Serum oestradiol 17β was measured throughout the menstrual cycle in 40 normal women, in 17 with fibroadenosis, in 12 with cystic disease and in 10 with cancer of the breast, by radioimmunoassay (Cameron and Jones, Steroids, 1972, 20, 737).

Results showed that (1) 36 of the 40 normal premenopausal women exhibited a constant pattern, but concentrations varied with age; (2) oestradiol was low during the follicular phase of the normal cycle (35-3 ± 4.4 pg/ml), rose to sharp pre-ovulation peak (192.9 ± 12.7 pg/ml) and plateaued during the luteal phase (67.3 ± 1.5 pg/ml); (3) patients with fibroadenosis showed a concentration pattern not significantly different from normal; (4) in patients with cystic disease, concentrations were significantly higher during the luteal phase; (5) patients with breast cancer considered as a group showed no consistent divergence from normal pattern.

OESTROGEN AND ANDROGEN RECEPTORS IN HUMAN BREAST CANCER. E. ENGELSMA, C. B. KORSTEN, J. P. PERSIJN and F. J. CLETON. Netherlands Cancer Institute, Amsterdam.

Oestrogen and androgen receptors were determined in human breast cancer tissue samples.

Oestrogen receptors were found in 41% of 157 primary cancers and in 46% of 84 metastatic cancers. Androgen receptors were present in 18% of 43 primary tumours and in 22% of 36 secondary lesions.

A strong correlation was found between the presence of oestrogen receptors in metastatic tumour tissue and the response to endocrine therapy: 31 objective remissions in 39 receptor positive cases and only 4 objective remissions in 45 receptor negative cases. And for androgen receptors no such correlation was detected in a small number of evaluable patients.

In 12 patients the presence or absence of oestrogen receptors did not correlate with the objective response to endocrine therapy. Some cases had to be recorded as a failure, when clinical improvement was present but without measurable tumour regression. The receptor content need not be the same in different metastatic deposits in one patient; this might explain some discrepancies.

OESTROGEN RECEPTORS IN HUMAN BREAST CANCER. G. LECLERCQ, J. C. HEUSON and W. H. MATTHEIM. Institut Jules Bordet, Brussels, Belgium.

Tumour tissue samples from 166 primary and 136 metastatic breast cancers were analysed for oestrogen receptors. Cytosol fractions were incubated with increasing amounts of 3H-oestradiol-17β (LeClercq et al. Eur. J. Cancer, 1973, 9, 665). Unbound radioactivity was removed by charcoal-dextran. Receptors were detected in 72% of the primary and 54% of the metastatic tumours. In 86% of the “positive” cytosols, the dissociation constant of the binding reaction varied between 0.5 and $20 \times 10^{-10}$M; in the remaining 14% the range was from 20-1 to $132 \times 10^{-10}$M. At the time of mastectomy primary tumours were examined together with the corresponding invaded axillary lymph nodes. A statistically significant correlation was observed between the amounts of receptors at both sites. In tumours the concentration of binding sites varied from zero to 1480 femtomol/mg protein. The distribution of the cytosols in regard to this parameter was continuous and inversely related to it. It is suggested that the “positive” and “negative” cytosols may not be qualitatively different, the latter simply containing receptors in amounts undetectable by the current methods. Receptors were never found in various oestrogen non-target tissues or in sera.

PREDICTION OF RESPONSE OF DISSEMINATED BREAST CANCER TO ADRENALECTOMY AND OOPHORECTOMY USING COMPUTER AIDED EVALUATION OF CLINICAL PRESENTATION. D. J. LEAPER and J. C. HORROCKS. Leeds General Infirmary.

Difficulties in predicting response to hormonal ablation are well known; criteria employed to make such a distinction vary from “clinical impression” through discriminant function to more recently reported assessments (e.g. oestrogen receptors). These methods however are to some degree fallible, time-consuming and difficult to perform.

An attempt to predict response to endocrine ablation in 100 patients using a computer aided analysis of some 18 clinical signs and symptoms has been made. Using a
simple Bayesian form of analysis, 69% accuracy overall was achieved in predicting survival time (with 80% accuracy in those patients who survived over 2 months) and accuracy in predicting an objective response was 82%, and 72% for a subjective response.

These results suggest that: (i) it is possible in most patients to predict response using simple clinical parameters and analysis; (ii) this can be done in routine practice quickly and easily; and (iii) such a system—if implemented widely—might be of significant benefit to individual women suffering from breast cancer.

**p-FLUOROPHENYLALANINE (pFPhe) AND MITOSIS: INHIBITION AND RECOVERY OF DIVISION IN HELA CELLS.** D. N. Wheatley and J. Y. Henderson. Department of Pathology, University of Aberdeen.

pFPhe inhibits the entry of HeLa cells into division; this effect is known to require incorporation of the amino-acid analogue into protein (Wheatley and Henderson, *Nature, Lond.*, 1974, 247, 281). Analysis of the proteins containing pFPhe made by HeLa cells on polyacrylamide disc gel electrophoresis systems showed excellent agreement with the Phe proteins. The turnover of pFPhe proteins also compared closely with that of the Phe proteins both at 37°C and 40°C.

When pFPhe is removed from the culture medium, cells recover their normal G₂ → M progression in a cycle related manner after a delay period which depends on both the concentration and length of pFPhe exposure. After careful analysis of conditions permitting recovery, it would appear that a highly labile protein or group of proteins is involved which can only suppress mitosis when pFPhe is maintained at "physiological" levels. At slightly elevated temperature the inhibitory action is accentuated.

**PREDICTION OF RESPONSE TO ANTIHORMONE TREATMENT USING AN IN VITRO TEST FOR DEPENDENCE OF HORMONES.** H. Salih, I. de Souza, H. Flax, K. Newton and J. R. Hobbs. Tumour Biology Group, Westminster Hospital Medical School.

*In vitro* hormone dependence has been defined by detecting enhanced pentose shunt activity in 24 h cultures of freshly biopsied human breast cancers after known hormones have been added to the culture medium. Four hormones (oestrogen, androgen, prolactin, growth hormone) have been implicated in half of the 300 breast cancers, and these could not be assessed adequately by the previous methods of studying urinary patterns of androgen excretion or measuring binding to receptors in homogenates. The clinical response of 40 patients to antihormonal treatments revealed: (1) 9/9 oestrogen dependent tumours responding to antioestrogens; (2) 6/7 androgen dependent tumours responding to antiandrogenic measures; (3) 5/6 prolactin - growth hormone dependent tumours responding to satisfactory hypophysectomy; (4) 3/3 prolactin dependent