Phage 12/57 does not produce clearing of broth cultures of 57 or 57/*S*, and in order to obtain high-titre lysates, recourse was taken to the modification of the confluent plaque method of Hershey *et al.*[8] described by Adams[9]. Successful experiments produced lysates of 57 or 57/*S* with plaque titres of 10^{10}/ml. as estimated by the agar layer method[10]. Lysates were centrifuged to clarity and rendered bacteriologically sterile by addition of chloroform.

Transduction experiments were conducted in a 37° C. water-bath and consisted of mixing 2 ml. of a 57/*S* lysate (about 2×10^{10} plaque-forming particles) with a deposit of about 6×10^8 wild type 57 cells obtained by centrifuging 1 ml. of an aerated overnight culture. The experiments were duplicated using a lysate of the wild type 57 of identical titre. No visible clearing occurs, and 15 min. after mixing, 0·1 ml. volumes were spread on a number of Difco *SS* agar plates. At 30-min. intervals 0·1 ml. volumes were spread on MacConkey agar containing 1,000 μgm. streptomycin sulphate/ml. After overnight incubation the *SS* plates were replicated[11] on to MacConkey agar containing 1,000 μgm. streptomycin sulphate/ml. An organism control (6×10^8 wild-type 57 in 2 ml. broth) and a lysate sterility control (2 ml. of the lysate) were similarly treated.

Replica plates of the *SS* agar in experiments using lysate from 57/*S* usually yielded about 100 colonies per plate, while those in experiments using the lysate from wild 57 were always sterile. Replica plates from organism controls were usually barren but occasionally showed 1 or 2 colonies per experiment. Lysate controls invariably confirmed their bacteriological sterility.

In experiments using lysates from 57/*S* the half-hourly direct platings on MacConkey agar containing 1,000 μgm. streptomycin sulphate/ml. first yielded colonies 2 hr. after mixing organisms and lysate. The corresponding plates in experiments using lysates of wild 57, and in the organism and lysate controls, never showed growth.

The transducing activity of 57/*S* lysates is not impaired by treatment with deoxyribonuclease (40 μgm. per ml. for 2 hr. at 37° C.) but is totally inhibited by phage 12/57 rabbit antiserum, which reduces the plaque titre from 10^{10} to 10^4/ml. The addition of a similar volume of normal rabbit serum to the lysate has no such effect.

Results outlined place this experiment in the class of bacteriophage-transmitted intrastrain genetic exchange.

The streptomycin resistance marker has been the only one employed to date. The high mutation-rate of wild 57 and wild 13 to sodium azide resistance precludes the use of this property as a marker. No biochemical or nutritional mutants have yet been recovered.

The transduction frequency per phage particle is about 10^{-7}, and is comparable with rates encountered in common transduction systems[12]. There appears to be a delay in phenotypic expression of transduced streptomycin resistance. This delay has also been encountered with the transduction of streptomycin resistance in the *Salmonella typhimurium* system[13]. As in the latter system no abortive transductions have been detected.

Study of the transduced organisms has proved that the streptomycin resistance is a stable characteristic. These organisms do not differ biochemically from the wild type. None of the colonies tested to date adsorbs phage present in either 57 or 57/*S* lysates. Mutants of wild 57 resistant to phage present in lysates of 57 are not resistant to streptomycin. The mechanism by which the streptomycin-resistant transductants of 57 become resistant to phage is being investigated.

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Characteristics of *Thiobacillus thioparus*

During investigations of the bacterial decomposition of thiosulphate and thiocyanate in effluents from gasworks, it became necessary to identify the organisms responsible. These were *Thiobacilli*, and one in particular, organism *G*, appeared identical with *T. thioparus* as described in Bergey[1]. To confirm this, its behaviour was compared with various *Thiobacilli* from the National Collection of Industrial Bacteria. As a result of this comparison it was discovered that the type species, *T. thioparus* (NCIB 8370), did not correspond with Bergey's classification on two important points: it grew on nutrient agar, and it grew anaerobically on thiosulphate containing potassium nitrate. To check this a further specimen of the organism was obtained, and although this was again a pure culture it showed precisely the same characteristics.

After discussion with a member of the staff of the National Chemical Laboratory, it was concluded that due to difficulties associated with the culture originally given to the Collection, NCIB 8370 was probably not *T. thioparus*.

The matter is of some importance, as strain NCIB 8370 was used by De Kruyff *et al.*[2] to show that *T. thioparus* and *T. thiocyanoxidans* are identical; as it seems not to be *T. thioparus* their conclusions would appear to be invalid.

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