



Sloan Career Cornerstone Center

Profiles of Civil Engineers



Henry Petroski, Ph.D., P.E.

**Chairman of the Department of Civil and Environmental Engineering
Duke University
Durham, NC**

Education:

B.M.E., Manhattan College

M.S., Civil Engineering, University of Illinois, Urbana-Champaign

Ph.D., University of Illinois, Urbana-Champaign

Job Description:

"I am currently Chairman of the Department of Civil and Environmental Engineering at Duke University. As an individual faculty member, I am expected to teach and carry out research, which includes writing up results in the form of articles and books."

Advice to Students:

"Read about the history of civil engineers and civil engineering to better appreciate the great role they have played in shaping the world as we know it. Also, notice the contributions of civil engineers that are all around us, in visible structures like bridges and skyscrapers as well as in less visible components of our infrastructures like water treatment plants."

Video Transcript 1:

"The role of a civil engineer is just very, very broad across all aspects of society. And it's a very responsible position to be in. But ultimately the civil engineer is serving society, and making sure that the infrastructure is in place, and is well-maintained. And also being responsible to look ahead and predict what is going to need attention down the line to make sure that there are roads in place, there are airports adequate to handle the traffic that's going to develop. To make sure that there's enough of a clean water supply, to make sure that sanitary conditions are preserved by making sure that a sewer system is in place."

Video Transcript 2:

"Oh, I think the engineering profession is very fulfilling. It certainly has been for me. It makes it possible to live a very comfortable life. It is a profession, and there's a certain pride and respect that comes with that. It's very people-serving. Without question, engineering is really the basis of civilization in many ways. We wouldn't have what we have today if it weren't for engineering. I mean, the comforts of having shelter. The food -- agricultural engineering provides enough food to feed a nation and the world. Medicine is a form of engineering in many ways, and engineers contribute a lot to the medical profession in developing instruments

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and tools that help in restoring health or keeping people healthy. Engineering is really a wonderful profession."

Video Transcript 3:

"Well, the kinds of skills that engineers have to bring with them into the 21st Century are probably communication skills, communication interpreted very broadly. And that includes good computer skills, knowing how to find one's way around the Internet, knowing how to use the computer to produce graphical images, drawings. What engineers used to do with a T-square and pencil they now really have to do with a computer keyboard and mouse. These are very important skills. Putting together a prospectus or a proposal for an idea is a very important skill that an engineer has to learn, has to develop really, because in working and communicating with other people you really have to be able to make a case for what it is that you are bringing to the table."

Video Transcript 4:

"What students learn in school is going to be different from what they do ten, twenty years out from graduation. But what's going to be common, what's going to be constant in that time, is the method that engineering students learn, the method of how to approach problems and how to solve problems. So their basic tools are never obsolete. The state of the art will change, but the basic tools that the students learn will be good for life. My advice to students is to pay attention to the fundamentals, to pay attention to the common features of the various courses. Whether they be in transportation, or structures, or environmental engineering, there are common approaches that all of those areas use. And catching on to that really makes you a much better engineer."

Video Transcript 5:

"Well, when somebody's enjoying a career it does tend to pervade their whole life. And sometimes it becomes a family joke when you go on vacation and you go out of your way to see a new bridge. But it all can be very pleasant and enjoyable."

Interview:

Petroski: I particularly enjoy writing books about the design process, especially as it relates to bridges and other civil engineering structures. The process of writing books is interesting because it begins with a great deal of reading and thinking about how to integrate all the facts and ideas into a coherent and interesting story that not only is entertaining to read but is also informative about the nature of engineers and engineering. Engineering students usually select their field in the first or second year of college. At the same time that you are coming to grips with the fundamentals of engineering, you should also pay attention to the broader issue of learning to learn a skill you will need to master if you are continue to develop as an engineer. Engineers also need a range of abilities not traditionally associated with the core curriculum. It is important to develop your writing and speaking communication skills, for instance. It is a good idea to get involved in campus activities that let you develop as a person as you learn to be an engineer.

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Q: Why don't you tell us what your background is, and how you came to do this?

