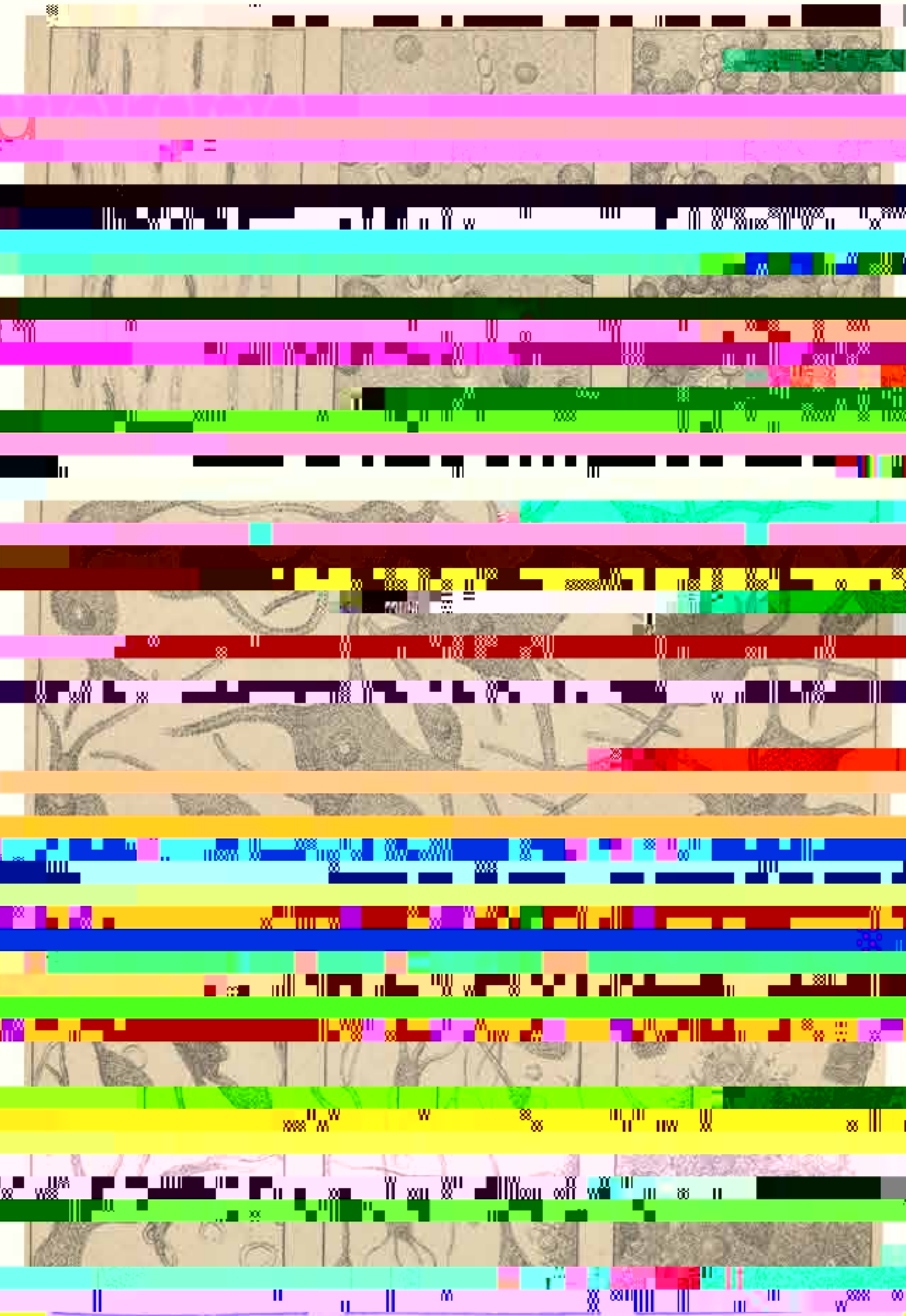


# CELL SPECIALIZATION

As the 19th century progressed, new methods emerged to fix, slice, and stain tissues and their constituents. It soon became clear that cells are organized into tissues and organs that perform different roles within a larger organism.



Human nerve cells Hassall 1852

Gradually, with the emerging microscope, scientists began to focus on one type of cell at a time, studying its structure and function in greater detail.

For example, with nerve cells, Italian biologist Santiago Ramón y Cajal used new staining methods to explore nerve cells and how they group and work together in nervous systems. Although they looked at different aspects of the nervous system, they vehemently disagreed in the 1890s. While Ramón y Cajal believed in discrete cells, Golgi saw a single connected network.



Section of tissue from a rabbit's nocardium Golgi 1903



Human spinal nerve fibers Ramón y Cajal 1903

They shared a Nobel Prize in 1906 for their work. Their innovations, observations, and disagreements at the time in history was a turning point in the history of biology.

While these researchers were studying individual cells, others were asking how the complex organization of cells arise from single-celled organisms.