a. Reverse mutation system in *Salmonella.* Histidine-requiring mutants exist which revert by single base pair changes, i.e., transitions or base pair insertions or deletions. By selection of the proper strains, most possible point mutation mechanisms can be detected.

b. Forward mutation systems based on resistance to streptomycin or other antibiotics, can be used. It is, however, uncertain how many places in the gene can mutate to give resistance mutants, and therefore, it is a question whether all types of base pairs changes can be detected.

c. Differential staining techniques (Eosin-Methylene blue), exist in which lactose nonfermenting mutations can be detected and quantitated.

CITED REFERENCE

(*1*) WHITFIELD, H. J., MARTIN, R., AND AMES, D. J. *Molecular Biology 21*: 335, 1966.

Neurospora.—Neurospora crassa is a haploid organism with seven chromosomes and a normal meiotic cycle. However, by using a balanced heterokaryon between biochemically marked strains, the diploid phase of higher organisms can be mimicked. Chromosome deletions as well as point mutations can thus be detected. Forward mutations can be recovered in the ad-3 region of chromosome 1 (*1*), without applying selective techniques. Either growing cultures or spores (*conidia*) can be exposed to chemicals under test. After the treatment, *conidia* are inoculated into 10 litre Florentine flasks and incubated for 7 days. Each flask can contain 10^6 colonies which are screened for presence of purple mutants. The frequency of the different fractions of the *conidia* population from the heterokaryon can be determined by plating on different substrates.

Very refined genetic analysis can be carried out on the mutants. The frequency and the size of the chromosome deletion can be determined (*5*), and the genetic alterations of the point-mutations can be identified at the molecular level (*3*, *4*). From the plate counts, it is possible to distinguish between nuclear and cytoplasmic inactivation.

Mutations frequencies induced by 500 r can be easily and practically detected. *Neurospora* is obviously metabolically different from mammals; therefore, tests for mutagenicity should include mammalian metabolites of the pesticide and the use of *Neurospora* in the host mediated assay system (*2*).

CITED REFERENCES

(*1*) DE SERRES, F. J. and R. S. OSTERBIND: Estimation of the relative frequencies of X-ray-induced viable and recessive lethal mutations in the ad-3 region of *Neurospora crassa. Genetics* 47: 793–796, 1962.