voltages produced, as scatter of the readings was caused by movement of the point. The voltage was dependent on the shape of the point, the tip radius in this case being about 0·2 mm.

A possible explanation of the above effect is as follows. At the metal – insulator contacts the difference of the Fermi-level of the metal, and surface or impurity levels in the dielectric, causes a flow of electrons from the metal to the dielectric. Due to the insulating property of the plastic, the charge transference is proportional to the actual contact area. When loaded, the electrodes are charged by different amounts due to the differential change of contact area, and so there is a change of voltage across the specimen. Hardness tests show that the area of indentation caused by concentrated loads on solid surfaces is proportional to $(\text{load})^n$, where n is between 0·6 and 1·0.

To test this hypothesis, a relatively large change of contact area for a small load was obtained by using a bead of mercury as the top electrode. Voltages of the same order as previously were produced by spreading the mercury over the surface with slight pressure.

Work is continuing on this problem, using more controlled conditions and carefully prepared surfaces.

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Aerobic Decomposition of Chitin by Micro-organisms

From manured garden soil two strains of chitinovorous bacteria have been isolated on agar plates of the following composition: chitin (finely ground), 1 per cent; dipotassium hydrogen phosphate, 0·1 per cent; magnesium sulphate, 0·1 per cent; calcium chloride, 0·03 per cent; agar, 1·5 per cent, in tap water; *p*H 7. The chitin was made from shrimps; the procedure of Benton[1] was mainly followed. Chitin thus prepared has a nitrogen content of 6·9 per cent and showed the characteristic X-ray diagram.

Chitin decomposition could be readily detected on the greyish-white agar, as chitinovorous strains form clear zones around their colonies. Stock cultures of the isolated strains could be kept on yeast extract glucose agar without loss of chitin-decomposing capacity.

In order to obtain information about intermediary products in chitin breakdown the following experiments were carried out. The strains were inoculated in 3-litre Erlenmeyer flasks, each containing 300 ml. of a liquid medium having the same composition as the agar medium mentioned above. The cultures were incubated at 30° C. with continuous shaking. One strain (still unidentified) showed rather slow decomposition of chitin, whereas the other (belonging to the genus *Corynebacterium*) attacked the chitin very rapidly, 3 gm. of chitin disappearing completely within three days.

At successive stages of decomposition of the chitin the culture liquids were treated as follows. After centrifugation, the liquid was filtered through a porcelain filter in order to remove all bacteria. Then the filtrate was evaporated *in vacuo*; the remaining 4–5 ml. were used for chromatographic analysis. Filter-paper chromatograms were made using strips of Whatman No. 1 filter paper, with collidine and phenol as solvents. Use was made of the following spraying reagents: ninhydrin, aniline hydrogen phthalate (Partridge[2]) and the hexosamine reagents (Partridge[3]).

In the culture liquids of both strains, acetylglucosamine as well as glucosamine appeared to be present. As the spots were rather faint, an attempt was made to accumulate intermediary products by checking growth in two ways. After initial incubation as mentioned above, some cultures of each strain were kept at 45°, the cultivation of others being continued under anaerobic conditions in a nitrogen atmosphere at 30° C. Then the culture liquids were treated as before. Under these conditions, culture liquids of both strains gave heavy spots of acetylglucosamine and glucosamine, showing that hydrolysis of chitin and subsequent deacetylation of acetylglucosamine had continued under conditions in which growth of bacteria was inhibited.

The appearance of acetylglucosamine and glucosamine in the chitin cultures was coupled with the formation of acetic acid and ammonia. The formation of ammonia makes it probable that glucosamine is deaminated by both strains; glucose, however, could not be found in the culture liquids.

Further studies on chitin decomposition are in progress.

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Sept. 14.

[1] Benton, A. G., *J. Bact.*, **29**, 449 (1935).
[2] Partridge, S. M., *Nature*, **164**, 443 (1949).
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Effect of Purines on the Multiplication of Plant Viruses

It has recently been shown[1] that the substituted purine, 5-amino-7-hydroxy-I-V-triazolo (D) pyrimidine (guanazolo), when sprayed on the leaves of plants delays or inhibits, within the plant, the development of certain virus infections. Subsequent work, reported briefly here, has shown that hypoxanthine, adenine and guanine reverse the activity of guanazolo, while other naturally occurring purines do not. The triazolo analogue of hypoxanthine also shows some virus-inhibitory activity.

In reversal experiments, compounds were sprayed on the leaves before inoculation. Effects were measured by the number of local lesions produced and by the numbers and time of development of systemic infections.

Using lucerne mosaic virus in *Nicotiana glutinosa* or *N. tabacum*, it was found that adenine, guanine and hypoxanthine at 0·01 *M* concentration reversed the activity of guanazolo (0·005 *M* in 0·1 per cent sodium bicarbonate), whereas xanthine, uric acid, theobromine, theophylline, caffeine, uracil, thymine and urea did not. Of the three purines which showed reversing activity, hypoxanthine was the most effective. However, the possible effects of guanine have not yet been adequately tested, since the compound has no detectable effect when applied in suspension in water, while at the *p*H at which it