HOW SCIENCE WRITING IS CHANGING

F: Hello, and welcome to the Beyond the Book conference call. All lines will remain in listen-only mode until the Q&A session. At that time, you have a question or a comment, then please press *1 on your telephone keypad. Today's conference call is being recorded. I will now turn the conference over to Mr. Chris Kenneally, Director of Author and Creative Relations. Sir, you may begin.

KENNEALLY: Well, thank you, Kimberly, and welcome everyone to another Beyond the Book conference call. I'm glad to have people here on board with us for an interview session with Barbara Gastel, the new editor of *How to Write and Publish a Scientific Paper*. And what we're going to do is first outline for you how the call will work, and to tell you a bit about the expectations for the call, make some promises to you that we will keep, and then we'll go right into our interview with Barbara.

First of all, tell you just a little bit about Beyond the Book and Copyright Clearance Center. Beyond the Book is a program on the business of writing and publishing that is sponsored by the not-for-profit Copyright Clearance Center. I'm its host. We're a podcast series. We're a live conference program. We're a variety of different things, all of which you can find at www.beyondthebook.com. This program itself will be a future podcast in that series. You'll be able to download a complete transcript, learn more about Barbara and the book, and get all kinds of information about our various programs all in that one spot, beyondthebook.com.

Copyright Clearance Center itself, which can be found at copyright.com, is the world's largest provider of copyright compliance solutions. And we are committed to supporting compliance through a wide range of innovative licensing services and comprehensive educational programs. And we know, because we work so much with the world of scientific publishing, that the pace of change has really accelerated in the last few years, and it can leave even the most seasoned researchers and editors and authors, too, of course, wondering how best to communicate scientific knowledge to a diversified and growing audiences – audience.

The underlying principles of scientific publishing are themselves largely unchanged over time, but new technologies and evolving editorial procedures have remade the landscape in important ways, and that's why we want to have Barbara Gastel help us navigate that new landscape. Barbara, welcome to Beyond the Book.

GASTEL: Oh, thank you very much, Chris. I'm delighted to be here.

KENNEALLY: Let me tell the audience just a bit about your background. You are a physician specializing in biomedical writing and editing. You are an associate professor of integrative biosciences, humanities in medicine, and biotechnology –

that's three different appointments, all of them at Texas A&M University in College Station, Texas. And you also coordinate the school's master degree program in science and technology journalism. Dr. Gastel has a BA degree from Yale University, and MD and MPH degrees from Johns Hopkins.

After medical school, she did an American Association for the Advancement of Science Mass Media Fellowship at *Newsweek* magazine. She worked in communication and administration at the National Institutes of Health. She's taught science writing at MIT and spent two years as a visiting professor of technical communication at Beijing Medical Institute – or, sorry, Medical University. Before coming to Texas A&M in 1989, she was assistant dean for teaching at the University of California San Francisco School of Medicine.

The other thing I should point out is that Dr. Gastel is editor of *Science Editor*, the periodical of the Council of Science Editors. She is active in the American Medical Writers Association as well and has received distinguished service awards from those two organizations. She is the author of three books, and in addition is the co-author, coeditor of this new edition of *How to Write and Publish a Scientific Paper*. Again, welcome, Barbara.

GASTEL: Thanks again.

KENNEALLY: What I want to start with is to point out that *How to Write and Publish a Scientific Paper* first appeared in 1979, which it seems ages ago, and it underwent four subsequent editions, all of them under the direction and editorship of Robert A. Day through 1998. And then the new edition, under your editorship, appeared last spring from Greenwood Press. And obviously those eight years have seen just this tremendous tsunami of change sweep across STM journals. There's a lot to talk about, and most of it has to do with the digital revolution, of course.

But what struck me as I reviewed your list of the – what's new in the book was the emergence of a new separate chapter on the topic of ethics. What's happened in the last few years to make that something that seemed important to you?

GASTEL: Thank you for asking it. I think I should backtrack and say with regard to the digital revolution, I think that has – there is a lot in the book about that, but that is more integrated into various chapters. And in earlier versions, ethics was in a chapter combined with rights and permission, and also it appeared near the end of the book. And our thinking was that it deserved a chapter of its own and also it deserved to be near the beginning of the book, because ethics in publishing, it's not an afterthought. It's really a foundation of scientific publishing.

Also, with regard to trends in society, there's been increasing emphasis, I think, on ethics in publishing. I know, for example, typically graduate students in the sciences have to have instruction on ethics. I think Council of Science editors have continued to emphasize ethics a lot. And so we felt it deserved its own chapter, it

deserved to be up front. I think one other thing that has happened in recent years is that the authorship of scientific papers is becoming more and more multicultural. People from more and more countries are publishing in the English language scientific literature, and people come from different traditions with different assumptions about what is right and what is appropriate. And so that was another reason felt it was important to make more of this material explicit and prominent.

KENNEALLY: Well, it's interesting. There's a lot to explore there. And certainly one piece of it that I'm curious about is how the digital revolution may have actually facilitated the sorts of ethical breaches that worry us all, whether it's in science journal publishing or journalism at large. And that is that, with the Web, it's so much easier than ever to take from any source in any measure other people's intellectual property and claim it as your own, if you will, and plop it down into your own manuscript. Isn't that true?

