SOME FACTS ABOUT SOAP.

The true soaps, says the *Journal of Chemistry*, are all salts of potash and soda, the former being soft soaps, the latter hard soaps; but these fatty acids unite with other alkalies and bases to form insoluble compounds, which are also often called soaps. If we mix a solution of common soap (containing stearate of soda, we will say) with one of lime, the soda salt is decomposed, and a stearate of lime is separated in an insoluble form. This reaction is a common one in the chemistry of the kitchen, though not a popular one with housewives. It takes place whenever soap is used with "hard water," which owes its bad name to the presence of salts of lime, magnesia, etc. When soap is dissolved in such water, the lime of magnesia unites with the stearic acid to produce the insoluble curdy flakes which appear. It is not until sufficient soap has been added to decompose all these salts and dispose of their bases that it becomes available for its legitimate business of cleansing. The harder the water, the more soap is wasted in this vexatious chemical process. If one has no hard water at hand, he can illustrate the reaction by dissolving a little Epsom salts (sulphate of magnesia) in water, and then rubbing some soap in the solution, or pouring some soapy water into it. The froth of the soap will vanish, and curdy flakes will be formed. The sulphate and the soap (call it a stearate of soda) have "swapped" bases; sulphate of soda is dissolved in the liquid, and insoluble stearate of magnesia is left floating as the white flakes.

Soap is always an alkaline or basic salt, and its detergent power depends on the degree of its alkalinity. The more nearly the soda is neutralized, the less capacity it has for combining with the grease and other matters which it is intended to remove. Of course this property in soap must be graduated to the purpose for which it is to be used. For the coarser work of the laundry, the ordinary bar soap, which is quite alkaline, or soft soap, with its more active potash, is required; while for toilet use an almost neutral soap is wanted, as the other would not only remove the impurities from the skin, but partially dissolve the latter, leaving it rough and uncomfortable.

The Composition of Cigars.—Let every honest smoker take courage. Cigars are not made out of cabbage leaves. The British government discusses the subject of tobacco adulteration in a big blue book, which contains a tabulated account of the seizures of the spurious article made in the United Kingdom since 1864, and in the whole volume there is no mention of the cabbage blossom. But there are many suspicious things among the ingredients, as the abstract in the *Pall Mall Gazette* shows. The first sort is required for the actual substance of the cigar; the second for improving its outward appearance; and the third for imparting to it what is supposed to be a better taste. In the former category the favorite substance seems to be the leaves of the lime-tree, the husks of wheat and oats, cotton, yarn, and tonquin bean. But there are numerous cases where the ingredients have been much more curiously selected, and have included cocoanut fiber, small seeds, cotton, wood, and bread. At one establishment, fifty pounds of tobacco dust were found and analyzed, when it was shown to contain string, wood, nails, grindings of tobacco-pipe, dirt, and all sorts of refuse. Another large class of materials is apparently used for securing the adhesion and consistency of the cigar when made. Amongst these, starch is the most prominent; but it includes gum and amidine, blue, gum arabic, glue, glycerine, and essential oils. The color of the fabrication is the next thing to be attended to, and for this purpose resort is had to yellow ocher, red sandalwood, logwood, lampblack, and Venetian red. As for the flavor of the cigar, it is varied to suit the most diverse tastes; but the usual object seems to impart to it a pleasing sweetness of tone. Accordingly saccharine matter, and especially treacle, is very largely pressed into the service. For those who like a rather more decided taste, liquorice, salt, logwood, glycerine, and aniseed are used.

Suspended Railway.—An English journal illustrates a proposed system of suspension railway in which the rails are supported by strong wrought iron clips suspended from brackets projecting from upright columns fixed on the outer edge of the pavements in streets, while the cars are also suspended from the rails by means of steel carrying rods descending from the axles of small traveling wheels. Either horse or steam power can be used, the engine being suspended in the same manner as the cars. Among the advantages claimed for it are that the roadway is not cut up, and that the resistance to draft is materially reduced.

