plasma concentration of DHA was 917·6 ± 317·8 ng/100 ml (range 324–3575) in 22 females and 922·65 ± 290 ng/100 ml (range 161–1841) in 17 males. From 2 to 30 days of age, plasma DHA levels were significantly lower: 344·4 ± 93·7 ng/100 ml (range 99–696) in 18 girls and 229·81 ± 81·11 ng/100 ml (range 54–685) in 18 boys. A progressive decline was observed throughout the first year of life; from 1 to 6 month of age mean values were 147·1 ± 53·6 ng/100 ml (range 43–409) in 16 girls and 151·6 ± 62·7 ng/100 ml (range 16–614) in 28 boys, and from 6 to 12 months of age they were 90·92 ± 43·3 ng/100 ml (range 20–218) in 11 girls, and 68·14 ± 30·9 ng/100 ml (range 8–330) in 24 boys. The adrenal origin of plasma DHA was confirmed by the sharp rise observed during stress and acute or chronic ACTH stimulation. In boys the testicular origin was attested by the increase noted under HCG stimulation.

54. Plasma aldosterone concentrations during the neonatal period and the first year of life, M. C. RAUX, M. T. PHAM-HUU-TRUNG, D. MARREC, F. GIRARD, J. HERVE and J. SALAT-BAROUX, Laboratoire de physiologie endocrinienne infantile, Hop. Trousseau, Paris, France Maternité Hôpital Rothschild, Paris, France

A direct radioimmunoassay for plasma aldosterone (PA) was applied to 85 normal newborns and infants, using a highly specific antibody. Blood samples were taken from the antecubital vein of the resting babies, 3 to 5 h after feeding, between 9 and 11 a.m. The 0–7-day-old babies had PA levels ranging from 0 to 330 ng/100 ml (65 determinations). In most cases, the levels could be considered high since only 3 values were found to be within the range of those of the non-stimulated normal adults (<3·5 ng/100 ml) and 60% of the values were higher than those of the stimulated normal adults (>30 ng/100 ml). In the first 3 to 5 days, the weight loss was between 3 and 10·5% and thereafter occurred a normal weight increase. There was no correlation between PA levels and the variations in weight. Sodium intake was evaluated for breast fed (0·1 to 0·3 mEq/kg), bottle fed (0·5 to 1 mEq/kg) and sodium loaded (3·5 to 4·5 mEq/kg) newborns. No correlation was found between PA and the sodium intakes. When the mother was submitted to a salt restricted diet during the late pregnancy, the PA level of the newborn was unaffected. In comparison with newborns, lower PA values and narrower ranges were found in older babies (3 to 80 ng/100 ml in the group aged 2 to 8 weeks, n = 12 and 3 to 12 ng/100 ml in the 2 to 12-month-old babies, n = 9). After the first year of life, the observed levels were within the range of those of adults. Some values reaching 5 to 42 ng/100 ml were observed in newborns suffering from adrenal diseases with acute salt loss. These values might reflect a limited aldosterone biosynthesis. Infants with salt losing kidney diseases had PA levels over 320 ng/100 ml. From this study, it appears that within the first year of life, PA levels must be interpreted with caution.

55. Ovarian-placental dependency in rat: estrogen biosynthesis by the rat ovary in late pregnancy, ROMAN REMBIESA, MARIA MARCHUT and AMELIA WARCHOL, Department of Endocrinology, Institute of Pharmacology, Pollish Academy of Sciences, Kiaków, Poland

While the biosynthesis of estrogens from progesterone has been adequately documented in the ovaries before placental development, evidence for the ability of the luteinized rat ovary to form estrogens in the late state of pregnancy is lacking. Observations in a number of laboratories suggested that the placenta could not take over the endocrine function of ovaries. Our observation confirmed this conclusion because no estrogens were isolated from rat placental tissue. However, we have observed conversion of C-21 steroids to androgens by placental tissue. This observation suggests that in rat during the second half of pregnancy ovarian-placental dependency may exist in the synthesis of estrogens. (Steroids 1972, **19**, 65). Thus, it was proposed that pregnant rat ovaries could synthesize estrogens from androgens.

To evaluate the ovarian-placental dependency hypothesis, we examined: (1) whether rat ovaries collected during late pregnancy were capable of removing the 17-side-chain of progesterone and of aromatizing the cleavage product and (2) whether rat ovaries were capable of aromatizing C-19 precursors. Our results indicated that rat ovary during late pregnancy is capable of forming estradiol-17β *in vitro* from 4-androstendione but not from pregnenolone, progesterone and 17-hydroxyprogesterone. Hence it appears that during pregnancy, placental androgens may be a precursor for the synthesis of estrogens by the ovary.

