Thomas Hunt Morgan (1866-1945) [1]

By: Sunderland, Mary E. Keywords: Genetics [2] Fruit flies [3] Biography [4] T. H. Morgan [5]

Although best known for his work with the fruit fly, for which he earned a Nobel Prize and the title “The Father of Genetics,” Thomas Hunt Morgan’s contributions to biology reach far beyond genetics. His research explored questions in embryology [7], regeneration, evolution [8], and heredity, using a variety of approaches.

The son of Ellen Key and Charles Hunt Morgan, T. H. Morgan was born on 25 September 1866 into a prominent family in Lexington, Kentucky. Morgan grew up exploring the environment around his childhood home and developed a special interest in fossils. As a young man, he spent a summer employed doing geological and biological fieldwork in the Kentucky mountains. He received his BS degree from the University of Kentucky and went on to pursue graduate work at Johns Hopkins University [9]. At Johns Hopkins, William Keith Brooks [10] supervised Morgan’s dissertation research, which examined the embryology [7] of sea spiders. Morgan was also influenced by his professors Henry Newell Martin and William Henry Howell, both of whom encouraged a physiological approach to biology. Morgan studied alongside fellow students Edwin Grant Conklin [11] and Ross Granville Harrison [12], with whom he remained close friends throughout his life. Although Edmund Beecher Wilson [13] had left Johns Hopkins by the time Morgan arrived, they later became close friends and associates. Morgan received his PhD in 1890 and remained at Johns Hopkins during the following year as a Bruce Fellow.

In 1891 Morgan began his professional career as an associate professor of biology at Bryn Mawr College [14], where he succeeded E. B. Wilson and worked with both Harrison and Jacques Loeb [15]. While at Bryn Mawr, Morgan took research trips to the Stazione Zoologica [16] in Naples, where he was introduced to the new *Entwicklungsmechanik* [17], or causal-analytical approach to embryology [7] and began collaborating with Hans Driesch [18] on studies of regeneration. Morgan remained at Bryn Mawr until 1904, during which time his research focused largely on experimental embryology [7]. Two of his students, Nettie Marie Stevens [19] and Lilian Vaughan Sampson, contributed significantly to studies in regeneration and cytology [20]. Morgan’s work on regeneration and experimental embryology [7] was motivated by the problem of differentiation [21]: how does an undifferentiated egg [22] or tissue produce the regulated, organized, fully formed adult? He explored this work in *The Development of the Frog’s Egg* (1897), *Regeneration* [23] (1901) and later in *Embryology and Genetics* [24] (1934). Morgan took a special interest in Sampson, whom he married in 1904, in what proved to be a busy year. The couple moved to Columbia University [25] where Morgan was appointed professor of experimental zoology, a position that allowed him to work alongside E. B. Wilson, who was then serving as department head.

At Columbia, Morgan pursued a variety of questions related to heredity, sex determination [26], and development. He drew on a diversity of methods and organisms, maintaining that researchers should be opportunistic and use whatever works. Starting with invertebrates, he studied vertebrates when they were useful, and by 1910 had discovered the possibilities offered by the fruit fly *Drosophila* [27] . In 1910–1911, Morgan hired the undergraduates Calvin Bridges and Alfred Sturtevant [28] to work on *Drosophila* [27] in the “fly room,” where they remained for the next seventeen years. There were rarely fewer than five people working in the fly room, which included such researchers as Otto Lous Mohr, Hans Nachsteim, Curt Stern, Theodosius Dobzhansky [29], Lilian Vaughan Morgan, and H. J. Muller.

Though Morgan maintained a life-long interest in embryology [7] and in regeneration, after 1910 his research focused primarily on *Drosophila* [27] genetics. In 1915 Morgan, Sturtevant, Muller, and Bridges published their landmark *Mechanisms of Mendelian Heredity* [30]. In that same year Morgan received a grant from the Carnegie Institute of Washington to support further work on *Drosophila* [27] .

In 1928 Morgan left Columbia to become professor of biology at the California Institute of Technology [31] where he was hired to establish and organize a new division of biology. Although Morgan continued, as he had for many years, to spend summers at the Marine Biological Laboratory [32] in Woods Hole [33], he also established a marine laboratory at Corona del Mar, which allowed his marine work to continue year round. He remained active in both research and administration at the California Institute of Technology [31] until his death after a short illness on 25 September 1966.

Morgan was the recipient of many honors and awards, including the Darwin Medal (1924), the Copley Medal of the Royal Society (1939), and the Nobel Prize in Physiology or Medicine [34] (1933). He was a member of many scientific societies, including the Royal Society, and he served as president of the American Morphological Society [35] (1900), American Society of Naturalists [36] (1909), the Society for Experimental Biology and Medicine (1910–1912), National Academy of Sciences [37] (1927–1931), the American Association for the Advancement of Science [38] (1930), and the Sixth International Genetics Congress (1932).

Morgan’s role in the biological sciences was far reaching and transformational. He is widely recognized as one of the most influential and important biologists of the twentieth century.

Sources

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Subject

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