The Use of Stories in Teaching[1]

Nel Noddings

Nel Noddings became interested in the use of stories in teaching through her own experiences as a teacher, both in high schools and in universities. She now serves as Lee L. Jacks Professor of Child Education at Stanford University, where she tells teachers-to-be about the value of using stories in their teaching. Her latest books are Educating for Intelligent Belief or Unbelief (1993) and Philosophy of Education (1995).

Good teachers have always used stories in their teaching, and often stories turn out to be more effective than arguments and explanations. Some subjects seem to lend themselves more easily than others to story-telling, but this apparent difference may be the result of practice—not something inherent in the subjects. I have taught mathematics, teacher education, feminist studies, and philosophy, and I think stories are valuable in all of those fields. For those of us who teach future teachers, stories become doubly important because they are likely to be used again and again across a spreading network of teachers and students. (On the use of stories in teaching and teacher education, see Clandinin et al., 1993; Witherell and Noddings, 1991).

Stories should not be construed as time-out from the serious business of teaching. Rather, they should be an integral part of lesson planning and presentation. I will discuss five categories of stories and their uses here, and, although my examples will come mainly from the fields in which I have worked, the categories apply quite generally. In all subjects, we can draw

---

[1]Chapter 2 *New Paradigms for College Teaching.* 1997. Wm. E. Campbell & Karl A. Smith, Eds. Interaction Book Company.

on historical and biographical stories, on personal stories, and on literature. We can use humorous stories as ice-breakers and to relieve tension. We can use other stories to get at the psychology of learning and help students to understand their own capacities and habits.

Historical and Biographical Stories

It would seem natural for teachers who love their subjects to study the history of those subjects. One might also expect teachers to be fascinated by the biographies of great thinkers in the field. However, when I look back on my own mathematical training, I am sad to say that none of my teachers shared such interests with their classes. It was not until I turned to the study of philosophy that my interest in the history and philosophy of mathematics was aroused and, with that interest, a parallel one in biography also grew.

It seems obvious that if college teachers do not use historical and biographical stories, it is unlikely that precollege teachers will use them. Why should it matter? First, one could argue that such stories add substantially to our students' cultural literacy. I think this is true, but I would not make stories the focal point of my instruction, test students on their content, etc. Such focus might well spoil the attractiveness of stories. Thus, although I believe that stories make a hefty contribution to cultural literacy, I prefer to let them contribute indirectly and with seeming spontaneity. (We will see in a moment that one must, paradoxically, plan for effective spontaneity.) Second, stories enliven a presentation, and this is in itself a reason to use them. Third, and for me the most important reason to use them, stories help to expand interests, connect with other fields, and relate otherwise esoteric subject matter to the universal problems of living. They help to reveal the teacher as a person and establish a climate of care.

With some planning, stories can be used to extend a theme over several units of work. Stories tend to accumulate around the personal interests of teachers, but by observing their effects on student listeners, we can expand our repertoires to include interests expressed by students. I'll give some examples.

I have long been fascinated by the fact that so many mathematicians have had religious and theological interests. Because almost all human beings—especially high school and college age students—have such interests (often in an anti-religious form), these matters should be part of academic discussion. (See Noddings, 1993.) But, of course, religious topics can be highly controversial, and many of us understandably avoid them. At the high school level, teachers often believe (wrongly) that they are constitutionally forbidden to address such matters. However, there is no legal restriction on sharing biographical information, and the biographies of mathematicians are often replete with theological interests.

Whenever a mathematics teacher introduces or uses a coordinate system, it is reasonable to tell stories about the life of Reneé Descartes, inventor of the rectangular coordinate system. There are many stories to be told: of multiple interests (how many people get to make major contributions to more than one field?), of personal idiosyncracies—matters of style and dress, of political intrigue and religious bigotry, and of theological interests.

In addition to his work in mathematics, Descartes did monumental work in philosophy, and some of that work focused on theological matters. One of his efforts is especially appropriate for discussion in a mathematics class. Descartes revived and perfected St. Anselm's proof of the existence of God. The proof can be presented in all its sophistication and elegance to some classes at the college level, and at the high school level, it can be presented in skeletal form. The basic idea is that perfection implies existence; that is, a perfect entity must exist because nonexistence would imply a flaw and, thus, nonperfection. The chain of reasoning, greatly simplified, looks like this:

1) If an entity is perfect, then it must exist.
2) God is a perfect entity.
3) Therefore, God exists.

