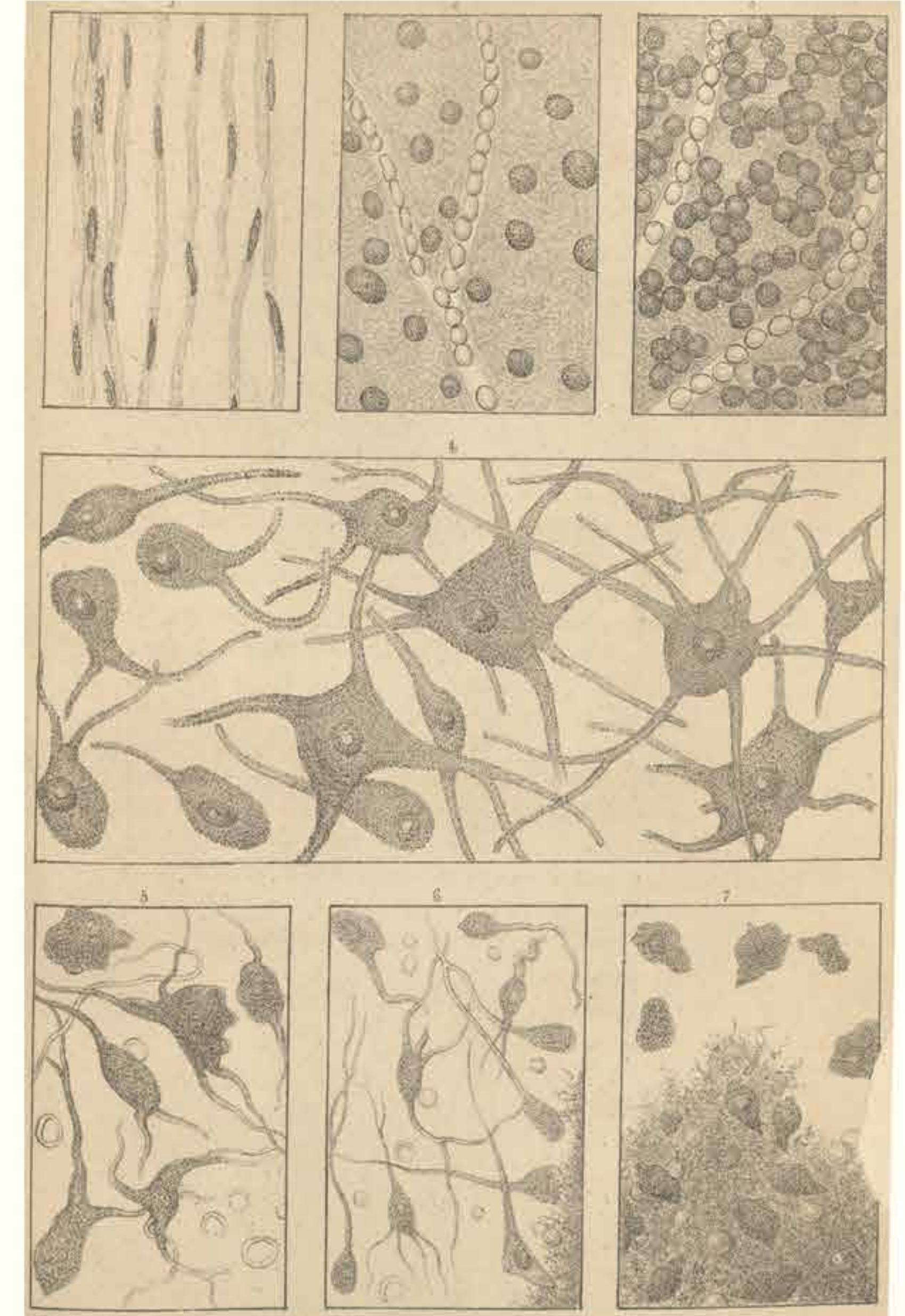


CELL SPECIALIZATION

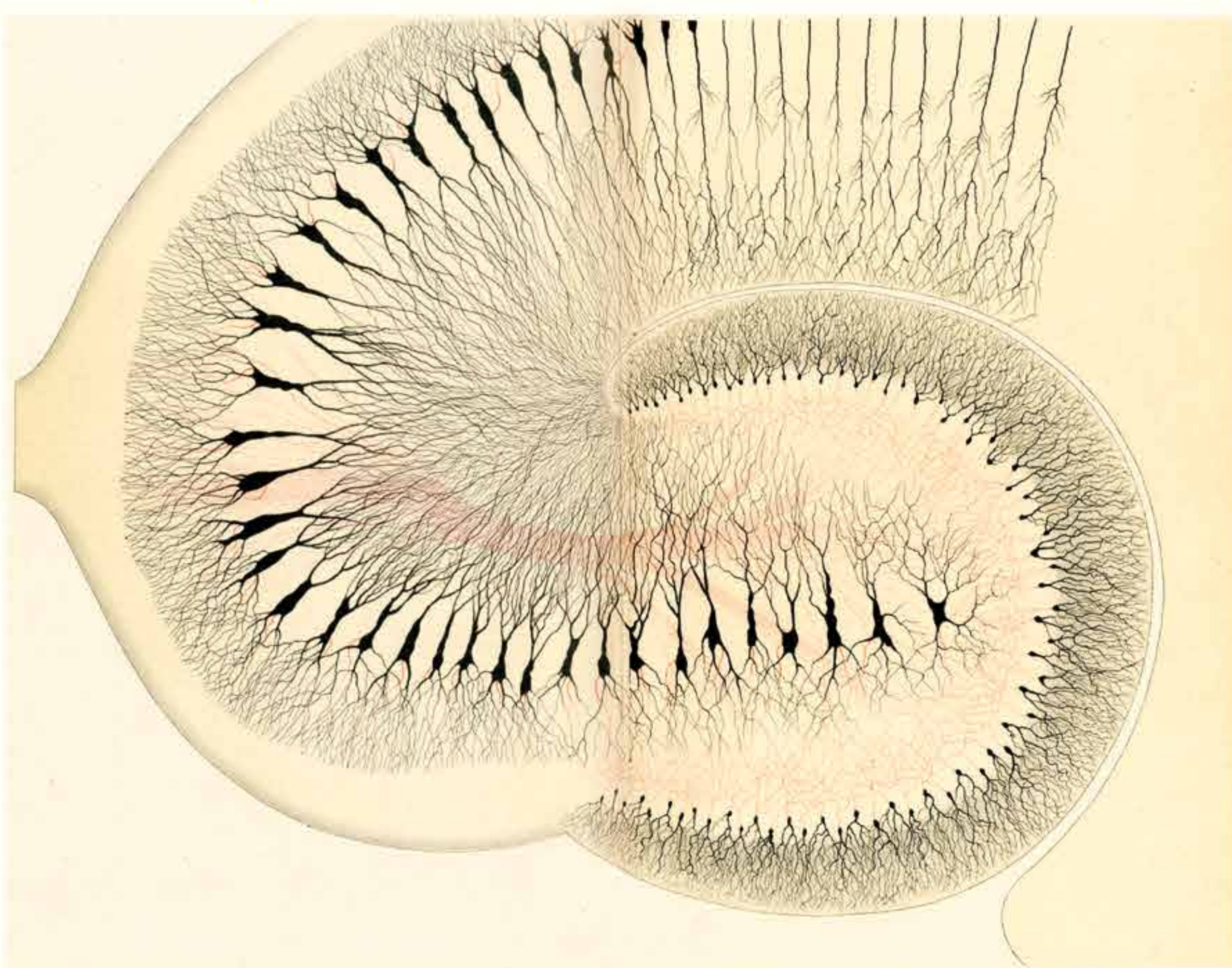
As the 19th century progressed, new methods emerged to fix, slice, and stain tissues and therefore interpret their constituent cells. Especially within medicine, it became clear that cells organize into specialized tissues and organs with varying shapes, playing different roles within a larger organism.