Petroski: Well, my background is I went to school at Manhattan College in New York City. I alternated between civil engineering and mechanical engineering as a major. I wasn't sure which way to go, and I seemed to change every summer. I ended up in mechanical engineering because that was the last change I made. So my bachelor's degree is in mechanical engineering. Then I went to graduate school, in large part because I enjoyed the mechanics, structural mechanics, structural engineering courses so much as an undergraduate. And I went to the University of Illinois, and I studied for a master's degree and a PhD there.

Q: Can you tell me about the way that civil engineering was taught when you had your courses when you were an undergrad? Do you think that it's changed since you've been there?

Petroski: There have been some changes, but a lot has remained the same. Generally speaking, students, when I went to school, which is about 35 years ago now, took more courses. Lab courses were often distinct from lecture courses, and you were graded separately for them. There was a lot more, I would say, contact hours, generally speaking. It took more credits to get a degree than it does now. Of course, the computer was nonexistent when I was a student. We used slide rules. Slide rules were a necessary piece of equipment for every engineering student. A lot of engineering students were known by the slide rules that they had attached to their belts. Somewhere around the 1970's after I began teaching, the slide rule became replaced by the electronic calculator. That was a very interesting period, actually. Professors at that time were very uncertain about whether students should be allowed to bring electronic calculators into class because it was thought that they might have an unfair advantage over the students that used the slide rule. But the computer - calculator revolution happened so quickly that it became a moot point, and now everybody of course just uses a calculator. Every now and then people that teach the way I do ask students in our classes, how many of you know how to use a slide rule. The number is decreasing every year. It's just about zero now. The only students that seem to know how to use a slide rule are those who have been taught by their father or their aunt or uncle who grew up with a slide rule.

Q: What drew you to civil engineering finally, though? At what point did you stop considering yourself a mechanical engineer and start thinking of yourself as a civil engineer?

Petroski: Well, when I came to Duke University, I was offered a job in a civil engineering department here to teach mechanics, which is an important part of engineering generally. Engineering mechanics involves itself with forces and motions and how bodies react to forces, how they move when a force is applied, how they deform, how they change shape. And these are all very important fundamentals for any branch of engineering. When I became part of the civil engineering department I felt I had to know as much about civil engineering as I could so that I could teach the students in the context of civil engineering. So I began to read a lot and study a lot, especially about structures. And then I began to write about structures and use civil engineering examples almost exclusively in my early books.

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Q: Can you talk a little bit about the writing process and give us an example of how many you have written, and what made you do it, and some titles?

Petroski: Well, I've written as of now about eight books. And the first book that I published was titled "To Engineer is Human", and the subtitle was "The Role of Failure in Successful Design". That was a book that was really prompted by a lot of questions that acquaintances were asking me. Neighbors were asking me why was it that bridges were failing. The Kansas City Hyatt Regency accident occurred in 1981 and people were wondering, asking me in particular when they knew I was an engineer, especially a civil engineer, why was it that that structure failed. Don't engineers know how to design structures like that after they've been doing it for so long. And I began to think about questions like that because I didn't have a ready answer. And in thinking about it I developed ideas about why structures do fail, why there are accidents, why sometimes things go wrong. And it really took a whole book to explain it adequately. And the book has become reasonably well-known for explaining why accidents occur and what it is that engineers do that sometimes goes wrong. I've written other books about failure and about things going wrong. One of them is called "Design Paradigms", and the subtitle of that is "Case Studies in Error in Judgment in Engineering". They all have got a lot of civil engineering examples in it about why things go wrong, how errors occur. How engineers make mistakes. I've also written a book about the pencil. It's called "The Pencil: A History of Design and Circumstance". And the idea there was to explain engineering in the context of a common object. A pencil is really a structure. You press on it and it can break if you press too hard. If you overload it, the way an engineer would describe it. And my original idea was to introduce ideas about engineering through the pencil. The importance of raw materials, and how they're processed, how they're assembled. How the wood supports the lead in the pencil, and why it does, and why it's necessary. And liken it to reinforced concrete because you have steel embedded in concrete the same way you have lead embedded in a wood-cased pencil. And it seemed that the pencil would be a good vehicle for conveying a lot of ideas about engineering. But it turns out in the writing process you often get led down tangential paths. And in the case of writing about the pencil, the history of the pencil itself more or less took over the book. And although it's still a book about engineering, the engineering is more implicit than explicit in that book. I've also written a book called "Engineers of Dreams: Great Bridge Builders and the Spanning of America" is its title. And that's a very long story about how bridges came to be in America from some of the earliest bridges of the 19th Century when the railroads were expanding to some of the largest suspension bridges today like the Verrazano Narrows Bridge and the Golden Gate Bridge. And there's really a continuous story there, and I wanted to tell it. And I tell it largely through the careers, the lives and careers of six engineers who played important roles in building, in designing and building bridges in America, including James Buchanan Eads who built the first bridge across the Mississippi at St. Louis. And that bridge today is called the Eads Bridge, named after its engineer, which is an unusual distinction for an engineer to have a structure actually named after him. I also tell the story of a lot of the New York bridges because they were very important when they were being designed and built, especially around the early part of the century. The bridges connecting Manhattan and Brooklyn, the Brooklyn Bridge was built -- completed in 1883, and that led to the development of greater New York City as we know it today. And because it was developing so quickly at the end of the 19th Century there were needs for a lot of other bridges between New York and Brooklyn. And I tell the story of those bridges. The story of the George Washington Bridge, the first bridge to cross the Hudson River at New York. A story that you know, like

