exponentially growing cultures (Hahn and Little, *Curr. Top radiat. Res.*, 1972, **8**, 39).

The following results were obtained with Chinese Hamster V79-379A cells grown in suspension to limiting cell density; cells remaining viable for 48 h in a post-mitotic state. Response to treatment with *e.g.* methyl methane sulphonate was compared with the response of similar, exponentially growing cells.

The survival curves have similar slopes but the shoulder is much reduced with stationary cells. Non-semi-conservative synthesis occurs in both cases but the recovery of template-DNA size is slower and less complete in the case of stationary cells. This is consistent with the hypothesis that ligation of DNA is a deficient aspect of repair in these non-dividing cells.

DECREASE IN THE ACCURACY OF DNA POLYMERASE FOLLOWING TREATMENT WITH γ-RAYS AND METHYLNITROSOUREA. R. SAFHILL, Paterson Laboratories, Manchester.

DNA synthesis *in vivo* must be a very accurate process in order that the integrity of the base sequence of the genome be maintained. When using *in vitro* systems, DNA polymerases from both bacterial and mammalian sources have been found to incorporate only one wrong base in several hundred thousand, whilst *in vivo* their accuracy could result in only one wrong base in 10^{10}.

We have been investigating the effect of ionizing radiation and various carcinogenic agents upon DNA polymerases and have found that γ-rays or methylnitrosourea will decrease both the activity and accuracy of *E. coli* DNA polymerase I, as well as the proteolytically cleaved form of the enzyme, by up to 2 orders of magnitude. An error-prone DNA polymerase has recently been observed in human leukaemic cells and several recent reports further indicate that there may be a connection between the accuracy of DNA synthesis and carcinogenesis (Loeb, Springgate and Battula, *Cancer Res.*, 1974, **34**, 2311).

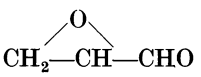
UNSCHEDULED DNA SYNTHESIS STUDIED IN THE INTACT ANIMAL. V. M. CRADDOCK, MRC Laboratories, Carshalton, Surrey.

While much evidence demonstrates the importance of DNA repair polymerase activity in mutagenesis and carcinogenesis, most work has been carried out using cell cultures. To relate repair of DNA to carcinogenesis, information is needed on its occurrence in the intact animal. The methods available, involving autoradiography or use of BUdR, have disadvantages. A new method is suggested which depends on the fact that the DNA and chromosomal protein content of the nuclei double in replicating cells, so that the nuclei become larger and denser and sediment more rapidly in a sucrose gradient. After an injection of ^{3}H-thymidine, non-cycling diploid and tetraploid nuclei can be separated from replicating ^{3}H-labelled nuclei (Haines *et al.*, *FEBS letters*, 1975, **10**, 113). Nuclei in which DNA repair synthesis is taking place do not double their content of genetic material, the ^{3}H-profile following the non-cycling diploids and tetraploids. Liver nuclei isolated from animals treated with DMN or MMS gave a " repair type " profile, which contrasted with that given by nuclei from untreated animals, or from animals in which DNA synthesis had been reduced by treatment with cyclohexamide.

CHROMIUM CARCINOGENESIS AND GLYCIDAL FORMATION. R. SCHOENTAL, Department of Pathology, Royal Veterinary College, London.

The mechanism by which simple inorganic compounds induce tumours is no less obscure than that operating in the case of organic carcinogens. It has been recognized that the latter probably acquire in the course of their metabolism epoxy- and carbonyl, or other functional groups, which allow cross linking of cellular macromolecules in a permanent manner (Schoental, *Br. J. Cancer*, 1973, **28**, 436; *Ibid.*, 1974, **29**, 92).

The tanning ability of chromates depends on the formation of glycidal, derived from neutral fats by hydrolysis and subsequent oxidation of glycerol. This epoxyacraldehyde,



cross-links proteins etc in the hides. Glycidal is known to be carcinogenic for mice and for rats (Van Duuren *et al.*), and I suggest that