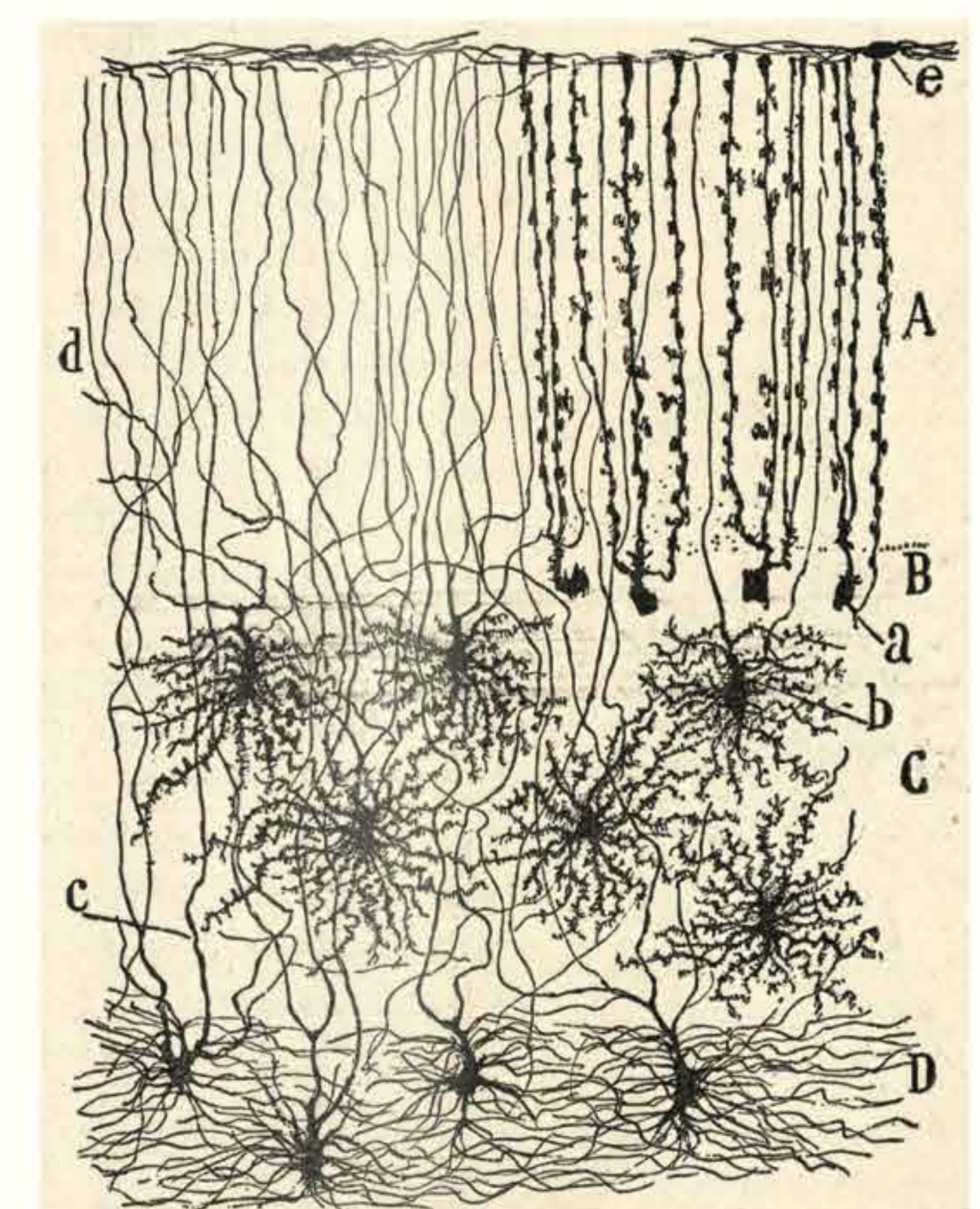
Human nerve cells Hassall 1852

Gradually, with the emerging field of cytology, researchers began to focus on one type of cell or another, exploring in greater detail their structure and function.

For example, with nerve cells: Italian microscopist Camillo Golgi and Spaniard 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 much the same things, they vehemently disagreed in their interpretations. Where Ramón y Cajal saw separate nerve cells, Golgi saw a single connected mass called a reticulum.



Section of tissue from a rabbit's hippocampus Golgi 1903



Human cerebellum nerve cells Ramon y Cajal 1909

They shared a Nobel Prize but still disagreed. Each pointed to his particular images as evidence for his claims. Their innovations, observations, images, and arguments show how exciting this time in history was. And how difficult it can be to interpret what we see with microscopes.

While these researchers were busy observing and interpreting specialized cells, others were asking: how do complex organisms with specialized types of cells arise from single germ cells?