
Clarifying Health and Disease in Darwinian Medicine via Phenotypic Flexibility and Robustness

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Abstract

While the recent marriage of evolutionary theory and medicine has greatly helped to explain the problem of ‘why we get sick’, Darwinian medicine’s stress on adaptationism and the EEA has hindered attempts to develop a coherent account of health and disease. While research into the developmental origins of diseases and mismatch theory provide more detailed accounts of disease etiology, Darwinian medicine still struggles to incorporate individual-level adaptations to changing environments, thereby reducing health to the mere absence of disease, and disease to a disadvantageous deviation from (past) species norms. This paper will suggest that the phenomena of within-individual phenotypic plasticity (phenotypic flexibility) and biological robustness could be harnessed to better define these concepts. Furthermore, some insights by the philosopher of biomedicine, Georges Canguilhem, regarding historical norms, individuality and the impossibility to clearly separate organism and environment when defining health and disease, will be used to problematize appeals to past environments to explain current pathological states. Taken together, these insights will contribute to defining health as an individual-level capacity to tolerate environmental perturbations (robustness) and the ability to establish new norms in the face of varying environmental demands (flexibility). Conversely, disease is not merely a deviation from (past) species norms, but the presence of a new norm entailing a constrained flexibility and weakened robustness within the current environment. While Darwinian medicine’s appeal to past environments can help explaining species-level vulnerability, some epistemological obstacles can be overcome by incorporating individual-level adaptations to changing environments into the definitions of health and disease.

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