are meanwhile left uncovered, to dispel any objectionable odor in the cream, which might arise from giving the cows a liberal allowance of alfalfa, or similar feed. The ripening process requires about twenty-four hours, where the cream is exposed to an even temperature of sixty degrees. The churn is box-shaped, and often has a capacity of three to four hundred pounds of butter. The rocking movement of the machinery is produced by the turning of a crank. The necessary power is generally furnished by a mountain stream, dammed in, and from which the water is carried, through pipes, to a Pelton wheel, which gives a pressure equal to twenty pounds horse power. A quaint little water-wheel churn is an object of interest to tourists visiting the beautiful McCloud river, near the base of Mount Shasta. The usual method, however, of rocking the churn is by hand, or horse power. The working of the butter is done by wooden rollers made for this purpose. The butter maker assists the process of thorough mixing, by feeding the rollers with flattened masses of dewy butter, which he handles with a long, wooden ladle. Where the conditions are exceptionally favorable, a dairyman in California counts upon an annual allowance of one acre to every cow, and receives an average product of fifty to seventy-five dollars per cow. The profits of cheese making are equally good. A northern California dairy in Sierra Valley made, during the summer, 5,000 pounds of cheese from the milk of twenty cows. Specimens of this cheese afterward took the premium at two fairs, held in adjoining counties.

[The illustrations shown on the preceding pages were engraved from photographs by W. Harris and O. Carpenter. Fig. 1 shows a water-wheel churn on the McCloud river; Fig. 2, Chinamen milking cows at the Kern dairy; Fig. 3, the butter room. Fig. 4 presents a dairy herd on the Mendocino hill-pastures.]

A CANVAS-COVERED GARDEN.

B. W. JONES, VIRGINIA.

The greenhouse, the conservatory, the hotbed and the canvas-covered plant bed, have been used to protect tender plants from cold, and to force them into development for the early market. But the expedient of sheltering an entire outdoor garden with a cover of canvas, or cloth, is a new device which for some years I have used with success. The canvas cover shelters tender things, such as frost will harm, during those few weeks in spring and autumn when the temperature of the air and of the soil is high enough for plant growth and development, but when, on any night, a frost might occur. It is an attempt to prolong the growing and bearing season of a variety of useful garden vegetables and fruits, and so hasten crops for early market, and extend the time in autumn during which tender vegetables, like tomatoes, beans, corn, beets, pepper, melons and potatoes, may be taken from the outdoor garden. I have found that by its use, from six to eight weeks are added to the season. The canvas cover also increases the temperature of the garden to a slight degree; and when the fence is made tight, the interior temperature may be raised four or five degrees.

The canvas garden should be of highly improved and liberally fertilized soil, intended exclusively for the growth of such desirable small fruits and vegetables as frost will injure in spring or autumn. It is not intended for the hardy crops that frost will not harm, which should be planted elsewhere in open ground, and no more ground should be taken to be covered with canvas than is absolutely necessary to furnish an adequate supply of the tenderer vegetables for family or market use. Not an inch of canvas more than is required to cover the ground inclosed should be used, and to this end the various crops must be crowded a little, and the soil highly fertilized and thoroughly tilled, to compensate for the crowding. The plat should be inclosed with a close-fitting board fence, and it were better to have the fence upon the northern side two or three feet higher than the rest, and the eastern and western sides to slope off toward the south. If the site is much exposed to cold and sweeping winds, the fence should be battened for security from cold.

If the canvas is spread over the garden at sunset, or a little before, when the atmosphere and soil are both warmed by the sun, and the canvas is made to fit closely over the top of the fence all around, this difference of temperature will be maintained under the canvas through the night. If possible to have it so, the canvas garden should always front the south, and be sheltered as much as practicable upon the side from which the prevailing cold winds and storms come. My canvas is made of plain cotton cloth, costing five cents per yard. With care in handling, and putting it away when the season for using it is over, I find that it will last several years. The canvas is only needed for about six to eight weeks in spring, and the same time in autumn. Heavy rains tear it by the weight of the precipitation, and hence it should be rolled up, and left resting on the north line of the fence when these occur. It is only needed on clear nights, when the thermometer shows that frost will occur. When a thermometer under shelter registers 35° F. on a clear night, frost will occur, unless it be windy. And if, at sunset on any clear day in spring or autumn, the mercury falls to 44° or 45°, the canvas should be spread, for sometimes frost forms at an air temperature of 40°, when heat rapidly radiates from the earth.

