that needs to be changed or fixed.”

Another gratifying part of writing a textbook is receiving compliments from complete strangers, Grisham says. Such comments make “you realize that you’re touching lives out there that you’ll never know about. You’ll never meet them, you’ll never know who they were, but you’re helping people get a better sense of this wonderful story of this wonderful field. There’s nothing better than having somebody write and say that.”

One part of the textbook writing process that Ball didn’t like was the review stage, which he describes as “a fundamentally depressing and de-moralizing process.” He acknowledges that one of the functions of reviewers is to find problems so they can be fixed, ultimately resulting in a better product. He wishes, however, that more reviewers would take the initiative to point out what they think is good about the book, to balance out the negative comments. When he received negative reviews, Ball would remind himself that “the best steel is forged from the strongest fire.” The experience taught him how to be a better reviewer, he says.

**THE PROCESS** of writing a textbook takes a long time. Production can add a year or more to the schedule. Grisham calls the process “unforgiving” and says it’s easy to fall behind.

“Delays accumulate. You don’t fall behind one week and catch up the next. It’s all you can do to stay on schedule,” Grisham says. “We were only off by a couple of months in a two-year revision process.” However, that delay meant that some schools didn’t have a chance to consider his text for their classes last year.

Ball’s textbook has been eight years in the making. When he first signed the contract, he asked for four years instead of the usual two to develop the manuscript to avoid disrupting the tenure process. Then because of editorial turnover, production took longer than it might have otherwise. Ball had previously written books, but not textbooks. He found the two experiences to be quite different.

“There were some things I didn’t realize were my responsibility,” he says. “I assumed that people who publish textbooks have files and samples all over the place of art and diagrams. You could say ‘I want a picture’ or ‘I want a diagram of this,’ and they could just turn to their in-house expert. It turns out that I’m the in-house expert. They wanted me to supply a sample of every piece of line art that the artist was supposed to render. I’m not sure if my inexperience led to delays, but it led to some back and forth.”

Getting the illustrations right is an iterative process, Stanitski says. “Illustrators sometimes take a bit of liberty with the illustrations. Sometimes they get the science right, and sometimes they don’t. You sort of work backwards to make sure the illustration not only has scientific accuracy but also has eye appeal.”

Moore, Stanitski, and Jurs incorporated “macro/nano” features in their text’s illustrations. These illustrations simultaneously show what is happening on the macroscopic scale—a photograph of a reaction in a beaker, for example—and the nanoscopic scale—an artist’s rendering of the interactions of the individual molecules. According to Moore, pedagogical research shows that students have difficulty making the connection between what they see happening on the macroscopic level and what’s happening to the individual particles. “I spent a whole day with the illustrator just on one chapter about thermodynamics, trying to figure out how best to illustrate the concepts,” he says.

Anybody thinking about writing a textbook needs to do it for love and not for profit. “Especially at the level of physical chemistry, you don’t expect to get rich off the royalties,” Ball wryly notes.

Garrett and Grisham’s first book—the big book that preceded their “Principles” book—took nine years from start to finish. “You’re spending a lot of your personal time doing it,” Garrett says. “If you start out doing it for the money, then you’re even crazier than starting out in the first place. The likelihood of having any real financial success that would outweigh the effort you put into it is rather slim.”

Regardless of the hard work and sometimes unpleasant experiences, the overall experience of writing a textbook is “immensely satisfying,” Ball says. “Despite the downs, it’s not something that I regret doing, nor is it something that I would never do again.”

**ADVOCATE** Moore encourages change, particularly in pedagogy.

**GEN CHEM** Whether writing for science majors or nonscience majors, Stanitski likes to show students that chemistry has a direct impact on their daily lives.

**COVER ART** Ball helped with his cover design (shown on the wall beside him) by suggesting that the words on the blackboard in the background of the cover be physical chemistry words.