Students in mathematics classes often enjoy looking for the flaws in this proof, and it is not unusual for some students to suggest flaws that have been identified and described by great philosophers. Needless to say, this can be a gratifying experience for students. Teachers who discuss this facet of Descartes's work need not declare their own status as believers or unbelievers. Further, they should be careful to point out that a flaw in the proof does not justify the conclusion that God does not exist.

Teachers who want to sustain the theme of religious interest or theology might follow up with stories about Blaise Pascal. Whether to do this immediately or to wait for a relevant mathematical topic—probability or statistics—is a matter of teacher's choice. In contrast to Descartes's approach through logical proof, Pascal approached the question with a wager. Befitting his interest in probability, Pascal suggested that we put our bets on God's existence. If we bet that God exists, live our lives accordingly, and he does exist, what do we stand to gain? If he doesn't exist, what have we lost?

In approaching the question of God's existence this way, Pascal made two important points: first, he argued, we can't ever *prove* that God exists; it is something we have to take on faith. Second, proof does not appeal to ordinary people and, if we hope to influence the bulk of our populace, we should use language and methods likely to reach them. This is an important point even today because there is considerable evidence that people are more likely to be moved by stories than by arguments. As teachers, we can infer from such evidence that we have to work harder at teaching students logical reasoning. Or we can decide that we should use stories and other methods more freely. Or, of course, we can do both and try to achieve a balance that is effective in our own teaching.

Once launched on a theme of this sort, one should be prepared to follow up, if student interest warrants it. Newton and Leibniz, who independently invented the calculus, both had keen theological interests. Newton was apparently more interested in theology than in mathematics, and he spent considerable time trying to show that biblical chronology and historical accounts could be made compatible. He also studied the problems and theological accounts of creation.

Leibniz analyzed the problem of evil. How can an all-good, all-knowing, all-powerful God be reconciled with the obvious existence of evil in the world? His *Theodicy* introduced a word that still describes an important field of theological investigation, and the topic is of vital existential interest because many, many people have rejected religion over just this issue. They cannot reconcile for themselves the simultaneous existence of a perfect God and evils in the world. The cruelty of the *Theodicy* (accepting the consignment of many souls to hell) is in part a legacy from Augustine, but the reasoning is typical of a mathematical thinker. Here, too, even high school students may identify the logical possibilities. If we do not deny that the evils of the world are really evils (as Leibniz did), what else might we do? "Process" theologians have variously suggested that we relax the overly-stringent criteria describing God. Suppose God is not all-knowing, but exists in time as we do. Does that help? Suppose God is not all-powerful and actually needs human help in overcoming evil. Or, finally, suppose God is not all-good. Students may find this last impossible or at least distasteful even to entertain, but they should know that some important thinkers (e.g., Carl Jung) have explored the possibility.

To reiterate the principles with which we started, such discussion may contribute to students' cultural literacy, enliven daily presentations, expand interests in and connections to other fields, and clarify the image of the teacher as a person. Every time we make connections to another field, we increase the possibility that students will find our own subject more relevant and interesting. No one topic will appeal to all students, but the entire set of topics may well span the space of student interests.

Having mentioned Newton and Leibniz, it makes sense to note that we could consider a theme other than theology. Available evidence supports the claim that each man invented the calculus. It was a case of simultaneous, independent creation. There are similar stories to be told about the invention of logarithms and much of the work on non-Euclidean geometry. An interesting question arises about the preparation of a "collective mind." Is there such a thing as a collective mind? How can it reasonably be described? Are there periods when the collective mind is ready for a new concept, skill, or device? Does that explain simultaneous invention?

