Initial results suggest that aggregation assessment methods based on changes in single cell or total particle counts may give misleading results under certain conditions. Using this technique, we have found that the extent of prior trypsinization has a critical effect on the subsequent kinetics of fibroblasts. Preliminary results with polyoma transformed fibroblasts show that initial cell suspensions contain a much higher proportion of single cells and form fewer and smaller aggregates than normal cells.

Wednesday 9 April

CLUSTERING IN ACUTE CHILDHOOD LEUKAEMIA IN DUBLIN. J. J. Fen-
nelly, J. Bell and A. McBride, Temple Street Children's Hospital and Our Lady's
Hospital for Sick Children, Dublin.

In a population of 80,000 in a Dublin area, 13 cases of acute childhood leukaemia
occurred in a 3-year period. In a comparable Dublin area of similar population 2 cases
occurred in the same period of time. Five of the 13 children lived within 500 yards of one
another and of these 5, 3 were diagnosed within a space of 10 weeks. The pre-
dominant type of leukaemia was lympho-
blastic. The father of one child with acute
myeloid leukaemia developed acute leukaemia
within 6 months of his son—both died
within 6 months of one another. Screening
tests on the 5 surviving family members
showed a significant increase in herpes
simplex virus titres. The expected instance
of this disease is just less than 3 per 100,000
per year. Our finding of 21 cases per
100,000 per year is statistically significant.

ORAL AND PHARYNGEAL CANCERS
IN TEXTILE WORKERS. E. Moss and
W. R. Lee, Department of Occupational
Health, University of Manchester.

There was a highly significant excess
(77%) of deaths in 1959–63 from oral and
pharyngeal cancers in male textile workers
compared with the male population of
England and Wales. The excess occurred in
tongue, mouth and pharynx.

Fibre preparers (mostly very dusty jobs)
had a highly significant excess of 330%,
weavers and knitters a deficit of 32%,
spinners and winders an excess of 32% and
bleachers, dyers and finishers an excess of
85%. Of 19 fibre preparers, 18 had worked
with wool and only one with cotton.

Occupational surveys of oral and pharyn-
geal cancer patients and age-matched controls
at Christie Hospital in Manchester and
Cookridge Hospital in Leeds are now covering
the two main textile regions of England. A
significant excess of textile workers has been
found in 57 female oral cancer patients in the
N.W. region where cotton predominates.

MALIGNANCY IN THE LARGE
BOWEL, THE INTER-RELATIONS OF
SEX, AGE AND SUB-SITES. J.
Powell, Regional Cancer Registry, Queen
Elizabeth Medical Centre, Birmingham.

A total of 23,000 malignant tumours of
the large bowel were registered in the
Birmingham Region during the period 1960–
71. The detailed classification used enabled
sex and age specific incidence rates to be
calculated for each sub-site.

Comparisons of these rates indicate a
surprising similarity between the sexes in the
proximal bowel, a change in the sigmoid and
the well known excess of males increasing in
successive segments of the distal bowel.
Within the colon, the sub-site incidence shows
some interesting contrasts. The ascending,
transverse and descending colon have virtu-
ally identical rates despite their differences in
length and surface area. On the other hand,
the caecum, hepatic and splenic flexures have
high rates out of proportion to their relatively
small size.

It is interesting to speculate on the
relation between these factors and current
theories on aeriology of the hind gut.

REPAIR PROCESSES AND THE RES-
PONSE OF DIVIDING AND NON-
DIVIDING CELLS TO ALKYLATION.
A. R. Crathorn, Pollards Wood Research
Station, Bucks.

It has been suggested that stationary
phase cultures of mammalian cells might be
better models of in vivo situations than
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 METHYL NITROSOUREA. 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 is 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 methyl nitrosourea 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,

$$\text{CH}_2\text{CHO}$$

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