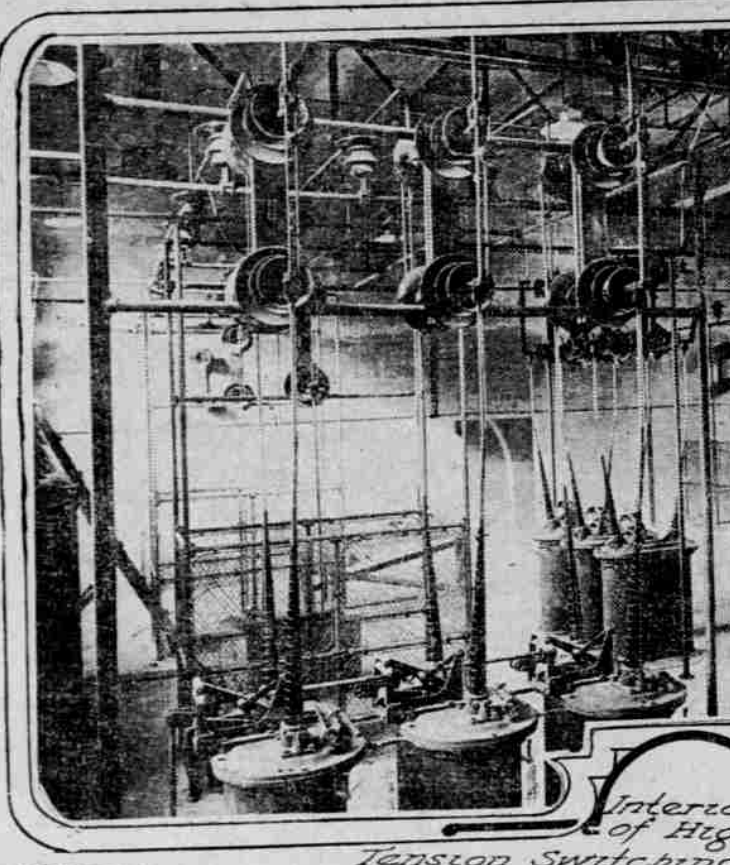
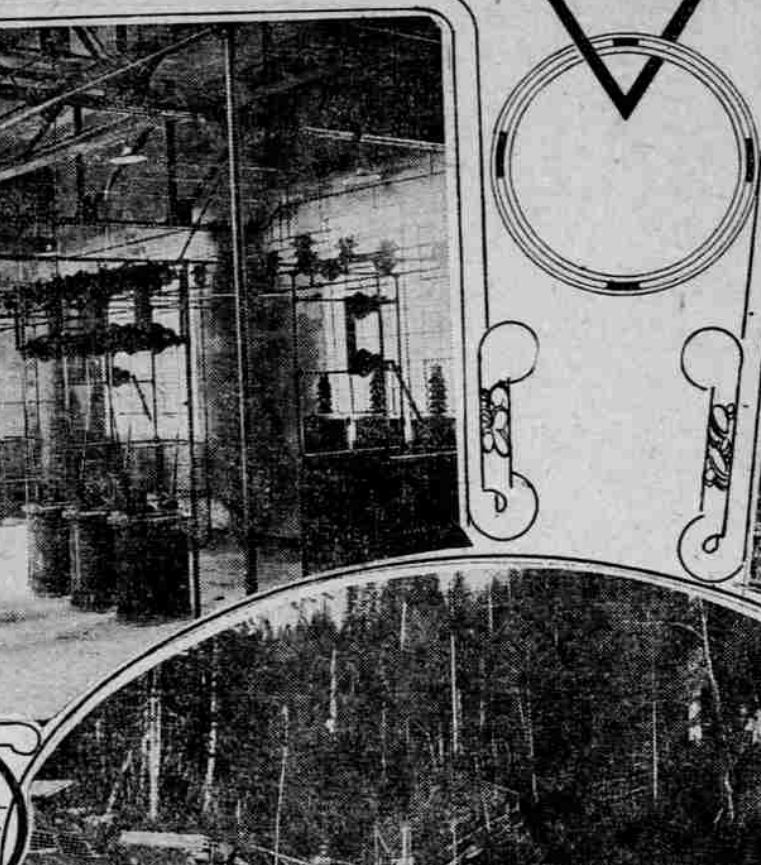


