

In the elm the numbers are .11 and 34, in the chestnut .15 and 34, and in the horse-chestnut the stem has a thickness of .32, and the six leaves have an area often of 300 square inches. Of course, however, these numbers are only approximate. Many things have to be taken into consideration. Strength, for instance, is an important element. Thus the ailanthus, with a stem equal in thickness to that of the horse-chestnut, carries a smaller area of leaves, perhaps because it is less compact. Again, the weight of the leaves is doubtless a factor in this case. Thus in some sprays of ash and elder which I examined, of equal diameter, the former have the larger expanse of leaves; but not only is the stem of the elder less compact, but the elder leaves, though not so large, were quite as heavy, if not indeed a little heavier. I was for some time puzzled with the fact that, while the terminal shoot of the spruce is somewhat thicker than that of the Scotch fir, the leaves are not much more than $\frac{1}{3}$ as long. But may this not perhaps be due to the fact that they remain on more than twice as long, so the total leaf area borne by the branch is greater, though the individual leaves are shorter? Again, it will be observed that the leaf area of the mountain ash is small compared to the stem, and it may, perhaps, not be unreasonable to suggest that this may be connected with the habit of the tree to grow in bleak and exposed situations. The position of the leaves, the direction of the bough, and many other elements would have also to be taken into consideration; but still it seems clear that there is a correspondence between thickness of stem and size of leaf. This ratio, moreover, when taken in relation with the other conditions of the problem, has, as we shall see, a considerable bearing not only on the size, but on the form of the leaf also. The mountain ash has been a great puzzle to me; it is, of course, a true *pyrus*, and is merely called ash from the resemblance of its leaves to those of the common ash. But the ordinary leaves of a pear are, as we all know, simple and ovate or obovate. Why, then, should those of the mountain ash be so entirely different? May, perhaps, some light be thrown on this by the arrangement of the