MAKING SOAP.

Most people in the country prefer home-made soap. They have the fat necessary in the shape of refuse lard, tallow, bacon, skins, etc., and the potash of soda can now be easily obtained for use with much less labor than was formerly required when the potash had to be extracted from the pile of wood-ashes at home. Where wood is used for fuel this is yet done.

If one has no home-made lye, buy caustic soda—you can get it at any apothecary's if nowhere else—and use it in this way: For hard soap take one pound of caustic soda, three pounds of fat, or five or six pounds of ordinary soap fat, and three gallons of water; put all together in a kettle over the fire and boil, adding three or four handfuls of salt before the boiling is quite finished; from two to three hours' boiling will be necessary. The experienced soap-boiler will know by its appearance when it has boiled enough. The novice will soon learn.

Where caustic soda cannot be obtained get common washing or sal-soda, and by the addition of lime make it caustic, after the following plan, which is the one generally in use at the present, and which makes an excellent soap: Take six pounds of washing soda and three pounds of fresh, unslacked lime; place together in any water-tight vessel—an iron kettle is best—and pour on two gallons of boiling water; stir occasionally until the lime is slacked and the soda dissolved, then allow it to settle. Take the clear lye from the top and pour it on the fat—of which three pounds common scrapings are to be taken—and commence boiling; then add another gallon of water to the settlings of the soda and lime, stirring as before. This lye is then to be added to the other while boiling; also throw in about six single handfuls of salt about half an hour before it is done boiling. Boil two hours.

Without the salt either of these methods will make a semi-soft soap; but for a real soft soap potash must be used. This you can buy for the purpose; or, if you prefer, extract from wood-ashes by simply mixing a little fresh lime with them and pouring on water. An old barrel or tub will do to hold them, if there is a hole in the bottom for the liquid to drain out. The ash-hoppers formerly used for this purpose are yet standing alongside of some outhouses on many farms, but seldom used now.

For toilet purposes a soap made with a vegetable oil is to be preferred—castile, palm, or cocoa—rather than those highly perfumed, but which are sometimes made from the most impure materials. If perfumed soap is wanted the common soap above can be melted, and perfume of any desired kind can be added; but it will be rather strong for delicate skins, and castile is much to be preferred.

Soap-making need no longer be dreaded by the women to whose lot it falls, as, by the methods we have given, as well as other similar ones, all the soap needed in a family for six months can be easily made in a single day.

It is sometimes said that the home-made soap costs more than it could be bought for. Perhaps it does, but then you have the satisfaction of knowing from what it is made.

EAU DE COLOGNE AS AN ANÆSTHETIC.—At a recent meeting of the Nice Society of Medicine, Dr. Hugues presented some observations upon the anesthetic influence of Eau de Cologne, which he had recently noticed. In one instance, that of a young lady afflicted with tubercular consumption, and with whom injections of morphine and the use of chloral had failed to produce the desired repose, a friend suggested a trial of Eau de Cologne, which she had already used with success in similar circumstances on some twenty different occasions. An immediate experiment was made, by placing a handkerchief well moistened with cologne under the nostrils of the invalid, who, in the space of seven minutes, sank into a profound slumber. The same experiment was repeated in other cases, with excellent results.

SUGAR MAKING.—On the subject of sugar making, the Ipswich *Observer* writes: "Mr. Eastes, of Beenleigh, has made a most astounding discovery in sugar making. He claimed to be able to crystallize the whole of the juice and leave no molasses. He tested his discovery at Dart's mill, near Brisbane and the result was astonishing. He experimented on Chigacca rattoon juice marking 10° Beaume, and from 1,900 gallons was produced 2,400 pounds of beautiful white sugar, equal to the refined of Yengaric, and not a pint of molasses! It was finished in vacuum pans, and came out with only a little moisture, which the centrifugal soon removed. This is assuredly the precursor of a revolution in sugar making, and the magnitude of its importance is tremendous."

