

## COMMENTARY ON *J. GENET.* CLASSIC

### Reading Waddington today

(A commentary on C. H. Waddington 1957 *J. Genet.* **55**, 241–245;  
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In the classic that follows, C. H. Waddington addresses ‘genetic assimilation’, a topic dear to him and of which he was one of the pioneers. Today, genetics and embryology (developmental biology) are well integrated, the links between evolution and genetics are many and strong, and the new field of evolutionary developmental biology (EDB or ‘evo-devo’) explores the developmental mechanisms that underlie the evolution and diversity of animal form. Yet, well before current integrative fashion was seen on the horizon, Waddington saw evolution, genetics and embryology in a seamless manner and called it ‘diachronic biology’.

An excellent textbook treatment of genetic assimilation is found in the latest edition of the classic textbook on developmental biology by Scott Gilbert (Gilbert 2006). Gilbert analyses Waddington’s contribution to the modern synthesis of evolution, developmental biology and genetics in another scholarly piece (Gilbert 2000) in *American Zoologist*.

Systems biology today tries to attempt another level of integration, and Robert and colleagues discuss many of the themes first elucidated by Waddington in their essay (Robert *et al.* 2001). Behera and Nanjundiah (2004) model the manifestation of phenotypes by environmental changes and the fixing of a genotype. These papers provide a diverse intellectual feast and point to how valuable Waddington’s prescient and thoughtful views are today.

#### References

- Behera N. and Nanjundiah V. 2004 Phenotypic plasticity can potentiate rapid evolutionary change. *J. Theor. Biol.* **226**, 177–184.
- Gilbert S. F. 2000 Diachronic biology meets evo-devo: C.H. Waddington’s approach to evolutionary developmental biology. *Am. Zool.* **40**, 729–737.
- Gilbert S. F. 2006 *Developmental biology*, 8th edition. Sinauer, Sunderland.
- Robert J. S., Hall B. K. and Olson W. M. 2001 Bridging the gap between developmental systems theory and evolutionary developmental biology. *BioEssays* **23**, 954–962.

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