

serious effect can be produced. Such, however, as are not acclimated cease to grow during any fall in the usual temperature, and commerce again on its rise. Unlike animals, plants have very little power to generate heat, and are therefore dependent on the media which surround them for whatever degree of warmth they require. The earth may be heated many degrees more than the surrounding air, and yet prove in no way injurious to vegetation. The unusual vigor of plants growing near hot springs, and in places artificially heated by subterranean fires, is also worthy of attention. A species of moss, the only living thing found within 4000 feet of the terminal crater of Mana Loa, was noticed by Wilkes; its existence there being due to the steam which escaped, and which supplied it with warmth and moisture.

This heated condition of the soil, thus natural to seasons and to regions of the globe, would suggest what is called bottom-heat in gardening. Many seeds, especially those of tropical plants, will not germinate unless in higher than ordinary temperatures of earth, and to excite them some kind of stimulus is requisite. It is not an unusual practice in America to sow such seeds in mid-summer in the open ground, which becomes so heated by the rays of the sun as to retain much of the warmth during the entire night. The hot-bed then, is a provision by which a constant and gentle warmth is maintained: and the external structure, which preserves this warmth, is called a frame. Many tropical plants will neither flower nor grow unless they are surrounded by an elevated atmosphere, and are planted in such heated soil as they are accustomed to; and the same holds true with many aquatic plants. Meyer found the temperature of the water in the rice-fields where the red Nelumbium flourishes to be 113 degrees. Hence the hot-house or stove is erected for their especial accommodation, and by a system of hot water pipes or some similar contrivance the required heat is procured.

The hot-bed differs from the stove, in having the space between the sash and the surface of the bed very shallow, and having its heat maintained by fermentation. The work of the gardener in the early spring months is directed to the hot-beds or frames, and in these he forces such vegetables as he wishes to have prematurely fit for the table. The art of framing or management of the hot-bed depends much upon the accuracy and care taken in its construction. The ground where it is to stand should be defended from cold and cutting winds, and enclosed by a tight and well-built fence, or by live-hedger. The frame can be made of any suitable material, but should be so constructed as to give the top surface a proper slope to the sun, as well as a declivity to carry off the wet when covered with the sashes or lights. It is essential that they should be as tight as possible, so that none of the warm air from within, or cold air from without shall penetrate through the cracks. On this declivity or slope the sashes should be laid, and in such a way that they can easily move or slide from top to bottom.

The bed that is to be covered by such frames

must be composed of good horse-stab's dung, selecting that which is fresh, moist, and full of heat. After a sufficient quantity of such is procured, it should be forked into a heap, so as to mix it well, and allowed to remain eight or ten days to ferment equally; a necessary precaution lest the bed become too hot and thereby destroy the germinating seeds. At the end of this period the dung should be shaken and mixed, and forced into a bed four feet thick, beating it down firmly with the back of the fork. It is calculated that this thickness will be diminished at least 8 inches in a fortnight, when the frame and sashes are to be put on and kept closed until the heat comes up, when the glass is to be raised behind to allow the steam to pass away. This accomplished, the manure is to be covered with soil, which has been previously prepared in the form of compost, of equal parts of light, rich garden-earth, the mellow surface loam of rich old pasture ground, and a portion of very rotten or old horse dung. This, having been well incorporated and exposed to the weather for several months before, is to be spread to the thickness of about 6 inches in a level manner, when the hot-bed is ready for use.

The seeds of most vegetables are sown in drills upon this compost, those of melons and cucumbers in small pots which are plunged into the soil. After the seeds are sown and the sashes are closed, the heat of the bed raises much steam from the moisture beneath; this should be suffered to escape by raising the corner of the upper end of the sashes. An hour before sunset the sashes should be shut and covered with matting or some suitable protecting substance; and this is to be taken off regularly an hour or so after sunrise. Great caution is requisite, in a climate like that of the Northern United States in order to keep up proper warmth and to exclude any frost. After the seeds have vegetated and the young plants have come up, the sashes should be raised a little in the day time, so as to admit fresh air; and if the surface of the bed appears to be dry it should be moderately moistened with water of about the same temperature as that of the enclosed air of the frame. After a while the heat will sensibly diminish, when it is customary to line the exterior of the bed with fresh dung, and cover these linings with litter.

TREE PLANTING.—Mr. Wm. Bright, (good authority) recommends to the Gardener's Monthly, the planting of all kinds of trees as near the surface of the ground as possible, even for quite large trees, digging about four inches deep only, setting the tree in the basin, and when covering to a mound with a cart load or two of earth prepared for the purpose. The tree then is in position to start its new roots into the top soil, which is warm, instead of into the cold bottom soil they have to when planted the ordinary way.

During the past year the Massachusetts cotton mills have manufactured 30,265,321 yards of cotton cloth, or a web of 18,190 miles in length.