Still another topic that can profitably be explored in connection with Newton and Leibniz is professional and national jealousy. The battle between followers of the two men—both groups insisting that their man did the creative work and the other was guilty of intellectual theft—was one of the most disgraceful episodes in the history of mathematics. Even Newton and Leibniz, who held themselves above the fray initially, descended to nasty personal attacks. (See the account in E.T. Bell, 1937/1965.) This battle over what we call today "intellectual property" is all the more deplorable when we remember that Newton is said to have commented, "If I have seen farther than others, it is because I have stood on the shoulders of giants." Generous credit is sometimes easier to give to those already dead than to contemporaries. Teachers can build effectively on this theme to help students understand how interdependent intellectual life is, how pervasive jealousies and antagonisms are, and how generous some great thinkers can be in their acknowledgement of others.

The Use of Literature

Thoughtful teachers often seek ways to introduce political and social themes into their regular classroom work. Because this material almost never appears in standard textbooks, teachers have to be persistent in looking for it. Sometimes it pops out unexpectedly. For example, many math teachers use the delightful science-fiction work *Flatland* (Abbott, 1952) to introduce notions of dimensionality and relativity. But *Flatland*, the story of a two-dimensional society, is filled with illustrations of sexism, classism, and religious mysticism. Indeed, I have heard teachers say that they refuse to use it *because* of its sexism (even though the sexism is probably satirical). My response is that its sexism gives us an excellent reason to talk about sexism in math class. Imagine a society in which all the males are polygons, and class status depends on the number of one's sides. Isosceles triangles are the working poor, so to speak, and those polygons with so many sides that they approximate circles are the priests at the top of the social hierarchy. Every father in Flatland hopes that his sons will have more sides than he has.

In this highly classed society, women are mere line segments, and special rules govern their behavior. They are, essentially, nonpersons.

In addition to sexism and classism, *Flatland* introduces a good bit of mysticism. The narrator of the story, an upstanding square, is visited by a three-dimensional entity. Of course, no one believes him, and he finishes his tale in prison—treated as either mad or subversively dangerous. In the mystical tradition, he longs for another visitation, something to reaffirm what he knows really happened. But how can one explain a third dimension to people living in a two-dimensional world? How would we describe a four-dimensional entity to our peers?

Alice in Wonderland is another book filled with stories that can be used by teachers interested in logic. Whether logic is taught in math, philosophy, or in a class that emphasizes critical thinking, *Alice* abounds in examples of both sound and faulty logic, and there are many references to philosophical problems that are current even today, such as theories of meaning.

In some fields—feminist ethics, for example—stories may provide the main content. Women's traditions have not been articulated as men's have been. In philosophy, feminist writers are just beginning to produce frameworks that arise directly out of women's experience. In such fields, stories are used to elaborate a perspective that grows out of lived experience. Philosophers working in this area do not reject reason and argumentation, but they use both to elucidate and harmonize lived experience and thought. Reason and argumentation are not primary modes.

To paint a vivid picture of a tradition (in my own work, the care tradition) that has not been cast into discursive language, we might draw on Mrs. Shelby in *Uncle Tom's Cabin*, on Doris Lessing's Jane Somers (*The Diaries of Jane Somers*), on Lucy Winter in May Sarton's *The*

Small Room, on the loving friends in Mary Gordon's *The Company of Women*, on Virginia Woolf's Mrs. Ramsay in *To the Lighthouse*. In extracting parts of these stories, we separate features we find admirable from those we deplore or feel ambivalent about. We may argue for our choices, and then we return to literature to find further examples to support our position.

The search for exemplars of the care tradition reminds me that, in the discussion of biography and mathematics, I did not mention the possibility of finding stories of women mathematicians. Surely, as we read and discuss *Flatland*, we will be moved to consider the role of women in mathematics. Some effort will uncover fascinating stories of Hypatia, Sonya Kovalevskaya, Emmy Noether, and many others (Perl, 1978).

I mentioned earlier that teachers have to plan for spontaneity (Hawkins, 1973). A teacher searching through familiar literature for examples of the care orientation will almost certainly begin to think about real women who have embodied this tradition, and then there will be a natural turn to history and biography. From *Uncle Tom's Cabin*, we turn to its author, Harriet Beecher Stowe, and from Stowe to her sister, Catherine Beecher. We think of Jane Addams and, perhaps, contrast her moral orientation with that of her good friend, John Dewey. We are reminded, as I was above, of omissions in earlier discussions. As we read biographical material, we are led to consider the times and historical background of each life and, from there, we move into literature that further enlivens the central topics we plan to discuss.