BULL RUN WATER POWER PLANT COST \$2,000,000

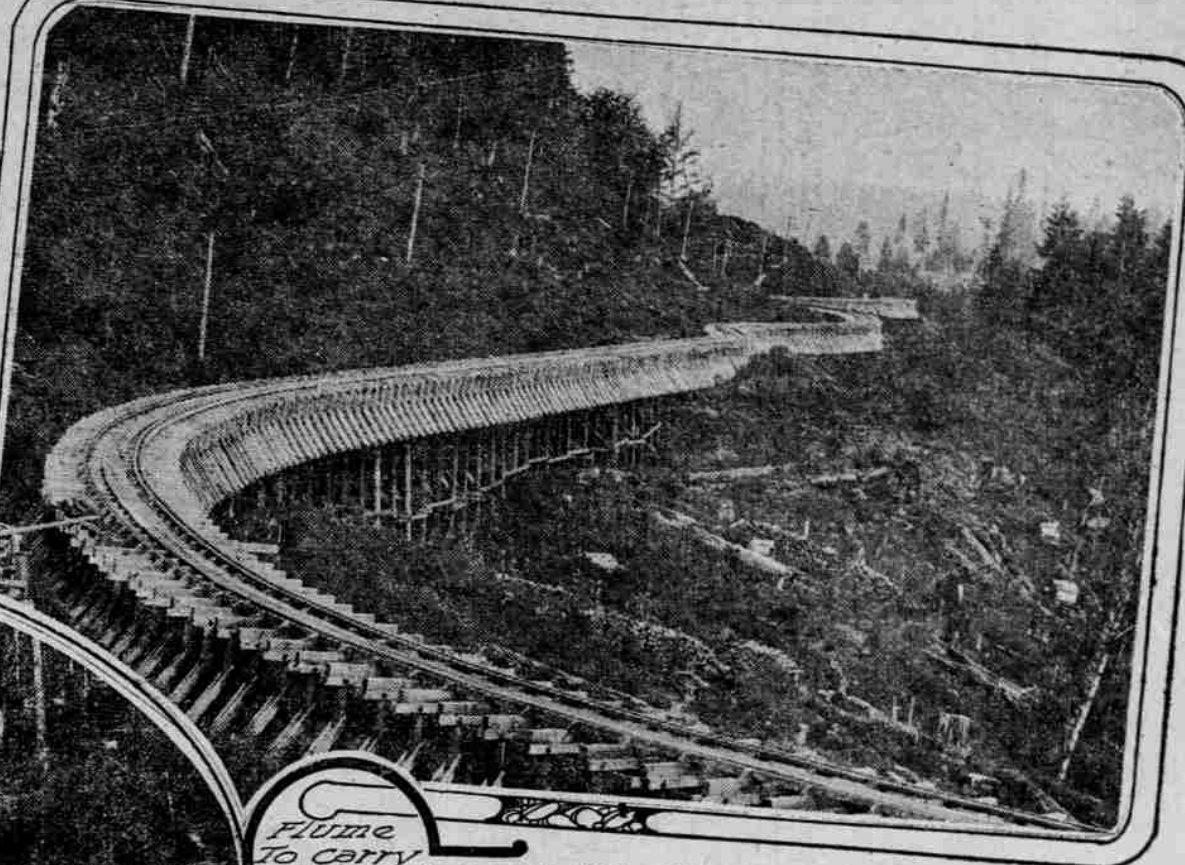
Auxiliary Station Will Be Ready for Operation About August 1 and Distribution of Energy Will Commence Within a Few Days Thereafter—High Head of Water Is Attained.