GASTEL: I think it is, because it's physically a lot easier than in the days when it was a matter of copying, retyping something. And I think it's easy to get sloppy, I think both in terms of just habits. I think most or all of us are used to pasting things into e-mail or forwarding, and then it's, I think, sometimes an easy step to doing that in one's own work. And I think sometimes just people aren't careful about attribution. They will be taking notes and just sort of slip something in. So I think it's tremendously important to keep track of sources of material, really important to attribute where things are from.

And my feeling is, if in doubt, one should cite the source. For me as an editor, if people cite sources too much, it's easy to take out the extra citations. But if people neglect to cite the sources of things, it's very hard for an editor to know. Or if an editor suspects, it's a lot of work for the author to go back and reconstruct things. So my feeling is keep really careful track of sources and document where things are from.

KENNEALLY: Well, as someone I knew once who played in a rock and roll band, he said if you're in rock and roll, you can never wear too much black. And it's true as well in science writing, you can never attribute too much. And I guess that's because science writing, among all the various writing disciplines, is really built on the foundation of what has come before, what other people have done. Their research is what you are building upon in your new discovery, your new findings, your new report. Isn't that true?

GASTEL: Right. It is in scientific writing, and I think that's a – often something that's difficult, particularly, I think, for young students, because they're very wrapped up in their own research and feel that it's enough just to present what they did and what they found. But it's important to integrate the work into the broader fabric of science.

KENNEALLY: Tell us about the point you raised earlier, which is determining just who gets credit as an author. Explain that and talk about how your book helps people parse through that decision.

GASTEL: Right. And I should say that Robert Day, who was the sole author of the earlier version, gets a lot of credit for this. Authorship is a sticky, sticky subject, and sometimes there are not totally clear-cut decisions. Also there can be somewhat different traditions in different fields. To take one example, I come mainly from the biomedical field, and the order of authors usually is the person who did – sort of took the lead in the work is first and then, put very simplistically, people with smaller and smaller contributions, and then sometimes, let's say, the head of the laboratory at the end. My husband's in mathematics, and there the tradition is normally just simply to list the authors in alphabetical order. And so he regrets the fact that his last name is Vogel. (sp?)

So there are differences in fields, but I'd say the overall principle is that to be listed as an author, you should have a major intellectual contribution to the work, be majorly involved in designing, analyzing, those kinds of things, not merely doing the physical labor. Sort of joke about the student who spent all summer pipetting and, well, that person deserves an acknowledging perhaps for the assiduous and precise pipettings, but would not be an author. And I think one really nice thing that this book does – and, again, Bob Day gets the credit for the original version of this – is giving an example of how a research project evolved and therefore how the authorship evolved as different people contributed.

KENNEALLY: And you mentioned cultural differences as far as attribution goes. Can you explore that with us, if there are any particular examples you're thinking of? And does that also apply to authorship? And you say it's different between disciplines. Is it also different across various cultures and nationalities?

GASTEL: I think so, and I believe there are other people who are – know more about this than I do. But I think in terms of attribution, in, I'd say, U.S. culture, there tends to be a lot of attribution. There's some more traditional cultures where there's not the same sense of intellectual property, and it's felt that once somebody publishes something, it's more common knowledge and it's OK to just take a paragraph and slip it into your own work and that perhaps the person would even be honored.

And so that could be different. Also, in terms of different traditions of authorship, again, there are some cultures where at least traditionally, let's say if someone was the department head, he or she would get his or her name on all the papers from the department, whether or not there was a contribution.

KENNEALLY: Right. And there have been some controversies in recent years around all of that.

GASTEL: Yes, there has.

KENNEALLY: You referred to Bob Day, and so just the fact you call him Bob Day rather than Robert Day, I think, tells us a little bit about your relationship with him, and I would appreciate your telling us how the torch happened to pass from him to you. He was a professor of English at the University of Delaware for many years and, like you, taught scientific and technical writing there. How did you first come to know the book, know Bob Day, and then finally wind up as the new coeditor, co-author?

GASTEL: I think it's a nice story, and in fact if I read it in a novel, I might think it was too contrived. It is – I became aware of the book – I think I became – I saw it in a bookstore right after it came out. At that time, I was a new medical school graduate going into medical communication, and just I remember starting to read the book and not being able to put it down, and just really totally enjoying it and gaining a lot of it from it. And then over the years, I taught from every edition in a variety of universities here and abroad, and always thought it was a wonderful book.

Meanwhile, I came to know Bob Day. He was actually the publisher of my first book. Before he was an English professor, he was in publishing, first of all, in journal publishing at the American Society for Microbiology, and then he was the director of the ISI Press when the Institute for Scientific Information had a publishing division. And they had a series of books on the aspects of scientific and technical writing, including his book. And one day when I was a new assistant professor, got a flyer, direct mail advertising for this series of books, and saying we invite you to try our books and so forth.

And I wrote back and I said I'm already using your books. I really like them, and I have an idea for another book in your series. And this was a book on communicating science to the public. And so I guess back then he was Mr. Day rather than Bob Day to me – asked me to submit a proposal, and they accepted it, and it ended up being the book, *Presenting Science to the Public*, which came out in 1983. And then over the years, Bob and I kept in touch, though not closely.

And then just a few years ago, I got a call from the current publisher of *How to Write and Publish A Scientific Paper*, and they asked me if I was familiar with the book, and I said, oh yes, quite familiar. I've taught from every edition. Well, what do I think of the book? Well, I think it's really good, otherwise I wouldn't have chosen to teach from every edition. And they said, well, do you think it's getting out of date? Do you think a new edition is needed? And I said, well, some parts are getting dated, especially parts relating to technology. I said, I don't think it's urgent, but I feel that a new edition should come out in the next few years.

