off through tubules located in the abdomen⁴. Elsewhere, 2-hexenal has been found in whale oil⁵ and is a common constituent of plants³.

Nothing is known of the function of 2-hexenal in Nature. It may serve as a repellent for predators of *Acanthocephala*. In the laboratory, *Acanthocephala* sometimes ejected this compound at imported fire-ants (*Solenopsis saevissima* var. *richteri* Forel) which were approaching. The ejection was unilateral to the side facing the ants and caused the ants to move away. When the ants actually attacked *Acanthocephala* it always ejected copious quantities of the secretion.

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¹ Griffiths, J. T., and Thompson, W. L., Univ. Fla. Agric. Exp. Sta. Bull., 591 (1957).

² Roth, L. M., Niegisch, W. D., and Stahl, W. H., *Science*, **123**, 670 (1956).

³ Dimick, K. P., and Makower, B., *Food Technol.*, **5**, 73 (1956).

⁴ Butenandt, A., and Tam, N. D., *Z. physiol. Chem.*, **308**, 277 (1957).

⁵ Onoe, K., and Hori, T., *J. Chem. Soc. Japan, Pure Chem. Sect.*, **73**, 275 (1952).

BACTERIOLOGY

Hæmolytic Activity of *Corynebacterium ovis*

THE Priesz-Nocard bacillus (*C. ovis*) which is responsible for a number of diseases of animals, including caseous lymphadenitis of sheep and ulcerative lymphangitis of horses, grows well on blood-agar medium, producing circular, opaque surface colonies which are frequently surrounded by a narrow zone of hæmolysis.

The hæmolysin, which is active against guinea pig, rabbit, horse and sheep corpuscles, is thermostable, non-antigenic and appears to be closely linked to the bacterial cells so that it cannot be obtained free in a filtrate¹.

During an investigation of the effects on animal erythrocytes of combinations of diffusible substances produced by bacteria (to be published), it was observed that mixed cultures of *C. ovis* and *C. equi* showed a synergistic hæmolytic effect on sheep, goat, ox and rabbit cells. The phenomenon was better illustrated by streaking the strains at right angles to each other on the surface of 1.5 per cent nutrient agar plates containing 4 per cent red cells which were previously washed three times in normal saline and re-suspended to the original volume of the blood. The inoculated plates were incubated in air-tight jars in a mixture of 10 per cent carbon dioxide and 90 per cent air, at 37° C. for 24–48 hr.

Fig. 1 shows the effect on sheep blood agar after 48-hr. incubation with the vertical culture streak of *C. ovis* running through the horizontal streak of *C. equi*. The hæmolytic pattern obtained is the result of the interaction of the diffusible products of both

Fig. 1. Sheep blood-agar plate showing the hæmolytic effect of *C. ovis* in the presence of *C. equi*

strains; that of *C. ovis* being active over a larger area than *C. equi* and neither exerting the hæmolytic effect independently. Unlike the hæmolysin described by Carne, the diffusible substance produced by *C. ovis* is active against ruminant and rabbit cells, but not horse red cells, and its effect is enhanced by the presence of 10 per cent carbon dioxide.

The plate method, which appears to be more sensitive than tube titration, has also been used to show that the diffusible product of *C. ovis* is filtrable and is capable of dialysation through 'Cellophane'; and is being adapted for antigenic studies.

These preliminary observations suggest that an indicator system of animal erythrocytes previously treated with an actively growing culture of *C. equi* may prove of value in elucidating the true nature of the hæmolysins of *C. ovis*.

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¹ Carne, H. R., *J. Path. Bact.*, **49**, 313 (1939).

Inhibition of Multiplication of Bacteriophage by Actinomycin

It has recently been found that actinomycin forms a complex with deoxyribonucleic acid but not with ribonucleic acid¹. In this communication we wish to present evidence to show that the antibiotic prevents multiplication of the phage while permitting the growth of the host bacterium.

The actinomycin used in these experiments was crystalline actinomycin S^{2,3}, supplied by the Daiichi Seiyaku Pharmaceutical Co., Ltd. The standard methods used for handling bacteria and phage and for determining nucleic acid were those described in another communication⁴.

Actinomycin S is known to prevent the growth of Gram-positive bacteria, but *Escherichia coli* B, a Gram-negative bacterium, used in this experiment, can grow actively in the presence of the antibiotic. Exposure of free T2r phage to 100 µgm./ml. of actinomycin S for 60 min. at 37° C. did not cause any