ing Co. 1970), between 30 and 40% had objective remissions.

Pre-treatment levels of prolactin were variable, and were not changed by treatment, whether or not remission occurred. Pre-treatment levels of oestradiol varied less, but were also substantially unchanged in all patients during treatment. Growth hormone showed no consistent response. In most patients in whom regression of disease was observed, values of luteinizing and follicle stimulating hormone did not vary, but in the majority of non-responders, gonadotrophin levels were lowered.

METABOLIC ABNORMALITIES IN TUMOUR BEARING ANIMALS. K. C. CALMAN and R. A. MCALLISTER, Department of Clinical Oncology, Western Infirmary, Glasgow.

Twenty-four hours after implantation of the TLX-5 lymphoma in CBA mice, the CoA content of liver was significantly reduced ($P < 0{\cdot}001$). Significant reductions in the CoA content continued up to the seventh day, when the animals were in a moribund state. The citrate content of liver showed no further significant increases until the seventh day. Significant reductions in energy content (ATP, ADP, AMP) of these livers did not occur until 6 days after implantation.

Control experiments in which normal CBA mice were challenged with i.p. injections of normal CBA spleen cells, or with spleen cells from A strain mice, showed no change in the CoA or citrate content of liver. No decrease in CoA was noted in starvation experiments.

These results indicate that serious metabolic abnormalities occur in the non-involved organs of tumour bearing animals and these may be related to the development of cachexia.

UPTAKE OF ^{67}GALLIUM BY NORMAL LACTATING MAMMARY GLAND AND BY TUMOURS IN THE DOG. A. T. YOXALL and L. N. OWEN, Department of Clinical Veterinary Medicine, University of Cambridge.

Following intravenous injection of ^{67}Ga it is known that there is a concentration of the isotope in several tumours and in a few normal tumours, including lactating mammary gland. Investigations in the lactating bitch have shown that ^{67}Ga and ^{45}Ca were taken up by the mammary tissue at the same rate and that the isotopes reached similar levels in both plasma and milk. The isotopes were found to be associated with calcium binding proteins in milk. It was not possible to show any correlation between ^{67}Ga and ^{45}Ca uptake in a transmissible venereal tumour.

A preliminary study to investigate if there is any association between the "leakiness" of tumour blood vessels as determined by the uptake of ^{125}I-albumin and ^{67}Ga in a melanoma has produced equivocal results.

THE PROGNOSIS FOLLOWING SURGICAL EXCISION OF CANINE MAMMARY CARCINOMATA. D. E. BOSTOCK, Department of Clinical Veterinary Medicine, University of Cambridge.

Spontaneously arising canine mammary carcinomata may be of value as models in immunotherapeutic trials for breast cancer in women, but before their full potential can be exploited their behaviour following surgery alone must be known.

For this reason, 227 bitches from which histologically confirmed mammary carcinomata had been excised were followed up. Only 43% of these animals were eventually destroyed as a result of the original tumour but the accuracy of the prognosis could be improved by histologically sub-dividing the tumours. Papillary and tubular adenocarcinomata carried the most favourable prognosis, the median survival times being 12 and 90 weeks. Dogs with solid carcinomata had a medial post surgical survival time of 44 weeks whereas for those with anaplastic carcinoma it was only 11 weeks. Clinical immunotherapeutic trials will thus be concentrated on dogs with the latter tumour types.

Since most dogs die from their tumour within 12 months of surgery it should be possible to evaluate the effect of post surgical immunotherapy sooner than would be possible with a similar trial in man.

AUTORADIOGRAPHY OF EHRLICH ASCITES TUMOURS TREATED WITH SOYBEAN TRYPSIN INHIBITOR *IN VIVO*. P. WHUR and H. KOPPEL, Cell Biology Unit, Marie Curie Memorial Foundation, Oxted and B. WEATHERHEAD, Depart-

ment of Anatomy, Birmingham University Medical School.