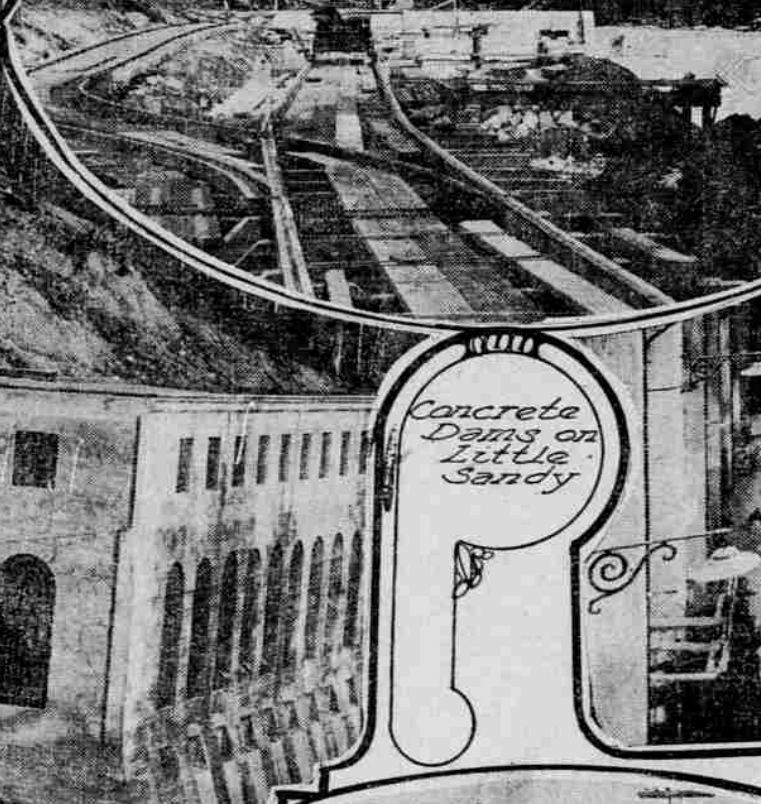
Interior of High Tension Switching Room



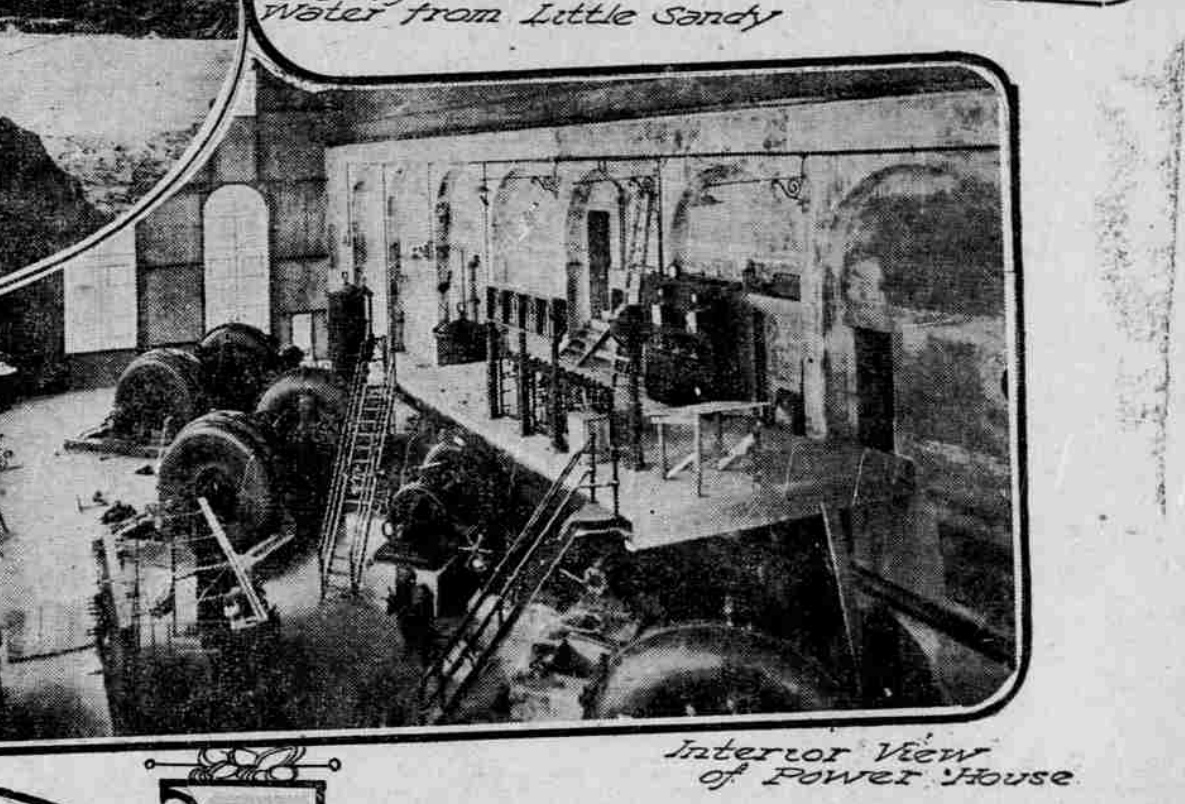
Flume to carry water from Little Sandy



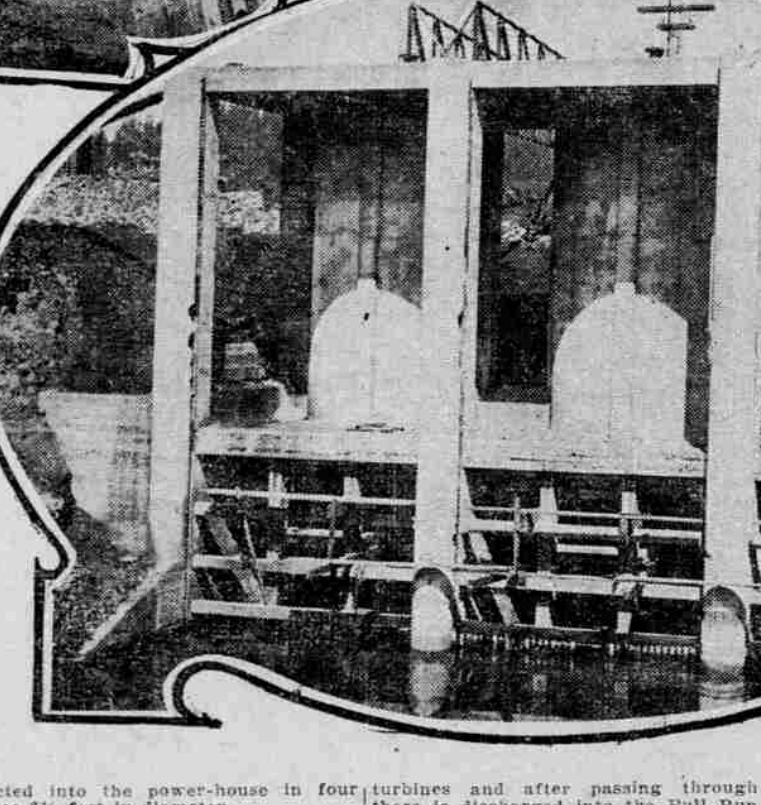
Exterior Power House and Transformer House



Concrete Dams on Little Sandy



Interior View of Power House



Intake Structure

At a cost of more than \$2,000,000 the Portland Railway, Light & Power Company now is completing on the banks of the Bull Run River in Clackamas County, what will be the highest head-water power plant of large size in the state. It will be ready for operation about August 1 and distribution of energy will commence a few days thereafter.

