

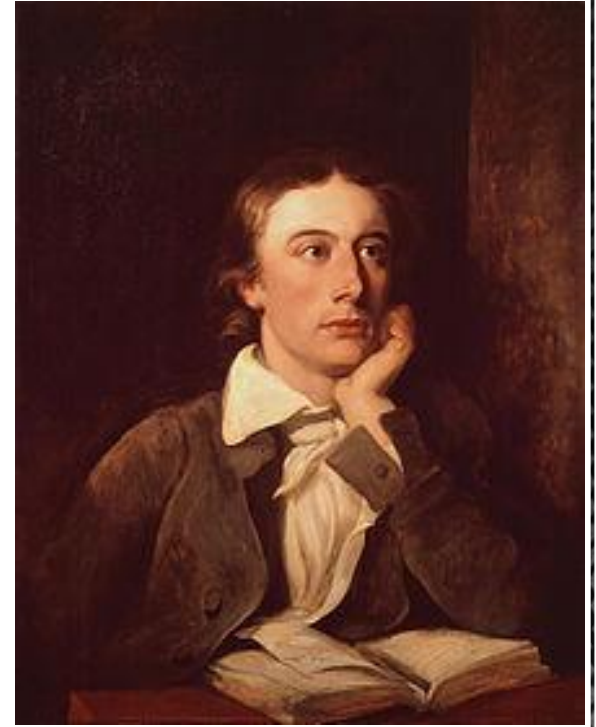
Can you pick out the poets? The Physicians?



**Writer Anton Chekhov**



**Poet William Carlos Williams**



**Poet John Keats**

Were all physicians

Approaches to technical writing

Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

“Liberal education contextualizes a person, places that person, places that person in a social, historical, rhetorical setting. It confers power to see, power to choose, power to design new solutions. It liberates the hurried technical communicator from that supposed panacea, doing it the old way because no one can imagine any alternative—certainly not an alternative that requires time to develop.”

—Russell Rutter’s 1991 essay, “History, Rhetoric, and Humanism”



Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

Recently  
July 12<sup>th</sup>, 2011

# THE CHRONICLE

of Higher Education

**The Liberal Arts Are Work-Force Development**



*By Rob Jenkins*



Approaches to technical writing



Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

Two-year colleges occupy a unique position in the national debate over the value of the liberal arts.

For students who are not liberal-arts majors, the core-curriculum courses they are "forced" to take as freshmen and sophomores will probably constitute the extent of their dabbling in the liberal arts. Those who go on to study business, engineering, or computer science are unlikely, as juniors and seniors, to sign up for additional classes in literature, biology, psychology, or art appreciation.

*Rob Jenkins*

Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

Now consider that, according to the American Association of Community Colleges, about half of all freshmen and sophomores are enrolled at the nation's 1,300 two-year colleges, and many of those students transfer to four-year institutions. For a large percentage of people who earn bachelor's degrees, then, the liberal-arts portion of their education was acquired at a two-year college.

