NOTES ON FOREIGN INVENTIONS.

Soap.—A patent has been recently secured by Messrs. R. Clegg, F. Angerstein and J. W. Page, of London, for making soap, as follows: Take 112 lbs. of the silicate of alumina, 56 lbs. carbonate of soda, in crystals, and boil them together in as small a quantity of water as possible, and until, on dropping a small quantity on a cool slab, it appears quite hard. This is called "composition A." Now take 112 lbs. each of silicate of alumina and carbonate of soda, and boil them for half an hour in 10 gallons of water, 112 lbs. of brown resin are now added to this, and the boiling continued until the whole becomes a homogeneous mass, when 56 lbs. of composition A are added, and the boiling continued for about half an hour longer, when it forms aluminous resin soap, and is called "composition B." To improve its quality, 14 lbs. of tallow and an equal weight of caustic soda are boiled together (adding fresh alkali occasionally) until saponification is effected, when it is then called "composition C," and is mixed with B, poured into molds, and cut into bars. Composition B may be poured into molds and cut into bars of itself, as it makes a resinous cheap soap without the grease, and may be very useful to employ in the preparation of cotton cloths for the bleaching process in calico print-works.

New Cement.—H. D. Scott, of Chatham, has taken out a patent for a new plastering cement, which is an improvement on a former patent. This inventor's cement is well-known in the London market, and consists of lime highly burned in a kiln in the presence of a small quantity of sulphur; after which it is ground, and used for plastering. The improvement consists in adding an equal amount of dry chalk to the lime treated in the manner described, grinding them both together, and mixing them up with water like common plaster.

Sugar for Brewing, Distilling and Making Vinegars.—There is quite a difference between the character of the spirits and vinegar obtained from cane sugar, and from malt sugar. To assimilate the properties of cane sugar to those of malt and fruits, C. Garton, of Bristol, has secured a patent, the process which he employs being rather peculiar in its character. He first dissolves sugar in boiling water, and places the solution in a trough lined with lead. Above this trough is a shaft with arms attached, for stirring the liquid in the trough at all points. The sugar solution is now agitated for six hours, and its temperature raised to about 160° Fah., so as to bring the liquor to the gravity of 40° Beaume. To each 112 lbs. of raw cane sugar thus treated, 8 ounces of sulphuric acid, of 184° gravity, are now added, after being previously diluted with 24 ounces of water, when the solution is agitated for three hours, then allowed to rest six hours; then it is agitated three hours and six alternately, three successive times, occupying altogether 36 hours; the temperature being maintained at 150° Fah. About 1 pound of chalk is now mixed with a gallon of boiling water, and added to the solution to neutralize the free acid; after which it is stirred well, and the heat maintained for one hour, when it is allowed to rest for twelve. A precipitate of the sulphate of lime now falls to the bottom, and the clear liquor is filtered and ready for use, to undergo vinous or acetous fermentation to produce superior spirits and vinegar.

Photoglyphic Engraving.—This is the name given to the invention of Fox Talbot, for engraving photographs on steel plates by sunlight. The publisher of the *Photographic News* (London) has prepared some plates of rare and beautiful pictures by this process, and has had them printed. The invention was described on page 113, Vol. XIV., of the SCIENTIFIC AMERICAN, but it does not seem to have met with that attention which it deserves from our artists. There is no other process known whereby a metal plate can be engraved entirely by chemical action; nor any other means whereby copies can be taken with such certainty. As we consider this a very valuable invention, we will again describe the process, as given very clearly and briefly by the *Photographic News*:

"A plate (either steel, copper or zinc), having been well cleaned, is to be rubbed with a linen cloth dipped in a mixture of caustic soda and whiting, and afterwards rubbed dry with another clean cloth; this process should be repeated twice. Coat the plate with a solution composed of 1 part of gelantine to 30 parts of water, and about 8 parts of a saturated aqueous solution of bi-chromate of potash. Pour the solution on the plate in the dark room as if it were collodion, drain off the superfluous liquid, and dry over a spirit lamp; the plate is then ready for exposure. Lay the object to be copied upon the plate, and expose in the copying-frame in the usual way—from one to several minutes in the sunshine, and for a much longer period if the sun is depressed; the operator must use his judgment in this matter. When the exposure has been sufficiently prolonged, the frame must be taken again into the dark room, and the plate withdrawn. On removal from the frame, it will be seen that a faint image is imprinted on the plate, the light having changed the yellow color of the gelantine to a brown wherever it has acted. Sprinkle over its surface some very finely-powdered gum copal, and distribute it evenly, care being taken to leave on the plate only a very thin layer. Lay the plate, face upwards, over the flame of a lamp until the copal is melted. This will require a considerable heat, and its accomplishment will be easily perceived by the change of color. When this takes place, leave the plate to cool gradually. This process may be termed laying the aquatint ground.

"The etching-liquid is prepared as follows: Take hydrochloric acid, and add to it as much peroxyd of iron as it will dissolve by the aid of heat. When saturated, filter, and afterwards evaporate it until, as it cools, it solidified into a brown semi-crystalline mass. This substance is per-chloride of iron. It is very greedy of moisture, and absorbs it from the atmosphere, if exposed to it.

"Water dissolves a very large quantity of per-chloride of iron with the evolution of heat. Saturate a small quantity of water with the per-chloride, and pour it into a bottle, with label No. 1. Fill a second bottle with a mixture of five or six parts of this saturated solution, and label it No. 2; and a third bottle with a mixture of equal parts of this solution and water, and label it No. 3.

