

THE ART AND SCIENCE OF STORYTELLING IN PRESENTING COMPLEX INFORMATION TO THE PUBLIC, OR, GIVE 'EM MORE THAN JUST THE FACTS. Anita M. Sohus and Alice S. Wessen, Jet Propulsion Laboratory/California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91109. Anita.M.Sohus@jpl.nasa.gov, Alice.S.Wessen@jpl.nasa.gov

ABSTRACT

Introduction: “All we want are the facts, ma’am,” Sergeant Joe Friday appeared weekly in the popular 1950s cop show *Dragnet*. Unfortunately, in communicating science to the public, just the facts can leave the public baffled, bewildered, and bored. In communicating science to the public, we need to learn to tell the story, not just the facts.

Science and engineering is serious business, requiring precise language and rigorous reporting of “just the facts.” Yet, we believe this very code of integrity has contributed to a public image, at best, of scientists as eccentrics and engineers as geeks, and at worst, as elitist snobs who speak in secret codes. The very heart of the science process — open discussion and disagreement — often leaves the public with the impression that scientists don’t know which way is up.

Unfortunately, the competitive nature of modern science contributes to the problem. One of the best known science communicators, Dr. Carl Sagan, suffered the slings and arrows of his scientific peers who disdained his “popularization” of science. Yet a whole generation of new scientists and engineers cite Dr. Sagan as their inspiration for pursuing these careers. They are asking where is today’s Carl Sagan?

And, Russ Rymer, a former editor for the American Association for the Advancement of Science and the New York Academy of Sciences, acknowledges; “science is easy to get wrong, even by the best-intentioned layman.”[1] Or, we might add, even by a well-educated professional in another field. Each branch and speciality in science and engineering has evolved (and is evolving) its own language, which only the initiated understand. Translation is needed for outsiders—anybody outside the field.

Beginning in 2001, all Caltech juniors must prepare a feature length article on a scientific topic, suitable for publication in a lay magazine, as a requirement for graduation. The students are mentored by faculty, and the results are published in the online Caltech Undergraduate Research Journal. The official reason for the requirement is to improve their writing skills for the competitive world of grant writing. Editor Rymer believes, however, that since these high-achievers are in a better position than most of us to change our world, they had better be able to explain their work clearly [1]. Says Rymer, “As it brings new knowledge to bear about our universe, science does more than provide new product; it establishes and reestablishes the meta-

phor of ourselves and society, the prevailing paradigms by which we live. It tells us, in ways other disciplines can’t, who we are and what we mean . . . this calls for intelligent interpretation.”[1]

Storytelling: It is story that captivates people’s attention and imagination: a Gallup poll in 1998 showed that 67% of Americans prefer to spend their evenings reading or watching TV, movies, or theatre performances—in other words, being immersed in a story. [2]

Good stories have drama, suspense, and engaging characters—and so do science and engineering. Storyteller Susan Strauss asserts in her book *The Passionate Fact: Storytelling in Natural History and Cultural Interpretation*, “In literary terms, the scientific method is solving a mystery.” She goes on to point out that scientists and historians are observers and recorders of phenomena, from which they extract data, which in turn they synthesize into amazing and often very beautiful stories. Yet, she believes, scientists and historians are often in great denial of their work as storytellers.

Strauss observes that content given as information does not invite us to question or wonder, while content expressed in a “story way” creates relationship, translates information into imagination and excites our imagining -- our sense of wonder [3]. This is especially important in education: Instilling a sense of wonder during the first eight years of schooling is more important than any content (R. Steiner) [3].

In Jonesboro, Tennessee, the Storytelling International Foundation has been nourishing storytelling and storytellers for over 25 years. Besides sponsoring a legendary annual storytellers festival, the Foundation has established an International Storytelling Center, which conducts professional development workshops in storytelling for educators, corporations, and institutions. Their primary focus is on health, conflict resolution, leadership and management, and children and youth. “Stories constitute the single most powerful weapon in a leader’s arsenal,” they quote Dr. Howard Gardner, Professor, Harvard University, and author of *Leading Minds* on their website.

We believe that as science communicators and educators, we have much to learn from the world’s great storytellers. The education/public outreach staff of several space science missions at JPL are forming a partnership with the International Storytelling Center to develop storytelling mentors and training.

