NEWS AND VIEWS

Placenta Critics Placated

THE story of placental porosity has taken some exciting turns and it seems that further surprises may be in store. The first instalment came in March this year when Maureen Tuffrey, N. P. Bishun and R. D. Barnes of the Institute of Child Health in London reported that they had found large numbers of the mother's cells in the tissues of newborn mice (*Nature*, **221**, 1029; 1969). The finding abruptly contradicts the accepted view that the placenta forms an effective barrier between mother and foetus which blocks the passage of immunologically competent cells between the two; in default of some such mechanism the mother would recognize and reject the foetus as foreign tissue.

This immunological challenge to accepted dogma aroused the expected reaction. Last week, workers in three independent laboratories announced their failure to confirm the passage of maternal cells across the placenta (W. D. Billington *et al.*, *Nature*, **224**, 704; 1969). At the same time Tuffrey, Bishun and Barnes described further experiments lending more stringent support to their previous results (*Nature*, **224**, 701; 1969). Is the placenta porous or not?

Much seems to turn at present on the particular mice with which Tuffrey and colleagues have worked. In their first experiment, they transplanted blastocysts of CFW mice, the standard strain at the Institute of Child Health, into the uteri of CBA/T_6T_6 foster-mothers. The CBA/T_6T_6 strain possesses a pair of characteristically shaped chromosomes and it was chiefly by identifying these marker chromosomes in the tissues of seven out of eight CFW mice that Tuffrey *et al.* concluded the placental barrier had been crossed. The proportion of CBA/T_6T_6 cells was so great (up to 28 per cent) that the CFW mice could be classed as chimaeras.

In trying to repeat these results Billington *et al.* used CBA/T_6T_6 mice as the foster-mothers and three other strains including CFW as the donors of transplanted foetuses. Although up to 9,000 mitotic cells were examined in each litter, in none of the transplanted foetuses was a single T_6 chromosome detected. What was noticed was the very similar appearance of the T_6 marker chromosomes and a pair of the CFW cell chromosomes. Could the workers at the Institute of Child Health simply have mistaken the two?

Billingham and his colleagues courteously sent a pre-publication copy of their manuscript to Tuffrey, Bishun and Barnes, as a result of which C. E. Ford and Anne McLaren visited their laboratory to look over the evidence. Ford and McLaren came away convinced that the T_6 and CFW chromosomes had not been misidentified. How then was the discrepancy between the two sets of results to be explained?

The final answer to the question will depend on experiments now under way at the Institute of Child Health. But for the moment it seems that a quirk of genetics may lie at the root of the tangle. It emerged from discussions between the two groups that the CFW mice used by Tuffrey *et al.* have been bred for several generations by brother–sister mating whereas the CFW mice used by Billingham *et al.* were colony bred. Billingham and colleagues therefore accept the results of Tuffrey *et al.* but suggest that the placental porosity is peculiar to the inbred CFW strain. Their own experiments, they believe, at least deny the generality of the phenomenon. Moreover, there are several ends to be tied up. If the invading maternal cells are lymphocytes and immunologically competent, why are there no immunological problems between mother and foetus in the inbred CFW mice?

Tuffrey, Bishun and Barnes believe that the discrepancy between the two sets of results can be explained otherwise than by the inbred nature of their CFW mice and they have experiments in hand to explore this possibility. The ball is in their court but, even if placental porosity turns out to be less general than it seemed at first, it is certainly an interesting phenomenon and the inbred CFW mice could provide an important tool for studying the barrier between mother and foetus.

Bacterial Genes Isolated

THE literature of molecular biology in the past five years is an impressive demonstration of the increasing sophistication of the tricks which can now be played. On page 768 of this issue of *Nature*, Beckwith's group at Harvard report another technical tour de force, the isolation of a structural gene from a bacterium. With remarkable ingenuity, they have exploited the techniques of genetics, DNA hybridization and electron microscopy to isolate the structural gene responsible for determining *E. coli* β-galactosidase as well as two of the genetic control elements that, in the cell, help to regulate its expression.

In *E. coli*, the genes involved in the metabolism of lactose are organized into a single unit of transcription and translation. In other words, the three structural genes which specify the three enzymes involved, together with their control genes, are all contained in a single stretch of the bacterial DNA, the lactose operon. Messenger RNA is transcribed from all three structural genes as a single molecule, a polycistronic messenger,