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many stories of bridges, really took decades to evolve. These make very interesting stories, and they give insight into how engineers go about creating things like bridges.

Q: So you've obviously disproved the theory that engineers can't write, or they can't communicate. Do you think that that's true? Is that something you've found as you've been in your career?

Petroski: No, I think it's a real misconception that engineers can't write or can't communicate. I teach a course that is mainly sophomore engineering students, and one of the requirements of that course is for the students to write a major term paper that is a case study of some engineering structure or some engineering project that particularly interests them. And I find that the students really all do a good job. They write well, and they get very excited about the project that they're involved in. And they not only have to write it up, but they also have to present it orally. And they do that well, too. In other words, I think engineers really are, engineering students and engineers are really excellent communicators. When they're communicating something that they know about and they're interested in, not just some arbitrary assignment that might be for a, oh, let's say a speech course.

Q: What are some other skills that engineers need to have? Young engineers coming into the 21st Century? Because things have been changing rapidly.

Petroski: Well, the kinds of skills that engineers have to bring with them into the 21st Century are probably communication skills, communication interpreted very broadly. And that includes good computer skills, knowing how to find one's way around the Internet, knowing how to use the computer to produce graphical images, drawings. What engineers used to do with a T-square and pencil they now really have to do with a computer keyboard and mouse. These are very important skills. Putting together a prospectus or a proposal for an idea is a very important skill that an engineer has to learn, has to develop really, because in working and communicating with other people you really have to be able to make a case for what it is that you are bringing to the table. All of these are really communication skills.

Q: How about when you were in school? What made you decide to keep on going to grad schools as opposed to going on to chemistry? Did you have co-ops or internships or anything while you were in school that you tried, or did you just always know that you wanted to focus on an academic pursuit?

Petroski: Well, while I was an undergraduate I had job. And one of the jobs I had was working for a scientific instrument supplier. And this supplier provided instruments to schools, high schools and colleges, for experiments in physics and engineering. And part of my job was to design new equipment and to design new experiments. And it was really like an engineering internship to me. It was one of the things that got me excited about engineering. But the course work also excited me. In doing the course work I enjoyed the development of the material, how it fit together, how it took me into new areas, and I wasn't tired of school at the end of being an undergraduate. So the natural thing was to go on to graduate school and try to learn more about what I enjoyed so much in undergraduate school. And one thing leads to another. And by the time you get a PhD it seems that you've got two choices, two main choices. One is to go into research, the other is to go into teaching. And I did both. The first ten years after I got my PhD I spent part of the time teaching, and I spent part of the time

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working as an engineer in a government laboratory. I was involved with designing experiments and analyzing failures, generally working as an engineer. And I enjoyed both equally. But in time I began to want to write more and more. I had been writing small pieces, essays for newspapers and magazines. But I wanted to write longer pieces, in particular books. And to do that it's best to be, usually it's best to be in an academic environment, because part of your job is to write and is to communicate. People view that in a university as a form of teaching. It's just teaching beyond the classroom. It's teaching a wider audience. It's trying to reach people that might not take a formal course in engineering but might want to learn about engineering nevertheless through reading a book. So that is what I'm pretty much doing now.