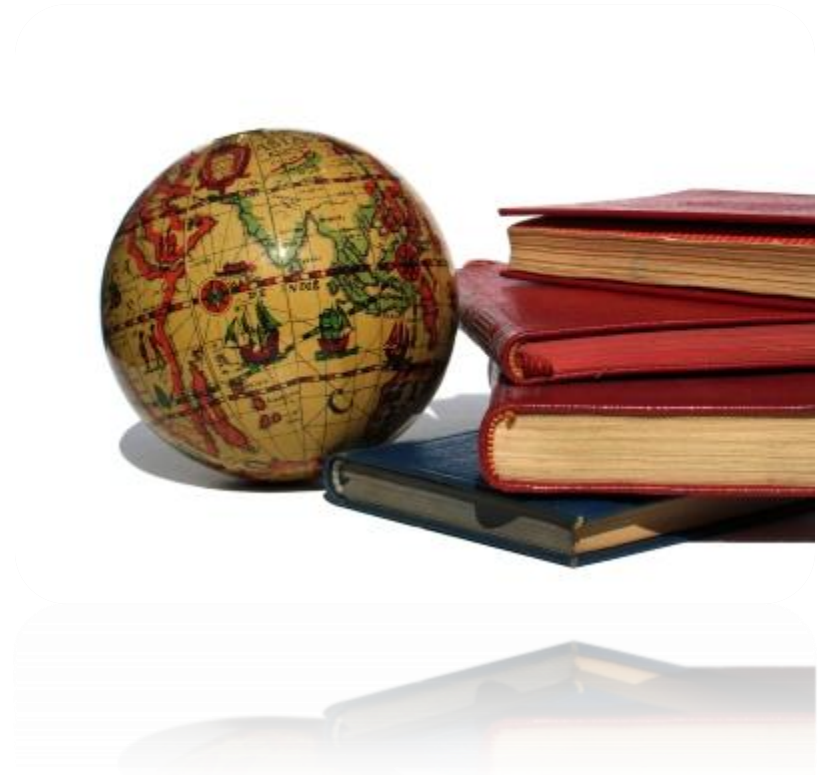


- Rob Jenkins

Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

Next, factor in all of the community-college students who enter the work force after earning two-year degrees or certificates, and whose *only* exposure to the liberal arts occurred in whatever core courses their programs required.

- Rob Jenkins



Approaches to technical writing

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The conclusion becomes obvious: Two-year colleges are among the country's leading providers of liberal-arts education, although they seldom get credit for that role. Many Americans learn at a two-year college most of what they will ever learn—in a formal setting, at least—about writing, critical thinking, the history of our culture and civilization, the environment, and human behavior.

*Rob Jenkins*

Approaches to technical writing



Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology



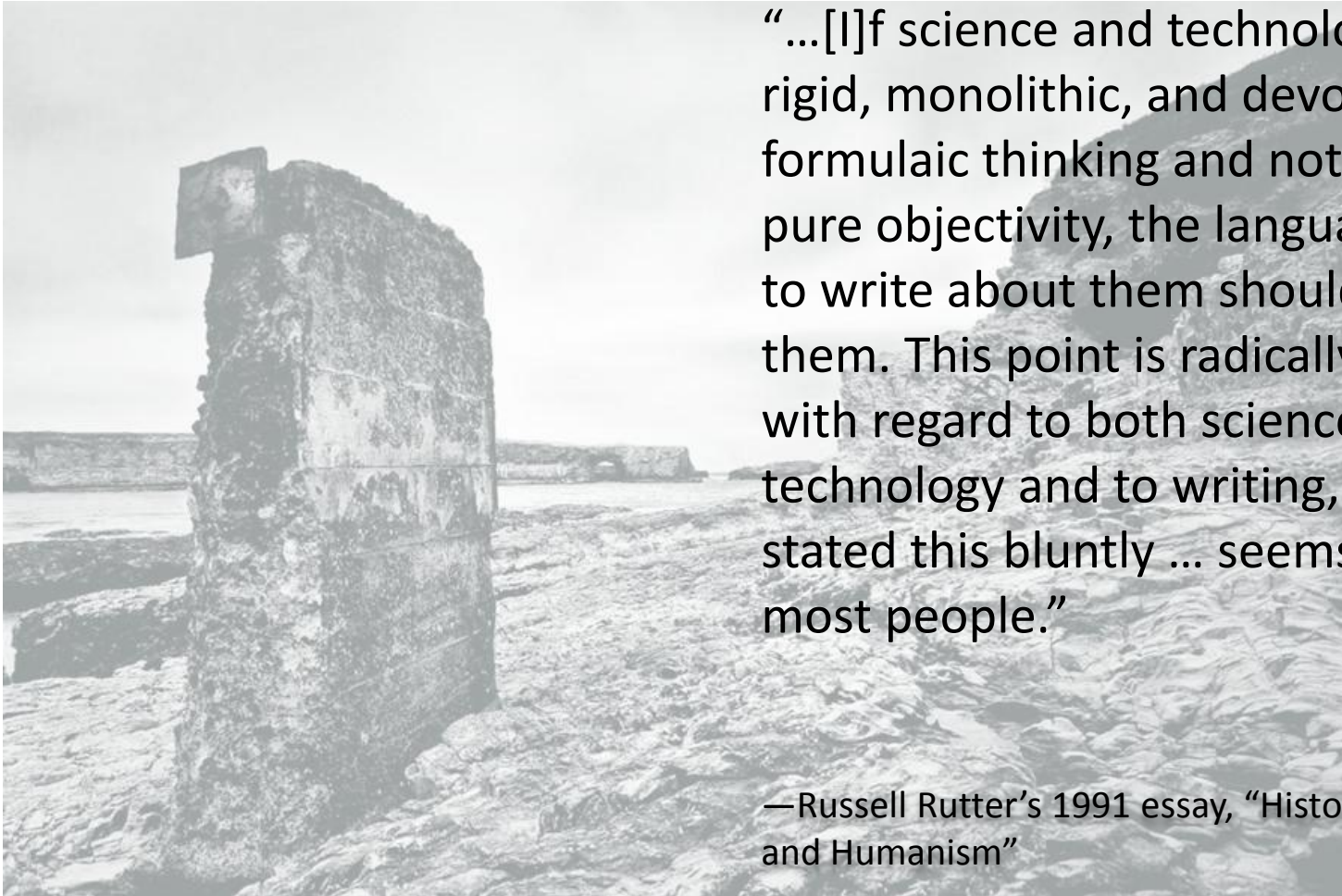
Employers rank communication and analytical skills among the most important attributes they seek in new hires, according to the National Association of Colleges and Employers.