And they really seemed to be very interested in my opinion of the book, so I said something that I didn't know if it was really my place to say or not, but I said if

you're thinking of bringing out a number of other editions, I know Mr. Day, and he retired several years ago and mentioned that at that time he was – the time we talked on the phone, that he was probably about 80 years old. And I said if you want to keep the book going, it might be helpful, sometime in the next few years, to start thinking about having a younger co-author. At which point they said, yes, that's why we're calling you. And so then they and Bob Day asked me to come up with basically a proposal for the revised version, which I did, and they accepted, and then we were off and running from there.

KENNEALLY: Well, and it mustn't have taken you too long to think about that proposal, because you had clearly already recognized what were the things you saw that had changed or needed to be put in. And that's what we'll talk about right now, which is what's new about the new edition. And I think that one way to start is about the way that the Web has shifted some of the responsibilities in science journal publishing, or at least changed the mix. And my sense is that the amount of the burden on the author has increased. Would you say that's true as well? And I think it's really about being able to produce as a submission a ready-to-publish manuscript. It's not like you could simply type it up onto white bond paper and send it in the mail. I think previous editions, you've told me, had a section on how to pack the manuscript in an envelope.

GASTEL: Right. That's true.

KENNEALLY: Nobody's going to be doing that anymore. And indeed, on the receiving end of all of this, people are going to be expecting an electronic document that they can almost flow into whatever happens to be their publishing software. That's true, more or less, isn't it? And doesn't that change the way authors have to do their work?

GASTEL: It's interesting how things have changed over the years. I still remember the days when people had technical typists, and I think now most scientists are keyboarding their manuscripts themselves. And I think it's true, rather than just – I remember when people would type up the manuscript or have the typist type them up, send them in, and then actually the publisher would re-keyboard everything. Whereas now, people are expected to provide things electronically and in the formats that the journal requests, which, as you mentioned, sometimes it looks like the ready-to-publish manuscript. Sometimes it doesn't, but it's more just providing the components in the way that the publisher can use them to put together the pages the way that they will look at.

And I think one thing I'd really emphasize here is following the instructions for authors. I find sometimes some of the younger authors I work with don't even realize that journals have their instructions on their Website. And I think one thing that takes a lot of the guesswork out of it is finding the journal's specifications for how to submit the electronic files and how they should be formatted. And my sense is that it has been challenging in many cases as the bumps are getting worked

out of the system, but it's starting to become easier, starting to become more standardized.

And I think, as with a lot of things with computers, at the beginning it takes a lot of work. Later it becomes more user-friendly. And I think it is getting to that, I think, as for with other electronic aspects, too, such as online peer reviewing, which I think a lot of us do, which, at least for me, at the very beginning it seemed just such a big production, and now it's something you pretty much take for granted.

KENNEALLY: Well, that's an interesting point, but before we talk about the peer review part – and it's really not disconnected from the submission part, because if it is electronic, it's all going to be part of one long train track. But the submissions now include not only text, but people are going to be submitting illustrations, photographs, and so forth. And so even the formats that those elements are in really need to be followed, because the Web is dictating the – well, it's dictating the formats, dictating the parameters of those kinds of submissions.

GASTEL: Although I think all along there were certain formats, because I remember when they'd be telling us whether things would be matte or glossy and other specifications. So I think it's a matter of, I think, just mostly getting used to new kinds of specifications. And this also gets back to – we were talking earlier about ethics, using them ethically, because with photography, too, traditional photography, there is opportunity to distort things, whatever. But I think it's often so easy to digitally manipulate something. So I think needs to be particular vigilance.

KENNEALLY: And again, we've seen some controversies around that, as I recall, and so people really do need to be diligent. And when it comes to submitting works that include not only the text, but photography, as well as illustrations, it may be that the particular authors are acquiring these from collaborators or they're getting them from other sources. And so among the various new chapters, including two of my notes here, you've got 41 chapters in the 6th edition, 12 of them entirely new. One of them is on rights and permission, then, is that right?

GASTEL: Right, it is. It used to be part of a chapter, but we felt that it deserved its own chapter and its own emphasis.

KENNEALLY: Is that because things have gotten more complicated?

GASTEL: I'm not sure that it actually has become more complicated. I know my life is actually easier because of the Copyright Clearance Center.

KENNEALLY: Well, I wasn't looking for the plug, but thank you anyway. But I –

GASTEL: But I think – I don't know if it's more complicated, but I think it needs more explicit attention, and so we felt it should be.

KENNEALLY: That's an important point, because – and again, it goes back to ethics, as you said, which is that people are much more sensitive to whose material is whose. And that's not something that can be taken lightly.

GASTEL: Not at all.

KENNEALLY: Absolutely.

GASTEL: And I think actually with electronic communication, in ways it's easier. Getting permission through the Copyright Clearance Center. I know for many publishers that I've gotten permission from, they now have places at their Websites where we can apply. Also, when the author is the copyright holder, I find with e-mail it's so much easier and quicker to contact the author about permission rather than, I remember from my first book, sending out a whole lot of letters.

KENNEALLY: Absolutely. And you're going to get a much faster response.

GASTEL: Definitely.

