Hogben, Lancelot

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Introductory article

Article Contents

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Lancelot Hogben, although less famous than contemporaries such as RA Fisher, Julian Huxley and JBS Haldane, left a lasting impression on twentieth- and twenty-first-century biology. Hogben's extensive background in experimental biology led him to introduce the *interdependence of nature and nurture* as a concept and tool for critiquing eugenic attempts to partition nature and nurture. This attention to the interdependence of nature and nurture can be traced into modern scientific practice (in research on gene–environment interaction, phenotypic plasticity and developmental systems theory) as well as modern scientific debate (in disputes over the limits of the human genome project, the heritability wars and the geneticisation of complex human traits).

Introduction

The early twentieth century was a bountiful time for biology: Mendel's experiments were rediscovered and the discipline of genetics was formed; the modern science of statistics was infused with new theory and methodology; experimental biology became standard practice and Darwin's theory of natural selection was joined with Mendel's principles of inheritance, forming the modern evolutionary synthesis. These developments all took place (at least in part) in Britain; therefore, it is not surprising that a handful of British scientists have come to be recognised as giants of twentieth-century biology: RA Fisher, Julian Huxley and JBS Haldane. What is surprising, although, is that Lancelot Thomas Hogben does not generally make this list, for throughout much of the twentieth century, Hogben was considered equal to any of these scientists. As just one instance, the influential geneticist CD Darlington recalled after Hogben's death, 'When I was very young, Galdane, Guxley, and Gogben (as the Russians called them), seemed to be the three Magi'. What's more, Hogben earned this reputation largely from his forceful criticisms of RA Fisher. Ultimately, then, even though Hogben's name is not as well known as these other figures, his lasting influence on twentieth- and now twenty-first-century biology is immense. **See also**: Darlington, Cyril Dean; Evolutionary Ideas: The Modern Synthesis; Fisher, Ronald Aylmer; Haldane, John Burdon Sanderson; History of Classical Genetics; Huxley, Julian Sorrell

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Early Career

Hogben (born on 9 December 1895, died on 22 August 1975; **Figure 1**) proudly claimed to have largely educated himself at the Stoke Newington public library in London. He excelled academically and attended Trinity College Cambridge in 1913. There, he cultivated his biological interests and became a staunch socialist (Hogben, 1998). After the First World War (during which Hogben, a

Figure 1 Lancelot Thomas Hogben, Hogben Papers, Special Collections, University of Birmingham. Reproduced with permission from the Special Collections, University of Birmingham.

pacifist, was imprisoned as a conscientious objector), he entered the academic life. In these early years of his career (roughly 1917–1930), Hogben focused on experimental physiology, investigating, for example, the mechanisms of amphibian metamorphosis with Huxley (Huxley and Hogben, 1922). During these years, Hogben also developed the African clawed frog (*Xenopus laevis*) as an experimental model organism, even naming his home in South Africa at the time '*Xenopus*' (Hogben, 1998). Hogben was primarily interested in using *Xenopus* to investigate the endocrine system, but as part of those investigations, it was fortuitously discovered that female *Xenopus* frogs, when injected with urine from pregnant women, ovulated within hours. Thus, the Hogben Pregnancy Test was born and remained the major pregnancy test for decades (Gurdon and Hopwood, 2000). Hogben, at the forefront of experimental biology in the 1920s, founded the Society for Experimental Biology with Huxley and Francis AE Crews, along with its associated *Journal of Experimental Biology* (Erlingsson, 2009). **See also**: *Xenopus* as an Experimental Organism

Interdependence of Nature and Nurture

In 1930, Hogben moved from South Africa to London to become Chair of Social Biology at the London School of Economics, where he remained until 1937. Hogben's target during these years was the scientific underpinnings of the eugenics movement. In the 1920s and 1930s, the eugenics movement was at its height in the United States and Britain. The leading scientist-eugenicist of the day was RA Fisher, who combined his groundbreaking developments in statistics and mathematical formalisation of natural selection with his eugenic agenda. A number of British biologists, such as Huxley and Haldane, eventually came around to recognising the faults of Fisher and the eugenics movement. Hogben, however, was unique in being an ardent antieugenicist from the very start. This is likely because he did not benefit from being born to an established scientific family (like Huxley and Haldane) but instead fought for his own reputation through self-education, thus making for a personal counterexample to the class-based hereditary determinism of the eugenicists. In contrast to the eugenicists who commonly assumed that complex human traits were a product of either genetic endowment or environmental input, Hogben emphasised the 'interdependence of nature and nurture' (Hogben, 1933). In this way, Hogben was the first scientist to make use of gene–environment interaction (or 'gene–environment interplay') as a tool for criticising the statistical tools of Fisher and the eugenic inferences made from those statistics (Tabery, 2008). **See also**: Eugenics; Eugenics Society; Eugenics: Historical; Fisher, Ronald Aylmer; Gene–Environment Interaction; Haldane, John Burdon Sanderson; Huxley, Julian Sorrell

Turn to Popular Science

Beginning in the late 1930s, Hogben turned to encouraging in the general population the same self-education from which he himself so benefited. This was a passion he pursued for the rest of his life. He published a series of hugely successful Primers for the Age of Plenty: *Mathematics for the Million* and *Science for the Citizen* (Hogben, 1937, 1938), wrote or edited several books on language (Bodmer, 1944; Hogben, 1943, 1965) and produced nearly a dozen books on the history of science for children and adults (Hogben, 1949, 1955, 1957, 1959a, b, 1960, 1970, 1973, 1974a, b). Although Hogben continued to pursue academic research during these decades (mostly on clinical epidemiology at the University of Birmingham), his dedication to popular science for the latter half of his career is likely why he is no longer remembered alongside Fisher, Huxley and Haldane.

