amniotic fluid surrounding the foetus. Recent work by S. G. Bhagwanani, D. Fahmy and A. C. Turnbull of the Welsh National School of Medicine, Cardiff, has shown that it is possible to correlate the quantity of lecithin in the amniotic fluid with the development of RDS and they suggest critical levels below which RDS can be fairly confidently predicted if delivery takes place (*Lancet*, i, 159; 1972).

Although the procedure for the collection of amniotic fluid is not without risks, it is already frequently used in certain cases where the benefits far outweigh any dangers involved, for example, to examine cases where a foetus is at risk from rhesus disease. Under a local anaesthetic a needle is inserted through the mother's abdominal wall into the amniotic sac and a small volume of fluid is withdrawn. Although steps are usually taken to locate the placenta, the needle can penetrate the placenta causing bleeding, and the passage of a needle through the uterine wall can itself stimulate labour, but the incidence of these complications is small.

The Cardiff group discovered, by quantitative assessment of lecithin in amniotic fluid at various times in pregnancy, that lecithin levels rise as pregnancy advances, the rise being most rapid after 32–34 weeks. In 97 infants lecithin levels estimated within twenty-four hours of delivery were 3.5–37.5 mg per 100 ml. and none of these infants developed RDS. Of 13 infants who developed RDS, 12 had lecithin levels of 3.4–0.6 mg per 100 ml. The thirteenth infant who developed very mild RDS had other congenital abnormalities which may have contributed to difficulties in respiration. The lowest lecithin levels were associated with the most severe RDS, and the critical level for lecithin measured twelve to twenty-four hours before delivery appears to be between 3 and 4 mg per 100 ml.

Many infants are born prematurely for reasons which are unknown and cannot be prevented, but many labours are induced before the foetus has reached maturity for maternal reasons or because intrauterine growth is retarded due to inadequacy of the placenta. In such circumstances obstetricians face a real dilemma, and the determination of the moment when the foetus is less at risk of dying once delivered than of dying *in utero* due to placental insufficiency is a difficult problem. It is already possible to measure substances such as oestriol in mothers' urine which give an indication of placental function. If these critical levels of lecithin concentration and their association with RDS are substantiated and the method becomes widely available, it would be a great step forward in neonatal paediatrics.

CANCER RESEARCH

Nature or Nurture?

from a Correspondent

PARTITION of responsibility between nature and nurture in the origin and growth of cancers was the topic of discussion at the fifth meeting in the series on the principles of experimental and clinical oncology at the British Museum (Natural History). The chairman on February 7 was Professor D. G. Harnden (University of Birmingham); the speakers were Dr L. N. Payne (Houghton Poultry Research Station, Huntingdonshire) and Professor J. H. Edwards (Birmingham Maternity Hospital).

Professor Harnden pointed out the formal necessity of distinction between genetic changes in the germ line which lead to heightened susceptibility to cancer and genetic changes in somatic cells such as are involved in the conversion to malignancy. Visible chromosomal changes in malignant cell populations could often be thought of as secondary to the malignant change itself. The exception was the Ph' chromosome which is usually to be found in haematopoietic cells of patients with chronic myelogenous leukaemia. The argument that visible chromosomal difference is likely to be associated with heightened susceptibility to tumours, based on the unusually high incidence of particular tumours in patients with Bloom's syndrome, Down's syndrome and chromatin positive Klinefelter's syndrome, all of which have congenitally abnormal chromosomes, is not supported by a survey of the chromosomes in blood lymphocytes of several thousand patients with an array of cancers. No marked differences are found in the frequency of chromosomal abnormality in people with cancer in comparison with a non-affected control group.

Dr L. N. Payne surveyed experimental studies on the genetic basis of susceptibility. High and low tumour strains of inbred animals have been known for some time, but it was worthy of note that no general susceptibility to cancer had been found but rather predispositions which affected particular tissues or organs. It was always difficult in studies of susceptibility done on whole animals to distinguish between particular environmental influences such as viruses which can be transmitted from parent to offspring and true genetic susceptibility to an extrinsic agent. Studies by Lilly have shown that resistance to the leukaemogenic Gross virus in mice is probably controlled by two pairs of dominant genes. But a polygenic pattern of inheritance of susceptibility is probably more common.

Dr Payne did, however, point out that

much more work with congenic lines of mice was required before the pattern would become clear. Of great interest were the marker genes such as "lethal yellow", "dilute" coat colour and "flexed tail", all of which were associated with high susceptibility to particular tumours. It was not certain whether these were examples of genes with pleiotropic effects or genes closely linked to those which determined susceptibility. Dr Payne's talk indicated very clearly that using either whole animals or their derived fragments in tissue culture it should be possible to understand soon and in detail some of the various mechanisms of susceptibility and resistance to oncogenic influences.

Professor J. H. Edwards, while elated at the array of information concerning genetic predisposition to cancer, was less sanguine about what could be done with it. It was perfectly possible using the techniques of quantitative genetics to establish the heritability of a particular kind of tumour but with only a few rare exceptions the information gained was not useful, principally because there was no marked inheritance of predisposition to the common forms of tumour. In some instances it had proved possible to find associations between particular blood group genes and certain cancers, but the metabolic significance of the finding could not easily be determined. Professor Edwards showed that pedigree studies could be fickle as they tended to change with time if staged on contemporary material.

COSMOLOGY

Gravity and Fred Hoyle

by our Astronomy Correspondent

SIR FRED HOYLE returned to a familiar theme in his presidential address to the Royal Astronomical Society on February 11—the possibility that the local world is not as independent of the large-scale structure of the universe as intuition might lead one to suspect. On the way Sir Fred also delighted the geophysicist fellows of the society with his views on the possible implications of such a cosmology in the history of the Earth. Although Sir Fred would not vouch for the veracity of the particular model which formed the basis of his address, he presented the model as an example of the kind of relationship between the large-scale and the small-scale worlds which is beginning to emerge from cosmological thinking.

This view which has obviously been intriguing Sir Fred recently arises from concepts of the universe in which the origin of the universe is seen not as a true origin but as a discontinuity which he likened to a discontinuity in quantum mechanics. In one such model, the