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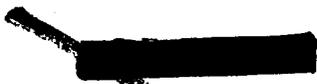
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BIOLOGY AND MEDICINE

RESEARCH

Biology

Cytogenetics

In recent tradescantia inflorescences experiments the chromosome aberration yield was enhanced if the centrifuge was started immediately after irradiation. It was also noticed that centrifuging for long periods of time, either previous to or during irradiation, decreased the aberration yield, apparently because the temperature rise due to friction of the centrifuge is enough to hasten the rejoining of broken chromosome ends. The fact that post-irradiation centrifugation can increase the chromosome aberration yield indicates that radiation-induced breaks are not latent. This suggests a new tool for determining whether or not the same number of breaks are induced by irradiation in air as in nitrogen.

It was demonstrated that treatment of Paramecium aurelia with low concentrations of H₂O₂ either before or after irradiation decreases the amount of detectable mutation. This finding is contrary to all previous findings which had indicated that the peroxide can act as a mutagen. It also shows that peroxide, acting after irradiation, does not enhance the effect of the radiation, as had been reported in England for bacteriophage. The effect decreased with time after irradiation but was still detectable a day later, following four cell divisions. A large effect was found even when none of the paramecia were killed and there was only a slight prolonging of the inter-division interval by the radiation. Thus it seems unlikely that a simple selection of non-mutant animals is involved. No satisfactory hypothesis can yet be offered.

Radiation Protection

It was found that in the human the bacterial recovery factor previously reported is present in the urine of both males and the females, including pregnant females. A 95 percent ethanol extraction of fresh urine yields a product purified approximately 10-fold. Paper partition chromatography is being used in attempts to purify this product. Experiments, designed to duplicate the recovery effect on a complex synthetic medium, are in progress.

Pathology and Physiology

Adult mice and rats surviving a nearly lethal dose of fast neutrons, produced in the 86-inch cyclotron, developed complete cataracts within 6 and 9 months, respectively; however, guinea pigs given the same dose developed only relatively mild opacities of the lens within the first year. These observations indicate the relatively high radiosensitivity of the lens of the mouse and the rat and suggest that severe cataract in the guinea pig results only from a dose of neutrons which exceeds the lethal dose for whole-body radiation.

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BIOLOGY AND MEDICINE (Contd.)

RESEARCH (Contd.)

A series of studies was undertaken to measure the exchangeability of radioactive potassium in frog embryos. A preliminary experiment establishing control levels was performed. The present work is concerned with a comparison of the exchangeability of potassium at various stages of development. Present findings indicate that the movements of lithium into and out of frog embryos is closely related to reciprocal sodium movements but not to potassium movements.