A detailed account of the tracer experiments performed at this Laboratory will be published in the near future.

HANS H. USSING

Laboratory of Zoophysiology,
University of Copenhagen.

[1] Krogh, A., *Proc. Roy. Soc.*, B, **133**, 140 (1946).
[2] Conway, E. J., *Nature*, **157**, 715 (1946).
[3] Lundegårdh, H., *Arkiv f. Botanik, Stockholm*, **32**, 12 (1945).

'Aerosporin', an Antibiotic Produced by *Bacillus aerosporus* Greer

A BACTERIUM isolated from the soil of a market garden in Surrey during February 1946 and afterwards from a Yorkshire soil and from the air has been found to produce an antibiotic of possible therapeutic importance for which, as it appears to be hitherto undescribed, the name 'Aerosporin'* is proposed. The production and properties of aerosporin are under investigation by a group of workers at the Wellcome Physiological Research Laboratories, and the purpose of the present communication is to direct attention to certain aspects of these studies, the results of which will be published in detail elsewhere.

The organism, a Gram-positive, spore-forming rod, has been identified by Mr. H. Proom with that described by Greer[1] from Chicago tap water as *Bacillus aerosporus*. *B. aerosporus* is considered by some authorities to be synonymous with *B. polymyxa* (Prazm.) Migula, and of three cultures so designated from the National Collection of Type Cultures, two (N.C.T.C. 4747, which originated from the Chicago Board of Health as *B. aerosporus*, and 1380) proved to possess similar antibiotic-producing activity, while one (N.C.T.C. 4745, from the United States and originally designated *B. asterosporus* (Meyer) Migula) did not.

The organism grows well in nutrient broth, but more satisfactory yields of antibiotic are obtained from half-strength broth to which sucrose or glucose and a trace of manganese has been added. In shallow layers at 28° C., the organism grows at the bottom of the culture fluid, where more or less mucilage is formed, depending on the choice of strain and medium. The antibiotic titre increases for four to seven days and then declines.

Aerosporin is a base, and methods for its extraction are similar to methods for streptomycin. Because the activity of the culture fluid is reduced by passage through a candle or a Seitz filter, the bacterial cells are removed by centrifugation. A convenient extraction procedure is one developed by Dr. C. G. Pope from the method for extracting streptomycin described by Van der Brook *et al.*[2] by which the aerosporin is adsorbed on to a suitable activated charcoal, the charcoal treated with dilute sulphuric acid, and the antibiotic eluted with aqueous acetone. The crude aerosporin sulphate is precipitated by the addition of dry acetone.

As described below, aerosporin is active against Gram-negative organisms, and the routine method for its assay has been a dilution method using *Escherichia coli* as the test organism. Two variants of the test have been used. In one the tests are read after approximately three hours incubation at 37° C.; in the other, after incubation overnight at 28° C.

Aerosporin is selective in its action against Gram-negative organisms. Among the more interesting of the pathogens against which it has proved chemotherapeutic in experimental infections in animals are *Hæmophillus pertussis*, *Eberthella typhosa* and *Escherichia coli* in the field of human medicine, and *Brucella bronchiseptica* and *Escherichia coli* strains of 'calf scour' in the veterinary field. The antibiotic is bactericidal in action, and, where attempted, cultural methods have failed to produce resistant strains.

Aerosporin is readily produced, is relatively stable, and in addition to its selective action is of high intrinsic potency. Weight for weight it has the same order of chemotherapeutic activity against Gram-negative organisms as has penicillin against Gram-positive.

G. C. AINSWORTH
ANNIE M. BROWN
G. BROWNLEE
Wellcome Physiological Research Laboratories,
Beckenham, Kent.
May 19.

* Application has been made by the Wellcome Foundation, Ltd., for the registration of the word 'Aerosporin' as a trade mark.

[1] *J. Infect. Dis.*, **42**, 508 (1928).
[2] *J. Biol. Chem.*, **165** (2), 463 (1946).

Selective Toxic Action of Thiosulphate on Plants

INVESTIGATIONS have been recently carried out on the effects of low concentrations of sodium thiosulphate on the germination and subsequent root growth of a number of plants. (These investigations were undertaken as a result of earlier work, not yet published, by Quastel, Hewitt and Nicholas, on the effects of thiosulphate on growth of crops in soils.)

The experiments were carried out with sterile seeds grown under rigidly sterile conditions by a technique recently described[1,2]. Three concentrations (namely, $M/1{,}000$, $M/100$ and $M/10$) of thiosulphate, together with controls, were used in normal culture solutions. Concentrations and controls were usually set up in triplicate, samples of 10–20 seeds being used in each tube or set of tubes. After a period of 7–10 days growth at 20–22° C. in artificial light (9 hours per day) the percentage germination and total weight of roots produced were found for each concentration. From these figures the 'root-growth index' (ratio of average weight of roots per seedling in thiosulphate solution to average weight of roots per control seedling multiplied by 100) has been calculated, and this gives a direct indication of root-growth inhibition by thiosulphate. This provides a rigid separation of the two effects (namely, on root growth and on germination).

Results for experiments on cress (*Lepidium sativum*) are seen in the accompanying figure, where root-growth index and percentage germination are plotted against a logarithmic scale of increasing thiosulphate concentrations. The straight lines join the mid-points of the observed values for each concentration. By interpolation, the concentration of thiosulphate necessary for 50 per cent inhibition of both root growth and germination can be roughly estimated. With cress these concentrations are $4{\cdot}7 \times M/1{,}000$ and $26 \times M/1{,}000$ for root growth and germination respectively.