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children's temporal judgments amount to little more than disguised spatial judgments. "20th-century children are instinctive Aristotelians," he says. Like medieval man, they perceive the passage of time as the rhythm of their own concerns.

The Brain's Maps

"Neural Darwinism: A New Approach to Memory and Perception" by Israel Rosenfield, in *The New York Review of Books* (Oct. 9, 1986), 250 West 57th St., New York, N.Y. 10107.

Why do people remember a joke they heard in second grade, yet forget the howler they heard yesterday? Sigmund Freud viewed memory as a permanent record of past occurrences; but the record was unreliable, he thought, because emotionally charged events could be repressed.

Today, specialists do not believe that memories form a fixed record in the brain. But they underestimate the role of individual psychology in memory and perception, according to Rosenfield, a history professor at the John Jay College of Criminal Justice in New York City. It is our "individual needs and desires" that determine how we recall people and events.

Charles Darwin observed that the "typical" qualities we associate with humans and other animals are abstractions that conceal their true natures: biologically varied, genetically diverse, selected by the ability to survive difficult environments. If Darwin's theory of evolution holds, says Rosenfield, then Nobel Prize-winning neurophysicist Gerald Edelman has an intriguing explanation of memory's idiosyncrasies.

In 1978, Edelman suggested that the brain may be seen as a Darwinian system evolving through variation and selection. His task was to determine how, given a particular set of genes, enough variability could survive within the brain's overall structure. Early embryonic development provided Edelman with an answer. Studies of individual cells revealed that genes alone did not control their destinies; rather, they became liver cells, nerve cells, brain cells, or whatever, depending on where they were when specialization began. Thus brain function (and structure) appeared to depend on the activities of neighboring cells, as well as on the individual characteristics of the cells themselves.

Edelman's "neuronal group selection" theory holds that, in humans, groups of brain cells compete to record different sensations. For example, a man in a concert hall might hear someone say "nine o'clock," and recall a past nine o'clock event. One set of brain "maps" would locate the speaker while another enabled him to continue hearing the music. Months later, the man might have again forgotten the hour but suddenly recall it by humming the concert melody. His memory did not function by repeating past images; rather, the brain "recategorized" information when its mapping system was activated in another highly individual context.

Just as Albert Einstein replaced Sir Isaac Newton's theories with a larger view of space and time, Rosenfield argues, Edelman's ideas may yield a "deeper view of human psychology." At the very least, he says, neural Darwinism "challenges those who claim that science... is little concerned with the unique attributes of individuals."