Q: What are the things that you are responsible for?

Petroski: Well, because I do so much writing, I get interviewed a lot, get called up by reporters who would like to know something about a particular bridge or a particular structure. When something goes wrong and it's in the news the reporters often want to get an expert opinion on it. And if you've written a book in an area that makes you an expert. So they will want to explore with you some of the implications of what might have happened, or sometimes they're writing stories looking ahead what's going to happen in engineering or technology and they would like to get some opinions about that. I also give a lot of lectures. Another thing that happens when you write books is people read those books, hopefully, and sometimes they like them and then they invite you to give talks. And they can be talks that range from a high school audience, grade school audience, an old folks home, a retirement village. Or they can be talks that might be for thousands of people in a large auditorium because it's a big meeting. It runs the gamut. But the opportunity to travel to these different places can be very interesting. You meet different people and you see how different people view engineering. There are a lot of different points of view. It's also an opportunity in traveling to give talks to see different bridges or different structures that, you know, I would have heard about, but hadn't seen. So there's that by-product, if you will.

Q: What gives you the most satisfaction of all these things that you do?

Petroski: I think writing for me is one of the things that makes me happiest from my personal career point of view, especially when there's recognition of the work that I produce. When it's reviewed in a newspaper or magazine, and it's reviewed favorably. Or people invite me to talk about it. I assume from that that they've enjoyed it, and they think that it's something worth talking about, hearing about. It's also very enjoyable as chairman of a department to recruit new, young faculty who then you can watch develop and grow. And we've been very fortunate at Duke recently in recruiting some very bright young people that have really begun to shine. And we're in the process right now of recruiting some more. So that's a very satisfying aspect of the job.

Q: It might not be possible for you to do this, but could you sort of give us an example of the way that you write a book? I mean, how you conceive the idea, and how it develops? And take us through those stages, and your participation in those stages.

Petroski: Well, the book "Engineers of Dreams" that I wrote about bridge building, I wanted to write a book about American bridges for a long time. There hasn't been as much written about American bridges as there has been about, let's say, British bridges. British bridges are very

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famous, and they've been written about over and over again from different points of view. But I didn't know very much about American bridges. And what I had read didn't tell me as much as I wanted to know. And very often that's the start of a book for me, is when what I'm interested in hasn't been written about, at least to the extent that it satisfies me that well, I know enough about the story now that I'm able to talk about it with some sense of confidence. So I wanted to write about American bridges, but how. How would I write about that. I also would like to write about things in a different way than has been written before. It's just part of my nature to try to approach things in a fresh manner. So I explored for really probably ten years how would I write this book about American bridges in a way that would satisfy me, and also readers, and be received by readers well. And I began to realize that the number of engineers who had really worked on bridges was a large number, but there were certain engineers that seemed to work in ways that were different. They became leaders in the field. They became the engineers that others talked about. They became the engineers that were quoted by other engineers. They became the engineers who acted as consultants on almost any bridge project that was current when they were at the peaks of their careers. So I began to focus on this smaller group of engineers that seemed to be the engineers around which others clustered. And it was very interesting how they interacted, and you know, some were mentors to others. Some were like students of others. And the story became interwoven and interrelated among these engineers. And telling the story of the bridges through the engineers then became a natural vehicle for telling the story that I wanted to tell. The process of writing is -- well, it's a mysterious one in many ways. But really, to me, writing and reading are almost inseparable. I can't write about the subjects I write about, I can't write about engineering, until I've read an enormous amount of background material to really see the area from a lot of points of view, and to be able to understand it so that it becomes almost second nature to me. So I read an awful lot. To prepare for writing the book on bridges I read just exclusively about bridges for probably two years. I read old issues of Engineering News Record, which is an important magazine in the civil engineering field and the construction field that really is a record of what's happened. I read a lot of the old articles in the transactions of the American Society of Civil Engineers, the ASCE. I read a lot of the memoirs that were published in the transactions of engineers that had died, and how their careers were summarized by their colleagues. I visited a lot of bridges. I took pictures and slides of a lot of bridges. I read every book I could find on bridges. After a while you begin to know the material simply because you're reading over and over again a lot of the same stories. And it's only then that I felt I was ready to write. And then in beginning to write I more or less try to let the story carry itself. Write along, and you try to describe how a particular bridge came to be conceived, for example. And you write along until -- if it starts not making sense to you, you say well, I'm not ready. And you've got to do some more reading. But if you're self-critical enough -- and that's important for an engineer, to be self-critical, whether you're writing a book about bridges or whether you're designing a bridge, you have to say well, now, this is right, and I can go on to the next step. But if it's not right you can't go on. You've got to find out what's wrong. You've got to check it. You've got to be sure that you're doing the right thing.