During cold and frosty weather in spring and autumn, the canvas must be spread over the garden every night, and rolled up again each morning, to let the sunshine in to the plants. This is a general rule. But if the temperature during the night should fall to the freezing point, or below, it is best to let the canvas remain over the garden a few hours to shut out the sun. A gradual thawing, under shade, often saves frozen plants. When it is certain that the temperature during the night will not fall to the frost point, the canvas need not be spread. But it is advantageous to growing crops in spring, to spread the canvas on any cool night, as it checks radiation from the soil, and renders the garden warmer within. When there is no longer any danger of frost in spring, the canvas is to be thoroughly dried, folded up, and laid away in a house, until time to use it again in autumn. After it is put on in autumn, it will have to remain in use as long as there are any tender crops to be protected.

It is probable that further experience with the canvas will so demonstrate its great utility, that it will be kept in use all winter long, from the time of the earliest autumn to the latest spring frost. It will be found beneficial, not only for sheltering tender crops from frost, but for the protection and speedier growth of all garden crops, and an aid in their cultivation in winter. In the latitude of Southern Virginia, and even farther north, much can be done in the open garden all through the winter season. I find it easy here, in 37° north latitude, to have onions, kale, lettuce, mustard, cress, leeks, turnips and other hardy plants growing in the open ground from November until April. And with the proper use of the canvas and placing of straw around, I have found, that, on mild winters I can add to the above, collards, cabbage, potatoes, beets, spinach and a few other desirable vegetables, and keep them growing through the winter. In very hard winters this would hardly be possible. With the canvas cover, the gardener can rest assured during spring or autumn nights that frost will not destroy the bright prospects of his labors and the reward for his work.

THE SOUTH AMERICAN TREE TOMATO.

C. R. ORCUTT, CALIFORNIA.

This plant is catalogued as *Solanum erectum* and *S. betaceum*, by different growers. The latter name is, presumably, correct. It is variously credited as a native of Jamaica, the West Indies, Guatamala and South America. It is undoubtedly indigenous to Central America, but is cultivated as far south as Valparaiso, and also in the Mediterranean region, for its egg-shaped fruit. The mature fruit is of a saturn red, with a carmine blush and veining. It is almost the size of a hen's egg, the flesh being firm, with a fine tomato-like flavor. The firmness of the fruit permits transportation, and this, combined with good keeping qualities, should render it valuable for market. It can be served as a dessert fruit or used in any way that the tomato is used. It is also useful for jelly making, and when green, it makes an excellent pickle. The plant is not hardy, is easily affected by frost or winds, but as a handsome evergreen shrub it will be useful for ornamental greenhouse growing in the East. It makes a bushy growth, with large foliage, attaining to a height of fifteen feet or more at its best estate. Its delicious fruit ripens out of doors in Southern California, from Christmas to the middle of February, and it is claimed that it can be made to bear the year around. In Ceylon and India this is said to be extensively grown for food, where it is known as the "poor man's fruit."

Fruits and Vegetables in Cellars.—Apples and vegetables that have been stored in the cellar in boxes, barrels, or upon shelves, should be sorted over at least twice during the winter, and all injured, decayed, or decaying specimens removed. In the case of apples, where only a decayed spot is found, the remainder will be utilized by the economical housewife for culinary purposes, especially if the fruit be scarce. Vegetables should be carefully looked over, particularly potatoes, as the emanations from the decaying ones are positively unhealthy, and a decayed tuber infects its neighbor.