We have previously reported (Whur *et al.*, *Br. J. Cancer*, 1973, **28**, 417) that intraperitoneal injections of soybean trypsin inhibitor into tumour bearing mice reduced the number of tumour cells recoverable in the ascitic fluid by up to 92%, and tentatively proposed on the basis of scanning E.M. observations that this reduction was attributable to large numbers of tumour cells adhering to the peritoneum. We have traced the fate of radiolabelled Ehrlich ascites tumour cells in autoradiographs of sections of the peritoneum and of cells from the ascitic fluid from trypsin inhibitor treated and untreated mice.

Our results indicate that cells on the peritoneum of treated mice, previously postulated to be tumour cells, are in fact of host origin. The disappearance of tumour cells from ascitic fluid of trypsin inhibitor treated mice is probably attributable to an enhanced inflammatory response in these animals.

GROWTH OF A CANINE SOLID MAMMARY CARCINOMA *IN VITRO* AND IN Nu MICE. L. N. OWEN and D. R. MORGAN, Department of Clinical Veterinary Medicine, University of Cambridge.

The biological behaviour of spontaneous anaplastic or solid carcinoma of the mammary gland in the dog is similar to carcinoma of the breast in women.

A 14-year old cross-bred terrier bitch developed rapidly growing and infiltrating solid carcinomata in the pelvic mammary glands on both sides. Following euthenasia, metastatic tumours in the lungs were made into a cell suspension and cultured in TC 199 containing 20% FCS. Better growth occurred following transfer to RPMI medium + 30% FCS or a very complex medium containing glutathione, cortisol and insulin. The culture has now reached its 40th passage with an approximate doubling time of 5 days.

Cells from the 30th passage were injected subcutaneously into a *Nude* mouse and within 22 days palpable tumours appeared. The histological diagnosis was solid carcinoma of similar appearance to the original primary and metastatic tumours in the dog. Tumour cells grown in tissue culture have been injected into foetal dogs and newborn puppies immunosuppressed with antilymphocyte serum.

GROWTH CHARACTERISTICS OF A HUMAN BLADDER TUMOUR SUBCUTANEOUSLY IMPLANTED IN IMMUNE DEFICIENT MICE. C. R. FRANKS, Imperial Cancer Research Fund Breast Unit, Guy's Hospital, London, D. R. TURNER, Department of Pathology, Guy's Hospital Medical School, London, and D. BISHOP and F. T. PERKINS, National Institute of Biological Standards and Control, London.

In previous studies (Franks *et al.*, *Nature, Lond.*, 1973, **243**, 91 and *Proc. R. Soc. Med.* (in press) 1974) it has been shown that human tumours can be grown by subcutaneous implantation in immune deficient mice. Growth has been assessed by serial measurements of the vertical and transverse diameters of the palpable tumour, and viability confirmed retrospectively at autopsy.

In this study, a papillary cell carcinoma of the human bladder on its second passage, 117 days after removal from the patient, was subcutaneously implanted in 5 mice. During the 70-day experimental period, needle biopsy was performed under anaesthesia at 14-day intervals using a disposable Menghini biopsy needle. The transverse and vertical diameters of the tumours were also measured using Vernier calipers.

The results show that between Day + 20 and Day + 25 there is a critical period during which the implanted tumours appear to undergo a process of selection, following which there is either an active increase in size or regression.

AGGREGATION KINETICS OF NORMAL AND TRANSFORMED BHK 21 FIBROBLASTS USING A PARTICLE COUNTER COUPLED WITH A CHANNEL ANALYSER. P. WHUR and H. KOPPEL, Cell Biology Unit, Marie Curie Memorial Foundation, Oxted.

We have examined cell aggregation in shaking suspensions using a Coulter model Fn counter coupled with a P64 channel analyser. After calibration this apparatus is used to detect the number of cells present in aggregates up to a maximum size of about 50 cells, and thus to calculate the net redistribution of cells between aggregates as aggregation progresses.