Remedy for Facial Neuralgia.—Dr. Luten, of Rheims, states that he has obtained excellent results from the cyanide of zinc in rheumatic facial neuralgia simulating cerebral rheumatism. He relates two cases in which, with intense facial neuralgia, there was continued and ardent fever, cephalalgia and tenderness, on pressure at the points where the nerves emerged. The symptoms rapidly abated under the use of the following mixture: Cyanide of zinc, one-fifth of a part, distilled cherry-laurel water, 25 parts, and tragacanth mucilage mixture, 100 parts. A tablespoonful, from hour to hour.

Black Walnut Stain.—The following, from the *Journal of Chemistry*, is a simpler recipe than the one we recently published and is said to be equally good. Take a pint of very thin glue, its adhesiveness being just perceptible, between the thumb and finger. Put into it a tablespoonful of raw umber, stir it well and put on warm with a sponge or brush. When dry, brush off and varnish. Another is to take one tablespoonful of Venetian red and half a teaspoonful of lamp-black, mixed into a paste and then diluted with the pint of glue water as before.

A bridge across the Nile at Mansura, designed by Alfredo Cottan, of Naples (who has built over 1,000 metallic bridges at Italy and the East), is partly of stone and partly of iron—"a combination of the suspension principle, with straight girders."

NOTES ON SANITARY BUILDING.

This subject is of importance to all home makers. In Dr. Buchanan's special inquiry, the various registration districts in the three southern counties of England, beyond the limits of the metropolis, were brought under detailed examination and the conclusion was reached that soil-dampness is a most potent cause of consumption.

Some writers believe that soil-dampness is the cause of many other diseases. Dr. Bell, in his report on the drainage of Kings county, N. Y., as reviewed by the *Independent*, expresses the opinion that not only consumption, but intermittent and remittent fevers, rheumatic affections, neuralgia, croup, quinsy, diphtheria, pneumonia, pleurisy, bronchitis, cerebro-spinal meningitis, erysipelas and diarrhœal diseases owe their origin in a great measure to this cause.

These considerations indicate the importance of living upon a dry soil, and make it obligatory upon any community whose territory is waterlogged, either wholly or in part, to drain such territory of its surplus water.

By surplus water is meant that which is not held in the soil by capillary attraction; all that water which would run away from a quantity of earth placed in a barrel with holes in the bottom. Such drainage can be easily accomplished. Unglazed tiling, with joints carefully protected, laid at a depth of three or four feet, with proper inclination, and at suitable distances, will drain any soil, however wet, in less than 24 hours. To ascertain whether a given locality requires draining, let an excavation be made to the depth of three feet, and, if water is found in it 24 hours after the heaviest rain, the locality is unfit for human habitation.

The site selected for a house should be thoroughly drained to a depth at least a foot below the bottom of the cellar; and the foundation should be so constructed that the storm-water which dashes against the house and the water which accumulates in freshets in its vicinity should be arrested and conducted away. This can be done by sinking the foundation-wall a foot below the cellar-bottom, placing a tile-drain outside of this, filling the excavation below the cellar-floor with concrete, building the cellar-wall of brick and covering the outside of this wall with some material impervious to water. It would be well to place above the drain, reaching to a point near the surface, a quantity of coarse gravel, to allow the water more easy access to the drain. If the land be at all springy, there should be, in addition to this outer drain surrounding the foundation, several cross-drains, all of which may have the same outflow.

Notes on Digestion.—In a recent lecture in London, Prof. Garrod gave an account of some of the processes of digestion. The action of the saliva and of the gastric juice was demonstrated experimentally. Saliva, he pointed out, does not affect albuminoids, but it does affect starchy foods, and the conversion of starch into grape sugar by saliva was shown in test tubes. This is now believed to be the only chemical part—the work of digestion—the saliva performs. The nature of the work of the gastric juice was shown by some which had been obtained from the mucous membrane of the stomach of a lion, recently dead. Albumen, fibrine, and casein cannot dialyse through the walls of the alimentary canal till the pepsine of the gastric juice has converted them into peptones. After dialysis, it is believed the peptones again are changed to albuminoids, but it is a curious fact that though albuminoids can be artificially converted into peptones, the peptones cannot be artificially reconverted into albuminoids. The use of artificially made pepsine is of great service to people of weak digestive power, and Prof. Garrod drew attention to Mr. Bullock's process, by which an "acid glycerine of pepsin" is obtained from the stomachs of pigs, and has been found by medical practitioners to be of great value.