*Rob Jenkins*

Approaches to technical writing



## Technical writing and liberal arts:

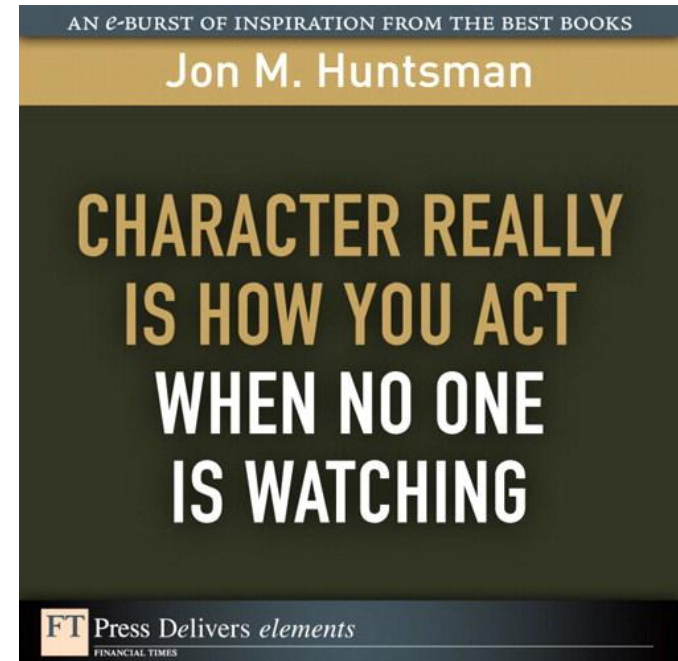


“...[I]f science and technology are rigid, monolithic, and devoted to formulaic thinking and nothing but pure objectivity, the language used to write about them should resemble them. This point is radically false, with regard to both science and technology and to writing, and when stated this bluntly ... seems false to most people.”

—Russell Rutter’s 1991 essay, “History, Rhetoric, and Humanism”

## Technical writing and liberal arts:

“There is more [much, much more] to technical writing than proficiency in writing, more even than knowing facts. Technical writing should not be so heavily mortgaged to pragmatism that it lacks cohesiveness and moral purpose.” (Challenger example.)



—Russell Rutter’s 1991 essay, “History, Rhetoric, and Humanism”

## Technical writing and liberal arts:

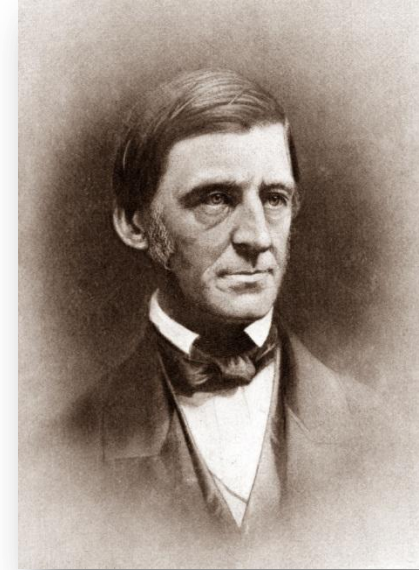
“Technical (STEM) communication belongs to a tradition that asserts the primacy of knowing and being over willing and doing. It insists that the **person thinking** is more important than the tools used or the system acted upon.”

—Russell Rutter’s 1991 essay, “History, Rhetoric, and Humanism”



## Technical writing and liberal arts:

“Man is thus metamorphosed into a thing, into many things. The planter, who is Man sent out into the field to gather food, is seldom cheered by any idea of the true dignity of his ministry. He sees his bushel and his cart, and nothing beyond, and sinks into the farmer, instead of Man on the farm. The tradesman scarcely ever gives an ideal worth to his work, but is ridden by the routine of his craft, and the soul is subject to dollars. The priest becomes a form; the attorney, a statute-book; the mechanic, a machine; the sailor, a rope of a ship.



