of the ribosome is hindered by spectinomycin.

At the same time the cataloguing of antibiotics in terms of their mode of action continues. Pestka (*Arch. Biochem.*, **136**, 80; 1970) has examined the effect of a range of antibiotics on the puromycin reaction, which involves the formation of a peptidyl puromycin bond, and so serves as a convenient prototypic protein synthesis model. It seems that chloramphenicol and sparsomycin function as competitive inhibitors of puromycin, whereas six other antibiotics are non-competitive inhibitors. Sparsomycin has been previously reported to promote the association of aminoacyl-tRNA with the ribosome and may therefore make it unavailable for reaction with puromycin. Whether chloramphenicol operates in a similar manner, or by specific inhibition of the peptidyl-transferase step, is not yet clear.

In a second report (*ibid.*, 89) Pestka examines whether the antibiotics disturb the translocation reaction by analysing the product of a poly-U-stimulated system for phenylalanylphenylalanine, and oligophenylalanines with chain length three or more. The relative amounts of these in the mixture then give a measure of the extent to which translocation—the ability of the ribosome to shift from one coding triplet on the messenger to the next—is inhibited. The presence of GTP and the protein factor *G* is another variable which can be controlled. The steroid antibiotic, fusidic acid, turns out to be the only one that unequivocally blocks the capacity of the *G* factor to induce translocation, though two others have a lesser, and probably secondary, effect. The remaining antibiotics tested inhibit oligopeptide synthesis, but their action is manifested in the absence of the *G* factor and GTP. It is most likely—and indeed in some case has been established previously—that these antibiotics operate by preventing the attachment of incoming aminoacyl-tRNA to the ribosome.

How such effects on the ribosome are physically accomplished by a single molecule of antibiotic is another issue, but it has been widely supposed to involve some steric disturbance, local or gross, of the ribosome structure. The first direct evidence for such an effect has been described by Sherman and Simpson (*Proc. US Nat. Acad. Sci.*, **64**, 1388; 1969). It is known from tritium exchange experiments that a considerable proportion of the exchangeable hydrogen atoms in intact ribosomes is inaccessible, but when the ribosomes are dissociated into their subunits by withdrawal of magnesium all exchange essentially instantaneously. The addition of streptomycin to *E. coli* ribosomes induces a considerable alteration in the tritium exchange kinetics: with low ratios of antibiotic to ribosomes there is a marked increase in exchange, suggesting a fairly extensive conformational loosening (or diminution in the strength of association between the subunits). In these conditions there is little inhibition of poly-U-directed polypeptide synthesis, or misreading (a familiar and striking effect of this antibiotic). When the molar ratio of antibiotic to ribosomes exceeds 0.1, however, both effects are progressively and strongly manifested, and at the same time the rate of tritium exchange begins to diminish, and falls to something considerably lower than the value for the pristine ribosome. Sherman and Simpson suggest that there are two completely different modes of interaction. With ribosomes from streptomycin-resistant cells neither type of effect can be observed.

HEALTH

Unusual Cause of Impotence

from our Social Medicine Correspondent

CIRCUMSTANTIAL evidence has been recently found of a possible link between impotence and the use of certain herbicides and pesticides (Espir *et al.*, *British Medical Journal*, **1**, 379; 1970). Between April and November 1967, four out of five members of a team of farm workers who had used these chemicals complained of difficulty in achieving and maintaining an erection, having previously been perfectly normal in this respect. None had any other symptom and none experienced an appreciable fall-off in libido.

The possibility of a toxic cause was not suspected immediately in the first patient, but fortunately he stopped using the chemicals of his own accord and recovered completely within 2 months of the onset of impotence. When a second patient of similar occupation visited the same general practitioner 7 months later, suspicion fell on the chemicals. He and two subsequent patients were advised to avoid further contact with the pesticides, and except for the third patient, who took a year to recover completely, all recovered their potency within 2 to 3 months. Each patient was treated with methyltestosterone, but Espir *et al.* say there is no clear evidence that this enhanced recovery, which may have occurred spontaneously after the men stopped using the chemicals.

Nine groups of compounds were used on the estate in question during 1967: organophosphorus, substituted phenols, dipyridyls, organochlorides, substituted phenoxy compounds, triazines, carbamates, dithiocarbamates and ureas and uracils. All were used either during early spring and/or late summer and autumn—coincidental with the reported impotence. The men had occasionally disregarded regulations concerning the safe use of chemicals because of the discomfort from the lack of ventilation with protective clothing.

According to Espir *et al.*, remission of impotence, as in the cases described, is not consistent with many of the possible organic diseases. Though multiple sclerosis could not be excluded on this basis, there were no other signs of any neurological disorder and neither was there any evidence of psychological, endocrinological or local structural disease. In view of the circumstantial evidence, and having been unable to find any alternative cause, Espir *et al.* conclude that the reversible impotence was probably due to the toxic effects of the chemicals to which the men were exposed, though there was no evidence of poisoning with these compounds. Organophosphorus compounds were originally thought to be responsible, but Espir *et al.* could not find previous reports of impotence as an isolated manifestation. They therefore cannot say whether the reversible impotence was caused by a single substance or by two in combination.

Additional support for the proposed link is provided in an article in the December issue of the *Medical News Tribune* (**19**, 21; 1969). Referring to this in their addendum, Espir *et al.* say the case in question was an agricultural labourer who, for 3 years, complained of impotence, nausea and some indigestion which started each year in March and lasted for 6 weeks—the time of year when he used insecticides and herbicides. The sprays which the labourer thought upset him were 'Metasystox 55', 'Gesatop' and 'Tecano'.