The supply of water for this plant is to be obtained for the first 10 months of its operation from the Little Sandy River, a branch of the Bull Run River. The concrete diversion dam on this stream is situated about three miles upstream from Bull Run Postoffice and the water is carried by means of a wooden flume 2 feet 6 inches by 6 feet 10 inches, along the hillside adjacent to the banks of the Little Sandy to its junction with the Bull Run, and thence continuing in the general direction of the Bull Run to the plateau at Bull Run Postoffice, where the water is discharged into a reservoir.

This reservoir is formed by surrounding a natural depression with a well-puddled retaining embankment which has been protected from the possible action of the waves by means of a rip-rap of selected stones. When filled up the reservoir will have a surface area of 145 acres and it will be possible in case of necessity to draw down the water level in it 35 feet, which will

make available a storage capacity of 22,400,000 cubic feet, equivalent to 585,000 horsepower hours of electric energy.

Due to the rapid fall of the Little Sandy and Bull Run Rivers between the diversion dam mentioned above and the power-house, which is located on the Bull Run River immediately below the reservoir, the water level in the reservoir is about 220 feet above the water level in the Bull Run River where the power-house is situated. In making use of the water for power purposes it is led through the intake gates, which are 19 feet in diameter and motor operated valves of butterfly type, located in a concrete intake structure. These intakes are to be protected by screens which are being put in.

Head is 1400 Feet at Power-House. After passing through the intake valves the water is conducted through 9-foot penstocks a distance of 1400 feet down the hillside into the power-house. There are two of these penstocks which are well anchored with concrete to keep them in position. About 450 feet below the intake valves, each of the penstocks is provided with a stand pipe and surge tank for protection against water hammer. Later on, after the penstocks have been thoroughly tested, they will be covered up for the greater part of their length to further protect them. About 140 feet before reaching the power-house these two 9-foot penstocks branch and the water is con-

ducted into the power-house in four pipes 8 1/2 feet in diameter. On reaching the operating room of the power house the water enters the

turbines and after passing through this is discharged into the Bull Run River through the tail race. The operating room of the plant is

150 feet by 46 feet, with a ceiling 45 feet high. It is served by a 40-ton electrically operated crane. The generating equipment consists for the pres-

ent of three alternating current generators driven by water wheels of the single-runner Francis type. The gate mechanisms are of the latest exterior wheel design. Each turbine has its own complete governor unit and oil pressure system and mechanically operated relief valve. In addition, as an extra precaution, there is provided on each of the penstocks a breaking plate designed to break should the pressure by any chance exceed a certain predetermined amount.

Two of the main water wheels have been manufactured by the Platt Iron Works Company, of Dayton, Ohio. One of the main water wheels has been manufactured by the Westman-Seaver-Morgan Company, of Cleveland, Ohio. There are two exciter units, the excitors for which were manufactured by the Platt Iron Works Company. All the main water wheels are of 4400 horsepower capacity. The exciter water wheels are of 200 horsepower capacity. The generators and all switchboards and auxiliary electric apparatus were manufactured by the Westinghouse Electric & Manufacturing Company, of Pittsburgh.

Room Provided for Fourth Unit. Room is provided for a fourth unit, which is to be ordered soon and installed early next year.

Immediately back of and above the power house operating room is located the low-tension switching room. Still further back and on a yet higher level is located the transformer house. At this point the electricity generated at 6600 volts is stepped up to a voltage of 60,000 for transmission to Portland. There are seven transmission oil water-cooled transformers in this building, each located in a separate concrete compartment. The high-tension switches are located on the upper floor

of the building, the transmission wires passing out of the building through large roof bushings.

The plant as described in the foregoing has an ultimate water wheel capacity of 25,600 horsepower, and a rated generator capacity of 15,000 kilowatts. The waters of the Little Sandy River will not be sufficient to operate the plant to capacity, and for the first 10 months of operation the maximum load will be restricted to between 5000 and 7000 kilowatts.