Ralph Waldo Emerson,  
*The American Scholar*



## Technical writing and liberal arts:

In this distribution of functions, the scholar is the delegated intellect. In the right state, he is, *Man Thinking*. In the degenerate state, when the victim of society, he tends to become a mere thinker, or, still worse, the parrot of other men's thinking.”

### SELF RELIANCE



A foolish consistency is the hobgoblin of little minds, adored by little statesmen and philosophers and divines. With consistency a great soul has simply nothing to do.

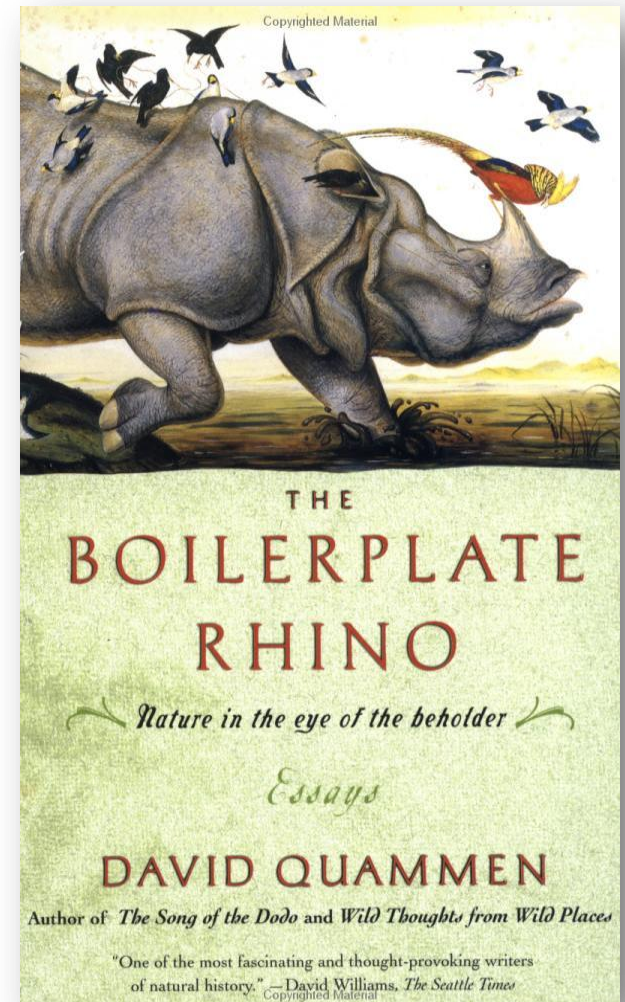
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~ Ralph Waldo Emerson  
May 25, 1803 - April 27, 1882

Approaches to technical writing

## Technical writing and liberal arts:

“... I’ve seen that science itself is a fallible human activity, not a conceptual machine-tool, and that while accuracy and precision can be easily achieved, validity and meaning cannot. The imperfections and constraints vitiating scientific knowledge stand as a warning about the limits of other sorts of knowledge—even shakier sorts—including that based on eyewitness experience.”



Approaches to technical writing

# Technical writing and liberal arts:

In many technical writing environments, the idea of “Positivism” dominates.

**Positivism:** Epistemological perspectives and philosophies of science which holds that scientific method is the best approach to uncovering the processes or truth by which both physical and human events occur. This theme has recurred since Ancient Greece.



## Technical writing and liberal arts:

“Thomas Kuhn demonstrated long ago that scientific theories used to explain the phenomena of nature are born, flourish, and finally die. The death of a theory leads to radical questioning of what for years has been taken as ‘normal science.’ Albert Einstein urged that excessive reliance on facts and methodologies was a flaw ....”

—Russell Rutter’s 1991 essay, “History, Rhetoric, and Humanism”