Q: Do you think this profession is rewarding to you professionally, financially? I mean, is it fulfilling?

Petroski: Oh, I think the engineering profession is very fulfilling. It certainly has been for me. It makes it possible to live a very comfortable life. It is a profession, and there's a certain pride and respect that comes with that. It's very people-serving. Without question, engineering is

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really the basis of civilization in many ways. We wouldn't have what we have today if it weren't for engineering. I mean, the comforts of having shelter. The food -- agricultural engineering provides enough food to feed a nation and the world.

Q: How about women and minorities and their presence in engineering? Do you feel that they have become more of a presence during your career?

Petroski: Yes. Women have definitely become a much more visible presence in engineering. If I'm not mistaken, when I went to school, there were no women engineering students that went to school with me. But then, I went to an all-boys school. I just realized that. But there were very few women in engineering when I was in school in the late fifties and early sixties. But by the time I began to teach about a decade later, there were becoming more and more women students. It was a little unusual for me at first since I did go to an all-male school as a student. I was not used to having women in the classroom. So when I began to teach, and some of the first students I taught were architectural engineering students, and there were a lot of women in that profession, it took some getting used to. But now we have probably as many as a third of the students in our classes at Duke are women in civil engineering.

Q: If you look from the perspective of the student, what are some things you wish you'd known when you were 20 or 19 and just beginning to look at engineering as a profession? Are there things that really, lessons that kids could get from this?

Petroski: Kids don't like to hear lessons from old people like me. I don't know. I guess I'm a firm believer in whatever you do is right. Not in a, you know, sense of abandon, but how you find your way through your curriculum is the best way for you, if, you know, you're honest about it. Obviously you don't just take courses in dance if you're really supposed to be an engineering student. You've got to keep a perspective on it. But I don't like to be too proscriptive. I don't think there's any one way to tell students, this is how you must study, or this is how you must do this test, because that stifles innovation. When I teach I give students design problems, and part of the idea is to get the students to realize that there's not one solution to a design problem. So telling them exactly how they're supposed to approach it would almost be counterproductive. The idea is to give them enough freedom to let them explore in their own way and discover what design is for them, for example. I don't have any, you know, message. I think it might be good if they read more. I think we are seeing more and more students coming through our programs that are not all that well read. And by not being well read -- and I mean in a broad sense of general reading, not just engineering -- by not being well read they're really not preparing themselves to be professionals.

Q: There's been a lot of talk that civil engineering is increasingly becoming a global profession. Do you think that that's been an overstatement?

Petroski: All professions are really becoming global. We're seeded in a variety of ways. We know that we have a much more international student body. Students are also going abroad to study much more. There is clearly a shrinking world. It's much easier to travel, it's much easier to communicate. It's much easier to get on the Internet and send messages to anywhere in the world at any time of the day. And people have become very comfortable in this environment, especially students. There seems to be little question that in the future there's going to be just a growing internationalism in engineering and in all professions.

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Q: What do you think the role of a civil engineer is today, if there is one?