Returning to *Dragnet*, a good deal of its success came from its basis in real-life, its attention to the details of the investigations, and its human portrayal of

the cops—their frustrations, the interruptions of their private lives, and the outcome of their investigations.[4] We can't help but see some parallels with the stories of many scientists and engineers!

Storymining: So where does someone who is unpracticed in storytelling start? One method is storymining, a way of looking at the facts to develop a story. Storymining enables storytelling. The concept of storymining is well-developed in NASA's Earth Science Enterprise, especially by such award-winning websites as Earth Observatory. Questions to ask when storymining include: Who are the protagonists? What are the objectives? What is compelling? What are the obstacles? What is the path to overcome the obstacles? Is there a crisis conflict? What is the path to understanding? What is the story of the solution? What are the connections? What will be the legacy? The next step? Then, tell the story.

Interpretation: Naturalist Freeman Tilden is credited with starting the interpretive movement in the 1950s. Interpreters try to connect *you*-- your heart and mind-- with time and place through storytelling. As defined by the Board of Directors of the National Association for Interpretation (NAI), "Interpretation is a communication process that forges emotional and intellectual connections between the interests of the audience and the inherent meanings in the resource." Although the interpretive profession focuses on nature and culture, there is much to learn from their methods, techniques, practices, perspectives, and skill sets for oral, written, and visual interpretation and storytelling. NAI sponsors a National Interpreters Workshop (this year in Virginia Beach, VA from Nov. 12 to 16, 2002), professional certification, interpretive research, regional chapters and regional workshops, and special interest sections ranging from living history to visual communications.

If you have ever visited a national park or a historical site, you have probably listened to an interpreter. The National Park Service's definition of informal education *is* interpretation. NPS has developed an Interpretive Development Program to develop the interpretive competencies of its staff, including presenting effective interpretive talks, conducting effective activities, presenting effective demonstrations, writing effective interpretive material, developing curriculum and interpretive media, coaching, and research. NASA's Earth Science Education Implementation Office is investigating the possibility of tailoring some of these courses for professional development of NASA Earth Science staff.

Summary: Storytelling is as old as humankind. Storytelling applied to communicating science and engineering content, however, may be a new concept to a generation of scientists and engineers trained to present "just the facts." While we have barely

scratched the surface here, a world-wide renaissance of storytelling has many resources, including the fields of journalism and drama.

Acknowledgements: The authors acknowledge stimulating conversations with Maura Rountree-Brown, Art Hammon, Richard Alvidrez, Michelle Viotto, Anita Davis, and Tom Nolan.

References: [1] Rymer, Russ, (2001 June 17) *Science and the Art of Storytelling*, in Los Angeles Times. [2] Gallup Organization (1999) *American's Favorite Evening Recreational Activity is Still Television*. [3] Strauss, S. (1996) *The Passionate Fact: Storytelling in Natural History and Cultural Interpretation*, Fulcrum Publishing, Golden CO [4] The Network and Cable TV Guide, Manhattan Beach, CA, <http://www.geocities.com/TelevisionCity/9348/dragnet.htm>

Further Reading: [1] Hartz, J. and Chappell, R. (1997) *Worlds Apart*, Nashville, TN [2] Tilden, F. (1977) *Interpreting our Heritage* [3] Beck, L. and Cable, T. (1998) *Fifteen Guiding Principles for Interpreting Nature and Culture*, Sagamore Publishing, Champaign, IL.

Websites

Caltech Undergraduate Research Journal
<http://www.curj.caltech.edu>

NASA's Earth Observatory
<http://earthobservatory.nasa.gov>

International Storytelling Foundation
<http://www.storytellingfoundation.net>

National Association for Interpretation
<http://www.interpnet.com>

National Parks Service Interpretive Development Program <http://www.nps.gov/idp/interp>

BIOGRAPHIES

Anita M. Sohus is the Lead for Informal Education in JPL's Education and Public Outreach Office, as well as the museum/planetarium liaison for the NASA Office of Space Science's Solar System Exploration Education and Public Outreach Forum. She has an English degree from UCLA, and has taken graduate courses in science education at the University of Southern California.

Alice S. Wessen is the Theme Lead for Solar System Exploration and Technology in JPL's Office of Communications and Education. She has led the development of partnerships with several non profits and commercial entities. She has a Bachelor in Science, Finance, and a Master in Education, with a focus on at risk populations.