For as long as this country has been committed to providing a basic education to all its children, we have been arguing about the best way to teach reading. In the 1800s, Horace Mann posited that we learn by coming to understand whole words: We read for meaning, and words have a content unrelated to how they are spelled out. By the middle of the 1900s, researchers were arguing, on the contrary, that we learn to read by sounding out words through their basic components—phonemes—and that it is through building phonetic skills that reading capacity is best developed. The two sides have been going at it ever since.

The temptation for an author coming fresh to the topic today is to take the cultural historian's synthetic approach and show how each side has contributed positively to how we teach literacy. This is not Mark Seidenberg's approach. In “Language at the Speed of Sight,” he develops a careful argument, backed by decades of research, to show that the only responsible way to teach children to read well is to build up their abilities to connect reading with speech and then to amplify these connections through practice, developing skillful behavioral patterns hand in hand with the neurological networks that undergird them.

“Language at the Speed of Sight” begins with the paradox that people become good at reading without having any idea of how they go about it. How did humans come to read in the first place? Drawing pictures of animals is one thing, but using arbitrary symbols to stand for speech-sounds that have meaning without resembling that to which they refer—that was a giant leap forward. Reading and writing are technologies that humans developed after many thousands of years, and the first chapters of the book provide a fascinating account of scholars’ best guesses as to how we first began to use abstractions to denote the sounds that make up words. “To be effective . . . ,” Mr. Seidenberg writes, “the properties of a writing system must align with properties of the spoken language it represents.” Due in part to the number of syllables in our speech, English employs an alphabet that represents both vowels and consonants. Phonetics matters.
Around the world there are many different alphabets, but wherever you go, all children have to acquire the same “specialized type of expertise” in order to be skilled readers. They must become “alphabetic,” and this “requires instruction, feedback, and practice.”

New computational models have helped us understand the iterative process through which kids seem “suddenly” to start recognizing patterns linking graphemes to phonemes. Children may be haltingly sounding out words, but when instruction is successful, young brains are growing more capable of recognizing patterns connecting marks on the page to sounds, and sounds to meaning. “Readers build neural structures that represent these statistical patterns and tune them every time a text is read.” Students don’t need to memorize explicit rules, but they do need experience so that “the child accumulates sufficient linguistic and experiential data to bootstrap the meanings of more and more words once they occur.”

“Language at the Speed of Sight” has interesting chapters on the reading difficulties labeled “dyslexia.” Mr. Seidenberg shows how computational models suggest that “the dyslexic brain” has trouble recognizing commonalities among words because of a “phonological impairment”—a deficit in the ability to link sound to word to meaning.
The heart of this book, though, is the concluding section on “educational challenges.” It is clear that we are not doing a good enough job of teaching young people deep reading skills. Despite enormous progress in the science of reading, every time we test the reading ability of American children, two-thirds score at low levels of competency. That's like having vaccinations at hand that are proven to prevent disease and then not using them because some people don’t believe in immunology. Intolerable. Or at least it should be.

Mr. Seidenberg has little patience for those who think that they are defending hardworking teachers by ignoring the evidence of our country’s mediocre performance in teaching kids how to read. The author knows that poverty and prejudice undermine education, and he knows that our education system works worst for those who need it the most, while wealthy families make sure their kids get well-funded schools and supplementary programs. But he doesn’t let social injustices distract him from the effort to improve education for all—an effort that, if successful, would help counteract both poverty and prejudice.

So much for how we should teach students. How should we teach teachers? Here Mr. Seidenberg has fewer good answers. He rails against the culture of our education schools, which, he claims, are more attentive to cultural diversity than to scientific research about education; he attributes bad teacher-training practices to the notion that ed schools view knowledge as a mere social construction. Here the scientist mounts an ideological soapbox without much supportive evidence. But he is right about the core problem: Too many American children are becoming adept only at rapidly skimming information in what they are told is a “post-truth” world where skills and facts don’t matter. Meanwhile, those who know they do matter are finding ways to read deeply, to learn and, through learning, to thrive.

Mr. Seidenberg makes a convincing case that we have learned more about reading and the brain in the past two decades than in the previous century. He also shows that our failure to use this new knowledge to improve how we teach children is causing real harm, especially to the most vulnerable. Every teacher of young children as well as those who train them should read this book.

Mr. Roth is president of Wesleyan University. His most recent books are “Beyond the University: Why Liberal Education Matters” and “Memory, Trauma and History: Essays on Living With the Past.”