InFocus | *Narrative and Engineering*
By Jon A. Schmidt, P.E., SECB

The second chapter of psychologist Jerome Bruner's 1986 book, *Actual Minds, Possible Worlds*, begins as follows:

> There are two modes of cognitive functioning … each providing distinctive ways of ordering experience, of constructing reality. The two (though complementary) are irreducible to one another. Efforts to reduce one mode to the other or to ignore one at the expense of the other inevitably fail to capture the rich diversity of thought. (p. 11)

Bruner calls the first mode "paradigmatic" or "logico-scientific." Its objective is *truth*, and its chief function is to acquire *knowledge*: it seeks empirical discovery guided by principled hypotheses, and favors tight analyses that appeal to logic and verification. It is top-down, theory-driven, categorical, general, abstract, context-independent, ahistorical, and consistent. Its subject matter is the *physical* realm, and the most primitive and irreducible element with which it deals is *causation*.

Bruner calls the second mode "narrative." Its objective is *verisimilitude* or plausibility, and its chief function is to impart *meaning*: it seeks universal understanding grounded in personal experience, and favors inspiring accounts that appeal to aesthetics and intuition. It is bottom-up, action-oriented, interpretive, particular, concrete, context-sensitive, temporal, and often paradoxical, even contradictory. Its subject matter is the *psychical* realm, and the most primitive and irreducible element with which it deals is *intention*.

These distinctions should sound familiar to long-time readers of this column. They closely resemble Steven Goldman's contrast of the Principle of Sufficient Reason, which Western culture has embraced since the time of Plato and the Sophists, and "The Principle of Insufficient Reason" (May 2008), which better reflects the nature of our profession. In other words, they align with the demarcation between science as knowing and "Engineering as Willing" (March 2010). They also loosely parallel the ancient Greek concepts of *episteme*/*techne* vs. *phronesis* ("Knowledge, Rationality, and Judgment," July 2012).

I suspect that most engineers (and philosophers) are like me – more comfortable operating in the first mode than the second. After all, an essay like this one primarily engages the paradigmatic mode; likewise for pretty much everything else that has appeared in this space over the years, not to mention the vast majority of other articles in STRUCTURE magazine and similar industry publications. What new insights could we gain about ourselves and our practice by deliberately applying the narrative mode instead?

In his 2010 book, *Letting Stories Breathe: A Socio-Narratology*, sociologist Arthur W. Frank suggests, "Stories work as people's *selection/ evaluation* guidance system" (p. 46). Rather than functioning as rules,

> Stories are better imagined … as a tacit system of associations that makes particular aspects of the world seem worth attending to and suggests default evaluations of what is selected … [This system] processes a large proportion of what might be called candidate-experience: what happens to a person that, if attended to, becomes that person's experience. Candidate-experience becomes experience because it fits stories people know. (p. 47)

There are echoes here of Bernard Lonergan's cognitional theory ("How We Know and What It Means," September 2009), the model of skill acquisition developed by Hubert and Stuart Dreyfus ("The Nature of Competence," March 2012), and Joseph Dunne's discussion of "The Rationality of Practice" (September 2012). Again, though, those authors wrote in the paradigmatic mode, while stories obviously belong mainly to the narrative mode. What explanatory stories do engineers know that "fit" our candidate-experience, thus turning it into actual experience – the kind that is essential for developing practical judgment?

Finally, "Stories are central to life," asserts author and educator Roger Rosenblatt in his 2011 book, *Unless It Moves the Human Heart: The Craft and Art of Writing*.

> They're everywhere: in the law, where a prosecutor tells one story and the defense tells another, and the jury decides which it prefers … In medicine, a patient tells a doctor the story of his ailment, how he felt on this day or that, and the doctor tells the patient the story of the therapy, how he will feel this day and that, until, one hopes, the story will have a happy ending. Politics? He who tells the best story wins … (pp. 18-19)

As is usually the case when these kinds of examples are given, engineering is not mentioned; and a common complaint among us is that, in comparison with these three professions, there is a dearth of popular entertainment featuring engineers in significant roles. Is this because stories are somehow *not* central to what we do and how we do it? Or does it rather indicate that we are not *telling* our stories often enough or well enough for them to resonate with other people?

Literary theorists have attempted to identify the basic elements of successful stories. According to Bruner, "One view has it that lifelike narratives start with a canonical or 'legitimate' steady state, which is breached, resulting in a crisis, which is terminated by a redress, with recurrence of the cycle an open possibility." (p. 16) Alternatively, "Kenneth Burke argues that 'story stuff' involves *characters* in *action* with intentions or *goals* in *settings* using particular *means*." (p. 20) Bruner himself considers it sufficient that the story "contains a *plight* into which *characters* have fallen as a result of intentions that have gone awry … And it requires an uneven distribution of underlying consciousness among the characters with respect to the plight." (p. 21)

If engineers ever manage to gain greater prestige in society and influence on public policy, I suspect that it will be because we have learned to construct and communicate compelling narratives that conform to these kinds of patterns. For better or for worse, a good story can often be more persuasive than a sound argument.▪

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