In order to operate the plant to its full capacity, there is being constructed at the present time a diversion dam on the Big Sandy River at a distance of about six and a half miles from the Bull Run power house. Water from this river will be conducted by means of flume, canal and tunnels along the banks and above the Sandy River a distance of two and one-half miles to a point on the side of the Devil's Backbone (which is the name by which the mountain separating the Little Sandy and Big Sandy is known) opposite the Little Sandy diversion dam mentioned earlier. Here the flume is to be carried directly under the backbone in a tunnel nearly a mile long and the water is to be discharged immediately above the Little Sandy diversion dam, uniting there with the waters of the Little Sandy River and will be conducted from that point by means of the Little Sandy flume into the Bull Run reservoir.

When this water is available there will be ample power to operate to full capacity the entire power house equipment. At present all of the preliminary work on the Big Sandy diversion has been completed, and about 200 men are engaged in the actual construction work. This force will be rapidly increased and the work pushed forward to completion early next year.

Answers to Correspondents

CARROLLTON, Wash., July 16.—Will you please tell me, through The Oregonian, how to make candied cherries such as are used for garnishing candies, etc. Can the Bing cherries be used? B. B. S.

HOME-MADE candied cherries are not difficult to make, and are usually excellent in flavor. They should warn you, however, not to expect the bright color of the commercial cherries. There is a special process for coloring candied cherries and maraschino cherries which is not usually available for the house-keeper who tries to imitate these products. Bing cherries may be used, but will of course be rather dark and dull in color, though they will taste good. I have had best success with large, sour, Kentish cherries.

Royal Annes can be given a certain amount of color by candying them in a syrup which is brightly tinted with red fruit juice, or with "color paste," or with the color which comes in some packages of gelatins. The following is an easy method:

Candied Cherries—Select large red cherries, remove the stones and weigh the fruit. For each pound of stoned fruit allow one-half pound (one cup) sugar. Put the sugar in a pan with just enough water or fruit juice to dissolve it. If the cherries are quite sweet, a little lemon juice or citric acid will be an improvement. A few kernels from the cracked pits may be added to the syrup for flavor. Cook the syrup to the "heavy thread" as for icing, then add the fruit. Bring to the boil, boil one minute, then set aside overnight. Repeat the boiling

up and standing over night until the fruit looks clear and transparent and the syrup clings closely to each cherry. Lay the cherries on a sieve or waxed paper in a warming oven or warm place so that the surface may dry a little, then roll them in granulated sugar and pack in boxes with a sprinkling of granulated sugar to keep them from getting sticky. Another way is simply to let them dry a little longer on the surface, after taking from the heavy syrup, but rolling them in sugar is easier and quicker, though it does not give the "glass" finish. Some makers drain them from the heavy syrup, dissolve a little more sugar in the latter if necessary and boil it to the candy stage; then add the cherries and stir violently until the syrup candies round them. Other stone fruits may be similarly treated.

A number of my correspondents have told me of their good success in candying fruit; but patience and "judgment" are necessary with the recipe.

PORTLAND, Or., July 13.—If you will kindly give a recipe in The Oregonian for dill pickles, I will be very grateful obliged, as I fail to find anything about dill pickles in either of my cook books. MRS. J. B. M.

Dill pickles are really a German relish, which may account for your not finding anything about them in your American cook-books. Strictly speaking, they should be made by "natural fermentation," being kept at a rather warm temperature until acetic acid has formed from the juice, after which they are drained, washed, and well covered. Many American housekeepers, however, have not the skill and judgment for keeping them in good condition by this method, and therefore use some vinegar in their making. Dill pickles are not very wholesome

for any one at any time, and should therefore be used in strict moderation by most people, and should never be given to children or persons of delicate digestion. They have a very low food value, is cents worth of dill pickles being barely equivalent in energy-supplying value to one ordinary slice of ordinary bread, and they contain scarcely any tissue-building material. Where children or grown persons for that matter) show a strong craving for acids and pickles, it is usually a sign that they are badly fed—receiving an unbalanced and unsuitable ration. Their diet should be carefully revised, and the acids they need should be given in the form of ripe or cooked fruits, not pickles.