A Hint for Our Grandmothers.—If the lady readers dislike darning socks and hose, as most ladies do, they can save one-half the mending by knitting heels and toes double, like streaked mittens. But many do not understand that, so I will explain. As soon as half the stitches are put on the heel-needle tie on another ball of yarn, which may be white or like the other ball, according to fancy or convenience, and coarser if you have it. Wrap both threads around the little finger, pass them under the next finger, put the middle finger between the threads, having the white towards you when knitting straight and from you when knitting backwards. To make the white show most upon the wrong side, put the forefinger under first one thread and then the other when knitting; also, widen once in four stitches the first time across to keep the heel or toe from drawing in. If knit in this way they will wear as long as the rest of the sock; will be warmer upon the parts soonest cold—which is quite an item when working for those we love—is much better than common double heel, and quicker knit.

Plea for Pure Air.—A few well-known facts will show the urgent necessity for pure air. The longest period of time upon record in which a man lived without food and water is about fourteen days. If water be given, but no food, life may be sustained longer than this; but deprived of air, human life may be extinguished in three minutes. This serves to show, in one way, and in a prominent manner, the high value of ventilation. Human life may be continued for a time by bad air, stagnant water, and decaying food; but without pure air, good water, and wholesome food, life soon loses all its freshness. Most persons make great exertions to obtain good water and sound food; but unfortunately, there is not often the same regard paid to the condition of the air. Is ventilation then of no importance? Should it not be studied by the statesman and the philosopher as well as by the physician?

Natural Gas in Ohio.—At East Liverpool, Ohio, contracts have been made for the boring of four more natural gas wells. The various uses to which this gas has been applied continues to excite the wonder and astonishment of all visitors to this town.

NOTES ON PRESERVING WOOD.

An increased demand for one of the residual coal tar products of gas manufacture is likely to arise, at no distant day, for the purpose of preserving wood from rot, and from the action of the various marine worms that so rapidly destroy woodwork in salt water. By permission of the Directors of the American Society of Civil Engineers, a paper of great interest in this connection was read by Mr. E. R. Andrews, of Boston; specimens of wood were exhibited which has been treated 20 years, and in constant use in railroad ties which showed no signs of decay. The process, as described, consists in extracting the sap from "green" wood, placed "in vacuo," and then filling the pores thus emptied of their sap with creosote oil under a pressure of from 60 to 100 pounds.

Results obtained abroad have established the practicability of the process, and its perfect success in preserving timber.

A writer in the *Journal of Forestry* gives the following on preserving fence posts: What I would recommend with fence posts is: the materials, when felled, to be directly sawn into posts, and stored under sheds thoroughly ventilated, where they will remain at least a year exposed to sun and wind. The neck, or part between wind and water, of each post should be slowly charred over a strong fire—slowly, because our principle means heating the timber thoroughly to the heart, so as to extract any moisture which may still be lodged at the center, and hardening a crust on the surface of the posts.

Afterward, to prevent the posts absorbing water, they should be well coated with coal tar, having its acid destroyed with fresh quicklime. The tar should be thoroughly boiled, to evaporate all watery matter, and applied boiling hot. A large tank holding the posts set on end, and filled with the scalding tar from a boiler, answers the purpose very well. Of course the upper half of the posts can be painted when placed "in place." I am fully convinced coal tar, properly applied to thoroughly seasoned timber, is far more effectual in preserving posts than creosoting, poisoning, kyanizing, or all the paraphernalia of iron prongs, sheet-iron wrappers (an American invention), etc. One great recommendation in favor of the above process is that it requires no skilled labor, and the cost is a mere trifle.

VARIOUS WOODS.

The following are interesting items concerning the commercial value and properties of the better known woods, as laid down by the *American Builder*:

Elasticity.—Ash, hickory, hazel, lancewood, chestnut (small), yew, snakewood.