KENNEALLY: And wherever they are in the world. Well, we mentioned the 41 chapters and the 12 that are new. There's a couple that are worth exploring, and we've alluded to the importance of them. And I think it's because the world has gone from being – I'm looking at the fifth edition here and the sixth edition. The fifth edition, it's also curious to show how things have changed. It's an attractive, but very obviously school or a scientific publisher with a grey-blue cover and dropout letters and so forth. And your new book has got this fabulous colorful shot of a scientist working with some sort of illuminated illustration of, I don't know, a microscopic image and so forth.

So clearly the way the Web and its emphasis on attractive design has made everybody aware of it, we've all been impacted that way. But it's the fact is the Web has globalized everything. The audience now for these journal articles isn't simply the U.S. or North America, but is indeed a world audience. And that means that authors are writing for a world audience.

GASTEL: Right, definitely. I think the trend was already underway before the Web, but the Web has greatly accelerated it.

KENNEALLY: Well, you have a chapter, and I believe it's a new one, which is "Writing Clearly Across Cultures and Media." What are you exploring in that chapter?

GASTEL: That is a chapter largely on how to write for an international readership, with the understanding that many readers of scientific papers, no matter what country they're in, are not native readers of English. And therefore, what are some of the things one can do to make reading scientific writing more accessible, ranging from

some of the choices about words and sentence structure to avoiding cultural allusions? These types of things.

KENNEALLY: And some of it is even just being careful about the kind of humor one uses.

GASTEL: Definitely.

KENNEALLY: And it seems to me that probably in that particular case, it's better to do without rather than risk the chance that something may unintentionally offend someone.

GASTEL: I think so. I think rather than risk that it either unintentionally offends someone or that it just baffles someone.

KENNEALLY: Right. Exactly. You don't – that's clearly, for any kind of writer, you do not want to lose your reader. If they have to stop and say what does he or she mean by that, then you've lost them and their attention is gone. You also talk about writing science in English as a foreign language. That too is a whole separate chapter. So it's not only writing for the global audience, but how, if you're from outside the U.S. and submitting to these journals, how to grapple with that submission when English is not your first language. Are there any particular tips for that type of author?

GASTEL: I guess one of them, which may seem ironic, is not to dwell too much on the fine points of language, that what journals want and can deal with is they want good content, they want it well-organized, and they want it clear. And if it's all those things, if there's some small grammatical problems, an editor can take care of them. So I would say that try to make the writing as polished as possible, but not stress excessively.

Another thing that I suggest, and I know I'm not alone in this, is that scientists for whom English isn't a native language, keep a list of stock phrases in their field, phrases that are used again and again. I remember when I was teaching in China, I had one student who wrote a really good, very idiomatic paper, and I asked him how he did it. And he said he went through about ten papers in his field and found phrases that were commonly used and made a list of all those phrases and used them, and it helped him to express what he was trying to say in standard and clear ways.

KENNEALLY: And it gave him some kind of confidence as he was doing that.

GASTEL: Right, yes.

KENNEALLY: Well, what's interesting, too – and I believe this must be related to what we keep calling the digital revolution – science, the reporting of science discoveries

and advances in science that are published in scientific journals has really blossomed over the last ten, 15 years. There is a public interest in scientific discovery – whether it's stem cell research, to the identification of the genes in the SARS virus, to whatever – has meant more scientists are now communicating not only to their peers through the science journals that they write for, but also subsequently to the public in various ways.

And so that means that they must be better at working with the media, and indeed you have a new chapter on that. What are some tips you have, because you've been on both sides of that? You're a scientist and you've done reporting for *Newsweek* and others.

GASTEL: I guess some of the tips is – I guess one is to know the medium that you're reporting for, because clearly – let's say if you're reporting – if you're being interviewed, let's say, by your local newspaper or by, let's say, a specialized magazine, it'll be different. So think about what the audience is. I would say if you can, find out the reporter's background, because that can help too. These days, people reporting on science range from people who just took the minimum of science in school to people who have Ph.Ds in the sciences. So I think knowing the reporter.

I think one of the main things is to keep on focus, usually, particularly if you're dealing with the broadcast media. Can't expect to go into a lot of detail, but if you can have one or two or three just main messages and make sure they get through – try to say them in a snappy way. I think another way is a thing that can sometimes help is to actually envision a reader or listener. Maybe it's your neighbor who is very bright, but does not have any background in your field. Something like that can sometimes help.

KENNEALLY: I particularly like the tip about know the reporter. And today you can do that with the flick of a keyboard at Google, because you can see what that reporter has published in the past. Many reporters have blogs where they tell you about themselves. You can see the organization. If you're not familiar – sometimes you're familiar if it's NPR or the *New York Times*, but a particular newspaper may be entirely new to you, and to understand its audience and what it's trying to cover, all you have to do is go online. So there's –

GASTEL: And I think that's another point, that often you can ask for a little while – I know if it's a daily newspaper, they may be on a tight deadline, but usually (inaudible) 15 minutes. And I think often it's good to take a little time, do a little research either online or, if you're at a university, if you have a media relations unit, they often are very familiar with the reporters. Do a little research on that. And I'd say get your thoughts together on what you'd like to say and what you'd like to emphasize.

I think another thing that's really helpful – and back to electronic makes it very easy – is it's – I think it's very helpful to reporters to have something in writing, particularly if they're covering something technical. And these days it's so easy to e-mail copies of papers or news releases or other things. So I would say try to provide something in writing if you can.

