Furthermore, the saving of time and printer's ink would amount to something in a word so often used. J. E. TODD

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FROST IN CALIFORNIA

TO THE EDITOR OF SCIENCE: In a recent issue of SCIENCE mention was made of the effect of a recent freeze upon the vegetation of southern California resulting in the destruction of many introduced varieties, including some very large trees.

The writer has been considerably interested in observing the effect of the freeze in this section, especially upon the different varieties of trees. Immediately following the freeze it did appear that many of the trees were probably killed. Peppers, eucalyptus, acacias and grevilleas among the larger trees suffered severely. Trees two to three feet in diameter and from twenty-five to thirty years old in some cases had the bark split clear to the wood almost from top to bottom of the tree. The bark turned black clear to the wood and great masses of it could be split off easily. Supposing that trees in such condition were certainly dead scores of them were cut down at once. Wiser counsel was to delay operations until opportunity was given to see what the outcome might be.

One can scarcely conceive what such a loss means to a community such as this, where shade means so much and where such magnificent results have been obtained. Some of our streets were lined with rows of eucalyptus from 75 to 150 feet high. Many of these have been cut down. Subsequent results show that delay in cutting and pruning was the wiser course in this instance, for, incredible as it may seem, many of the trees which had their bark split and turned black and loosened from the wood seem to have begun to develop a new bark, or in many cases the old bark seems to be reuniting with the wood and leaves and branches are being put forth.

I do not believe a single pepper of any size perished. In fact it seems to the writer that in their new coat of green they look brighter and fresher than ever.

Some of the acacias and grevilleas were probably killed, but I visited an acacia just recently which two weeks ago one would certainly have pronounced dead. The bark was split and loosened from the trunk and dry as tinder, the limbs were bare and brittle and dry enough to burn, but to my surprise when last I saw it here and there along the trunk the bark seemed to be reforming and green shoots a foot or more in length had grown. It looks as if with judicious pruning and care the tree might be made to live, though probably hideously deformed.

Perhaps the most surprising results are to be observed among the eucalyptus trees. Some varieties have suffered severely. The sugar gum (*E. cornocalyx*), lemon gum (*E. citriodora*), *E. robusta* and *E. callyophylla* suffered considerably. The blue gum. *E. globulus,* was injured in some localities. *E. amygdalina* was not injured at all.

The surprising feature in every case is the formation of a new bark or the rejuvenation of the old. Trees on which the bark was split and black and loosened from the wood now have bark green and full of sap and firmly united to the wood. The branches are for the most part dead, except the very large ones, and stand out bare and brown. The trunk and larger branches are covered almost from top to bottom with a new extremely dense growth of adventitious branches, thickly covered with leaves, giving the tree a peculiar fuzzy appearance.

Judging from the recovery of trees which two months ago were apparently lifeless, I believe it is safe to say that very few trees which were more than two or three years old and in a fairly healthy condition when the freeze came need have been cut. Judicious pruning will later be necessary.

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SCIENTIFIC BOOKS

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