Elasticity and Toughness.—Oak, beech, elm, lignum-vitæ, walnut, hornbeam.

Even grain (for Carving or Engraving).—Pear, pine, box, lime tree.

Durability (in Dry Works).—Cedar, oak, yellow pine, chestnut.

Building (Ship-Building).—Cedar, pine (deal), fir, larch, elm, oak, locust, teak. Wet construction (as piles, foundations, flumes, etc.).—Elm, alder, beech, oak, whitewood, chestnut, ash, spruce, sycamore.

Machinery and Millwork (Frames).—Ash, beech, birch, pine, elm, oak. Rollers, etc.—Box, lignum-vitæ, mahogany. Teeth of wheels.—Crab tree, hornbeam, locust. Foundry patterns.—Alder, pine, mahogany.

Furniture (Common).—Beech, birch, cedar, cherry, pine, whitewood. Best furniture.—Amboyna, black ebony, mahogany, cherry, maple, walnut, oak, rosewood, satinwood, sandalwood, chestnut, cedar, tulip wood, zebra wood, ebony.

Of these varieties, those that chiefly enter into commerce in this country are oak, hickory, ash, elm, cedar, black walnut, maple, cherry, butternut, etc.

American Axes in England.—Ex-Premier Gladstone has become the Horace Greeley of England, and wields the American axe as freely as he writes pamphlets. More than this, the announcement is made that the American style of axe has been introduced by enterprising English manufacturers, and they have ground their tools by getting the great liberal to turn the crank. The narrative is in this wise: A Sheffield firm about the year 1873, commenced the sale of an excellent American patent axe, which was shown and attracted considerable notice in the trade at the South Kensington exhibition of that year. The blade was the best polished steel and the handle of hickory, and, inspired with a happy thought, the firm recently presented one of the highly-finished specimens to the statesman woodman, who not only accepted the gift, but has also used the axe. Acknowledging the gift, Mr. Gladstone writes: "Gentlemen, I am so glad you have added that useful article, the American axe, to the list of our home productions, and I thank you for favoring me with a specimen, which seems, as much trial as I have made, to possess all the merits of the original. I find it necessary to study efficiency in proportion and weight, and it is under this issue that I think the American axe comes out well, especially for soft and free-grained woods. The handle is, I think, excellent, but I always wish it were cut straight across at the end, at a right angle to its direction or axis. I remain, gentlemen, your faithful servant, W. E. Gladstone. December 13th, 1877." This make for the future, we understand, is to be termed "The Gladstone wedge axe."

Imitation Ebony.—Ebonized wood is much in demand nowadays for painted panels and other decorative purposes. In some respects it is preferable to the genuine ebony. Apple, pear and walnut wood, especially if fine-grained, may be "ebonized" by the following process: Boil in a glazed vessel, with water, four ounces of gall-nuts, one ounce of logwood chips, half an ounce of vitriol and half an ounce of crystallized verdigris; filter while warm, and brush the wood with the hot solution a number of times. The wood, thus stained black, is then to be coated two or three times (being allowed to dry completely after each coating) with a solution of one ounce of iron fillings in a quart of good wine vinegar. This is to be prepared hot, and allowed to cool before use.

FIREWOOD TO THE ACRE.

In a good deal of observation on the subject, says Marsh, the largest quantity of marketable wood I have ever known cut on an acre of virgin forest was 104 cords, or 403 cubic yards, and half that amount is considered a very fair yield. This estimate is far above the averages given to the statistician of our department of agriculture, which are as below:

In Franklin county Me., the best woodland yields forty cords per acre; the average is about twenty-five. In Sagadahock and Hancock counties the average yield is thirty cords per acre.

In New Hampshire, the average yield is put from twenty to forty cords per acre in the different counties.

In Vermont, the forests yield from twenty-five to fifty cords per acre. Some forests are estimated to furnish 200 cords.

In Rhode Island, about thirty cords per acre.

In Connecticut, sprout lands yield about twenty-five cords per acre every twenty-five years.

In New York, from thirty to sixty cords per acre. The original forests in some of the counties are estimated at sixty-five cords.

In Delaware, well-set second growth woodlawn yields thirty to forty cords per acre.