FORCE-GIVING FOOD IN SUMMER.—Brown bread, oatmeal and fruits are all force-giving, but to a less extent than fats, yet sufficiently so for the requirements of the season, and those persons much who have very muscular work to do may use more freely force-giving foods in hot weather than those whose labor is sedentary and light. From experiments which we have seen tried, over and over again, however, we are satisfied that even farmers, in the hottest days of summer, who are obliged to work in the harvest field can do more work, suffer less with heat, and incur less risk of sunstroke by following the rules we have laid down, than by using a highly carbonized diet of oils and fats.—*Dr. Holbrook.*

COPPERING IRON AND STEEL, DRY WAY.—In cases where it is desired to give a stout coating of copper, brass or bronze to wrought or cast-iron goods, and a uniform thickness is not essential, a sufficient quantity of the metal is set to melt in a crucible. Its upper surface receives a layer of Gaudoin's flux, a mixture of cryolite and phosphoric acid, and the article, heated to the temperature of the bath, is placed in it. If the article is heavy, it will be well to heat it gradually and thoroughly, both to avoid unequal expansion and to obviate the danger of the coating peeling off in consequence of unequal contraction.

KETTLES.—The old notion that a three-legged tea-kettle boils soonest, is correct, because the legs conduct heat more rapidly than the plain surface alone.

DURABILITY OF TIMBER.

The durability of timber is almost incredible. The following are a few examples for illustration, selected for the *Railway Age*, from various sources, and vouched for by scientific men.

The piles of a bridge built by Trajan, after having been driven more than 1,600 years, were found to be petrified four inches, the rest of the wood being in its ordinary condition.

The elm piles under the piers of London bridge have been in use more than 700 years, and are not yet materially decayed.

Beneath the foundation of Savoy place, London, oak, elm, beech and chestnut piles and planks were found in a state of perfect preservation, after having been there for 650 years.

While taking down the old walls of Tunbridge castle, Kent, there was found in the middle of a thick stone wall a timber curb, which had been enclosed for 700 years.

Some timber of an old bridge was discovered while digging for the foundations of a house at Ditton park, Windsor, which ancient records incline us to believe were placed there prior to the year 1396.

The durability of timber out of ground is even greater still. The roof of the basilica of St. Paul, at Rome, was framed in the year 816, and now, after more than 1,000 years, it is still sound, and the original cypress-wood doors of the same building, after being in use more than 600 years, were, when replaced by others of brass, perfectly free from rot or decay, the wood retaining its original odor. The timber dome of St. Mark, at Venice, is still good, though more than 850 years old. The roof of the Jacobin convent, at Paris, which is of fir, was executed more than 450 years ago.

The age of our country's settlement does not enable us to refer to examples of like antiquity; but no good reason appears to exist why timber may not be as durable in America as in Europe. Many old white-pine cornices here exist, which, having been kept properly painted, have been exposed to the storms of more than 150 years. The wood is still sound, and the arrises are as good as when they were made; while freestone, in the same neighborhood, has decayed badly in less than 50 years.

WHAT IS AN ENGINEER?—At the last meeting of the English Society of Engineers the President, Mr. Vaughn Pendred, stated in his address that in the highest sense of the term an engineer is a man who cannot only invent or devise but execute; in a subsidiary sense every man who can construct is an engineer. Such an admirable definition, says the *Mining Journal*, can offend no one, for it will include not only the Telfords, but the Stevensons, and the builders of such elegant bridges as that which recently doubled up in Germany, but also the entire manufacturing population of the world, from Sir Joseph Whitworth to the itinerant tinker; it will account, too, for the freedom with which the title of engineer is assumed by men of all classes and possessing various degrees of knowledge, and should have the effect of largely increasing the number of members of that useful society of which Mr. Pendred is the able representative. Admitting that every man who can construct is an engineer, there will be less difficulty in accepting the President's gratifying assurance that the whole army of engineers, civil and mechanical, has operated from the earliest ages to the present moment in the achievement of a great work, no less a work than the civilization of mankind, and that he is enunciating a great truth in declaring that engineers have done more to raise men to the high level which they now occupy than even the philosopher or the statesman; that engineers are *the* great civilizers of mankind, and that nearly all that is good, or pleasant, or worth having in modern life—happy engineers—results from their labors.

