C74-03466

August 10, 1974

Mr. William L. Carter
Philip Morris Research Center
Richmond, Virginia

Dear Bill:

I was most pleased to receive your report on "Location of Pectin in Tobacco Plants". The outcome helps to define still more exactly the problem that led to this study.

1). Although I am a little uncomfortable about identifying the opaque material in your photgraphs as pectin and pectin alone, I think it fair to conclude that at least Pectin-like materials are distributed much more generally through the cell wall than I had assumed. Further, it is clear that these, presumably amorphous, materials are present as films or coatings upon a lamellar ground material that does not stain with your reagent. That is, the lamellar structure tends to fade out as you extract the "pectic" materials.

2) I looked for some indications of the concentration of pectin in the area of the middle lamellae of the cells (in histological sense). There are some indications in figs. 1, 2 and 3, but the concentration is nowhere nearly so definitive as I had assumed.

3) All figs. show some tendency for the vacuolar surface of the wall to stain darker, and I would guess that this is protein rather than pectin. Does your reagent stain protein? I don't know the precise chemistry of the staining reaction. If the material is not protein, then it would appear that there is a "pectin"-rich zone on the inner surfaces of the walls.

4) In any case, my model must now be revised to allow for the diffusion of water molecules from a very large number of cellulose strands into and through pectin coatings and likely for the multiple repetition of this process before these molecules finally escape the cell wall mass. This is a much different model from that earlier envisaged in which diffusion from an essentially clean cellulose layer was succeeded by diffusion through a pectin layer with very substantially longer mean diffusion paths than in the revised model; longer, that is, in terms of diffusion through a single material before entering an adjacent layer of the next material.

Perhaps we can discuss the consequences of this on my next visit. Thanks again for the information.

Sincerely,

Ray D.

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