Opinion

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A Narration on Genomics and Genetics

Dr. Run-Zhi Lai*

Department of Biology, University of Utah, United States

***Corresponding author:** Dr. Run-Zhi Lai, Department of Biology, University of Utah, United States, E-mail: runzhi_lai@biology.utah.edu

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Introduction

Genomic technologies have had a profound impact on understandings of what it means to be human and our links to the world we inhabit, and on practices of inhabiting the world. This book considers this impact across a range of literary forms, cultural practices, and political imaginaries, and argues that new descriptions of biological value introduced through practices of genomic sequencing from the late 1970s registered a broader crisis of narrative form. Examining a wide range of texts by Doris Lessing, Samuel Delany, Boris and Arkady Strugatsky, Kir Bulychev, Kazuo Ishiguro, Saidiya Hartman, Yaa Gyasi, Svetlana Alexievich, and Jeff VanderMeer, Narrative in the Age of the Genome casts new light on the intersections of genomics with politics of racism, sexuality, labour and gender, neoliberal economics and environmental crisis.

Genomics is a recent convergence of many sciences including genetics, molecular biology, biochemistry, statistics and computer sciences. Before scientists even uttered the word genomics, these other fields were richly developed. Of these fields, the history of genetics and molecular biology are particularly relevant to the techniques, experimental designs, and intellectual approaches used in genomics. The development of computers and the internet has provided researchers ready access to the large body of information generated throughout the world. Understanding origins is a constant pursuit of man. In the 1858, our understanding of the origin of species and how species variability arose was revolutionized by the research of Darwin and Wallace. They described how new species arose via evolution and how natural selection uses natural variation to evolve new forms. A few years later, Gregor Mendel, an Austrian monk, summarized his years of research on peas in his famous publication. In that paper, he described the unit of heredity as a particle that does not change. This was in contrast to the prevailing "blending theory of inheritance." Equally important, Mendel formalized the importance of developing pure (genotypically homozygous) lines, keeping careful notes, and statistically analyzing the data. His approach of crossing individuals with variable phenotypes and following them in successive generations is still the only approach utilized to understand the genetic inheritance of a trait. Others in this century were concluding that statistical approaches to biology would help solve problems in biology and inheritance. Except for his early adult years, Mendel did not have an active research program. Therefore, his groundbreaking research went largely unnoticed. It was not until 1900 that others, who had performed similar experiments to his, arrived at the same conclusions. Their publications cited his work, leading to a rediscovery of the Mendelian principles. Quickly following the rediscovery, other genetic principles such as linkage, lethal genes, and a bit later, maternal inheritance were described. In each case, the principles provided to be simple extensions of the Mendelian laws, providing further evidence of their importance. At the beginning of the century, the work on chromosomes coalesced into the chromosomal theory of inheritance. This theory focused research on the chromosome as the location of genes. The field of cytogenetics was based on this discovery. The first observations of chromosomal abnormalities (duplications, deletions, translocations, inversions) are reported. Observations such as position effect demonstrate that there is a direct link between chromosome structure and phenotype. All of these discoveries justified research to discover the physical basis of heredity.