College teachers can profit from the example of good elementary school teachers. Such teachers are always on the lookout for materials that will interest their students. Vacationing, shopping, reading, watching television, they are always collecting objects, stories, pictures, coupons, and all sorts of ideas that may come in handy some day. In contrast, we college teachers seem to plan in a much more linear and constrained fashion. To break out of that mold, we have to think more broadly, perhaps even syncretistically. To be useful pedagogically, things do not have to fit together in a deductive chain. As David Hawkins (1973) put it in his discussion of planning for spontaneity:

> Everyone knows that the best times in teaching have always been the consequence of some little accident that happened to direct attention in some new way, create a brand new interest that you hadn't any notion about how to introduce. (p. 499)

To be ready for such accidents, teachers must build a repertoire of stories.

Good teachers are hardly ever off-duty. If that sounds too demanding, there is a bright side—overly conscientious teachers can now find permission to read for fun and to read over a broad range of topics. In a very real sense, such reading, if it is watchful reading, may enhance one's teaching for years to come.

Personal Stories

Students like to hear stories about the personal experiences of their teachers. Of course, no responsible teacher devotes whole class periods to such stories, and the overuse or injudicious use of personal stories may cause a lack of respect for the teacher and a loss of interest in the subject. But students can profit from learning what attracted you to your field, why you chose the school at which you did graduate studies, whom among your professors you admired and why. They may also profit from hearing what you had to give up, who encouraged you, what you hope to accomplish, and it can be especially reassuring for them to hear that you did not always succeed and how you handled failures or near-failures. Obviously, these stories should not come out all at once—like "true confessions"—but they should be introduced when they are relevant. This means that you have to be sensitive to the needs of your students and maintain a steady concern for what they are going through.

I have used the pronoun "you" above because I am talking directly to my readers, particularly you professors and teachers new to the field. Students like to hear stories from all their teachers but they especially appreciate stories from their younger teachers. Stories from well established older professors are more like fiction than possibilities for their own lives. Students can identify more closely with younger teachers, and their anticipated experience in graduate school will be more nearly like theirs than like that of their older professors. In all of this, we have to remember that not all students will go on to graduate school, and so our stories should not overemphasize that experience. Struggles with career choices, moral dilemmas, and existential questions are usually of interest to most students.

I can still remember vividly a moment from my own undergraduate years when a young professor of earth science briefly described his own view of mortality. To die, to decay, and replenish the beloved earth seemed to him entirely fitting and quite beautiful. I had never heard anyone express such a view. It astonished me, but even then it did not strike me as heretical. Rather, as a quiet statement of commitment, it impressed me greatly and set me to thinking in ways I had never before dared.

All teachers can contribute stories about their own growth as teachers. I often tell prospective teachers about my early years as a math teacher. I worked very hard, and I expected my students also to work hard. Although I was scrupulously fair, I was much too strict. I remember with considerable pain grading a geometry student's exam a "13." Well, I argued, that is all she earned—13 points out of a possible 100. I wouldn't give such a grade now. Anyone capable of the simplest arithmetic knows that it is almost impossible to recover from such a grade. All incentive to work harder is lost. In later years, I made "50" the bottom grade. It says "failing" very clearly, but it allows for recovery, and it saves a bit of the student's dignity.

I also learned that positive grading is more appreciated than negative grading; that is, instead of scoring problems "-3" or "-6," I learned to score them +7" and "+4." This practice encouraged students to share their thinking. They knew that I was looking for what they had learned, not just for their mistakes. There were even times when students got a full 10 points for a problem solution that ended in a wrong answer. If all the work was right and clearly laid out and some tiny error (usually computational) was made, I charged that to "the heat of the examination." This sensible generosity did much to alleviate test anxiety.

Reflecting on my own testing and grading practices led to more than the changes mentioned above. I decided that, if I really wanted students to learn the material, it shouldn't matter whether they demonstrated competence on the first try or at some later date, and so I allowed students to retake tests as often as they needed to (within the parameters of school district marking periods). Today, in my university teaching, I do not give letter grades at all, and I ask students to resubmit papers that are not satisfactory.