## Technical writing and liberal arts:

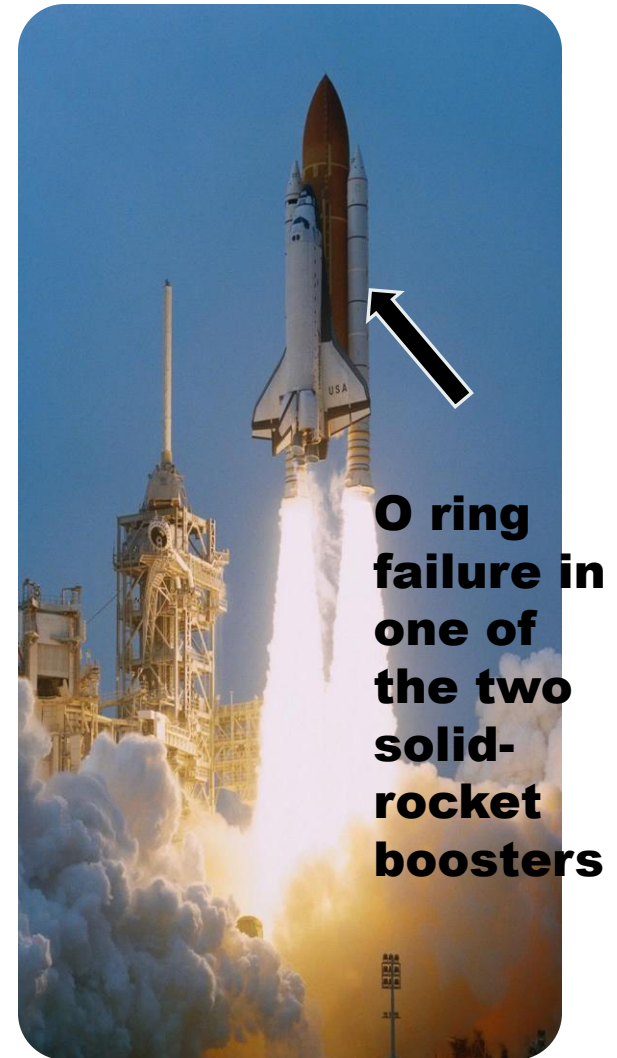
What happens in science and technology when there is a failure of imagination? A failure of culture? A failure of “person” and “man [and woman] thinking?” What happens when writing becomes too heavily mortgaged to pragmatism? When STEM becomes too monolithic and devoted to formulaic thinking?

Are there any bigger questions?

Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

“[Researchers] Winsor and Pace show several managers and engineers knew the type of O-rings used in the Challenger had already cracked under test conditions and thus might crack during launching. Memorandums were written ... a conference was held involving managers and engineers at which ... O-ring failure was discussed. ”

—Russell Rutter’s 1991 essay, “History, Rhetoric, and Humanism”



Approaches to technical writing

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“...[T]he decision was taken to launch the Challenger. ‘Why,’ Winsor asks, did those who knew of the problem with the shuttle’s solid rocket boosters not convince those in power to stop the launch?’”

—Russell Rutter’s 1991 essay, “History, Rhetoric, and Humanism”



Approaches to technical writing

Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

And who can forget?



Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

“For Pace, the Challenger disaster illustrates in graphic terms how human the process of communication is,’ and he urges that technical communication scholars [writers] and decision makers ‘broaden their perspectives of communication to include the human values inherent in the process.’”

—Russell Rutter’s 1991 essay, “History, Rhetoric, and Humanism”

**This image?**



Approaches to technical writing

Another example of failure?

On July 22<sup>nd</sup>, 2011,  
this full-page ad  
ran in USA Today:



Another example of failure?



## US AIRWAYS' UNWRITTEN POLICY: Revenues First, Safety Second?

We know this is going to sound unbelievable, but please read on.

On July 16, 2011, a US Airways Captain with 30 years of experience stopped her flight from departing. Something was wrong with the airplane. She was deeply concerned about a balky power component that, should it continue to fail, might have eliminated all electrical power to her trans-Atlantic flight.

Another example of failure?



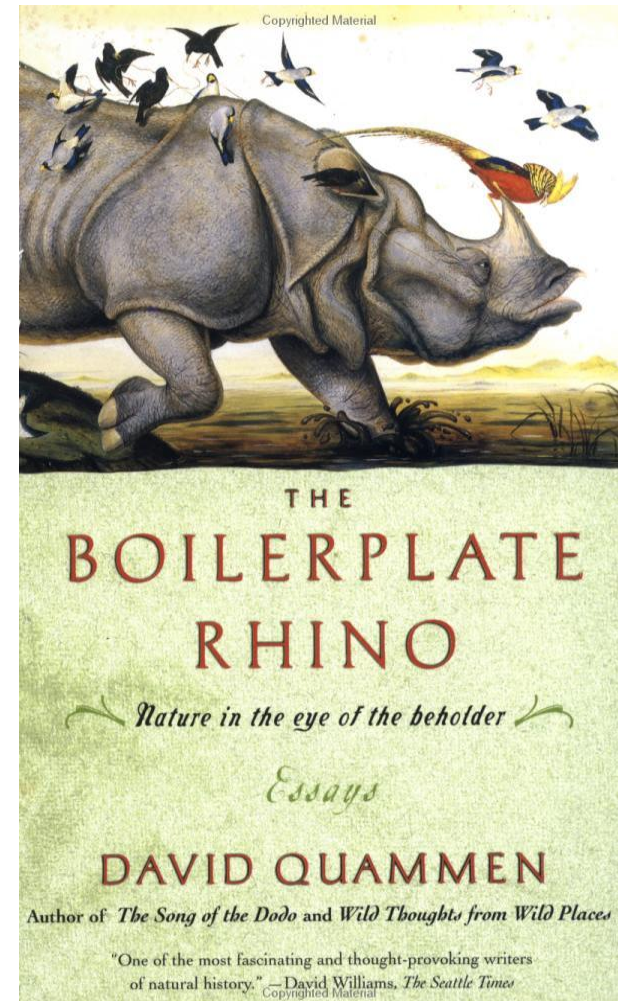
Despite her valid concerns, US Airways' management pressured her to fly the airplane, over the ocean, at night. When she refused to jeopardize the safety of her passengers, US Airways' security escorted her out of the airport, and threatened to arrest her crew should they not cooperate.