KENNEALLY: That's good advice. Well, we're a little bit more than halfway through the program here. Just to remind everybody who has joined the call that you're listening to a Beyond the Book conference call. My name is Chris Kenneally, Director of Author Relations at Copyright Clearance Center. We have on the line Barbara Gastel, who is the new coeditor, co-author of *How to Write and Publish a Scientific Paper*, which is now in its sixth edition from Greenwood Press.

If you have any questions, we do invite you to join us for the Q&A part of the program, which will be coming up shortly. If you would prefer to e-mail your question, you can do that directly to me at beyondthebook, all one word, beyondthebook@copyright.com. Let's, if we can, bring in a colleague here to tell us just a little bit about how what you're saying jives with her own experience. Welcome, Diane Feldman.

FELDMAN: Hi.

KENNEALLY: Diane is the principal of AuthorCraft Editorial Services, and she's been writing and editing professionally for over 20 years, and works extensively with medical researchers on their manuscripts – editing them, preparing them for submission to either textbooks or journal articles. She is active in both the Society for Technical Communication and the American Medical Writers Association. And I should say that I do want to welcome all the member of both AMWA and STC who are on this call. We also have members of the National Association of Science Writers joining us today.

Welcome to you all, and welcome, Diane. Now Diane, in your work with writers there – you're based at the Research Triangle – and I just want to ask you if what you're hearing Barbara say sounds familiar to you.

FELDMAN: Oh, all too familiar, particularly all of the aspects about the electronic side of publishing these days, from the ease of publishing – and really, I do think it's easier, although, as you've mentioned, Chris, that it puts – increasingly, the burden is put on the researcher to do the work of the manuscript. That's because the work of the manuscript is so much less cumbersome than it used to be. And so in a way, I think it's a great improvement.

But one of the interesting things that's a result of all of this is that now with it being really as easy as it is, there are – there's just far more submissions than there used to be. And, oddly enough, there's also just a skyrocketing number of journals to submit to. So it's all kind of dizzying, I think, for an author to decide who

they're going to submit to. And of course everybody wants to submit to the prestigious journals, and those journals are getting overwhelmed with submissions because it's so easy to submit to them.

And so it's really just a magnified process these days. And in such an environment, it's really important for a researcher to – the researcher who's able to submit a paper that is both scientifically sound and well-written and conforming to the instructions of the journal definitely has an edge.

KENNEALLY: Absolutely. And I'm happy to plug the book, because I believe in the book. You've told me that that's how authors can use Barbara's book, really. It's a way to help them find a calm center. If you're a fiction writer, you need a cup of tea and maybe some nice music playing in the background. But if you're a science writer, really what you ought to have in front of you is a copy of this book, because your work, 99% of the time, is the science and only very rarely is the writing. But with this book on hand, it's a way to get some focus, right?

FELDMAN: That's absolutely true, and I was reminded of how well the book serves that purpose as I was reviewing it earlier this week. Each of the chapters is short and addresses one particular point – "How to Write the Method" section, for example. And the purpose of that section and pitfalls and what tense to write in, even little things like that are explained clearly and briefly so that you can just take your snapshot – no chapter is more than a few pages long – and get centered for that section you're about to write right now. It's great advice.

KENNEALLY: And there's also some good advice you were telling me before about how to get ready to write. Again, it's not the cup of tea or the music that's playing in the background. What are things that scientists in their very busy lives need to think about as they are going to sit down to write?

FELDMAN: Well, that was the part I was especially glad to see added to this version of the book. When I give talks to researchers, I often spend quite a bit of time on tips for sitting down to write, because it's a daunting process to people who don't do it every day. And it's a complicated one. Writing a scientific paper involves a lot of collecting of data and sifting through data and condensing data and then packaging that data in the middle of clear and cogent text. It's not an easy process, and when a person is very busy, the very idea of sitting down to do it at all seems overwhelming. How am I going to spend three days? Where am I going to find three days to write this?

And one of the best tips I think is in the book is to carve out some time and say, all right, I'm going to – I know that these hours of these days are pretty quiet for me. Those are my writing times. And I'm going to be done by (inaudible) because I'm going to do this much a day.

KENNEALLY: Right. A journey of a thousand steps – of a thousand miles, rather, begins with one step. Well, Barbara, I want to come back to you and ask a question before we invite the audience to join us here. You are – and it's a long list, right? You're a physician, a journalist, a professor whose research covers humanities and technology, and it sounds like there's a potential for conflict there – the writer versus the scientist. Do you have practical advice from your own experience for how scientists can write better, certainly, but also feel better about the act of writing itself? How to approach writing as a task itself, apart from the various details about the methods and so forth? Some of them may just be worried that I'm not a writer, I'm a scientist, I can't do this.

GASTEL: I guess one of the things that I would echo what Diane was saying, I think one of the most helpful things is to carve out some time. I think my big conflict is probably not between the science and writing, but just between all the things I'm trying to get done and finding time to write. Certainly with this book it was a challenge, and I think the idea of having some blocks of time to write. I think in terms of advice on writing and then feeling better about writing, I guess your thought – well, I'm a scientist, I'm not a writer – I think one of the things that always impressed me about the earlier editions of the book, and it still says it, is that writing a scientific paper, it's not a literary task. It's almost the opposite of it. You don't want lovely metaphors that can be interpreted 12 different ways in a scientific paper.

Writing a scientific paper is pretty straightforward and largely a matter of being organized and clear-thinking, which are a couple of things that make someone a good scientist. So I don't think there's probably much, if any, correlation with, let's say, whether one can write sonnets and whether one can write a scientific paper. If someone's a scientist, they've got the capacity to do it.