In the opening paragraphs of this section, I urged young professors to share their personal-professional experiences with students. I said that such experience is usually regarded as interesting and relevant because the differences in age and status are not quite so great as they are between students and full professors. However, older professors can give a special gift in discussing their development as teachers. The importance of this discussion is obvious for those who teach future teachers. But many students appreciate hearing that professors reflect on their work as teachers and that they have changed, grown, and matured in their thinking about that work.

Again, sharing personal stories may be encouraged by reading the stories of others. In my own development as a teacher, I have found particularly useful Sylvia Ashton-Warner's (1963) *Teacher* (elementary school reading), Carl Rogers' (1969) *Freedom to Learn* (teaching at every level), Wayne Booth's (1988) *The Vocation of a Teacher* (college English), and Bruce Wilshire's (1990) *The Moral Collapse of the University* (philosophy at the college level).

Humorous Stories

Stories in the first three categories can, of course, be humorous, but the stories I have in mind here are usually very short, and they are rarely part of an extended theme. They are relevant to the moment, and they serve mainly to relax tension, establish a warm pedagogical climate, and keep students awake. They are often corny, and students frequently respond with groans, but then they go on to tell the stories themselves—sometimes as examples of bad jokes.

One of my math professors told the story of how and why Noah had invented logarithms. It seems that as Noah was saying farewell to all the animal pairs after the flood and enjoining them all to "go forth and multiply," a pair of snakes demurred. "We can't multiply," they apologized. "We're adders." Thereupon Noah invented logarithms so that all the "adders" of the world could multiply.

There was another story about a brilliant mathematician who tried hard to be a good teacher. One day a student asked for further discussion of a result the mathematician had presented in his usual laconic form. The professor accepted the request genially enough, stepped to the side of the room, stroked his beard, and wrinkled his brow in concentration. Then his eyes lit up, he strode to the chalkboard and wrote the answer again. "See!" he exclaimed, "there's another way of doing it!"

The above story would fall in nicely with a discussion of one's own development as a teacher. Sometimes stories from a repertoire of humor do fall into a theme we have decided to explore. For example, math teachers who choose to elaborate on the theological interests of mathematicians will surely want to include a story about the great algorist, Euler. He, too, concocted proofs of God's existence, but the one for which he is remembered is a nonsense proof. Story has it that Catherine the Great implored Euler to do something about the atheistic influence of the prominent French philosopher Diderot. Therefore, in front of the gathered court, Euler presented a proposition to Diderot: "Sir, $\frac{a+b^n}{n}=x$, hence God exists; reply!" It is said that Diderot, like so many of our students today, recoiled at the sound of mathematics and fled, humiliated, from the scene. True or not, it makes a good story. However, students should be aware that Euler also devised serious proofs of God's existence—none of which, of course, is accepted today.

Stories of this sort are best used sparingly and never with the same class twice. Most good teachers do not include these stories in their lesson or lecture plans; rather, they store them in ready memory, and pull them out on suitable occasions.

The Psychology of Learning

It is odd that professors who are obviously entranced with their subjects rarely consider or discuss the psychology of learning those subjects. By "psychology of learning" I do not mean formal psychological experiments on memory and the like but, rather, questions and issues that should interest any serious student: Under what circumstances do I learn best? At what time of day am I sharpest? When is it best to put a problem aside? Are there strategies that can reduce the burden on memory?

Jacques Hadamard (1954) explored the phenomena of invention in mathematics. In an appendix to his study, he included questions from a well known questionnaire. Mathematicians were asked whether they were affected by meteorological conditions such as temperature, light, season, and the like; whether they engaged in regular exercise and of what sort; whether they worked best standing up, seated, or lying down. Commenting on Hadamard's study, James R. Newman (1956) noted:

> Hadamard...considers whether scientific invention may perhaps be improved by standing or sitting or by taking two baths in a row. Helmholtz and Poincareé worked sitting at a table; Hadamard's practice is to pace the room ("Legs are the wheels of thought," said Emile Angier); the chemist J. Teeple was the two-bath man. Alas, the habits of famous men are rarely profitable to their disciples. The young philosopher will derive little benefit from being

