in "An Apology for Idlers," "is a symptom of deficient vitality: and a faculty for idleness implies a catholic appetite and a strong sense of personal identity." So much is unknown about learning and teaching, even after Bain's years of research. Does the Pentecostal, transforming teacher really exist? Or is she just one of the many platitudinous figures wandering our social minds?

Testimonials of appreciation fall into a pattern, beginning, "You may not remember me, but. . . ." In the middle of the letter come accounts of life influenced and well lived, then the obligatory "I will never forget you." After a teacher receives her first hundred of these letters, she realizes the student never knew her, and maybe didn't know her subject either.

—Sam Pickering

Science & Technology

THE ESCAPE FROM HUNGER AND PREMATURE DEATH, 1700–2100: Europe, America, and the Third World.
By Robert William Fogel. Cambridge Univ. Press. 191 pp. $70 (hardcover), $23.99 (paper)

From our present perch of affluence, we forget the abject misery, malnutrition, and starvation that most people endured for most of recorded history. In a fact-filled book geared toward scholars, Nobel Prize–winning economist Robert Fogel of the University of Chicago reminds us of the huge strides in conquering widespread hunger and of the immense economic and social consequences of that achievement.

It may shock modern readers to learn how poorly fed and sickly most people were until 100 or 150 years ago, even in advanced countries. In 1750, life expectancy at birth was 37 years in Britain and 26 in France. Even by 1900, life expectancy was only 48 in Britain and 46 in France. With more fertile land, the United States fared slightly better, with a life expectancy that was greater than Britain's in 1750 (51) but identical to it in 1900 (48). Urbanization and industrialization in the 19th century actually led to setbacks. As Americans moved from place to place, they spread "cholera, typhoid, typhus . . . and other major killer diseases," Fogel writes. Urban slums abetted sickness and poor nutrition. Fogel questions whether rising real wages in much of the 19th century signaled genuine advances in well-being. "Is it plausible," he asks, "that the overall standard of living of workers was improving if their nutritional status and life expectancy were declining?"

By contrast, life expectancy in advanced countries is now in the high 70s (77 in the United States). Compared with those of the early 1700s, diets are 50 percent higher in calories in Britain and more than 100 percent higher in France. Summarizing his and others' research, Fogel calls this transformation "technophysio evolution." It has had enormous side effects.

First, we've gotten taller. A typical American man in his 30s now stands 5 feet 10 inches, almost five inches taller than his English counterpart in 1750. (Societies offset food scarcities in part by producing shorter people, who need less food.)

Second, we've gotten healthier. Although Fogel concedes that advances in public health (better water and sewage systems, for instance) and medicine (vaccines, antibiotics) have paid huge dividends, he argues that much of the gain in life expectancy stems from better nutrition. With better diets, people become more resistant to disease—their immune systems work better and their body tissue is stronger—and they have healthier babies.

Finally, better diets have made economic growth possible. An overlooked cause of the meager growth before 1800, Fogel argues, is that many people were too weak to work. In the late 1700s, a fifth of the populations of England and France were "effectively excluded from the labor force." As people ate better and lived longer, they worked harder. Fogel attributes 30 percent of Britain's economic growth since 1790 to better diets.

This conclusion seems glib. After all, better diets came from technology that enabled

more productive agriculture—better cultivation techniques, better seeds, more specialization. What, specifically, were these advances? Fogel doesn't say. His overwhelming focus on scholarly research on diets also makes his comments on the Third World an elaboration of the obvious (in effect: lots of people are still hungry), with little in the way of recommendations for what could be done. Fogel is always illuminating and, in his omissions, often frustrating.

—Robert J. Samuelson

OBSESSIVE GENIUS:
The Inner World of Marie Curie.
By Barbara Goldsmith. Norton. 320 pp. $23.95

Marie Curie's family donated her workbooks, diaries, journals, and other papers to the Bibliothèque Nationale in Paris at the end of the 20th century. In what may have been a cataloging first, the library initially had to sort the collection into three groups based on level of radioactivity.

Barbara Goldsmith's new biography uses these literally and figuratively hot resources (and others) to take a fresh look at the past century's most famous woman scientist. Goldsmith, the author of *Little Gloria . . . Happy At Last* (1980) and other books, portrays Marie Curie (1867–1934) as a blend of brilliance, resolve, passion (for work and at least three men), recurring depression, obsession (this is not the first biography of Curie to include that trait in its title), achievement, and pragmatism.

Most scientists make only incremental contributions to the corpus of scientific knowledge. Curie's accomplishments were numerous, monumental, and, like the elements she discovered, radiant. She won two Nobel Prizes—one in 1903 with her husband, Pierre, and another colleague, and a second, solo prize in 1911—and her scientific heirs, her daughter and son-in-law, won their own Nobel in 1935.

Of course, Curie couldn't have foreseen that the papers documenting her life would intimidate archivists many decades after her death. Her discoveries were anti-ecclesiastical. In 1898, she found something entirely new under the sun, the highly radioactive element radium. The mysterious, invisible, silent substance did, though, share one important property with the sun itself: It emitted energetic rays (hence the name Curie gave it) that could activate and burn living cells. Although Curie called radium "my child," it was an ungrateful offspring, contaminating not just her papers but her body—she died at 67 of radiation poisoning.

Curie understood that radium, like the sun, could have both therapeutic and destructive uses. Her interest resided exclusively in the salubrious applications. For example, she designed mobile x-ray units during World War I, when other chemists and physicists were adapting the new chemical elements to novel weaponry. Curie and her daughter drove "Les Petites Curies" to hospitals at the front, x-rayed wounded soldiers, and made calculations to help surgeons locate shrapnel and bullets in tissue.

Curie plumbed the unseen and the unknown. Outside the laboratory, she frequented séances in hopes of communicating with Pierre, who had been knocked down, crushed, and killed in 1906 by a horse and dray. Inside the laboratory, her ghostly lures were radium and another of her discoveries, polonium (named for Poland, her homeland). Curie extracted both elements from pitchblende—a dark, complex mineral—by fractionation, a tedious separation process. Pitchblende could be a symbol for Curie's dark and complex life: Embedded in both were elements of extraordinary bril-

Marie Curie, c. 1900