56. Comparison of plasma hormone levels in the first trimester of normal human pregnancy with these same levels in pregnancies following induction of ovulation, J. R. T. COUTTS, P. ENGLAND and W. P. BLACK, Department of Gynaecology Research, Glasgow University, Glasgow Royal Infirmary, 106 Castle Street, Glasgow, Scotland

The corpus luteum in the human secretes relatively large amounts of hormones including progesterone, 17-hydroxyprogesterone and oestradiol-17β. In anovulatory women in whom ovulation was stimulated by treatment with human menopausal gonadotrophin (HMG) and human chorionic gonadotrophin (HCG), the ovarian production of these hormones was increased. When conception occurs the corpus luteum secretes increasing amounts of these hormones and maintains the pregnancy in the first trimester. The stimulus for luteotrophic activity is probably HCG synthesized by the products of conception. Serial weekly plasma samples have been collected in two groups of pregnant women from 5 to 16 weeks after their last menstrual period. The first group consisted of 12 apparently normal pregnancies and the second group of 8 pregnancies in women following induction of ovulation with HMG and HCG. Plasma levels of HCG, progesterone, 17-hydroxyprogesterone and oestradiol-17β were determined by specific radioimmunoassays in each of the plasma samples. The results of these assays in each of the 2 groups of patients were averaged and these results show that the corpus luteum of pregnancy has a functional life of 8 to 10 weeks; thereafter maintenance of the pregnancy is the responsibility of the trophoblast. Comparison of the hormone levels in the 2 groups of patients confirmed the increased ovarian activity as a result of induction of ovulation. Comparison of the profiles of these hormones in peripheral plasma in the 2 groups of patients will be made and the hormone levels will be related to the outcome of the pregnancy in successful and unsuccessful cases.

57. Monitoring early pregnancy with RIA of steroids. Prognostic value of estrogens and progesterone. R. MONDINA, P. CAPETTA, G. MOJANA, E. ANTIFORA, M. MEILLE and F. POLVANI, II° Clinica Ostetrico Ginecologica della Università di Milano, Laboratorio di chimica degli ormoni del C.N.R. di Milano, Italy

Radioimmunoassay was used to determine the levels of estrogens and progesterone in plasma of the following three groups: normal women in luteal phase, normal patients in early pregnancy, and patients whose pregnancy was threatened by abortion terminating both favourably and unfavourably. Cases with uterine pathology or maternal medical diseases were excluded. The data may be summarized as follows: the steroids examined (estrone, estradiol, estriol and progesterone) increase gradually in normal pregnancy. There is evidence of the beginning of placental steroidogenesis. In those pregnancies in which there was a risk of abortion that terminated favourably, the levels of estrogen (and notably estradiol-17β) remained normal, however this was not the case for those pregnancies resulting in abortion. It is therefore concluded that monitoring the levels of estrogens in plasma in early pregnancy has a prognostic value, whereas progesterone levels have less significance.

58. The early increase of plasma unconjugated estriol in pregnancy. Significance and clinical usefulness, R. DE HERTOGH, K. THOMAS and I. VANDERHEYDEN, Endocrinology and Nutrition Unit, University of Louvain, Hôpital Saint-Pierre, Leuven, Belgium

In early pregnancy, the production of estrogens results from the sequential activity of three endocrine tissues: corpus luteum, placenta and fetal adrenals. The latter produce dehydroepiandrosterone sulfate, which is hydroxylated in position 16 in the fetal liver and aromatized into estriol in the placenta.

The increase of estriol in mother's plasma could then mirror the start of this important fetal function. Plasma samples were obtained from pregnant women from the fifth week of pregnancy onwards and unconjugated estriol was extracted with diaethylether, separated from other estrogens on Sephadex LH_{20} column chromatography, and measured with a specific radioimmunoassay.

Plasma levels of unconjugated estriol remained below 100 pg/ml up to the ninth week of pregnancy in all cases. By the 10th week, a rapid increase took place which became steeper after the 12th week. The shape of the estriol increase and the mean levels were the same in normal and diabetic pregnancies. This steep increase was due to the activity of the fetal adrenals, as shown by the increase of the E_3/E_2 ratio in normal pregnancies, and by the low estriol levels in molar pregnancies.

