# Interview Bruce Lewenstein

*By Jean-Baptiste Gouyon*

(interview conducted by email)

Bruce Lewenstein is Professor of Science Communication in the Department of Science and Technology studies and the Department of Communication at Cornell University. Editor of *Public Understanding of Science* from 1998 to 2003, Lewenstein looks back at his tenure in the following interview, highlighting the debate he prompted early on in the journal's pages about science centers, but also regretting not devoting more space to constructing bridges between science communication and science education. As a scholarly field, says Lewenstein, public understanding of science is vibrantly diverse and should remain so as it derives strength from this diversity. The journal can be a space to showcase and celebrate these different perspectives, but also to offer synthesis and reviews that can identify more general perspectives. Over the past 30 years, models of science communication, as with so many attempts at producing such synthesis, have flourished. Lewenstein himself proposed one, the famous Web model of science communication. None of these models, he concludes, are right or wrong. All are heuristic tools, that help us think problems through.

**Q: How did you became editor of PUS?**

A: John Durant had created the journal and I'd been one of the founding associate editors. When John decided to step down, he asked me to be editor. We weren't very institutionalized at the time and our then-publisher, the Institute of Physics, didn't have deep knowledge in the field, so there wasn't an application process or organizational gauntlet to run.

**Q: What was your project?**

A: The field was just entering its rapid growth, and I felt strongly that we needed to continue to encourage all possible directions. I didn't want us to be a place just for survey results, or for case studies, or to be about journalism only, or to be about museums only. The point

was – and I think still is – that this is a diverse field that is enriched by thinking about it from multiple perspectives.

**Q: What was the state of the field then?**

A: We were just beginning to talk about "the problem of the deficit model" (in my first editorial, I called it both that and "the dissemination model"). But we didn't yet know what would replace it. We knew we needed more theoretical richness (John had instituted a set of "theoretical perspectives" that brought in more general ideas, especially from sociology and psychology). Various methodological and conceptual discussions of surveys were emerging as that field spread beyond just a few researchers.

The term "public engagement" was not yet in vogue. We were still finding our way between the poles of "Science isn't appreciated enough! We need to find out how to get more people to understand and use science!" and "We need to get science off the pedestal! We need to understand that it's not about understanding!" I think we've made a lot of progress *within the field of scholars and informed practitioners* at seeing when those poles point in the same direction, not in opposition. But it's still a battle we face in the wider scientific community, I think.

During my time as editor, we began to see whole topics with enough research to create ongoing discussion. We had special issues on climate change (in 2000!), on genetics, on xenotransplantation, on biotechnology, on science and fiction.

**Q: Looking back, is there a paper you are particularly proud of having published in the journal?**

A: Not one, but a triplet: In my very first issue, we published an article that John had solicited, about "The Science Center Movement" by John Beetlestone (the founder of Cardiff's Techniquest in the UK) and colleagues.[1] Later that year, James Bradburne (then at the short-lived NewMetropolis science center in Amsterdam, later a prominent art museum director) responded with a critique, calling science centers "dinosaurs and white elephants" .[2] I still send people to that debate and a subsequent rejoinder to the rejoinder by Per-Edvin

[1] 1998, vol. 7, no. 1, pp. 5-26
[2] 1998, vol. 7, no. 3, pp. 237-253

Persson (longtime director of Finland's Heureka science center), titled "Science centers are thriving and going strong!" .[3]

I'm also surprised how often I go back to an editorial I wrote in 1998, about visiting the Exploratorium in San Francisco – it still reminds me of the magic of how many different things a science center can be.[4] Of course, the fact that it featured my own kids might be why I return!

**Q: Conversely is there a paper you "missed"?**

A: I'm not sure there's a paper, but there's a whole field: Informal science learning. I know that I personally had built a wall between the "public understanding" world and the "science education" world. I didn't realize that there were an increasing number of people trying to find the crossovers. It would be another 10 years before that particular middle ground really started growing.

We also missed – and I think the field is still missing – attention to activists who use science but don't think of themselves as being in "science communication" or "public understanding." I'm thinking mostly of environmental activists, but a richer understanding of how critics of GMOs or artificial intelligence use science among their tools would help us develop a richer understanding of how science information circulates and what roles it plays in broader social movements.