Before she was removed from the aircraft, two other US Airways pilots also refused to fly the aircraft. After she was removed from the airport, three more US Airways pilots refused to fly the aircraft, citing their own concerns about the fitness of the plane. It turned out the pilots were right: the power component was faulty and the plane was removed from service and, finally, fixed. Eventually, a third crew operated the flight, hours later.



## Technical writing and liberal arts:

“Moral: We live in a tricky universe and it behooves us to be just a bit provisional about our convictions. Spending so much of my working life on short-term but intense spates of research into widely various subjects, I’ve also been schooled in the lesson that additional investigation generally leads towards increased complexity, ambivalence, even confusion, not toward increased certainty.”

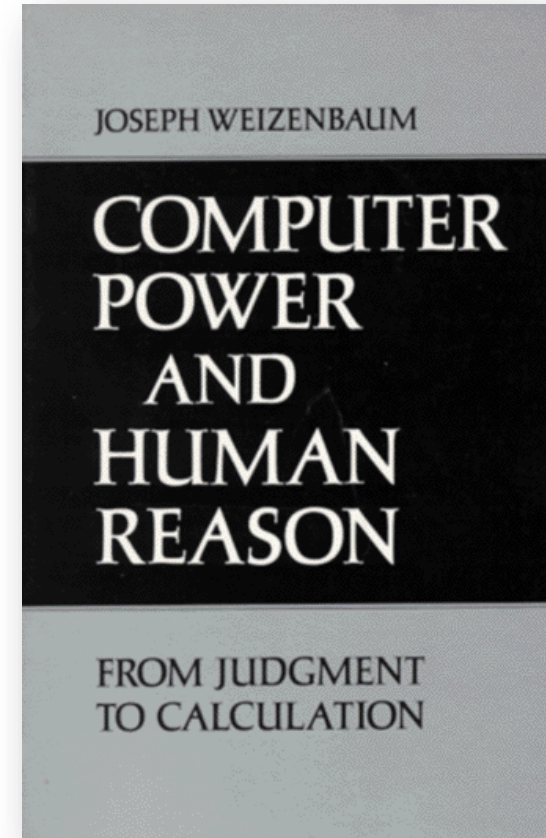


Approaches to technical writing

## Technical writing and liberal arts:

“Ever-faster computers enable us to derive ... mountains of data in ... minutes, and ever-more-sophisticated desktop systems present hordes of layout and page-design alternatives. Whatever benefits these adjuncts to communication may confer, it seems ... that [digital] efficiency, which tells us that anything *can* be done, bids fair to replace human judgment, which tells us what *should* be done.”

—Russell Rutter’s 1991 essay, “History, Rhetoric, and Humanism”



Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

*Imagination is more important than knowledge, for knowledge is limited to all we know and understand, while imagination embraces the entire world, and all there ever will be to know and understand.*