SINGULAR FORMATIONS.—The character of the bed-rock at and near Point Bar, on Trinity river, is very different from the general run of river mines. In a general way deep places in the bed-rock, unless they are regular channels or crevices, pay nothing; the pay dirt not extending below the level of the surrounding rock, but continuing along in the gravel at that level. At and near Point Bar, the reverse is the case, the best and richest pay having been always found in deep depressions of the bed-rock. On Point Bar itself some four or five of these deep places have been found, filled with big bowlders and blue gravel, rich in gold. The deep places are from thirty to a hundred yards long, fifteen to thirty yards in width and of a varying depth. One in the river, a short distance below the old store and garden, was twenty feet deeper than the water in the channel, and looked like a long, deep hole in the bed-rock, as in fact it was. Hughes & Wallace have found two such depressions in their claim opposite Garden Bar, one mile below, both of which prospect well; and so far as worked have paid well. It is the only place along the river that we know of, where anything like a "pothole" pays anything below the level of the surrounding rock.—*Trinity Journal.*

LAKE SUPERIOR SHIP CANAL—The troubles of this unfortunate corporation do not seem to be entirely ended yet. The sale of the canal, its franchises, lands, etc., was made under foreclosure proceedings on the 11th of May. The property, says the Detroit *Post*, was bid in by trustees for about $877,000 (a sum not sufficient to pay the preferred bonds in full), who proceeded to organize a new company, to whom it was transferred. All parties of record consenting thereto, the sale was confirmed by Judge Brown several days since. At the time of the sale a representative of some of the New York bondholders was on the ground and filed with the master making the sale a written protest against the proceeding, alleging that there was a ring, a conspiracy; that an appeal was pending, that the sale had been insufficiently advertised, and that capitalists stood ready to buy the property in due time at something like its value. This protest was ignored, and this protestant came before Judge Swayne and asked that the confirmation of the sale be set aside. There was much talk about fraud, rings, extraordinary haste in confirming the report of sale, etc. Judge Swayne took the matter under advisement.

THE CANADIAN PACIFIC RAILWAY.

We have heard but little lately of this great enterprise to which the Dominion of Canada is committed, but some interesting information as to the progress and position of the railway is afforded in a report just issued by Mr. Sandford Fleming, the chief engineer of the undertaking. The surveys or examinations made by Mr. Sandford Fleming and his associates have not all been of the same character, but they have varied according to circumstances. They may be subdivided under six heads: First, explorations; secondly, exploratory surveys; thirdly, revised surveys; fourthly, trial locations; fifthly, location surveys; and sixthly, revised locations. At the commencement of the survey, all the sources of information open to inquiry with regard to the passes through the Rocky mountains were consulted; and after careful examination, it appeared that two passes known as the Howse and the Yellow Head possessed advantages which, taken in conjunction with the approaches to them, called for further examination. It was evident that the obstacles which intervened between the passes and the coast of British Columbia were of a serious character, and that the selection of the pass through the main Rocky mountain range depended on the discovery of a practicable line across the whole mountain region. After various examinations, the Yellow Head pass was preferentially selected, and it was found that it was possible to reach the coast by the course and outlet of the rivers Thompson and Fraser, the line terminating at an excellent harbor on Burrard inlet. It was ascertained that portions of the route through the Rocky mountain region would be expensive, but that the engineering features which govern the cost of working a railway and transporting goods promised to be much more favorable on the Canadian line than on the American route.

Ten routes have been opened for consideration by Mr. Sandford Fleming and his assistants. These routes terminate on the coast of the main land at seven distinct harbors, but they all converge on Yellow Head Pass. The line has been "located" with sufficient accuracy to admit of the construction of an overland telegraph. Upwards of 1,000 men have been employed in the surveys directed by Mr. Fleming, and the routes explored amount in the aggregate to nearly 46,000 miles. Of this aggregate, eleven thousand five hundred miles were laboriously measured yard by yard, through mountain, prairie, and forest, with spirit level, chain, and the usual appliances. Mr. Fleming is obliged to admit that, although several routes are available from the Rocky mountains to the Pacific coast, it cannot be claimed for any one of them that it is free from constructive difficulties.

