Marshall McLuhan created a generation of cultural and media theorists with his phrase “The medium is the message.” What does this mean? A quote from a later book by McLuhan suggests an interpretation: “Societies have always been shaped more by the nature of the media by which humans communicate than by the content of the communication.” So, for example, the television portrayal of the Gulf war and the radio broadcast of the same event have dramatically different outcomes regarding human understanding of what transpired. A fledgling technology, and its new medium, affects our fundamental appreciation of a thing. Models are forms of media. They mediate the world for us. A recent book edited by Morgan and Morrison, “Models as Mediators” suggests as much for models as they are used in science and engineering. Modeling is about choosing the appropriate metaphor or analogy with which to better understand a phenomenon. In this sense, we create media about phenomena to bridge the gap between what we do not know, and what we are trying to comprehend. To appreciate the tight connection between media and modeling, consider media such as TV, radio, and computer games. These media are also models, often of artificial scenarios. Our view of the Gulf War was mediated by TV broadcasts, and so these broadcasts were models of the war since most of us were not there to witness events first hand. But even if we were, we could not escape the mediation afforded by models: eyeglasses and special scopes mediating between eyesight and visual reflections, maps mediating between the landscape and our understanding of terrain, and phones mediating between the voices and ears of our comrades. Although one might talk of absolutes such as “reality” and “truth”, all we have at our disposal are models, which mediate the world for us, differently, and on a personal level. We are trapped in media, and so, in models.

Media are so effective that we often forget that a medium exists, and we connect directly with the things being represented. No person has captured the essence of this situation better than the Belgian artist Magritte. Magritte was a surrealist artist (1898-1967) who created a large number of paintings of ordinary objects, positioned in ways that cause one to reflect upon meaning. In one of his most famous paintings, he portrays a pipe and then underneath the pipe, one reads “Ceci n’est pas une pipe” Well, of course, it is not a pipe. Instead, it is a painting of a pipe, and this was Magritte’s point. The media of oil paint, stretched canvas, and gesso primer provide the illusion of what we interpret to be “pipe” just as the media composed from mixtures of dead plant and synthetic material provide the illusion for any meaning that you derive from this printed article. It is a wonder that meaning can come from objects such as pressed and processed plant material. Figure 1 depicts another of Magritte’s work. We cannot get away from the medium, the model, the interface, in our interpretation of “reality”.

Figure 1: "La Condition Humaine" by Rene Magritte
What does all of this say about models for simulation? It suggests that we remind ourselves of the importance of the medium, and to acknowledge that different media have different effects on our understanding and interpretation of other objects. You have to ask yourself how life might be different if you modeled dynamics using materials other than the paper and flat cathode ray tubes that you currently use. Simple algebraic expressions, including time since as simulationists we require time in our deliberations, such as $y(t) = y(t-1) + 3$ are only one flat mode of representation. It looks so natural to us since we have been writing equations since grade school. Can it change? Should it change? For the longest time, we could not afford to use other materials in our creation of models since these materials were expensive. Dead animals and plants have served us well in the creation of paper and ink, and the processes underlying these media have been gradually refined over the centuries to where they have become second nature, and generally affordable. Then, the computer comes along and changes everything. Now, with technologies exemplified by Microsoft’s XBox and Nintendo’s GameCube, we are able to explore dramatic 3D worlds. Even the creation of these worlds has become much cheaper due to available modeling and animation tools. Our media is changing, and our models will change.

**IMAGE CREDIT:** Rene Magritte, “La Condition Humaine” Copyright 2000 Artist Rights Society, New York, NY.