sterile urine containing the glucuronide. Our experiments suggest that more than a simple hydrolysis of the glucuronide may be involved in the action of the organism, for we have not always been able to detect glucuronic acid itself, which should be present after hydrolysis.

Staph. albus might occur as a contaminant of urine collected in the usual way. Our work, however, does not show that this organism is the only common one which may be concerned in glucuronide destruction, and we are at present engaged in a more systematic search for bacteria of the glucuronide-destroying type.

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Intermediates in Soil Nitrification

ON somewhat indirect evidence, the theory has been put forward[1,2] that hydroxylamine is an intermediate in the first stage of soil nitrification, that is, the stage in which ammonium ions are oxidized to nitrite ions. I have now tested this theory directly by making use of the observation[3] that fresh soil percolated with an ammonium salt and potassium chlorate produces no nitrate but only nitrite, because the chlorate ion selectively inhibits the proliferation of the nitrite-oxidizing micro-organisms. It therefore follows that if hydroxylamine is an intermediate in nitrite formation, a soil percolated with hydroxylamine and chlorate should produce nitrite in the percolate. Because the colorimetric estimation of very low concentrations of nitrite is simple and certain, the hydroxylamine may be tested at very low concentrations and its possible toxic effect[4] minimized.

The soil percolators[5] were actuated by a stream of air, previously sterilized and freed from traces of ammonia by passage through $M/50$ copper sulphate in $M/50$ sulphuric acid, fed in through the bubbler tubes. In these percolators, 10-gm. lots of the crumb layer of San Juan chocolate soil (air-dried and sieved 4·0 mm.–1·0 mm.) were percolated for 24 hours with 100 ml. distilled water. This wash percolate was then discarded, and the soils repercolated with 100 ml. of either $M/10{,}000$ potassium chlorate, or $M/10{,}000$ potassium chlorate containing ammonium sulphate and/or hydroxylamine. Parallel tests were also run with hydrazine in place of hydroxylamine, hydrazine being another possible intermediate. All nitrogen compounds were added to a concentration of 7 μgm. nitrogen per ml. percolate. After five hours of test percolation, the nitrite concentrations of the percolates were determined by the Griess – Ilosva reagent. The results are given in the accompanying table.

Nitrite formation by 10 gm. lots of San Juan soil percolated with 100 ml. $M/10{,}000$ potassium chlorate with or without the addition of various nitrogen compounds at concentrations of 7 μgm. N/ml.

Nitrogen compound added to percolate	Nitrite–nitrogen concentration of percolate after 5 hours percolation (μgm. N/ml.)			
None	<0·01	<0·01	<0·01	<0·01
Ammonium sulphate	0·26	0·26	0·26	0·26
Hydroxylamine hydrochloride	<0·01	<0·01	<0·01	<0·01
Hydrazine sulphate	<0·01	<0·01	<0·01	<0·01
Hydroxylamine hydrochloride plus ammonium sulphate	0·26	0·26	0·26	0·30
Hydrazine sulphate plus ammonium sulphate	0·29	0·29	0·27	0·24

These results do not prove that neither hydroxylamine nor hydrazine is an intermediate in the first stage of soil nitrification; they suggest that neither compound acts as such when added extracellularly. It is possible, for example, that neither compound can penetrate the cell wall, or that both are destroyed by other soil reactions before they can reach the nitrifying cells.

If it is true, however, that hyponitrite is an intermediate[6] and that carbon dioxide is essential in soil nitrification[7], then there is a distinct possibility that the first *recognizable* step in nitrification in soil is the dismutation of ammonium bicarbonate into hyponitrite and formaldehyde:

$$NH_4HCO_3 \rightarrow HNO + H_2O + H.CHO.$$

This equation is tentative and lacks experimental proof; but the similarity it bears to the 'basic' equation of photosynthesis is interesting in view of Godlewski's suggestion[8] that the energy released by ammonium oxidation by the nitrifying organisms replaces that captured by the photosynthetic process in photosynthesizing organisms.

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Nomenclature of the British Littorinidæ

THE currently accepted classification of the British Littorinidæ (= Lacunidæ) is that of Winckworth[1]. In his earlier publication[2] on the nomenclature of this group, Winckworth assigns the species formerly included under *Littorina*, on the basis of differences in the methods of reproduction, to four genera, thus: (1) *L. littorea* (L.) to *Littorina* Ferrusac, (2) *L. saxatilis* (Olivi) to *Littorivaga* Dall, (3) *L. neritoides* (L.) to *Melarhaphe* Menke and (4) *L. obtusata* (L.), *L. æstuarii* (Jeffreys) and *L. littoralis* (L.) to *Neritoides* Brown (the occurrence of *obtusata* in Great Britain being, however, thought doubtful). "It has long been known that *L. littorea* has pelagic egg-capsules and passes through a free Veliger stage, while *L. rudis* is viviparous and *L. littoralis*, like the species of *Lacuna*, deposits eggs in oothecæ on the seaweeds." To the objection that these differences are ecological and should have no place in a classification based on morphology, Winckworth's reply was: "The closest groups are *Littorina* and *Neritoides* and to my mind the distinction between a Mollusc with a free Veliger stage and one that does not pass through this stage still remains of generic importance, while in