In making any kind of pickles more depends upon the freshness and soundness of the vegetables and the purity of the other ingredients than upon any "recipe."

Dill Pickles No. 1.—Make brine strong enough to float an egg; then add to it half as much water. Wash perfectly fresh cucumbers and wipe them; then put them into a large crock or small keg in single layers with a layer of well washed dill, grape leaves, and bay leaves. Pour the brine over, and lay a cloth on top of the pickles; then an inverted plate or round board to keep the pickles under the brine. Wash the cloth frequently to prevent the formation of mold.

Dill Pickles No. 2.—Select fresh, tender medium-sized cucumbers, wash them and let soak several hours in cold water. Then dry them and place them in a large crock or small keg in layers with dill, grapevine leaves, a few bits of bayleaf, cherry, and horseradish leaves, being careful not to overpower the dill flavor. Add six level tablespoons salt to every quart of water, for the brine, and boil this 5 minutes. Cool and pour over the cucumbers, filling the crock to overflowing. Cover with a cloth and plate or board as above, washing the cloth frequently as soon as acetic fermentation has taken place, store in a cool

cellar. A layer of horseradish leaves under the cloth is said to be particularly useful in keeping off molds, but I cannot vouch for the truth of this.

Dill Pickles No. 3.—Prepare the cucumbers as above, but scatter salt in the layers with the dill, adding a few bits of bayleaf and a few cloves with the other leaves. Instead of making a separate brine, pour boiling water over the layers of cucumbers, salt and leaves. Finish as above.

Dill Pickles No. 4.—Make pickles by any of the above methods. After a few days drain off some part of the brine and add vinegar in its place with more dill and leaves.

PORTLAND, Or., July 22.—Will you kindly tell me (1) how to make sunshin preserves; also kindly give (2) a recipe for buttermilk ice cream. (3) Do you know of anything that will make straight hair stay in curl at the beach? Thanking you in advance. MRS. C. H. M.

Sunshine Preserves are good, but to my mind not so much better than the ordinary kinds as to pay for the extra trouble, nor are they especially adapted to the Portland climate, where we can seldom count, beforehand, on the several consecutive days of the really hot sunshine necessary to the success of these preserves.

Sunshine Preserves No. 1.—Weigh the fruit after it is prepared for cooking, and take an equal weight of sugar. Cook the sugar with half its weight of water until a light thread may be formed. Put in the fruit and cook 15 minutes, after the mixture boils. Pour the cooked fruit on large platters, cover with glass and let stand in the sun two or three days, or until the syrup is thick, or put up in small tumblers, covered with glass, and let thicken in the sun.

Sunshine Preserves No. 2.—Gather fresh, perfectly ripe fruits, removing hulls, stones, etc., and spread them on large dishes, so as not to touch. Set them in the hot sun, on a roof or balcony, and protect them from dust and flies. Take them in every evening and do not put them out until the dew is off in the morning. Do this three or

four days, according to the kind of fruit and the amount of sunshine. Then pack them in layers in stone jars, with an equal amount of best light brown sugar (having the first and last layers of sugar), and cover the jars closely. Let them stand three or four months before using, when there should be plenty of rich syrup.

Buttermilk Ice Cream.—One quart fresh buttermilk, one-half cup sweet cream, 3/4 cups sugar, one tablespoon vanilla. Mix the ingredients thoroughly, being sure the sugar is completely dissolved. Freeze like ordinary ice cream. This is the simplest form of buttermilk ice cream, but there are, of course, variations. A little lemon juice and grated lemon rind are preferred by some to the vanilla. Others use a little cinnamon for flavoring. A lighter texture is obtained by adding one egg-white beaten stiff, when the mixture has been frozen to a mush. If the egg is used, allow two extra tablespoons sugar.

