the *F*-III (chloroform) fraction there were less gibberellin-like substances in girdled than ungirdled at R_F 0-0.5. In both the *F*-IV (acid) and *F*-V (acid butanol) fractions there was a greatly increased gibberellin activity in the ringed fruit. In the *F*-IV there were peaks from R_F 's 0.2-0.7, and R_F 0.9-1.0. In the *F*-V fraction there were three peaks, R_F 's 0.1-0.3, 0.5-0.6, and 0.9-1.0.

These results show that ringing is associated with great differences in content of gibberellin-like substances in 'Black Corinth' berries, and the increase in certain gibberellins may cause the enlarged fruit. Previous work with crude extracts failed to reveal an increase in hormone content in auxin and gibberellin as a result of ringing⁵. It is now necessary to discover which of the known gibberellins are involved in fruit enlargement, and hopefully the mechanisms involved. These results also indicate that many types of gibberellins are present in grapes, and that they occur in extremely high amounts.

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Timber Decay caused by Bacteria

In an inspection of a ninety-year-old building in Copenhagen some of the foundation piles were found to be soft from the surface inwards to a depth of 20-30 mm.

Samples of the softened wood of *Pinus silvestris* and *Picea abies* from 16 piles and one whole pile were taken for microscopic examination.

On cross-section of the wood, stained with safranin and aniline blue in picric acid, a number of the tracheids appeared to be heavily stained, especially along the rays and then in a more scattered pattern among apparently healthy cells. The stained parts consist of more or less fibrous, granular or amorphous masses together with different micro-organisms. In longitudinal radial sections the decay pattern is more clearly visible. First, small

Fig. 1. Decay in tracheidal walls of *Pinus silvestris* ($\times c.$ 930)

conical depressions are seen to extend from the cell lumen into the secondary wall; the depressions spread more or less irregularly to all sides in the secondary wall but do not penetrate the middle lamella. The tracheids adjacent to the rays are attacked first; next, tracheids at the growth ring boundary; then the attacks are more scattered. The passage of the micro-organisms seems to be through the ray cells and the bordered pits in the tracheids.

From the decay pattern it was concluded that the micro-organisms in question might be cellulose-decomposing. Some species of bacteria were observed together with fine hyphae and spores of an actinomycete.

In selective isolation experiments some aerobic sporulating bacteria and an actinomycete were isolated. The nutrient used was a cellulose-mineral salt medium with 0.01 per cent yeast extract. After inoculation, the enrichment culture was heated for 1 h at 60° C.

The isolates were proved to be cellulose-decomposing, but it has not yet been possible to develop in cultures the decay in wood cell walls described above. The actinomycete has been referred to the genus *Micromonospora*.

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Response of Oxidation and Phosphorylation in Citrus Mitochondria to Arsenate

COMMERCIAL application of lead arsenate to citrus foliage has long been used to accelerate reduction of acidity in grapefruit. The effective moiety has been found to be arsenate. Control of citric acid accumulation by some other means would be highly desirable and is the object of the work recorded here.

Arsenate competition with phosphate as an electron acceptor indicates that phosphorylation could be the key to the mechanism of citric acid accumulation. Citrus mitochondrial preparations capable of oxidative phosphorylation offer good material for phosphate esterification investigations¹. This communication will also amplify the previous brief account of mitochondrial isolation².

Cell particulate fractions were isolated from orange fruit at different stages of maturity according to the following procedure. The orange fruit sections of *Citrus sinensis* (L.) Osbeck (generally about 100 g fresh weight) were separated from the peel immediately after gathering and cooled to 0° C. All solutions, equipment, and subsequent operations were carried out at 0°-2° C, except the measured reactions which were at 25° C. The homogenizing solution consisted of sucrose 0.25 M, mannitol 0.37 M, ethylenediamine tetraacetic acid (EDTA) 0.005 M, and cysteine 0.004 M adjusted to pH 7.0 according to Wiskich *et al.*³. The mitochondrial suspending solution contained mannitol 0.3 M, *tris* 0.01 M, magnesium chloride 0.005 M, and was adjusted to pH 7.0 with potassium hydroxide.

The juice vesicles were ruptured under the homogenizing solution, 1 : 1 (w/v), by hand with the aid of a stainless steel grater. Because of the generally high acidity of the juice (up to 50 m.equiv./100 g fresh weight), the pH was maintained at 7.0 by continuous addition of potassium hydroxide, using the bromthymol blue indicator.

The homogenate was then strained through four layers of cheese-cloth and the filtrate centrifuged at 500g for 5 min and the debris discarded. The supernatant solution was then centrifuged at 15,000g for 15 min and the pellet suspended with the aid of a Potter-type homogenizer in 100 ml. of suspending solution per 100 g original fresh weight. A slow speed (500g for 5 min) was used to further remove non-mitochondrial nitrogen⁴. Unless otherwise