of soda is prepared in Cornwall, where the tin mines yield a large quantity of wolframe. It costs from £12 to £18 per ton. The sulphate of ammonia costs about £14 per ton, and has hitherto been used for manure.

M. Sauvageon, a French investigator, has discovered that cotton cloth which has been exposed for a certain time to the vapour of burning sulphur, assumes such an amount of incombustibility, that although it will char and become brittle when held over the flame of a spirit lamp, it cannot be made to take fire, while under like conditions similar cloth, but unprepared in this way, is flamed immediately. If the alleged facts be borne out in practice, the problem is solved, for the simplest domestic means may be devised for subjecting, after being washed, all white clothing to the vapour of sulphur, which will tend to make it still whiter. Moreover, it may not prove necessary to repeat the exposure so often.

Uses of Coal Tar Pitch.

M. Kuhlmann has found a new use for burnt pyrites, which, he says, made into a mass with a quarter of its weight of coal-tar pitch, forms, when cold, a material of remarkable hardness and sonoreity. He states, too, that when hot pitch is applied to plaster, it drives out some of the water of hydration, and penetrates some distance into that porous material. The author thinks that pitch will effectually preserve the exterior decorations of buildings from the action of water and the consequences of frosts,—which we are as willing to believe as that the appearance of the building would not be at all improved by the application.

Flat Bottom Barque.

On Friday last a barque named the "Virginia" was launched at Liverpool from the building yard of Mr. John Robinson, south side of Duke's Dock. The launch, though attended with some apparent difficulty, consequent on the marked difference between the level of the building yard and the river, a height of ten feet, was accomplished in perfect safety. The "Virginia" is a ship of somewhat peculiar construction, the principle having been patented. Her bottom is flat, and she has three keels, in addition to which only straight timber is employed in the building. Her length is 115 ft., beam 23 ft., and depth of hold 12 ft. Her registered tonnage is 200 tons, but has carrying capacity equal to 500 tons, and is classed for seven years at Lloyd's. The time occupied in building the "Virginia" was only 40 days and 40 nights, and she was launched with her masts and a portion of her rigging fitted.

New Turbine.

An improved turbine has been provisionally specified by Professor Charles Fink, of Berlin, Prussia, which is constructed with a fixed outer ring of adjustable direction vanes, contained between two parallel horizontal annular surfaces, between which adjustable vanes the actuating water passes, and is directed by them into and through a series of buckets or openings formed with or attached to a ring or wheel attached to a shaft or spindle, and free to revolve within the ring first mentioned. The actuating water, after passing through the buckets of the inner ring or wheel (and thereby giving a rotary motion to the same, and to the shaft or spindle upon which it is fixed), passes downward through a suitably formed pipe or tube, from which it is ultimately led away in any convenient manner. The necessary movement for adjusting the vanes to any required angle may be imparted to the annular ring by leavers or other convenient or suitable means.—*Builder.*

A New Material for Ceramic Manufactures.

Dr. Muspratt, Principal of the Liverpool College of Chemistry, is of opinion, from an analysis he has made of a sample of phosphate of lime from Estremadura, the almost inexhaustible supplies of which have lately been made available by the concession of the right of working the quarries to Mr. F. K. Dumas, of London, that it is admirably adapted, on account of its purity, for the manufacture of porcelain and Parian. It contains 93 per cent. of phosphate of lime, nearly 4 per cent. of silica, a little phosphate of magnesia, and a trace of carbonate of lime. The phosphate worked at the island of Sambrero, of which Mr. Dumas is the consignee, is of analogous composition to that of Estremadura.

Mr. Glaisher's Balloon Ascents.

Among the most prominent results of Mr. Glaisher's balloon ascents, the following have been noticed:—

1st. That the temperature of the air does not decrease uniformly with the height above the earth's surface, and, consequently, the theory of a decrease of 1 deg. of temperature for an increase of elevation of 300 ft. must be abandoned. In fact, more than 1 deg. declined in the first hundred feet when the sky was clear, and not so much as 1 deg. in 1,006 ft. a height exceeding 5 miles.

These experiments are the first to yield any definite information on the subject; more experiments are required to settle the law satisfactorily, but its effect on the laws of refraction will be great; all the elevations of the balloon are, to a certain extent, erroneous, for it has never happened that the mean of the extremities has given the mean of the whole column of air.

2nd. The degree of humidity decreased wonderfully with the height, till at above 5 miles there was scarcely any aqueous vapour at all.

3rd. That an aneroid barometer can be made to read correctly, to the first place of decimals certainly, and to the second place of decimals probably, to a pressure as low as 7 inches.

4th. That a dry and wet bulb thermometer can be used effectively up to any height on the earth's surface where man may be located.

5th. That the balloon does afford a means of solving, with advantage, many delicate questions in physics.

In a recent lecture on the Soils of England, Dr. Augustus Voelcker stated the result of certain experiments to be as follows:—

1. That the calcareous clay soil absorbed about six times as much ammonia from the liquid manure as the sterile sandy soil.

2. That the liquid manure in contact with the calcareous clay soil becomes much richer in lime;