**Q: Were there any big changes in the journal during your time as editor?**

A: The big change was our shift in publishers: We'd initially been published by the UK's Institute of Physics, which had a longstanding interest in science education. But after about a dozen years of wonderful support from them, their strategic goals changed, and they sold us to Sage. That turned out really well for us, because now we could be marketed with similar journals, especially *Science Communication*, which increased the range of people who could see us. Within a few years (though after I'd stopped being editor), we'd gone from a quarterly to publishing six and then eight issues a year.

One other change: Initially, although we published in English, we'd also included Spanish and French abstracts for all articles. By my final year as editor, we'd decided that the other

[3] 2000, vol. 9, no. 4, pp. 449-460
[4] 1998, vol. 7, no. 4, pp. 267-269

languages weren't necessary, that our readers mostly seemed comfortable with English. In retrospect, that was the wrong decision, and worked against the goals of diversity and inclusion that we support today. The over-representation of English in the scholarly literature is a serious problem that affects what we know about the world.

**Q: What role has the journal played in your professional life?**

A: I met people. Lots of people. And I learned from them so much, about so many topics. One of my stock lines: You should remember that I started my career as a journalist; researchers know everything about a very narrow thing, and journalists know nothing but about a great many things. But as a researcher – I'm still a journalist, ranging widely over lots of topics. Being editor reinforced that tendency of mine.

Of course, being the editor gave me visibility, too, so I was invited to places to give talks or workshops, and again I learned from those people. I think being editor helped with my understanding of the global nature of the field, though I still didn't do enough to reach out to emerging scholars in Africa, Asia, and Latin America.

**Q: What does the journal mean for you today?**

*Public Understanding of Science* represents the best of scholarship – a place for people with diverse interests and diverse methodological and topical commitments to come together to find a shared space for discussion. I'm proud that we are highly regarded in multiple scholarly communities (such as Communication and Science & Technology Studies). I'm proud that one of the earliest and most astute science journalists and science observers, the late Dan Greenberg, thought us sufficiently important to attack us in one of his books![5]

**Q: How would you characterise the state of the field today, and what role can the journal play in it?**

A: The field today is incredibly vibrant, served by multiple specialty journals (at least eight, by my count)[6], and seen as relevant to a wide range of other fields, so that one has to read

[5] Greenberg, Daniel S. (2001). *Science, money, and politics : political triumph and ethical erosion*. Chicago: University of Chicago Press.

[6] *Public Understanding of Science; Science Communication; International Journal of Science Education – Part B: Communication and Public Engagement; JCOM; JCOM-America Latina; Frontiers in Communication: Science & Environmental Communication; Science Popularization (China); Indian Journal of Science Communication.* I'm sure there are more, especially in languages other than English.

far beyond those specialty journals to keep up.[7] Both researchers and practitioners continue to create new opportunities for discourse (in person, in traditional publications, in new forms online). Of course, all that makes it hard to continue to have an overview of the field. So I think we need to be publishing review articles – what is the state of knowledge about science museums? about community-based science? about science journalism? about models of science communication? about knowledge and attitudes toward science? about science online? And so on. We need to be a place both for cutting edge research and for overviews.[8]

**Q: Do you think scholars should be engaged politically? Or should they remain at a distance from the phenomena they study?**

A: The notion of the distanced, "objective" scholar is no longer tenable (if it ever was). We need to be engaged for multiple reasons. First, our field is not divorced from practice, and any attempt to stay distanced will mean we don't get the benefit of the knowledge and insight that practitioners have. (That was the point of the 1998 editorial I mentioned above.) And without those connections, we won't frame our research in ways that enable practitioners to use the results that we produce. Equally important is that our work is critical for the issues of the day: the tensions among nationalism, populism, and globalism; mis- and dis-information, where politics and science intermix; attention to equity and justice, at levels from the individual and institutional to the global; the great existential threats of climate change and – as we are alas still finding – global pandemics. We have knowledge that is relevant to addressing these issues, and we need to ensure that we are part of the meaningful discussions where decisions are made. We won't be if we fail to recognize that all decisions are political, whether or not they are partisan. We must engage.

