY.—Some interesting experiments have been made at the works of the Saville Street Foundry Engineering Company, Sheffield, where a portion of roadway laid down by Messrs. Davidson, Walker and Hainge, the patentees, was severely tested. The patentees state that asphalte roadways are generally admitted to possess all the elements of a perfect road, namely, noiselessness, absence of vibration, perfect sanitary conditions, great durability, costing less than any other paving to cleanse, cheaper also, and repaired when cut into for excavations with the greatest ease; the only objection hitherto being the want of foothold for animals. This last is effected by the application to asphalte pavements of iron plates or frames with projecting iron studs or bearing surfaces at suitable intervals, the spaces between them being filled in with asphalte, thereby producing a paving of asphalte, with slightly projecting iron studs or bearing surfaces adapted to sustain heavy traffic and to give the requisite foothold for horses. The foundation was composed of 9 inches of rough concrete on cement. Above that was 1 inch of fine concrete and upon this was placed a framework of iron from which iron studs projected to the surface. Forming a surface and almost level with the iron studs was run in the Val de Travers asphalte, thus giving a foothold to the horses and a waterproof roadway.

PRICE OF GAS.—The following are the official prices of gas as supplied by some of the principal gas companies of America:—Albany, N. Y., 2 dols. 75 cents; Brooklyn, 2·75; Boston, 2·25; Charleston, 4·00; Chicago, 2·50; Defiance, Ohio, 10·00 (70-candle gas, Patton's process); Indiana, Pa., 3·00; Lowell, Mass., 2·50; Morris, Ill., 2·00 (15-candle petroleum gas, Wren's patent); Mahonay City, Pa., 10·00, 70-candles; Morristown, Pa., 3·00, (18-candle, coal); New York, 2·50; New York, Harlem, 2·75; New Brunswick, N. J., 2·70; New Haven, Conn., 2·75; Niagara Falls, N. Y., 3·50; Pittsburgh, Pa., 1·00; Philadelphia, Pa., 2·15; Plymouth, Pa., 10·00, (70-candle, Patton's); Saratoga, N. Y., 5·00; San Antonio, Texas, 7·00; Salem, Oregon, 7·00; Salem, Ohio, 2·70; Sunbury, Pa., 10·00, (70-candle, Patton's); Tidioute, Pa., 2·00 Wren's process; Washington, D. C., 2·25; Washington, C. H. O., 2·20, Wren's 6 dols. for 80-candle gas. From the foregoing statistics, we gather that the highest-priced gas is that made under Patton's process, and yielding an illuminating power of 70 candles at a cost of 10 dols. per 1000, whilst the lowest-priced gas is that manufactured according to Wren's process, at from 1 dol. 20c. to 2 dols. But for 80-candle gas under this process 10 dols. is charged; the average charge for ordinary gas being 3 dols. to 4 dols. per 1000. In one place reported—viz., Poughkeepsie—the charge is 2 dols. 70c. under Gwynne and Harris's process.

SCIENTIFIC GLEANINGS.

HOT BLAST IN THE BESSEMER PROCESS.— Experiments made at Zeltweg, in Styria, show that a hot blast cannot conveniently be employed in the Bessemer process, owing to the giving away of the bottom of the converter after two operations. Further experiments are considered desirable.

METHOD OF DETERMINING THE HARDNESS AND QUALITY OF STEEL.—M. A. Chary heats pieces of a given size as high as they will bear without burning, and then bends them by blows of a hammer to and fro until they break. Steel not red-short should stand at least ten such bendings before breaking.

IRON PYRITES AS A REMEDY AGAINTS OIDIUM.—M. François states that iron pyrites have approved themselves efficacious, even in vineyards situated in districts where the vine is treated with sulphur. The green of the leaves and young shoots is intensified by its use, the improved appearance of the plant making itself recognisable at a distance; vines treated with iron pyrites look as if they had been dressed with a rich winter manuring.

CHLORINE COMPOUNDS IN THE BLAST FURNACE.—Menecke has observed in several cases the presence of ferric, calcic, potassic, and other chlorides, as well as hydrochloric acid in the gases from blast-furnaces. He finally traced it to the coke used, and from water which had been used to wash 36 kilos. of coke he obtained 43·54 grms. NaCl and 1·38 grms KCl. A furnace using daily 1000 cwt. of such a coke would receive 60·47 kilos. NaCl, corresponding to 38·73 kilos. HCl gas, or about 2 carboys of commercial acid.

GREAT FAILURE IN THE COPPER ORE TRADE.—The whole of the copper ores of Cornwall and Devon are sold to one or other of ten firms of smelters. One of these, trading under the style of "The Governor and Company of Copper Miners of England," has announced its suspension. The company holds a charter dated 100 years ago. The failure of any firm buying copper ores has not been known within living memory, and some Cornish mines will be severe losers. The company will have to be wound up in the Stannaries Court.

EXTRACTION OF GALLIUM FROM ITS ORES.—To get this mineral, says M. de Boisbaudran, you must take the advice given in the cookery book, about catching your hare. To extract a few centigrammes of gallium you must first get matter that contains any of it, and that is the difficulty. To go exploring, at least 25 kilogrammes of ore are indispensable, for one wants at least 500 kilogrammes of rich ore, so-called, for 10 centigrammes of gallium. M. de Boisbaudran divides the ores he treats into four groups: A, rich ores; B, poor ores; C, very poor ores; D, ores containing no gallium.

BALLOON EXPERIMENTS.—On the 14th inst., at two p.m., M. Ménier will experiment with two balloons, of 50 cubic metres capacity each, with the object of showing the practicability of their propulsion and steering. Verbal explanations will be given by the inventor. The experiments will take place at the Rond-Point de l'Allée de Sept-heures, Spa.

NICKEL ORE IN SPAIN.—In the province of Malaga, there is a deposit of nickel ore, from which some tons have already been raised. Specimens of the ore have been examined at the laboratory of the Paris School of Mines, and gave 8·96 per cent. of nickel, without cobalt.

GREAT BRITAIN AND ROUMANIA.—At the instance of the Birmingham Chamber of Commerce, the Foreign Office lately made representations to the Roumanian Government as to the propriety of placing this country on the same footing as Austria in regard to the duties on hardware, &c. It is now intimated that the Roumanian Legislature has passed a law authorising their Government to offer to Great Britain the extension to this country of the privileges of the most favoured nation for a period of nine months, which places Great Britain on the same level as that obtained by Austria through her connection with Roumania.

REGISTRATION OF TRADE MARKS, FRANCE AND SPAIN.—On the 30th June last a treaty was concluded between France and Spain for the mutual protection of the trade-marks of each country. The trade-mark of a manufacturer in one country may not be counterfeited in the other, or in case of infringement an action for damages will lie in the defendant's country.

COMPAGNIE FRANÇAISE DES MESSAGERIES MARITIMES.—The fleet belonging to this company was valued at the end of 1875 at £4,342,653, or £10,240 less than the estimated value at the end of 1874. Two new first-class steamers began running in the course of last year, the *Djemnah* and the *Equateur*. The former makes the voyage to Shanghai, the latter to La Plata.