"When the plate is quite cool, pour on it a small quantity of solution from bottle No. 2, and spread it quickly over the plate by means of a camel-hair brush which has been used for no other purpose. The liquid will speedily begin to act on those parts of the plate on which the light has not acted, it being unable to penetrate through those parts of the gelatinous solution upon which the light has acted. The etching proceeds with considerable rapidity, and should be suffered to continue for some minutes. If the rapidity is too great, it may be checked by adding to No. 2 solution a little of No. 1, doing this with care, as the addition of too large a quantity would render its action too sluggish, and it would require to be stimulated by some of No. 3. When the exact strength required has been thus arrived at, the operator may proceed with confidence in his manipulations. The liquid must be moved about the plate during the whole operation with a camel-hair brush; and when the etching has proceeded far enough, the liquid must be wiped off the plate with a piece of cotton wool, and a stream of cold water poured over it, so as to cleanse it as rapidly as possible; then wipe the plate with a clean linen cloth. When faint portions of the picture fail to appear, Mr. Talbot dips a camel-hair pencil in No. 3 solution, and touches these parts, which causes the details to appear with great rapidity; and it is evident that, in the event of its being desirable to check the action of the liquid on any part of the plate, this could be accomplished by dipping a pencil in No. 1, and applying it in a similar manner."

STRAIGHTENING A CHIMNEY STALK.—Quite an interesting operation was successfully completed in Port Dundas, Scotland, for the restoration of a chimney which had settled out the perpendicular. This was accomplished by sawing several of the mortar beds between the courses on the side from which the chimney leaned, thereby allowing it to come back with its own weight without the application of any external force. Only one draught was cut at a time, to guard against any shock which might have endangered the state of the building, and by keeping the saws wet, a bed of mortar was prepared for the superincumbent weight to settle down upon. Twelve cuts were made in this manner on different parts of the structure, which generally set before the saws had passed through half of the circumference, particularly in those made nearest the ground, where the weight was greatest. The principal dimensions of the chimney are—Total hight, 468 feet; from surface to top of cope, 454 feet; outside diameter at foundation, 50 feet; at surface, 34 feet; at cope, 14 feet.

BARKS FOR TANNING.

The following is the substance of a very useful and interesting article on this subject, in a recent number of the *Shoe and Leather Reporter:*—

There are four species of oak barks chiefly used in tanning. The first is the Spanish oak, which thrives in Maryland, Delaware and Virginia, and in all the States south of 41° N. In the Atlantic States, this species is most abundant, and in Georgia and the Carolinas it is known by the name of "red oak." Its bark, which is thick, black, and deeply furrowed, is preferred for coarse leather, which it makes more pliable and of a better color. Hemlock bark is often with advantage mixed with it. In the southern States, the Spanish oak grows to the hight of 80 feet, having a trunk four or five feet in diameter; while in some of the northern States it does not exceed 30 feet in hight, with a diameter of five or six inches.

The common red oak grows abundantly in Canada and in the northern States, especially in the southern half of New York, in New Jersey, in northern Pennsylvania, and along the ridge of the Alleghanies. Its bark is very generally employed, though inferior in several respects to some other kinds. This tree grows to the hight of 70 or 80 teet, and has a diameter of three or four feet.

The rock-chestnut oak is seldom found in the southern States, but abounds in elevated districts having a broken, rocky surface. On some of the Alleghany mountains it constitutes nine-tenths of the forest growth. Hence the name "rock oak," by which it is known on the banks of the Hudson and on the shores of Lake Champlain. It has received in Pennsylvania, Maryland and Virginia the name of "chestnut oak. Its bark is thick, hard, and deeply furrowed, and differs from other barks in that the epidermis or outer layer contains a large proportion of tannin, which is usually in other kinds confined chiefly to the under layers. In Pennsylvania and New York it abounds, but only the bark of the small branches and young trees is used in tanning.

The quercitron or black oak grows throughout the States, below the latitude of 43° N., and in the more elevated sections of Georgia and the Carolinas. Its bark is not very thick, but is bitter, deeply furrowed, and of a deep brown or black color. It also imparts a yellow color to the ooze; and leather tanned with it is apt to give a yellow tinge to the stockings. This inconvenience, however, may be obviated by an inexpensive chemical process. Quercitron bark is much used, as it is abundant, cheap, and rich in tannin. This tree often attains a hight of 90 feet, and a diameter of four or five feet.

Besides these four kinds are others less known. The white oak chiefly grows in Florida, and to the south of 46° N. Its bark is preferred for leather for saddles, and similar purposes. The scarlet oak is found as far north as lat. 43° N.; its bark is very thick. The gray oak in Maine, New Hampshire, and Vermont; and the live oak is never found more than twenty miles inland; its bark being black, hard, thick, and replete with tannin. Other kinds of oak bark are occasionally used, but not to any great extent in the United States.

Most of the sole leather in our country is tanned with the bark of the hemlock tree, which is unknown in the Old World. The common British oak grows in almost every country in Europe, and is the chief agent used in tanning. It sometimes reaches a hight of one hundred feet, and the trunk grows occasionally to fifteen feet or more in circumference. This majestic tree will stand hundreds of years, and when at a distance from other trees, it spreads its gnarled branches so that its head is often broader than its hight. The foliage resembles that of the white oak of this country. In northern Russia, and in some parts of France, the bark of a shrub called the Kermes oak is used in tanning. This shrub grows to the hight of three to five feet, and bears some resemblance to a small holly tree. The bark of the root is rich in tannin, and is said to produce a very superior quality of thick, durable, impervious sole leather.

In early spring, the opening leaves indicate that the sap is circulating the most actively, and it is found that the bark then contains nearly one-third more tannin than in autumn, consequently in this country, the proper time for barking trees will vary, according to latitude and other circumstances, from the end of April to the beginning of July. Wet seasons and damp localities are prejudicial to the bark and lessen its tanning power. The bark of southern oaks and of such as grow in high ele-