By pooling the results of normal and diabetic pregnancies, the dispersion of the gestation ages in several ranges of plasma estriol levels were as follows:

Estriol ranges: (pg/ml)	100–150	150–200	200–300	300–400	400–550	550–800
Weeks of pregnancy: (mean ± s)	10·2±1·2	11·5±0·8	12·2±1·2	13·7±1·0	13·8±0·9	15±1·0
n	21	17	17	15	18	18

It is felt that repeated measurements of unconjugated plasma estriol in early pregnancy (between the 10th and 16th week) can contribute to determine the gestational age, particularly in diabetic pregnancies in which fetal maturity has to be carefully taken into account.

59. Pregnancies with low estriol production, PREBEN GAEDE and J. G. KLEBE, Departments of Obstetrics and Gynecology, Rigshospitalet and Oresundshospitalet, Copenhagen, Denmark

Estimations of estriol in blood and urine have for a long time been used as the best hormone parameter for foetal well-being. Nevertheless both placenta and foetus are involved in the production of the hormone. While a specific foetal hormone is still missing, both placenta lactogenic hormone (HPL) and chorionadotropin (HCG) are specific placenta hormones of great clinical value in cases of placental insufficiency.

Low estriol values in blood or urine are in most cases caused by abnormalities in the foeto-placental unit. Besides placental insufficiency several other reasons are possible such as enzyme defects in placenta (sulfatase defect), anencephali or foetal death, or medical treatment of the mother with drugs (fluorsubstituted corticosteroids or antibiotics).

In patients with low estriol values a placental functional test can make a differentiation between foetal and placental defects possible in a more detailed way than estimations of HPL. Infusion of dehydroepiandrosterone (DHA) and/or its sulfate ester (DHAS) to patients with low estriol production allow us to investigate both the aromatizing enzyme system in the placenta and the placental sulfatase activity by measuring the serum estradiol concentration. It is the same enzyme systems which are involved in the conversion of 16α-hydroxy-DHAS to estriol in the foeto-placental unit, and the paper deals with examples where the DHA/DHAS test has been of great clinical help.

60. Plasma progesterone and estriol determinations in normal and high-risk pregnancies, E. R. JAEGER-WHITEGIVER, E. FRIEDRICH, B. FAUSER, P. NOTTEBAUM and A. E. SCHINDLER, Universitätsfrauenklinik, Tübingen, Germany

The measurement of estriol (E_3) in plasma or urine is used to monitor fetal-placental function in high-risk pregnancies. Data in the literature indicate that in pregnancies complicated by Rh-incompatibility, the quantitation of this steroid does not directly reflect the severity of fetal jeopardy caused by Rh-incompatibility. Therefore, specific radioimmunoassays for plasma E_3 and progesterone (P) were used to reevaluate the effects on the hormone patterns found in Rh-incompatibility and other pathological conditions. Plasma P and E_3 were measured following other extraction and a Sephadex LH-20 chromatographic step by using specific antisera. P and E_3 ranges for uncomplicated pregnancies were calculated from 300 samples taken at various weeks of gestation from a total of 275 women. Values were measured from 3 normal twin pregnancies. Single determinations were made from 54 plasma samples taken randomly throughout gestation from 49 women with complicated pregnancies (e.g., diabetes, pre-eclampsia, anencephaly, pre- and postmaturity) and serial determinations were made from 9 women with pregnancies complicated by Rh-incompatibility. the mean E_3 values for normal pregnancies range from 0·38 ng/ml plasma ±0·38 S.D. (n = 5) in the eighth week to 13·77 ng/ml ± 3·16 S.D. (n = 8) in the 40th week. The normal P values range from 20·86 ng/ml ± 10·49 S.D. (n = 5) in the eighth week to 136·97 ng/ml ±33·4 S.D. (n = 8) in the 40th week. Even in severe cases of Rh-incompatibility, normal to high E_3 and P values were found, confirming previous results. Only shortly prior to intrauterine death, a rapid fall of plasma E_3 and P concentrations occurred.

61. Hormonal pattern of threatened abortion, J. GERGELY, J. VAN PEBORGH, M. L'HERMITE-BALERIAUX and R. HECHTERMANS, Department of Obstetrics and Gynaecology (Pr. R. Vokaer), Brugmann University Hospital, Free University of Brussels, Belgium

Sixty cases of threatened abortions were studied, from