DEEP MINING SHAFTS IN EUROPE.—Twenty years ago the deepest mining shaft in the world reached only about 2,000 feet below the surface. The very deepest, we believe, was a metalliferous mine in Hanover, which has been carried down to the depth of 2,200 feet. The deepest perpendicular shaft to-day is the Adalbert shaft in a silver-lead mine in Przibram, in Bohemia, which has reached a depth of 3,280 feet. The attainment of that depth was made the occasion of a three-days' festival, and still further noticed by the striking off of a large number of commemorative silver medals of the value of a florin each. There is no record of the beginning of work on this mine, although its written history goes back to 1327. Quite recently an elegant commemorative volume has been written and printed, which is most interesting to those who have a taste for either the actualities or antiquities of mining industry. There are two other localities, however, where a greater depth has been reached than at the Adalbert shaft, but not in a perpendicular line. These are: first, the Rocksalt bore-hole, near Sperenberg, not far from Berlin, which, a few years ago, had been bored to a depth of 4,175 feet; second, the coal mine of Viviers Remus, in Belgium, where the miners, by shaft sinking, together with boring, have reached a depth of 3,542 feet. Turning from these two mines, no shaft, in unbroken, perpendicular line, has as yet exceeded the depth of 3,280 feet.

PROGRESS ON THE BROOKLYN BRIDGE.—The work of laying two of the four great cables of the Brooklyn bridge is now in progress. The steel billets out of which the wire of these cables is manufactured, says the *American Manufacturer*, are from the works of Messrs. Anderson & Passavant, of Pittsburg, and, as delivered, are drawn to a fourth inch in thickness. The work of preparing the wire from these billets is done at a manufactory in Brooklyn. Before being galvanized this wire measures 165-1000 of an inch in diameter. Before being sent to the bridge it is galvanized and receives two coats of oil, increasing the diameter to from 168-1000 to 173-1000, weighing in coils of from 800 to 1,200 feet, not less than 60 pounds. On the anchorage the wire receives another coat of oil, and is wound on to drums in lengths of about 10 miles, the wires being spliced, and from them is paid out and brought to the New York anchorage by means of the carriers. The cables, of which there will be four, when complete will consist of 19 strands of 330 wires each. It is thought that one strand for each cable can be completed in one month, at which rate it will take nineteen months to finish the cables. The cables will measure about 15½ inches in diameter, and weigh some 800 tons each.

THE WATER ROUTES FROM CHICAGO TO NEW YORK.—Erie canal-men have reduced their charge to four cents per bushel on corn from Buffalo to New York; the lake vessels are carrying from Chicago to Buffalo for two cents, and, adding the elevator charges at the latter place and the insurance, the total cost of sending a bushel of corn from Chicago to New York is now about seven and a half cents, the rail rate being about 16½ cents per bushel. Last year the canal rate alone was nine cents on corn, which was a large reduction from former charges.

THROUGH THE PYRENEES.—A tunnel through the Pyrenees will complete the railroad communication between France and Spain by January 1st, 1878. It will save twelve hours of diligence riding.

POISONS IN WHITE RUBBER.

We have lately alluded to the dangerous qualities in this substance. The subject is worth further description and we quote from the *Manufacturer and Builder* as follows: Rubber is at present largely adulterated so as to make it cheaper. The overshoes and boots made of this material are adulterated with finely-ground burned potter's clay, of which it can stand as much as 65 per cent. without losing its fitness for the purpose. The adulteration is harmless, only the material is not so strong, and the shoes or boots, instead of lasting several seasons, as the old-fashioned little or non-adulterated material, scarcely last one season, as they tear very easily and holes soon wear in them. While the pure rubber is stronger than the best leather, the adulterated rubber is less strong than the worst leather.