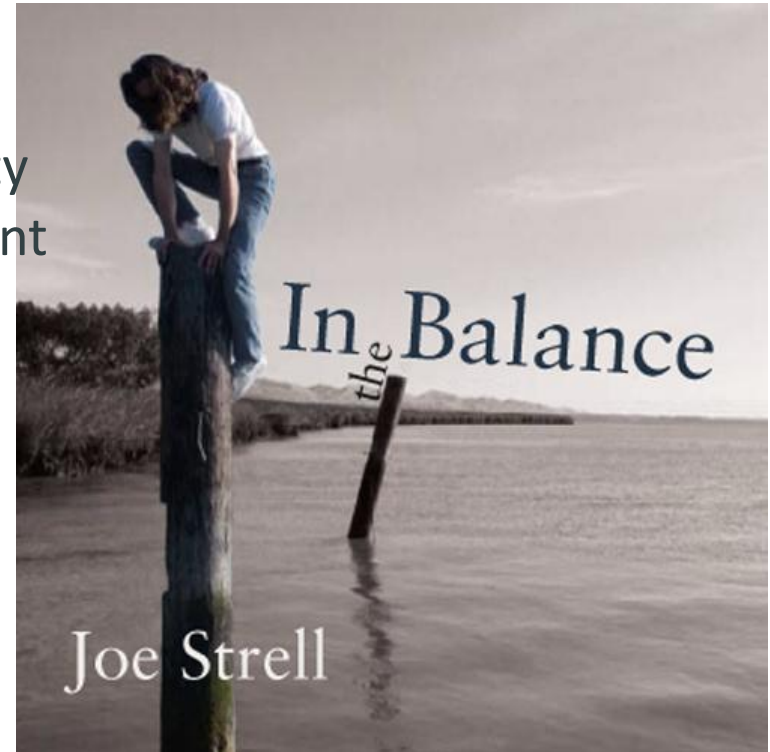
—Albert Einstein



Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

“James Adams observed, ‘Certainly in a problem between two people, the ability to see the problem from the other’s point of view [which requires reality-directed imaginative thinking] is extremely important in keeping the tone of the debate within reasonable bounds of refinement [and that] no solution is possible [without it].’”

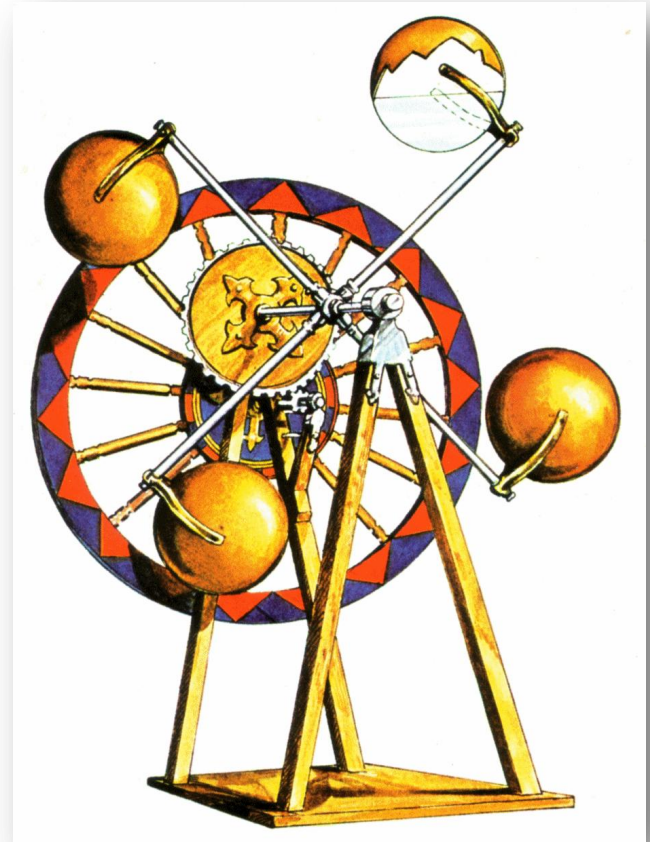
—Russell Rutter’s 1991 essay, “History, Rhetoric, and Humanism”





Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

C.P Snow's book, "The Two Cultures and the Scientific Revolution," reflects on, as reviewer Peter Dizikes puts it, "the dangerous schism between science and literary life." Bottom line is education (including tech writing) should not be overly specialized and science can be used to raise standards of living via its advancements.



Approaches to technical writing

Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

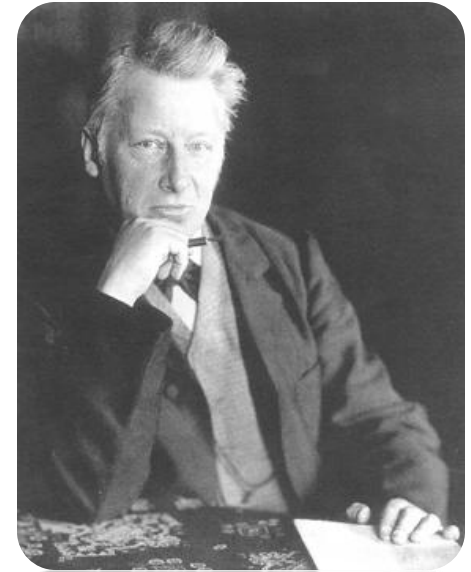
What helps technical and science writers think creatively?

