Digitally Bridging the Two Cultures

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C.P. Snow in his May 7, 1959 Rede Lecture at Cambridge, "The Two Cultures and the Scientific Revolution,"[1] made a case that the academy is divided into two cultures – the "literary intellectuals" and the natural scientists. He saw himself as a person who lived in both – trained as a scientist in Rutherford's Cambridge physics lab in the 1920s, elected a Fellow of Christ's College, and then achieving fame as a writer, known for his novels and plays – receiving twenty honorary degrees. His greatest fame may be the Rede Lecture, which generated a volume of commentary extending to the present day.

He characterized the cultures this way: "The non-scientists have a rooted impression that the scientists are shallowly optimistic, unaware of man's condition . . . the scientists believe that the literary intellectuals are totally lacking in foresight . . . ." He examined the divide, concluding that in the UK the scientists' "links with the traditional culture . . .[were] nothing more than a formal touch of the cap. They are self-impoverished." As for the other side, "they still like to pretend that the traditional culture is the whole of culture, as though the natural order didn't exist. As though the scientific edifice of the physical world was not, in its intellectual depth, complexity, and articulation, the most beautiful and wonderful collective work of the mind of man."

Although the literary types accepted the benefits of the Scientific Revolution, which made their lives easier, they did not view science as contributing fundamentally to their intellectual concerns. On the other hand, the scientists did not believe that the literary intellectuals could help them in their understanding and mastery of the physical world.

Snow proposed an agenda, to reform education in the UK and use technology to close the gap between rich and poor nations. He also saw a waste of intellectual potential, saying: "The clashing point of two subjects, two disciplines, two cultures – of two galaxies as far as that goes – ought to produce creative chances." But he said the chances exist only in a vacuum because the cultures cannot communicate, and the separation is increasing decade by decade. The separation is driven by success of the Scientific Revolution – applying science systematically to industry and by the lack of interest among the literary intellectuals in the consequences of the industrial and scientific revolutions. He claims they are not equipped to understand it because of the university system.

Where are we now nearly half a century later? Have the galaxies moved farther apart? Are the chances imagined only in a vacuum? I believe that new forces are reversing the separation. The major counter force is the information revolution, a product of computer science that created cyberspace. The literary intellectuals have found this a place where they are forced to interact with browsers, search engines, text editors, digital libraries, and automatic language translation; and where they can thereby express themselves in novel ways. For example, narrative threads are used to organize interactive applications such as computer games, giving rise to a new genre of writing. And hypertext opens new dimensions and a non-linear order in stories. Conversely, scientists encounter writers in a

novel way, as co-workers in extending and enriching cyberspace, e.g., by putting "juice" into on-line characters – the juice is what brings the character to life.
Cyberspace is shaped by culture, custom, and law as well as by technology, forcing the information scientist to work with the intellectuals to understand these forces the way a physicists must understand nature.

On the other hand, specialization has continued to increase and certain elements of the divide stand out as fundamental and defining, such as the different purposes for writing. For instance, in science writing, style is much less important than in literature where style is integral to content. As my colleague Jonathan Culler says, "Literature is language that `foregrounds' language itself."[2] In cyberspace, language is enriched by computational tools that create new forms of digital expression – from webs of hypertext to interactive documents, suggesting that creative interactive literature will foreground digital expression.

In both computing and literature, ideas create a new state of affairs. As Culler says, "Literary utterance creates the state of affairs to which it refers." Computer programs do so as well. Behind this observation we find both philosophical and practical depth. This commonality suggests how elements of the traditional culture, such as the centrality of narrative, can be virtualized, examined under the computational microscope, and transformed by computers. Narrative structures are abstracted in digital form, programmed, and replayed on new data. For example, there are programs that create historical narratives from a database of facts based on themes, such as social history or economic history or feminist history. The deep grammatical structure of literary texts is exposed as data accessible to computers which animate it and move it along axes of virtual time, and into virtual cultures, ancient and future. Some of these capabilities have become so compelling that they are being proposed as grand challenge problems for computer science, such as the UK challenge of Bringing the Past to Life for the Citizen.

The science of computing and information is providing concepts and tools for the literary intellectuals as well as for physicists, life scientists, and engineers. Information science has created a new domain of knowledge and a computational mode of thought unknown before the mid-twentieth century; it is changing how we create knowledge in all fields, literary and scientific. It has altered the context of inquiry as profoundly as any philosophical movement, whether performance interpretation, structuralism, deconstruction, psychoanalysis, or the computational theory of mind. Digital information and computation have filled the vacuum to produce those "creative chance encounters" imagined by C. P. Snow. I am confident that we will see "collisions" in cyberspace that create conceptual waves rippling through intellectual history.

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[1] C.P. Snow, The Two Cultures, Cambridge Univ. Press, 1998 (reprinted 98, 2000, 2001, 2002, 2003).

[2] Jonathan Culler, Literary Theory, A Very Short Introduction, Oxford Univ. Press, 1997.