Rubber hose and sheet rubber are usually adulterated with soapstone. This gives a lighter color to the material, while the burnt clay adulteration leaves it dark-colored, which is preferred for shoes. But some adulterations are hurtful, being poisonous in their nature. Such is the adulteration with zinc-white, which makes the rubber very light-colored, and is used in the rubber for nursing-bottles and children's toys. The effects of zinc poisoning on the system are scarcely less alarming than lead poisoning. Some time ago a little child in Pennsylvania died from chewing a paper collar, which, like many paper collars, was prepared with zinc-white; and cases are now on record where children have become sick from keeping rubber toys in their mouths. So many cases of zinc poisoning from the white nipples of nursing-bottles have already occurred, that the use of zinc in them has been mostly abandoned. These rubber nipples, or dolls, when laid in vinegar, become covered with an incrustation of zinc acetate. In one case, in 0.73 gram of a doll 0.45 gram of zinc oxid was found, (over 60 per cent.) In subjecting such rubber objects to a red heat, 62 per cent. of ashes remained, while the ashes were yellow while hot and became white on cooling, which is the characteristic behavior of zinc oxide, called zinc-white. In another case, in a doll warranted harmless, 58 per cent. of ashes was obtained, mostly all zinc oxide.

Several chemical journals are now calling attention to these facts, and it is to be hoped that it will effect an amelioration in the consciences of the manufacturers.

CROOKED RAILWAYS.—We read of something abroad which has been hinted at in our own country. The crooked nature of the railway from Galatz westward parallel with the Danube is a peculiarity which there is nothing in the surface of the land to account for. A correspondent of *Le Temps* explains that in following out on the map the capricious zigzags which the principal Roumanian railway describes, a circumstance which becomes more complicated in the eyes of the traveler by reason of a number of curves of a utility more than questionable, one asks himself the reason of this extraordinary antipathy for straight lines, which has placed under the cannon of the Turks an important point in the line of communication so valuable, since it would have been both more direct and safer to have one line run ten good leagues distance in the interior. Here is the singular explanation they give, such as it is. The Roumanian railway was undertaken by Strousberg. It was a memorable impudence, to speak with prudence. One of the stipulations of the contract was that there should be a certain subvention per mile, and this was accorded before the line was laid out. The contractor accordingly lengthened his line with curves to the utmost possible extent.

GRANITE RAILWAYS.—A French engineer has proposed to establish tramways with granite tracks in lieu of rails, in Finisterre. He is of opinion that this system is far preferable to the ordinary railroads. There already exists a vast network of what are in truth tramways with granite rails, worked by horse traction, in northern Italy. In the streets of the principal towns, and sometimes on the roads, tracks of granite are laid in the highways. The surface of these tracks being flat and perfectly smooth, the wheels of the vehicles glide over them with the least possible friction. The conductor of each vehicle takes care so to guide it that the wheels always remain on the granite. The author of the project maintains that there is nothing to prevent the granite lines from being used by carriages driven by steam power, in like manner as though drawn by horses. At the same time it is not proposed to adopt the train system on granite tracks; each carriage will be provided with its own steam power, will move by itself, and be guided by means of a mechanism specially devised for the purpose.—*Pall Mall Gazette.*

LIQUID WATERPROOF SHOE POLISH.—The following is said to be a good formula for the purpose: Dissolve 1 oz. of india rubber in 1 pint of oil of turpentine by the aid of a water bath, preventing loss; dissolve 15 ozs. of pure beeswax, 2 ozs. of Burgundy pitch, and 1 oz. of gum olibanum in 4 pints of oil of turpentine; then rub 2 ozs. of the finest lamp-black with 1 pint of oil of turpentine to a smooth mixture, and mix the three solutions. Add now ½ pint of copal varnish and afterwards 5 pints of lime water in quantities of 4 ozs. at a time, stirring after each addition, and continuing the stirring after the whole of it is added for some time afterwards. The mixture must always be well stirred up before any is taken out for use.

THE INTERIOR SEA IN ALGERIA.—From the recently published report by Rondaire on his mission to the Chotts, between Biskia and the Gulf of Gabes, in North Africa, *apropos* of the project of making an interior sea, the *English Mechanic* learns that some 25,000,000 to 30,000,000 cubic meters of sand would have to be displaced directly. The probable expense is put at 25,000,000 to 30,000,000 francs. The water of the Mediterranean would be depended on to effect the deepening of the trench, to the extent of 110,000,000 cubic meters.