

fies and absorbs nourishment through its roots or mycelium. The growth of this fungus c. the leaf interferes with its normal function of assimilation from the atmosphere which, more or less, according to the severity of the attack, stunts and lessens the general growth.

Fig. 2 shows a cross section of one of the affected



Fig. 2. (After Trelease.)  
Section of a spot on an affected leaf.

leaves as it appears under the microscope. The spores are usually oval in shape, and in the majority of cases one celled. A single spore (such as one of those borne on the slender stalk shown in the figure), germinating, sends out a small tube, which penetrates the tissue of the leaf, and growing rapidly, soon begins to produce new spores, and so spread the disease. How it penetrates through the hard skin of the leaf is not known, though it is now accepted that it is not necessary that the leaf be punctured by an insect to allow it to gain admittance. Prof. Budd, of Iowa Agricultural College, thinks that the degree to which this pest proves injurious is largely influenced by the leaf structure, and he makes the general statement that the apples, pears, cherries and plums of the east plain, where the seasons are hot, dry and changeable, do not scab or mildew to any serious extent, while all the fruits of the west coast of Europe do.

The growth of the scab on the fruit is exactly similar to that of the leaf. The surface of the apple is at first slightly disfigured with small spots, which soon become darker and spread rapidly, causing the fruit in many cases to crack badly. The centre of the spot soon becomes hard and dry, indicating that growth has ceased in this part, while the outer edges continue to spread.



Fig. 3. (After Trelease.)  
Section through the edge of a scab on the apple. Magnified 200 diameters.

Figure 3 shows a section of a diseased spot as seen through a microscope. It will be seen that the fungus grows merely in the cells, forming the skin of the apple.

From the time that the fruit first sets it is liable to be attacked by this disease, and observers have noticed that in many cases it has spread so rapidly as to almost completely check the growth of the young apple. Mr. McD. Allan, President of the Fruit Growers' Association, is firmly of the opinion, expressed by others also, that the disease may be communicated from apple to apple in the barrel.

Though no varieties are yet known that are absolutely free from this disease, yet there are a number that are comparatively so compared to others. The Russets, Ben Davis, Maiden's Blush, Grimes' Golden, Wealthy, Rhode Island Greening, Duchess, Alexander, and Red Astrachan seem to be more capable of resisting these attacks, while the Fameuse or Snow, Northern Spy, and Baldwin appear to be more susceptible.

In respect to the remedies the first consideration is to make the conditions as unsuited as possible for its reproduction. It is noticeable that orchards on

heavy, undrained soils, suffer more than those on light soils free from stagnant water or excessive moisture. Keeping the trees well pruned so as to give the tree greater vigor of circulation, and also not allowing the orchard to suffer for want of proper manuring are important requirements. Having the conditions as healthful as possible for the trees, then recourse may be had to other measures to make the treatment more effective. It is a difficult matter to destroy the fungus after it has obtained a hold in the leaf or apple. The most effectual time of treatment being before it has gone so far. The roots or mycelium in the leaf or fruit, are hard to kill, but the spores may be prevented from germinating and spreading the trouble.

A late report of the Washington Department of Agriculture treats of this question. Simple solutions of sulphate of copper ought not to be used according to these authorities, as their use is almost certain to injure the foliage. They state that the Bordeaux mixture, made as follows, may be used at any time without fear of injury: Dissolve 16 lbs. of sulphate of copper in 22 gallons of water; in another vessel slake 30 lbs. of lime in 6 gallons of water. When the latter mixture has cooled it is slowly poured into the copper solution, care being taken to mix the fluid thoroughly by constant stirring. If it is well to have this compound prepared some days before it is required for use. It should be well stirred before applying. Some have reduced the ingredients to 2 lbs. of sulphate of copper and 2 lbs. of lime to 22 gallons of water, and have obtained good results. The Washington authorities recommend the following course of procedure:

1. In early spring, before the buds have commenced to expand, spray the trees thoroughly with a solution of sulphate of iron, using 4 lbs. of the iron sulphate to 4 gallons of water.
2. As soon as the fruit has set apply the Bordeaux mixture.
3. If the weather be such as to favor the development of the scab fungus, a third application should be made two or three weeks after the second using the same materials.

The old supposed remedy of boring holes in the tree and filling them with sulphur has been forsaken, owing to the fact that it proved of no use whatever, but resulted in much damage being done to the tree.