> punctual like Kant, the biologist from cultivating Darwin's dyspepsia, the playwright from eating Shaw's vegetables. (p. 2039)

Almost certainly Hadamard is right when he says that cultivating the habits of famous thinkers will do little to enhance the inventiveness of students. But studying their own habits and the conditions under which they work best may help students to improve their work. Notice, too, that Newman could not have made the above comments if he had not been familiar with stories about Kant, Darwin, and Shaw. Those stories can be used to get students thinking about their own working and learning styles. Hadamard explored at length the possible contributions of the unconscious mind to problem solving and invention. Drawing heavily on the account of Henri Poincareé (1956) and the analysis of that account by Graham Wallas (1926), he described the stages of thought called preparation, incubation, and illumination. In the state of preparation, a thinker works hard to solve a problem; he or she formulates plans, entertains alternative hypotheses, exercises all sorts of strategies, and, with no success, sometimes gives up. However, the "giving up" is temporary. One has to get on with other matters, and so the problem is set aside for a while.

A remarkable thing often happens. As the thinker is seemingly fully occupied with something else, the answer springs to mind. Hadamard and others have explored this phenomenon. What accounts for it? Some have suggested that resting the mind does it. But the mind is not actively re-engaged, so this explanation is not convincing. Others have suggested that the subconscious mind continues to work on the problem even while the conscious mind is busy with other matters. We are not sure what accounts for the happy result, but the stage has been labeled "incubation." The "aha" experience that follows in successful cases is the stage of illumination.

There are many wonderful stories of discoveries made through preparation, incubation, and illumination. (See Hadamard, 1954.) If teachers can add stories about their own experiences, students may be convinced of the reality of the events. In my days as a high school teacher, I told many of these stories. Some students, of course, wanted to skip the stage of preparation. These were people who were also attracted to learning foreign languages in their sleep. Of course, without the hard work of preparation, no results were forthcoming. Perhaps the most important idea that students gained from these discussions is that hard work, even if it does not pay off in immediate results, is likely to produce something eventually. Students have to learn not to measure their scholarly efforts in terms of gross productivity. Teachers should help by refraining, occasionally, from assigning grades. Some assignments, or parts of assignments, should be undertaken without fear of penalties.

It seems likely that most students do not use their minds well. They settle into drab modes of coping with academic work. It can be exciting for some to hear about the visual methods used by mathematicians and scientists and to learn that, despite the claims of many philosophers, some great thinkers (e.g., Einstein) have insisted that the core of their new ideas was established not verbally but visually or even kinesthetically.

In *Awakening the Inner Eye* (Noddings and Shore, 1984), my co-author and I have suggested ways by which students can enhance intuitive modes and thus add to their powers of thinking. First, one must have a congenial setting. Most of us need at least fifteen minutes of gradually deepening concentration in order to enter an intuitive mode. Pearl Buck, for example, needed fresh flowers and a peaceful view in order to get started on her writing. Descartes often worked (thought deeply) while lying abed mornings. Pablo Casals got in touch with his own musical muse by starting every morning by playing Bach fugues. Students should be encouraged to explore what works for them. (Again, there will be some who will copy Descartes by lying in bed, but not by thinking.)

Second, we must encourage receptivity. Receptivity, as I am using it here, should not be confused with passivity. Today we are so aware of the evils of passive learning that we sometimes castigate ourselves for lecturing. But students and listeners can be very active; they can generate and construct during a lecture, and these capacities should be cultivated. To be receptive is to be wide awake, open to ideas, willing to believe. Too often, especially in philosophy, we require students to analyze and raise objections prematurely. A receptive attitude induces a consummatory experience, one of enjoyment.

Third, an intuitive mode is aimed at understanding and not just the production of a particular result. Stories of artists and scientists working in this mode can be very valuable. Such work is not rushed; it is not guided by specific learning objectives. One of the worst suggestions made by professional educationalists is that all teaching and learning should be directed by pre-specified objectives. This approach takes all the romance and fun out of learning and leads to the debilitating notion that all intellectual effort must culminate in a measurable result, under specified conditions, in a particular span of time. Stories of genuine intellectual effort should help to dispel this pernicious notion. (This is not to say, of course, that <u>no</u> academic work should be guided by specific learning objectives. Some work is well suited to that method.)