Hogben's Legacy in Scientific Practice and Scientific Debate

Even still, Hogben's influence continues to this day. In terms of scientific practice, modern research on the relationship between genes and environment during the process of development (sometimes called 'phenotypic plasticity' and highlighted by developmental systems theory) owes much to Hogben's original break from the nature–nurture *dichotomy* in favour of the *interdependence* of nature and nurture and the importance of gene–environment interaction. Likewise, *Xenopus* remains one of the most important model organisms among practicing biologists (especially developmental biologists). In terms of scientific debate, the exchange between Hogben and Fisher over the importance of nature and nurture separately or in interdependence lasted throughout the twentieth century and continues today. Debates over the heritability wars; the nature/nurture debate; the relationship between race, IQ, and genes; the geneticisation of complex human traits; the lasting influences of eugenics and the limits of the human genome project all involve disputes over the ability to partition and highlight the primacy of the gene over the developmental relationship between gene and environment. Hogben's early formulation of the interdependence of nature and nurture in critique of Fisher has been echoed in each successive iteration of that old debate, and it will continue to be echoed as the debates themselves persist. **See also**: Developmental Systems Theory; Eugenics: Contemporary Echoes; Gene–Environment Interaction; Geneticization: Concept; Geneticization: Debates and Controversies; Genetics as Explanation: Limits to the Human Genome Project; Heritability Wars; Nature/Nurture – A Philosophical Analysis; Phenotypic and Developmental Plasticity in Plants; 'Race', IQ and Genes; *Xenopus* as an Experimental Organism

References

Bodmer F (1944) *The Loom of Language*, edited by L Hogben. London: Merlin Press.

Erlingsson SJ (2009) The Plymouth laboratory and the institutionalization of experimental zoology in Britain in the 1920s. *Journal of the History of Biology* **42**: 151–183.

Gurdon JB and Hopwood N (2000) The introduction of *Xenopus laevis* into developmental biology: of empire, pregnancy testing and ribosomal genes. *International Journal of Developmental Biology* **44**: 43–50.

Hogben L (1933) *Nature and Nurture, Being the William Withering Memorial Lectures*. London: George Allen and Unwin Ltd.

Hogben L (1937) *Mathematics for the Million*. New York: W. W. Norton and Company, Inc.

Hogben L (1938) *Science for the Citizen: A Self-Educator Based on the Social Background of Scientific Discovery*. New York: Alfred A. Knopf.

Hogben L (1943) *Interglossa: A Draft of an Auxiliary for a Democratic World Order, Being an Attempt to Apply Semantic Principles to Language Design*. New York: Penguin Books.

Hogben L (1949) *From Cave Painting to Comic Strip: A Kaleidoscope of Human Communication*. London: M. Parrish.

Hogben L (1955) *The Wonderful World of Mathematics*. Garden City, NY: Garden City Books.

Hogben L (1957) *The Wonderful World of Energy*. Garden City, NY: Garden City Books.

Hogben L (1959a) *The Wonderful World of Communication*. Garden City, NY: Garden City Books.

Hogben L (1959b) *The Signs of Civilisation*. London: Rathbone Books.

Hogben L (1960) *Mathematics in the Making*. London: Macdonald.

Hogben L (1965) *The Mother Tongue*. New York: Norton.

Hogben L (1970) *Beginnings and Blunders; or, Before Science Began*. New York: Grosset and Dunlap.

Hogben L (1973) *Maps, Mirrors and Mechanics*. New York: St. Martin's Press.

Hogben L (1974a) *Astronomer Priest and Ancient Mariner*. New York: St. Martin's Press.

Hogben L (1974b) *Columbus, the Cannon Ball, and the Common Pump*. London: Heinemann.

Hogben L (1998) *Lancelot Hogben, Scientific Humanist: an Unauthorized Autobiography*. Suffolk: Merlin Press.

Huxley JS and Hogben L (1922) Experiments on amphibian metamorphosis and pigment responses in relation to internal secretions. *Proceedings of the Royal Society of London, Series B* **93**: 36–53.

Tabery J (2008) R.A. Fisher, Lancelot Hogben, and the origin(s) of genotype-environment interaction. *Journal of the History of Biology* **41**: 717–761.

Further Reading

Kevles DJ (1995) *In the Name of Eugenics: Genetics and the Uses of Human Heredity*. Cambridge, MA: Harvard University Press.

Mazumdar PMH (1992) *Eugenics, Human Genetics, and Human Failings: The Eugenics Society, its Sources and its Critics in Britain*. London: Routledge.

Sarkar S (1996) Lancelot Hogben, 1895–1975. *Genetics* **142**: 655–660.

Tabery J (2006) Looking back on Lancelot's laughter. *Mendel Newsletter* **15**: 10–17.

Tabery J (2007) Biometric and developmental gene-environment interactions: looking back, moving forward. *Development and Psychopathology* **19**: 961–976.

Wells GP (1978) Lancelot Thomas Hogben. *Biographical Memoirs of Fellows of the Royal Society of London* **24**: 183–221.

Werskey G (1978) *The Visible College: The Collective Biography of British Scientific Socialists of the 1930s*. New York: Holt, Rinehart and Winston.