(4) LEA, D. E.: Actions of radiations on living cells. (2nd ed.) New York. Cambridge University Press, 1962, 416 pp.
(5) PUCK, T. T.: and F. KAO: Genetics of somatic mammalian cells. V. Treatment with 5-bromodeoxyuridine and visible light for isolation of nutritionally deficient mutants. *Proc. N.A.S.* 58:1227–1234, 1967.

The host-mediated assay.[1]—A great deal of recent work in genetics has served to point out the universal nature of the genetic code. Although the level of organization of genetic material in bacteria is different from that in man, there is no basis for assuming that the action of a mutagen will be markedly different. It is essential, however, to properly define the ultimate mutagenic agent occurring in the mammalian host. There are numerous examples of compounds that are not mutagenic in micro-organisms, but are converted to active mutagens in animals, and there are many compounds that are active in micro-organisms but detoxified in mammalian systems. The host-mediated assay was developed to determine the ability of laboratory animals to either activate or detoxify compounds in regard to their mutagenic activity.

In this assay, the mammal, during treatment with a potential chemical mutagen, is injected with an indicator micro-organism in which mutation frequencies can be measured. It is important to note that mutagen and organism are administered by different routes. After a sufficient time period, the micro-organisms are withdrawn from the animal and the induction of mutants is determined. The comparison between the mutagenic action of the compound on the micro-organism directly and in the host-mediated assay indicates whether the host can modify the compound and whether mutagenic products can be formed as a result of host metabolism. The formation of mutagenic metabolic products from dimethylnitrosamine, and the plant toxin, cycasin, have been reported using this procedure.

Indicator micro-organisms presently being used in this procedure include the histidine auxotroph of *Salmonella typhimurium*, and *Neurospora crassa*, where scoring for forward mutations is carried out. In the *Salmonella* system, a number of known auxotrophs are injected intraperitoneally in an animal previously treated with the chemical. After six generations, approximately 3 hours, the organisms are recovered from the intraperitoneal cavity and the induction of mutation determined. The effect in the animal is compared with the effect of the chemical in an *in vitro* plate assay. In the *Neurospora* system, *conidia* from the *Neurospora dikaryon* described earlier can be injected into the peritoneal cavity or subcutaneously in mice or rats. In rats, the *conidia* can also be injected into the testis. After 48 hours, 50–70 percent of the *conidia* can be recovered with approximately