Human Embryo Research: Yes or No?

The Ciba Foundation. (Pp 232; £6.95.) London: Tavistock Publications. 1986.

The title of this collection of papers and associated discussions of a meeting held in 1985 could be misleading. In a characteristically clear chapter, Anne McLaren points out that in the human by “.... about 16 days after fertilization, all the cells derived from the fertilized egg are finally committed to being either part of the individual embryo or outside it”. It is therefore only after this period of time that the term ‘embryo’ might be considered legitimate. Before this, which is the period considered here and when the conceptus is less than 0.5 mm in size, perhaps the term pre-embryo would be more appropriate, though some (Maddox) consider that this merely fudges the issues.

Currently, human fertilised eggs cannot be cultured in vitro beyond nine days (Edwards), and in IVF fertilised eggs are transferred only at about the eight cell stage. Removing one or two cells at this time and then culturing to provide sufficient material for prenatal diagnosis, estimated at present to require 100 000 cells for DNA studies (Williamson), has not yet been performed though no doubt will eventually become a reality. Research on fertilised eggs might also explain certain cases of infertility and paradoxically lead to the development of new contraceptives.

Though there are therefore potentials in studying cultured human eggs, important ethical problems have to be faced: even at this early stage in development is it right to subject the material to experiment and sacrifice; could this represent a ‘slippery slope’ and by habituation lead to an unacceptable extension of such activity (Williams)? These and many other matters are addressed in this well organised and edited volume contributed to by a number of eminent embryologists, geneticists, writers, philosophers, theologians, and lawyers.

For some of us many ethical problems are not absolute but change with time as our knowledge and understanding increase. We should certainly remain vigilant regarding research on early human conceptuses but to me, at least, there seem to be more pressing matters facing mankind at the present.

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A Genetic Switch: Gene Control and Phage λ

By M Ptashne. (Pp 128; £14.50.) Oxford: Cell Press/Blackwell Scientific Publications. 1986.

Two principles are central to molecular genetics: gene expression is regulated by proteins binding to DNA and complex phenotypes are controlled by the coordinate regulation of multiple genes. The first principle was deduced from Jacob and Monod’s studies of the *lac* operon of *E coli* and the second principle was derived from analysis of the life cycle of bacteriophage λ . The simplicity of the *lac* operon and the beautiful complexity of $\phi\lambda$ were my first introduction to genetics. Reading Ptashne’s book was like revisiting the student classroom and re-experiencing the thrill of the first meeting with $\phi\lambda$.

The first chapters describe with great clarity the principles and strategies which are used by $\phi\lambda$ to control its life cycle. Most emphasis is placed on the decision points in the life cycle: upon infecting a hapless *E coli* the phage must decide between vigorously replicating (lytic growth), in the process killing the host, and integration into the host genome (lysogeny). In response to a changing environment, an integrated phage can also decide to revert back to lytic growth. If you do not know how these decisions are made, read this book.

The later chapters and appendices consider the experimental evidence for the assertions in the earlier chapters and argue the author’s contention that gene regulation in $\phi\lambda$ provides a model for regulation of developmental processes in eukaryotes.

Throughout there is an emphasis on the shape of molecules and the corresponding structure-function relationships. X ray crystallography played an important role in the birth of molecular biology and to understand biology it is necessary to understand how proteins work and interact with other molecules.

Much of the public discussion of this book has revolved around the suggestion that $\phi\lambda$ illustrates all the principles needed to explain the genetic regulation of development in eukaryotes. This provocative view may be correct. However, during the argument Ptashne confuses the issue by considering a lysogenised *E coli* as a genetic entity; as far as $\phi\lambda$ is concerned, *E coli* is always an environment.