I think one of the things that sometimes people don't realize is that writing a good scientific paper usually does take a lot of drafts and a lot of rewriting. Sometimes people say I'm not a writer, because it doesn't come out right the first time. I don't know any scientist for whom it comes out just right the first time. I remember a number of years ago, I was very, very lucky to have come speak to my class the person who was then the editor of the *Journal of Clinical Investigation*. And this man was just known for being a wonderful scientific writer, for having papers that were beautifully written, that were published almost as is.

And so they have a very nice talk, and at the end of class, one of the students timidly raised his hand and said, well, Professor Gastel says we need to rewrite our work to bring it up to proper standards. Do you ever rewrite your scientific papers? And he said, well, if I'm lucky, only ten times. And so I think realizing nobody cares how bad the first version is, as long as you rewrite it (inaudible), I think.

I think another thing is that reading, I think, makes for good writing. A lot of the scientific writers I know that I think do the best work are people who read widely –

not only scientific papers, but all kinds of things, because I think in reading you get a feel for what good writing is.

And I think another thing is realize that writing a scientific paper, getting it published, is a team effort that – one thing is that the editors at journals, part of their job is to make their journal and you look as good as possible. So they're – it's certainly been helpful to me. There are things that, no matter how many times I revise, I don't catch, I don't correct. And there are editors there who are a safety net for me. The other thing, it's great we have Diane on the line, because there are professional editors out there – they're people known as authors' editors – who work directly with authors to help get papers in shape, so that when they go to their journal, they are in the best form possible.

KENNEALLY: Right. And that advice, writing is rewriting, is one that we all need to remember, no matter what kind of writing we do, whether it's for my 13-year-old daughter doing her essays or for someone who's well along in a career. And I guess before we go to questions – and operator perhaps we can get ready to do that process – it seems to me that the kind of advice that we're giving here sometimes sounds familiar, but it's worth reminding ourselves no matter where we are in our careers, because it's easy enough to forget.

Well, operator, at this time, can we suggest that people ask questions of Barbara Gastel?

F: Thank you. We will now begin the Q&A session. If you have a question or a comment, simply press *1 on your telephone keypad. To cancel, simply press *2. Once again, it's *1. Please stand by while questions register.

KENNEALLY: Well, I always have a tendency to want to fill dead air from my background as a radio journalist. Barbara, I'm going to ask you a question. It's a term you use – the two terms you used that I just loved, and maybe you can tell us briefly what they are until we get someone to ask a question here, which is spaghetti publishing and salami science. It sounds delicious, but what is it, exactly?

GASTEL: Actually, I think Diane was the one who introduced me to spaghetti publishing, so why don't we ask her about spaghetti publishing and –

FELDMAN: Oh, no – now I have to apologize to Chris, because I meant to say salami, and I was just using the wrong word.

KENNEALLY: OK. Well, it sounds great. But what is salami science, then? Tell me.

GASTEL: I guess either of us could answer that. Basically, salami science is slicing a piece of research into tiny little pieces, really thin slices, to get a lot of scientific papers. The thought is, I think some people feel that, for example, in – when

they're being evaluated for promotion, that they think that people just count how many publications they have, so they think, well, if they do one piece of research and publish different parts of it as different papers, rather than do one big paper, gee, maybe they can get four papers rather than one.

But that usually doesn't fly. Number one, the more important thing is it makes things confusing for readers. It doesn't serve readers well. And astute evaluators realize what's going on.

KENNEALLY: Right. It's like the airlines – to save money, they keep taking a little bit of cheese off the little pizza they serve, and pretty soon there's no cheese on the pizza and it's not pizza anymore. Operator, have we managed to coax anybody online to ask us a question here, or are they content to hear us chat?

F: I show no questions, sir.

KENNEALLY: OK, well, then I wonder whether I can just keep on asking you some questions, Barbara. I'm looking again at the list of new chapters, and you also talk about providing peer review. And that's a new chapter there. What's changed, what's new, and are there some pointers about that? Because again, clearly, that's part of this process here, to be able to contribute. Even if you're not an author of a paper, you may be asked to do peer review.

GASTEL: And I thought we should put this in here for a couple of reasons. One is, I think especially once one starts becoming an author and become recognized and cited, you have to do peer review, but often people don't receive training or education in this. And then I thought also being able to see things from the peer reviewer's side can help one write a paper that's more likely to be peer-reviewed. One area that would talk about is when you're invited to do peer review, responding to the request, deciding whether you're an appropriate peer reviewer or whether maybe someone else would be more appropriate, either because they know more about the subject matter or because – I think an important thing, and this gets back to the early question about ethics, is avoiding conflicts of interest, because sometimes if someone's in the same field, there may be a conflict of interest.

KENNEALLY: Right. That's certainly something that we haven't touched on, and that is the sensitivity to conflicts of interest today. Again, it's an impression from someone outside the community, but concerns about that seem much heightened in the last few years, with the potential for someone to be writing on research that has an impact for a pharmaceutical company, for example. How are authors handling all that? Are there guidelines for that? Is it – usually it's like obscenity. We know a conflict of interest when we see it. But can we just trust our gut, or are there some resources, including in your book, that can help us sort through whether something indeed is a conflict?