Petroski: Well, the role of a civil engineer, the role of any engineer, is really very broad. It fundamentally is problem solving, approaching problems that society really presents to us, whether they be in waste water treatment, or bridge building, or road construction. But ultimately the civil engineer is serving society, and making sure that the infrastructure is in place, and is well-maintained. And also being responsible to look ahead and predict what is going to need attention down the line to make sure that there are roads in place, there are airports adequate to handle the traffic that's going to develop. To make sure that there's enough of a clean water supply, to make sure that sanitary conditions are preserved by making sure that a sewer system is in place. The role of a civil engineer is just very, very broad across all aspects of society. And it's a very responsible position to be in.

Q: What are some things that you like to do when you're not working? Hobbies, other interests -- is this a kind of pursuit, this career, is it something that you really can't separate? Is there no personal life and professional life? Is it all sort of, you're living your career?

Petroski: Well, when somebody's enjoying a career it does tend to pervade their whole life. And sometimes it becomes a family joke when you go on vacation and you go out of your way to see a new bridge. But it all can be very pleasant and enjoyable.

Q: Well, do you have kids? You have a family?

Petroski: Oh, yes.

Q: Would you talk a little bit about that and how it's been to balance both? I mean, to be a professor and also a dad, and other things you like to do outside of this.

Petroski: There isn't much. Well, you know, when my children were growing up I certainly did a lot of things with my children. I used to play ball a lot with my son. But you know, as children grow up they begin to have an independent life also. I would say now, at this stage in my career, most of my time is spent in one way or other, directly or indirectly, relating to my writing and my teaching and my job as a professor and chairman. And social aspects get interwoven with professional aspects. But in a very enjoyable way. Next week I'll be going up to Canada to address the Canadian Society for Civil Engineering. And while up there I'm sure I'll enjoy seeing a new part of Canada, Quebec, a small town called Sherbrooke. I'll also take a day trip up to the Quebec Bridge to take some slides of that, because I know they'll be useful in my teaching and my lecturing, and it'll also be an opportunity for me to see that bridge again, and see it perhaps in a different light. And I understand more about it now than I did when I first saw it many, many years ago. So although it's part of my career and my job, at the same time it's, you know, just a very enjoyable excursion that I'll be very, very happy to do. I'll go over to Montreal and visit McGill University and talk to some people there about the course I developed in teaching young engineering students about what engineering is because they want to hear that. And I'll get a different point of view from them. There'll be inevitably some social interaction at the same time. And I'll meet new people and I'll get to see a new campus, get to see part of Montreal that I hadn't seen before because I haven't visited McGill. So there

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are all these different aspects to it, although it appears like you're working all the time. It's really not as simple as that.

Q: Are you a member of any professional societies? Is it important to make those kinds of affiliations?

Petroski: It's very interesting to be a member of a society such as the American Society of Civil Engineers. It gives you a different perspective on the profession by going to meetings of a society like the ASCE. I belong to a lot of societies. I belong to the American Society of Civil Engineers, and several others. At a meeting of the ASCE typically there will be academics and practitioners. And to hear them talk from their different points of view is very interesting and gives a different perspective on the profession. To hear the practitioners -- the practitioners see engineering slightly differently than the academics do. And we've got to remember what we're doing in the universities. We're really preparing students to a large extent to go out and practice. So we can't be oblivious to what it means to practice.

Q: Could you talk a little bit about the different perspectives that you think practitioners have as opposed to academics?

Petroski: Well, practitioners tend to be more practical. Academics tend to be more academic. And generally what that means is academics sometimes want to study a problem for its own sake, whereas practitioners seldom want to do something of a studious nature for its own sake. If they want to study something it's because they need to know about that particular area because they've got a problem in the field, or they're building a new structure that might be involved in a different soil condition, and they have to study the soil in order to understand how to deal with it in the construction process. So the ends of the academics and the practitioners are different.

Q: Have you had mentors in your career? Or have you been a mentor?