[7] In recent months, I've found relevant work in the *Proceedings of the (US) National Academy of Sciences; PLOS One; Bioscience; East Asian Science, Technology, and Society; Citizen Science – Theory and Practice;* and preprint servers like *ArXiv, BioArxiv,* and *PsyArXiv.* Plus of course closely-related journals where work frequently appears mixed in with other topics, such as *Social Studies of Science; Science, Technology & Human Values; Journal of Communication; Journalism & Mass Communication Quarterly; Visitor Studies; Curator;* and still sometimes *Science* and *Nature*. And I haven't even mentioned the risk communication, environmental communication, and health communication journals! The Internet also makes far more accessible than when I started in the field the incredible range of grey-literature, reports, and other informal publications.

[8] To some extent, the *Routledge Handbook of Public Communication of Science and Technology*, edited by Massimiano Bucchi and Brian Trench, now in its third edition, addresses this need.

**Q: To me, one of your major contributions to the field has been the "Web Model of Science Communication".[9]How would you evaluate its significance and its influence on the field?**

A: I'm honored that you would call that one of my major contributions. Though I certainly think so, I can't say that it's been widely cited or used. In fact, one of my next big writing projects is to try to articulate the model more fully, to make the argument that public communication of science and technology does not come "after" science but is fully a part of the process of producing reliable knowledge about the natural world.

**Q: What do you think is the role of models in science communication scholarships?**

A: Models are useful heuristically – they help us think through problems. But I don't think of them as "right" or "wrong." Different models highlight different features of what we're trying to understand. For example, more widely cited than my web model has been my classification of public communication of science and technology into "deficit," "contextual," "lay knowledge," and "public engagement" models.[10] (Almost half of the cites, interestingly, are to a *samizdat* typescript version that was posted online; only a few more are to the final publication.) There have been many other models, some with two categories or three, some with different shapes (cones[11], Venn diagrams[12], overlapping triangles[13], 3-D cubes[14]), all trying to cope with the fact that this isn't "one" thing we're dealing with. Many of them have some kind of "deficit" vs. "dialogue" element, though others try to get around that. You see the same issue arise in fields like citizen science, which also has a plethora of models

[9] Originally published as Lewenstein, Bruce V. (1995). From Fax to Facts: Communication in the Cold Fusion Saga. *Social Studies of Science*, 25(3), 403-436, then updated in Lewenstein, Bruce V. (2011). Experimenting with Engagement. Commentary on "Taking Our Own Medicine: On an Experiment in Science Communication.". *Science And Engineering Ethics*, 17(4), 817-821. https://doi.org/10.1007/s11948-011-9328-5

[10] Brossard, Dominique, & Lewenstein, Bruce V. (2010). A Critical Appraisal of Models of Public Understanding of Science: Using Practice to Inform Theory. In L. Kahlor & P. Stout (Eds.), *Communicating Science: New Agendas in Communication* (pp. 11-39). New York: Routledge.

[11] Bucchi, Massimiano. (1998). *Science and the Media: Alternative Routes in Scientific communication*. London: Routledge.

[12] Storksdieck, Martin, Bevan, Bronwyn, Risien, Julie, Nilson, Roberta, & Wills, Kellie. (2018). *Charting the intersection of Informal STEM Education and Science Communication: Results of a social network study*. Washington, DC: CAISE (Center for Advancement of Informal Science Education).

[13] American Academy of Arts and Sciences. (2019). *Encountering Science in America: A Report from the Public Face of Science Initiative*. Cambridge: American Academy of Arts and Sciences.

[14] Stocklmayer, Susan M. (2012). Engagement with Science: Models of Science Communication. In J. K. Gilbert & S. M. Stocklmayer (Eds.), *Communication and Engagement with Science and Technology: Issues and Dilemmas, A Reader in Science Communication* (pp. 19-38). New York/London: Routledge.

attempting to categorize the many different kinds of activities that take place. I'm not deeply theoretical in how I think, nor am I trying to create "a" theory of public understanding or public communication of science and technology. The value of models is that they help us think and reflect on what is at stake in the particular project we're researching or building or evaluating or actually doing at any given moment. Ultimately, that's my goal: to get us all to think more about what we're doing and what's happening in the world around us.