GASTEL: There's a little bit in the book. Also, Council of Science Editors has been quite active and actually had a conference on that and has published reports on it also. Here's another instance in looking at instructions for authors with regard to that. And now, at least for many journals, one has to actually sign a conflict of interest statement asking about conflicts of interest. And my feeling is, if in doubt – if you think there's something that even might be a conflict of interest, mention it and let the journal decide whether it may be. But I think it is important. I think now with – it seems in the biomedical sciences, more and more research has been funded by companies, and there is the – there'd be potential for conflict of interest.

KENNEALLY: And I think it's true again – and this is an aspect of the digital revolution that is – well, this is another example, I should say, where the digital revolution has an impact, and that is that there are a lot of people out there who are hunting for conflicts of interest. And so whereas in the past, if you published in a journal, your readership would be more curious about the science, now that the public can find a lot of these articles online, they are – many of them are rather suspicious readers and are looking for places to find problems.

And so as you say, again, better to be overstating your concerns rather than understating them and find that someone's going to look at it in a way that would be unfair to your work. I think that that's probably the most important thing, which is that when you are doing the peer review, you want to be fair to other peoples' work and you want to be fair to your own work.

GASTEL: And with peer review, I think the most important thing I'd, I think, want to emphasize is that peer review should be constructive criticism, that peer review has at least two main functions. One is the function of advising the editor of the journal as to whether to publish the paper and, if so, what revisions would be advisable. But peer review also has – I see it as a very important educational function. And usually in peer reviews, you have one section that's confidential for the editor and then another that both the editor and the authors see.

And I think especially when reviewing papers by new or young authors, I think it's a great chance for education. And I think as a peer reviewer, for me, one of the most satisfying type of things is spending a lot of time on a peer review for something that has good science but is not presented appropriately or to best advantage, and then see a rewritten version come out that's much stronger.

KENNEALLY: That's a reward for your involvement with it. One last question to ask about – and again, this goes to the digital revolution, and I'm going to stop using that phrase, I'll find a new one – is something which I may not be calling it correctly by its name, but submission management software. Because today, as we said, that the author needs to be submitting the particular manuscript in certain format, that's because it's not simply that they'll use that to publish the piece, but that along the way, a number of people are going to be touching the work in that chain that goes from submission all the way to publication and beyond – the peer

review, the editor, the production people and so forth. And that has become, as you said, Barbara, a much more refined service. But has it shaped science writing at all, do you think?

GASTEL: Was this like some of the templates?

KENNEALLY: Well, just the idea that there are so many people touching the writing now and touching the writing in this collaborative space that is the Web. Is that having –

GASTEL: Now, that's interesting. I just don't know – it's perhaps an interesting research question, because I think even before, there were lots of people touching it, but it was a matter of people circulating carbon copies, things like that. But Diane, do you have feelings about that?

FELDMAN: I tend to agree with you that the people – lots of people were touching it anyway. The big difference to me now is that everything is just done much more quickly. And there is, as you say, Chris, a more collaborative aspect – that reviewers might consult with each other so much more easily because of e-mail rather than the laborious processes they might have gone through before. I don't think it's actually changed the nature of the writing, though. That pretty much stays the same.

KENNEALLY: Right. That might be hard to do. There's a lot of established structures and standards that probably aren't going to shift that much.

GASTEL: That's right. And actually in some cases, it may actually make it easier to follow those structures and standards, because sometimes there are, for example, templates for the different sections. So it may make it, for better or for worse, more difficult to deviate from the – I think one thing that has changed that's electronically – but again, it's more just ease rather than what happens – is with reference reformatting. Now in the various software programs, we can put in the bibliographic information and they will reformat the reference list in what style of whatever journal. That is certainly a lot easier than in the days that – I remember the early, tedious days of people retyping reference lists to change the format.

KENNEALLY: Well, Barbara and Diane, I want to thank you both very, very –

F: Excuse me, sir?

KENNEALLY: Yes?

F: We have two questions in the queue.

KENNEALLY: We do? Well, wonderful. Well, we will take those two questions. As I mentioned at the start of the program, we do want to keep to an hour as much as we

can, because I know people have schedules to get to. Barbara has just come to us from a three-hour class today, and she may have others to get to. But we'll certainly take those two questions. And who do we have our first question from, please?

F: From Deanna Graham. (sp?)

KENNEALLY: Welcome, Deanna. What's your question?

GRAHAM: Thank you. Hello. I've enjoyed this very much. Thank you very much. I wanted to ask what you think has been the influence of manuscript management systems and technology. I know that over the past five years or so there's been a lot of development in that area and competition is increasing, and I was wondering how that has affected writing and submissions in the scholarly arena.

KENNEALLY: Well, we were just talking a little bit about that, Deanna. Barbara, do you have a sense that some of the early starts in that – what have people learned about what works and what doesn't work? Is there anything that calls itself to mind?

GASTEL: I'd actually be interested in hearing our caller's perceptions of that.

KENNEALLY: Deanna, do you have any thoughts on that?

GRAHAM: I guess what my perception has been is that these systems have allowed there to be more submissions and allowed the process to happen faster and perhaps things to go to print or to the online version quicker. But I wonder about the amount of submissions as a result and therefore the quality of what is being put out there.

GASTEL: I think that's a valid, valid concern. Diane, do you have a –

FELDMAN: I do. I happened to work in the offices of a well-known journal at a time when they were transitioning from the old system to a manuscript management system. And just in a year's time, we did see the number of submissions go up a great deal. And I think probably the biggest effect, besides needing – well, I was about to say needing more file space, but we didn't really, because things got to be where there wasn't anything in a file except a single sheet telling us where to find what we needed online.