Discussion of the psychology of learning in a particular field can be as important as teaching the content. Such a discussion is greatly enhanced by stories, both biographical and autobiographical. Hearing the stories opens new vistas for students. Searching for them adds pleasure and relaxation to the lives of teachers.

Summary

Stories can be used to increase the cultural literacy of students, to enhance our presentations, to extend the influence of our subject to other fields and into existential questions of universal interest, and, overall, to establish a climate of care in our classrooms. I will close this chapter with the analysis of a paragraph that illustrates the points I have made here.

In an exploration of his own theological interests, Martin Gardner (1983) scoffed at "fake immortalities." He, like many of us, wants a continuation of his own consciousness, not a conceptual imitation of immortality. He wrote:

> It does not fortify my soul in the least to know that after I die all unmarried men will still be bachelors, that 37 will still be a prime number, that the stars will continue to shine, and that forever I will have been just what I am now. Away with these fake immortalities! They mean nothing to the heart. Better to say with Bertrand Russell: "I believe that when I die I shall rot, and nothing of my ego will survive." (p. 282)

Sharing this paragraph with students tells a personal story of sorts; it reveals my interest in mathematics, philosophy, biography, and theology. It has the potential to increase students' cultural literacy. Do they know that "All unmarried men are bachelors" is a famous tautology used repeatedly in philosophy? What will they say if asked whether 37 is a prime when it is written as a numeral in base 5? (It is, of course, but because it appears as 122_5, many students will say that it is now divisible by 2!) Do they know that some prominent theologians have described immortality in terms of the record of our experience in the mind of God (an ultimate form of permanent record or transcript)? Have they heard of Bertrand Russell?

Students who are fortunate enough to hear such stories from their teachers may find their intellectual lives enormously enriched. They may read more widely and find soul-mates among writers who share their own idiosyncratic interests. They may even find satisfying answers to some of the persistent existential questions that all of us, as thoughtful human beings, face.

References

Abbot, Edwin A. 1952. *Flatland*. New York: Dover.

Ashton-Warner, Sylvia. 1963. *Teacher*. New York: Simon and Schuster.

Bell, Eric Temple. 1937/1965. *Men of Mathematics*. New York: Simon and Schuster.

Booth, Wayne C. 1988. *The Vocation of a Teacher*. Chicago: University of Chicago Press.

Clandinin, D. Jean; Davies, Annie; Hogan, Pat; and Kennard, Barbara. 1993. *Learning to Teach: Teaching to Learn*. New York: Teachers College Press.

Gardner, Martin. 1983. *The Whys of a Philosophical Scrivener*. New York: Quill.

Hadamard, Jacques. 1954. *The Psychology of Invention in the Mathematical Field*. New York: Dover.

Hawkins, David. 1973. "How to Plan for Spontaneity." In *The Open Classroom Reader*, edited by Charles E. Silberman, 486-503. New York: Vintage Books.

Newman, James R., ed. 1956. *The World of Mathematics*. New York: Simon and Schuster.

Noddings, Nel, and Shore, Paul. 1984 *Awakening the Inner Eye: Intuition in Education*. New York: Teachers College Press.

Noddings, Nel. 1993. *Educating for Intelligent Belief or Unbelief*. New York: Teachers College Press.

Perl, Teri. 1978. *Math Equals: Biographies of Women Mathematicians*. Menlo Park, CA: Addison-Wesley.

Poincareé, Henri. 1956. "Mathematical Creation." In *The World of Mathematics*, edited by James R. Newman, 2041-2050. New York: Simon and Schuster.

Rogers, Carl R. 1969. *Freedom to Learn*. Columbus, OH: Merrill Publishing Company

Wallas, Graham. 1926. *The Art of Thought*. London: J. Cape.

Wilshire, Bruce. 1990. *The Moral Collapse of the University*. Albany: SUNY Press.

Witherell, Carol and Noddings, Nel, eds. 1991 *Stories Lives Tell*. New York: Teachers College Press.