lower spurs, having two buds each, and both started. One of them we intend for a bearing-cane next summer, therefore allow it for the present to grow unchecked, tying it if long enough to the lowest wire. The other, which we intend for a spur again next fall, we pinch with the thumb and finger to just beyond the last bunch or button, taking out the leader between the last bunch and the next leaf, the cross-line indicating where the leader is to be pinched off. We now come to the next spur on the opposite side, where we also leave one cane to grow unchecked, and pinch off the other.

We now go over all the shoots coming from the arms or laterals tied to the trellis, and also pinch them beyond the last bunch. Should any of the buds have pushed out two shoots, we rub off the weakest: we also take off all barren or weak shoots which may have started from the foot of the vine.

The bearing-branches having all been pinched back, we can leave our vines alone until after the bloom, only tying up the young canes from the spurs, should it become necessary. Do not, however, tie them over the bearing-canes, but lead them to the empty space on both sides of the vine, as our object must be to give the fruit all the air and light we can without depriving it of the necessary foliage, which is of greatest importance for the formation of sugar in the berries. To do so the leaves must be well developed and healthy. Diseased mildewed foliage, however, will not promote the sugar-formation, but rather impede the same.

By the time the grapes have bloomed, the laterals will have pushed from the axils of the leaves on the bearing-shoots. Now go over these again, and pinch each lateral back to one leaf. In a short time the laterals on the fruit-bearing branches which have been pinched will throw out suckers again. These are again stopped, leaving one leaf of the young growth. Leave the laterals on the canes intended for next year's fruiting to grow unchecked, tying them neatly to the wires with bass or pawpaw bark, or with rye-straw.

If you prefer training your vines on the horizontal-arm system (Fig. C), the mode of summer-pruning will in the main be the same. Pinch off the end of each upright shoot as soon as it has made two leaves beyond the last bunch of fruit: the shoots after being stopped will soon start, and after growing a few inches should be stopped again, as we wish to keep them within the limits of the trellis, and the laterals should be stopped beyond its first leaf. Thus we try to keep the vine equally balanced in fruit, foliage, and wood. It will be perceived that fall-pruning, or shortening-in the ripened wood of the vine, and summer-pruning, shortening-in and thinning-out of the young growth, have one and the same object in view, namely, to keep the vine in proper bounds, and concentrate all its energies for a twofold object, namely, the production and ripening of the most perfect fruit, and the production of strong healthy wood for the coming season's crop. Both operations, in fact, are only different parts of one and the same system, of which summer-pruning is the preparatory and fall-pruning the finishing part; but, while the vine will bear, without apparent injury, any reasonable amount of pruning during its dormant state in the fall or winter, any severe cutting during the summer is an unmitigated evil. G. W. Campbell, the well-known horticulturist, says: "All the summer-pruning I would recommend would be the early rubbing out of superfluous shoots upon their first appearance, leaving only what is required for next year's bearing-wood. This, with the pinching or stopping the ends of such shoots or canes as were disposed to be too rampant in growth, would be all I would ever consider necessary. Some of the most successful grape-growers within my knowledge carefully prune their vines in the fall or early spring, and then leave them entirely without summer-pruning."

Diseases, etc.

The American mildew (*Peronospora viticola*) first presents itself in the form of spots resembling a small accumulation of powdered sugar, not larger than a lentil, on the underside of the leaf; but imperceptibly these spots extend and join until they cover a larger portion of the entire lower face of the foliage. Later still, the centres of attack dry up and take the colour of brown or dead leaves, so that these mildewed, shrivelled, dried-up leaves are often confounded with or taken for sun-scald; but, on closer observation, mildew can easily be distinguished from sun-scald. If the effect of the latter, there is no white powdery mushroom vegetation visible on the lower face of the leaf. Mildew mostly attacks the foliage, sometimes also the young green stems; rarely the small, young, never the full-grown, ripening berries.

The important difference between Peronospora (the American mildew) and *Oïdium* (the European mildew) is not only that Peronospora appears on the lower, while Oïdium appears on the upper surface, but that the former penetrates the entire tissue of the leaf, while Oïdium grows on its upper surface only. Humidity and dryness exert a preponderating influence on the development of the disease; rain, dew, even fog, favour the spread and germination of the spores, while a prolonged drought restricts and kills them.

Professor Riley, the United States Entomologist, at Washington, handed me the following bulletin of his on these mildews (I have never heard of the Peronospora having developed itself in New Zealand, but it is as well that viticulturists should be acquainted with its appearance and characteristics):—

Two Chief Species.

There are very many fungi known to attack the grape-vine, as is evidenced by a glance at such works as "Fungi parassiti dei Vitigni," by Dr. Romueldo Pirotta (Milan, 1877); Die Pilze des Weinstockes," by Felix von Thumen (Vienna, 1878). But the two principal fungi, both of them popularly called "mildews," which interest the grape-grower, on account of the extensive injury they cause, are the *Uncinula spiralis* (Berkeley and Curtis), and the *Peronospora viticola* (Berkeley). Any popular statement in reference to grape-vine mildews, in order to be accurate, must take cognisance of these two species which occur ordinarily under opposite atmospheric conditions.