But besides just having so many more to deal with, I would say that the journal, then, had to get a little bit stricter about turning things back that clearly didn't – I hate to be sniggly about this, but clearly didn't follow instructions, as in having too many tables or that kind of thing. Just to cut down on the sheer volume.

KENNEALLY: Right. You have to emphasize that that's probably one way to make a first pass, if you're the journal editor, is who's complied with my directions and who hasn't, and go from there. Operator, we have a second question?

F: Come from Barbara Snyder. (sp?)

KENNEALLY: Barbara, welcome. And where are you calling from?

SNYDER: Hi there. I'm from Mason, Ohio.

GASTEL: Hi, Barbara.

SNYDER: Hi, Barbara. (laughter)

KENNEALLY: Well, Barbara, meet Barbara. And tell us, what's your question and perhaps a little bit about yourself.

SNYDER: I work at Procter & Gamble and am the manager of the medical writing section here, and actually, Barbara and I know each other quite well from AMWA.

KENNEALLY: Oh, that's wonderful.

SNYDER: And my question actually is for you, Barbara. You had mentioned using authors' editors. Could you speak also to the benefit of using medical writers, particularly for researchers that have either less time to write or, frankly, a little less writing ability?

GASTEL: Actually, I know that you know more about that than I do, so why don't you say a little bit about it?

SNYDER: Well, OK. Speaking from the perspective of someone who manages writers and hires contract writers – and we actually do manuscripts as well as clinical kinds of documents, regulatory documents – just from our experience here within the company and with a couple of the other companies I've been in, the scientists are scientists first. And they prefer the science to the writing. The writing is more onerous to them. It's not something – and I think Diane maybe spoke to this earlier. It's not something they're particularly – they feel particularly good about doing. Everyone – I don't know who said it – everyone likes to have written. But the writing process itself is not an easy one, and the review process, even internally, is not an easy one.

And so for us, whether it's using an internal resource or hiring a contract writer, it's generally worthwhile, and I would say cost-effective, to use a professional writer. They know the journals. They know the journal requirements. They know how to say things succinctly. They're just better at it, and it's – I'm not saying that you can't have a researcher who's also an excellent writer. But I think that's more rare.

I think it's the collaboration between the two. If you have an excellent writer and you have an excellent researcher, the collaboration will yield you a better paper.

KENNEALLY: And of course, if I can say, because I'm familiar with AMWA, there are various standards that are involved here. We're not talking about just any old writer, somebody who claims to be a freelance writer. I've been one myself, but I wouldn't dare write a medical paper. And it would be something that it would behoove any author in choosing such a writer to really check out credentials, see past publications, maybe even talk to some people who've worked with him or her in the past, and really feel confident that that writer understands the particular kind of science and so forth.

GASTEL: Right. And I think the keyword in – or at least a keyword in what Barbara says was collaboration. I think to work, it has to be a true collaboration. It's not a matter of oh – and I don't – there's my – there are my data, goodbye. I think the scientist and the writer have to work very closely together to make sure that the scientists' ideas are fully and accurately represented.

KEANNEALLY: And it may be, too, if you're looking ahead as an author, even before you get to the writing part, you've got to do the research part, and before you do the research part, you often have to do the grant writing part. And in your grant, you should perhaps make some provision, among all the various costs, for having someone participate in that writing piece.

GASTEL: I would go even earlier than that. The ideal thing, I think, if you're going to have a medical writer, make the medical writer really a part of the team from the beginning. Bringing in somebody, I think, at the end, where they haven't seen how the research evolves and things, it's not as good as having a medical writer who's one of the people who is preparing the grant application as well, who is meeting with the research team while the research is going on, and then has a sense of how the thinking has evolved, and can – and then, I think, can do a better job.

SNYDER: I think that's an excellent point, Barbara. Here, and maybe it's standard within the pharmaceutical industry, very often the writer who is working on the manuscript at the end also wrote the final (inaudible) report of the results and also wrote the protocol for the study.

GASTEL: Right, exactly. So I think they're really part of the research team rather than an add-on.

CK: Right, right. Well, thank you for that question, Barbara. Appreciate your call and for joining us. I want to, again, thank particularly the participation of Barbara Gastel, who is, as I say the, co-author, coeditor of the new sixth edition of *How to Write and Publish a Scientific Paper*. If you're in that world and it's not on your reference shelf, it ought to be. It's out from Greenwood Press, and that's at greenwood.com. Thanks for joining me, Diane Feldman, who comes to us from

North Carolina and is the proprietor, if I may say, of AuthorCraft at authorcraft.net. My name is Chris Kenneally, Copyright Clearance Center, Director of Author and Creative Relations.

For all of you on the call, we're going to send you a brief survey to get your impressions about the program and suggestions for future programs. We will be podcasting this call later on this spring, and we will alert you to when that is available. We hope you will subscribe to our podcast series at beyondthebook.com. There will be a transcript posted, and you're welcome to share that with your colleagues as well. If you have any questions, comments, catcalls about this call, do e-mail me directly: ChrisK, C-H-R-I-S-K, at copyright.com. Thank you all again for joining us for this Beyond the Book conference call, and have a good afternoon.

GASTEL: Well, thank you so much, Chris.

KENNEALLY: Thank you.

FELDMAN: It was a pleasure.

KENNEALLY: Bye-bye, now.

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