Lessons from a grand master

John C. Gerhart

The Triumph of the Embryo. By Lewis Wolpert. Oxford University Press: 1991. Pp. 244. £14.95, \$22.95.

LEWIS Wolpert is well known to developmental biologists for his experiments on sea-urchin gastrulation, hydra regeneration and limb development. He is also renowned for his inspiring generalizations about 'positional information' in the late 1960s, in particular his statement that an embryonic cell's genome and developmental history provide the choices, but its position is the chooser. His work and writing stimulated a generation of developmental biologists to turn to experiments on pattern formation. It is noteworthy that he has now written a book "which enables nonspecialists to learn how embryos develop". Such books are rare, perhaps because an understanding of developmental biology not only requires knowledge of the differently changing embryos of many different groups of organisms, but also nowadays draws on the fundamentals of many other areas of biology, such as genetics, molecular biology and cell biology. To make the subject comprehensible, Wolpert repeatedly stresses his belief that unifying principles underlie the differences and complexities. Of course, it takes someone of Wolpert's purview to discern these principles.

Throughout, he remains true to his objective of explaining how embryos develop. He makes little attempt to hold one's attention with stories of scientists and discovery, or with the history of ideas in the field, or with anecdotes about strange creatures. Nor does he resort to simple analogies to explain difficult ideas. There is no speaking down to his nonspecialist reader. In the absence of these devices, the book reads like a serious text. The ideal nonspecialist reader might be a bright secondary-school pupil or first-year university student, or someone with a

training in another aspect of biology, for example medicine, who wants to become acquainted with the facts and ideas of developmental biology. Specialists may also enjoy the book (if merely to see how well Wolpert renders their subject).

The range of topics is enormous: cleavage of the egg into cells, morphogenesis, pattern formation (positional information and induction), limb development, the role of DNA in development (the developmental programme), cell and tissue differentiation, *Drosophila* development (currently the

A mouse embryo at 15 days of gestation (reproduced from *Molecular Biology of the Cell* by Bruce Alberts et al., published by Garland).

best understood case), brain development, sex differentiation, growth, cancer, ageing, regeneration and evolution. Experimentation, description and interpretation are well balanced in the presentation which is organized around Wolpert's generalizations about development, in particular around the concepts of positional information and developmental programmes.

I have a few criticisms of this organization. First, although positional information works well as a unifying concept, the idea of developmental programmes comes across less well. The idea of a 'programme' as a series of operations is introduced early on but it becomes increasingly hard to guess the meanings of the many shadings of the term throughout the book: developmental programmes, generative programmes, the cell's

programme, genetic programmes and internal programmes. (In the last chapter, Wolpert reveals that "[t]he generative program is essentially contained within the genes", a statement about which the nonspecialist reader may want much more said, much earlier on.) Second, oogenesis is largely omitted as a topic, leaving the reader unenlightened as to where eggs come from and how the embryo establishes its first regional differences. Finally, the notion of genomic equivalence might have been presented earlier in the book (it is not really made explicit until about a third of the way through) to prepare the reader for the problem of the selective and position-dependent readout of genetic information in development.

This is a clear and engagingly written book, recommended certainly to nonspecialists, but also to developmental biologists who wish to see how a senior figure in the field can bring order to a chaotic subject without forcing his opinions on the reader. Above all, Wolpert loves his subject and cannot help but share his enthusiasm with us. □

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■ Oxford University Press have also recently published *Transdifferentiation: Flexibility in Cell Differentiation* by T. S. Okada. Most of the studies that Okada mentions are at the cellular level. £45.

Hyperinteractive

Robert Temple

The Hypnotic Brain: Hypnotherapy and Social Communication. By Peter Brown. Yale University Press: 1991. Pp. 322. £25, \$40.

THIS is a book ruined by a preconception. The author is determined that hypnosis shall be a "socially-interactive phenomenon". The baleful influence of the late Milton Erickson, a brilliant clinician but shaky theorist, is at work here. And there is too much reliance on the work of Nicholas Spanos, which in my opinion is unconvincing and tendentious. It might be said that Brown is not attentive enough to other schools of thought. Why does he pay so little attention to Ernest Hilgard, a giant in the field?

Brown makes much of the view that multiple-personality disorder is also 'socially-interactive'. He says that "[s]ocial roles must be constantly renegotiated" and speaks of the need for alternative personalities to "rehearse themselves" and evolve as social products. An alternative personality needs "an initiation process and progressive rehearsal of the role". In my view, this is not only nonsense but potentially dangerous non-