Among the several aspects under which bacterial wilt of alfalfa might be discussed, two have been selected which are believed to be of chief interest among agronomists. One is the relation of winter injury to bacterial wilt; the other is a discussion of methods whereby resistance to wilt may be sought and studied. The search for resistance and an examination of the character and limitations of any resistance that may be found are tasks in which agronomist and pathologist must participate. A consideration of the utility of methods is essential to effective participation. Inasmuch as mechanical injuries to the alfalfa plant resulting from winter freezing appear to be the most frequent condition making infection possible, a review of the precise manner in which these injuries develop is a useful background against which methods of artificial inoculation may be compared and developed. The great need for artificial methods in the study of resistance to this disease will become apparent later.

The natural course of infection in bacterial wilt has been described previously and may be reviewed very briefly here. The bacteria causing wilt enter the plant through wounds. These wounds may be any exposure of the living active parenchymatous tissue of the plant to water in which the bacteria may be carried. The bacteria do not live and grow in dead tissue. The wounds to which natural infections have been traced thus far have always been in root or crown close to the soil level. The wounds may be very slight indeed and not of themselves damaging to the plant to any appreciable degree. From the point of first contact with living cells the bacteria grow between the larger younger cells chiefly in the rays until they pass through the cambium and enter vessels. When the bacteria have entered vessels, they are easily carried in water currents a long way up into the stems and down into the taproot where they cause a plugging not only of the vessels in which they have entered, but of nearby vessels. This process of plugging is not rapid, and while it is going on the plant if growing rapidly is adding new vessels which the

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