I am afraid I cannot help you much. I have straight hair and in my time have tried "curling fluids" of many different kinds in the vain hope of looking less like a sky-terrier in the wash-tub when I go to the beach or take an ocean voyage. But I cannot say that I have had much success. Now, I simply use philosophy, and as tight hands and hairpins can compass. During the first few hours of every sea voyage I vow that I am an egg. Death or an unexpected island is all I long for. Still later, I usually feel so light-hearted (and possibly light-headed) that my locks might be like Medusa's without their worrying me. And so that fringe, or "transformation," or whatever they call it, has never been brought. If you don't like the "false front"

idea, you might try dampening your hair with quince or egg white and water, shaken together, before "doing it up" by whatever method of curling you are in the habit of using. Or you might try the following: One and a quarter ounces gum arabic mucilage, 1 1/2 ounces glycerine, 1 1/2 ounces carbonate of potash, 1 quart rose water, 6 ounces Portugal extract.

Dissolve the carbonate in the rose water, then add the other ingredients. Shake well, let stand a week before using and dilute with a little warm water if it seems too thick. But my best advice to you is not to bother about curls and crimps. You can probably find a simple and becoming way of "fixing" your hair that will be both more comfortable and more stylish than any "fussy" method.

PORTLAND, Or., July 23.—I have some beautiful dill pickles, and would like to give them to you, if you will. I have heard they are called "coasters," something like a small saucer, to stand the glasses on. Will you let me know how to arrange the table, and if coasters are used to hold a glass of water to call for them, will you tell me about them, as I am very anxious to get some if they are still used. Thanking you in advance. M. B. E.

Dealers tell me that coasters are selling in increasing quantities, and that manufacturers are bringing out of a passing fancy. They are more or less of a passing fancy. They have no particular connection with dillies, and would not be used at a dinner or luncheon, either with or without a tablecloth. They usually come with a tray to match and are useful when lemonade, fruit drinks, or beer are served in an informal way, with or without an accompanying "bite to eat." Your question about "how to arrange the table" is rather too wide to be discussed within the limits of this column. General principles of good taste and "reason in all things" should be mastered, and then "correctness" will turn upon the occasion, the menu and the amount of available service.

If you do not feel sure of yourself, I would suggest that you study some of the manuals of table service for human stomachs, obtainable from the public library, and then adopt the formal instruction thus obtained to your special circumstances. Study also the art of flower arrangement, a matter in which many women are surprisingly awkward and helpless, and upon which much of the delicacy and attractiveness of a table really depends.

Steamed Mussels.—Visitors to the seashore are well acquainted with these little bivalves, which, despite some belief in their being unfit for human stomachs, make the most delicious eating. The safest supply is gathered from the big rocks submerged by the tides, with the gathering of lemons, done both at low tide. Take only the mussels with shells fast closed, for when the shell is open, and comes apart easily, this denotes that the fish has died a natural death. Wash the mussels off first in sea water, freeing them of weeds and mud with an old kitchen knife. Then give them several baths in fresh water. Dump half a peck in a big pot, pour over half a cup of water, cover the vessel and set it over the fire for steaming. In 10 or 15 minutes every mussel shell will be open and there will be a delectable supply of juice in the pot. Have some drawn butter ready and eat the mussels hot and directly from the shells, dipping each in butter. If the mussels are cooked at a house, they can be served in bowls, just as they are in the shell, with a liberal supply of the hot liquor over them. Delicious flavorings for mussels cooked in this manner are a glass of white wine and a squeeze of lemon juice, both of which are dumped into the bowl served each person. As soon as the mussels get cold they lose much of their delicacy, but fine fritters can always be made of the ones left over.