Petroski: Well, mentoring takes many different forms. When I was a student I would say I had mentors. I'm not sure that my mentors always knew that they were my mentor. For example, if you're taking a class from a professor that you particularly enjoy, or admire, or find just very, very interesting, and what might be called a role model, you might emulate that person even though the person doesn't even know your name. Mentors can be found in books. You might read some author's work that you particularly enjoy the point of view of. And that book or the author could be the mentor, and whether you use the terminology that the book or the author is the mentor is something you could debate. So I think there are many forms of mentors, and very often a mentor can change as you progress through your career. Who might be a mentor for you in school might not be a good mentor for you later in your career. It might be somebody who is a co-worker, or somebody who is older, or even younger. I think a younger person can be a mentor to an older person under certain circumstances.

Q: What does the future hold for you? What are the next things on your list, or are you in a place where you feel you've done what you want to accomplish?

Petroski: Well, I hope I'm never at the point where I've done everything I hope to accomplish. One of the worst positions for an academic researcher or a writer to find himself in is, what am

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I going to do now. What you really want is you want to have so many ideas that you have to choose from among them, and you choose the one that at the time interests you the most or that gives you the most opportunity or that you'll enjoy the most or you think that you're ready to do. And these others you put aside, and you're going to come back to them. It's always nice to have this pile of things that you're going to come back to, because really the worst thing is not to have anything to do. In my case I would say right now for the foreseeable future I just would want to write some more books. Exactly what those books are I'm not sure at this moment, but I know they'll be about engineering, some aspect of engineering, because I don't think I fully understand engineering yet, and by writing about it I begin to understand it more. Writing is a sort of disciplined thinking, and you're forced to get it right because many, many people are going to read it, editors, critics, reviewers, and the general reader. And these people write back to you if you get it wrong, or if you get a little sloppy in your thinking. So you've got to be on your toes.

Q: Can you give me an idea of the wide array of responsibilities that you have here as department head? Give us a sort of typical day or typical week illustrating those responsibilities.

Petroski: Well, there probably isn't a typical week in being a department chairman. As the year progresses different things happen. This last week, for example, at Duke University we had graduation commencement weekend. And that was different. Basically there was a lot of checking of details to ensure that students had satisfied their requirements for the degree, checking the graduation list, going to graduation. This year I gave one of the addresses at one of the diploma ceremonies, for example, so I had to prepare that week before this week. After graduation I begin cleaning off my desk of a lot of the things that had to be put aside in the last weeks of class when I had a lot of project papers to grade. I had about 50 students each having written about a 20-page paper, and I had to read those within about a week's time, so a lot of other things got put aside. There is always the unexpected phone call, the unexpected e-mail message that comes across. Sometimes people call up and they want to come and interview you and videotape you for a CD-ROM. That's enjoyable, but it interrupts other things. So you go back and forth.

Q: How about just in general? Could you give us like, the five areas you're responsible for? What are the responsibilities of your job? If you were a student looking at you, what kind of courseload do you carry, how much time can you spend doing research? Do you have to do all the administrative stuff in the department, too? And what is that really like?

Petroski: Well, a chairman of the department generally doesn't teach as much as a professor would. Right now I teach in the spring, but I don't teach in the fall. In the fall there are other things that have to be done. We are looking for faculty, have faculty searches. So you have to do a lot of writing of advertisements for defining what those positions are going to be. You have to organize committees. You have to begin to read through resumes and curriculum vitae. That's the wrong plural. It's curricula vita. Curriculum vitae is the singular. CV's is an easier way to say it.

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Q: So you have your course load and faculty search.

Petroski: Well, there are visitors that come to the university that review our programs. Our curriculum was recently reviewed for accreditation by the Accreditation Board for Engineering and Technology, what's known as ABET. And there was a lot of preparation for that. Gathering a lot of statistics, writing a lot of descriptions. There are visitors that come. Some of them are people that contribute to the University in different ways, some of them monetarily, and they have to be entertained. You have to describe programs to them, and generally show them around and make them feel welcome and comfortable. There are other people that come. They are looking at the University as a possible place to come to school, or to send their children to school. They want to know about what it is we do. So there are impromptu visits like that. It's an interesting opportunity to meet different people, but you never know what's going to happen.

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