In a bulletin of recent date the Washington authority recommends the use of "liver" of sulphur or sulphide of potassium, using the solution of the strength of  $\frac{1}{2}$  oz. to the gallon of water. This should not be prepared until you are ready to make the application.

Mr. E. S. Goff, of N. Y. Experimental Station, obtained, with hyposulphate of soda, excellent results from making four applications; the first three being 1 lb. of the hyposulphate to 10 gallons of water, and the fourth reduced one half.

It is needless to say that in packing apples it is of the greatest importance to separate the spotted and diseased ones from those that are healthy and free from infection.

## The Home.

### Thoughts in a Garden.

BY ANDREW MARVELL.

How vainly men themselves amaze,  
To win the palm, the oak, the bays,  
And their incessant labors see  
Crown'd from some single herb or tree,  
Whose short and narrow verged shade  
Does prudently their toils upbraid;  
While all the flow'rs and trees do close  
To weave the garlands of repose.

Fair quiet have I found thee here,  
And Innocence, thy sister dear!  
Mistaken long, I sought you then  
In busy companies of men.

Your sacred plants, if here below,  
Only among the plants will grow.  
Society is all but rude  
To this delicious solitude.

No white, nor red was ever seen  
So am'rous as this lovely green.  
Fond lovers, cruel as their flame,  
Cut in these trees their mistress' name,  
Little, alas! they know or heed,  
How far these beautys her exceed!  
Fair trees! where'er your barks I wound,  
No name by your own be found.

When we have run our passions heat,  
Love hither makes his best retreat.  
The gods, who mortal beauty chase,  
Still in a tree did end their mace.  
Apollo hunted Daphne so,  
Only that she might laurel grow:  
And Pan did after Syrinx speed,  
Not as a nymph, but for a reed.

What wond'rous life is this I lead?  
Ripe apples drop about my head.  
The luscious cluster of the vine  
Upon my mouth do crush their wine.  
The nectarine, and curious peach,  
Into my hands themselves do reach.  
Stumbling on melons as I pass,  
Insard' with flow'rs, I fall on grass.

Near while the mind, from pleasure less,  
Withdraws into its happiness:  
The mind, that ocean where each kind  
Does straight its own resemblance find.  
Yet it creates, transcending these,  
For other worlds, and other seas;  
Annihilating all that's made  
To a green thought in a green shade.

Here at the fountain's sliding foot,  
Or at some fruit tree's mossy root,  
Casting the body's vest aside,  
My soul into the boughs does glide,  
There, like a bird, it sits and sings;  
Then whets and claps its silver wings;  
And till prepar'd for longer flight,  
Waves in its plumes the various light.

Such was the happy garden state  
While man there walk'd without a mate;  
After a place so pure and sweet,  
What other help could yet be meet?  
But 'twas beyond a mortal's share  
To wander solitary there:  
Two paradises are in one  
To live in paradise alone.

How well the skillful gard'ner drew  
Of flow'rs and herbs, this dial new!  
Where, from above, the milder sun  
Does through a fragrant zodiac run;  
And, as it works, th' industrious bee  
Computes its time as well as we;  
How could such sweet and wholesome hours  
Be reckon'd but with herbs and flow'rs.

—Harper's Monthly.

## Generosity.

If selfishness dwarfs, and withers, and shrivels all that is good and noble in man, generosity, which is its opposite, is rain, and sun, and earth to the best impulses of his nature. The two, like the spirits of the good and of the evil, cannot dwell together in the same bosom in harmony, for so completely antagonistic are they to one another, that they cannot come together without commotion and conflict, ending in the discomfiture of the one or the other.

Generosity is like the waters of the overflow of a spring. It goes forth in what but for their presence would be waste places of the earth, and produces loveliness and beauty and utility in all its journeyings to and fro.

It touches as with a magic wand the homes of sorrow and want, and breathes balm into their midst.

It casts its eyes upon the needy, and compassionate efforts follow. It is more God-like than pity, for where it exists, there must be active outgoings for the relief of those who come beneath its benignant glance. Show me a generous *child*, and I will show you a gem of beauty—beauty brighter than what is found in the coronet of kings. Show me a generous *young* man, and I will show you a treasure that will outweigh the wealth of a Croesus; and show me a generous *old* man, and I will show you golden grain more lovely than was ever gathered into earthly storehouse.

Generosity is a reservoir that never empties itself. The greater the drain, the more rapid the inflow, be-