In Maryland, from thirty to forty cords, etc.

In Oregon, however, among the evergreens and oaks, the yield seems perfectly astounding. In Douglas county there are thousands of acres which would yield from 300 to 600 cords per acre. Oak-timbered lands yield an average 100 cords per acre. Says the annual report of the land office, in relation to this land, "it will produce from 25,000 to 300,000 feet per acre," and "there are vast tracts that would cover the entire surface with cord wood ten feet in hight." The report speaks of forests of pine trees "from one to fifteen feet in diameter, and 200 to 300 feet high," and red and yellow pines of gigantic growth, often attaining a hight of 300 feet, and from nine to twelve feet in diameter.

Eternity.—"Eternity has no gray hairs!" The flowers fade, the heart withers, man grows old and dies; the world lies down in the sepulcher of ages, but time writes no wrinkles on the brow of eternity. Eternity! stupendous thought! The ever-present, unborn, undecaying, and undying—the endless chain, compassing the life of God—the golden thread, entwining the destinies of the universe. Earth has its beauties, but time shrouds them for the grave; its honors, they are but the sunshine of an hour; its palaces, they are but as the gilded sepulcher; its possessions, they are the toys of changing fortune; its pleasures, they are but bursting bubbles. Not so in the untried bourne. In the dwelling of the Almighty can come no footsteps of decay. Its day will know no darkening—eternal splendors forbid the approach of night. Its fountains will never fail—they are fresh from the eternal throne. Its glory will never wane, for there is the ever-present God. Its harmonies will never cease—exhaustless love supplies the song.—*Spurgeon.*

Choosing a Scythe.—The disposition of steel in a scythe is to be best understood by seeing one which has been broken across the blade. Sometimes tools of this class are steeled "naked," so that all the steel shows itself at once on the top side of the blade, but this plan is not to be recommended. It is better to have iron on both sides of the steel which just shows itself along the edge, and runs in toward the back to stiffen the blade and to form a constant cutting edge as the tool wears away. Now, in buying a tool, bear in mind that the most steel may show in the one steeled naked, because all that is there is in sight, but in the other case there would be a great deal more steel useful for carrying an edge, although it would show less because the bulk of it would be hidden between the iron. It will not do, then, to be deceived by appearances. The best plan is to depend on a good maker for good steel and sufficient of it.

Cracked Wheat.—This excellent dish is often spoiled, says a lady in the *Rural New Yorker*, by very good cooks who think they must stir it all the time to keep it from burning. Too much stirring makes it like paste; putting in more water when nearly done has the same effect. One-third of wheat, by measure, to two-thirds of water, soft, if you have it, will make it about right. The water should be cold when the wheat is put in; it should cook slowly and be covered closely. In this way scarcely any stirring will be found necessary. There is a deliciousness in this dish when cooked as above, which is never found if stirred while cooking. The same may be said of oatmeal, only the latter should be quickly stirred into boiling water; cover closely and let cook for about 20 minutes. Wheat may be cooked about the same time, although it bears cooking longer.

Apple Turnovers.—Make a paste of sour milk or buttermilk with a little soda and salt, as for biscuits, except that more shortening is necessary. Rub the shortening into the flour and add the milk; then cut off a piece the size of a biscuit and roll out rather thin. Have ready dried apples stewed, sifted, sweetened and spiced to taste. Place a large spoonful on one-half of the rolled paste and bring the other half over it, pinching the edges securely together. Fry in hot lard, turning them frequently to brown evenly. Also, if you will make up your soda biscuits for tea in precisely the same fashion, and before putting into the oven wet the surface with milk, you will find it an agreeable variation from the usual way.

Plain and Galvanized Iron Wire.—The *Telegraphic Journal* says that in reply to a communication addressed to them by Mr. G. B. Prescott, the well-known American electrician, a number of the European telegraph administrations have, without exception, given the result of their experience as in favor of galvanized wire on the score of ultimate economy. It appears from these reports that the duration of non-galvanized wire for telegraphic purposes in Europe is from 15 to 20 years. Galvanized wire that has been in use some 25 years gives little sign of deterioration.