...[T]he first scientist to recognize a correlation between scientific talent and non-scientific pursuits was Jacobus Henricus van't Hoff, a Dutch Scientist who won the first Nobel in chemistry. In his essay "Imagination in Science," he argued that the greatest scientists almost invariably display their imagination in non-scientific fields as well.

Examples include Galileo, also an artist, craftsman, musician, and writer.

From: "Nurturing creativity in science takes breath of training"

March 23, 2009, Michelle & Robert Root-Bernstein, *Imagine That*



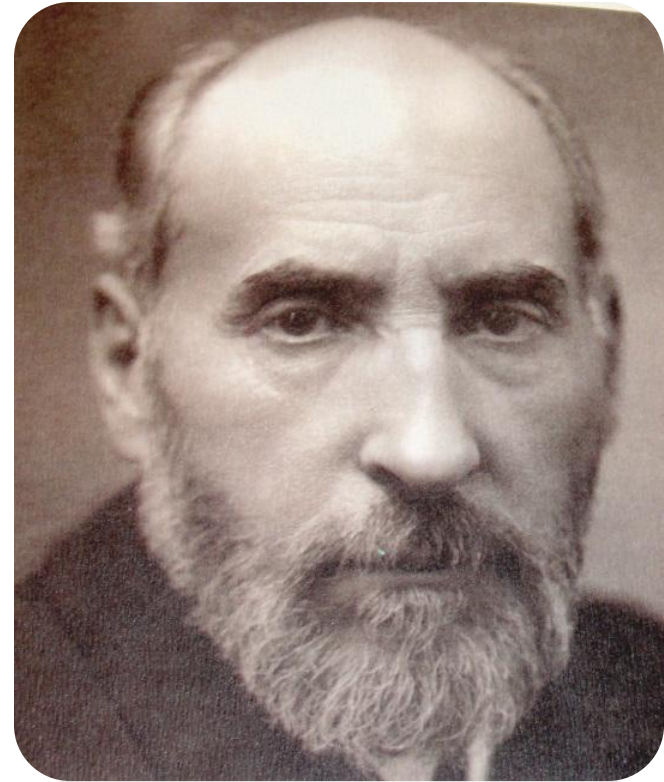
**van't Hoff also was a talented flautist who wrote poetry in four languages**

Approaches to technical writing

Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

What helps technical and science writers think creatively?

Ramon y Cajal, one of the founders of neuroanatomy and an early Nobel winner (1906) practiced gymnastics, produced the first color photographs in Spain, painted, and wrote science fiction. When it came to recruiting students he rejected those focused solely on their science.



From: “Nurturing creativity in science takes breath of training”  
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Approaches to technical writing

Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

What helps technical and science writers think creatively?



“The far sighted teacher,” he once wrote, “will prefer those students who are somewhat headstrong, contemptuous of first place, insensible to the inducements of vanity, and who being endowed with an abundance of restless imagination, spend their energy in the pursuit of literature, art, philosophy and all the recreations of mind and body.

From: “Nurturing creativity in science takes breath of training”

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Approaches to technical writing

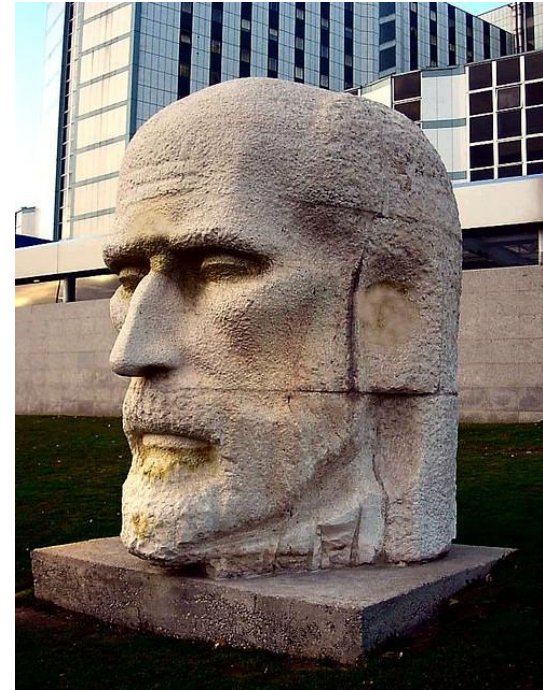


Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

What helps technical and science writers think creatively?

### **Ramon y Cajal**

To him [or her] who observes them from afar, it appears as though they are scattering and dissipating their energies, while in reality, they are channeling and strengthening them ...

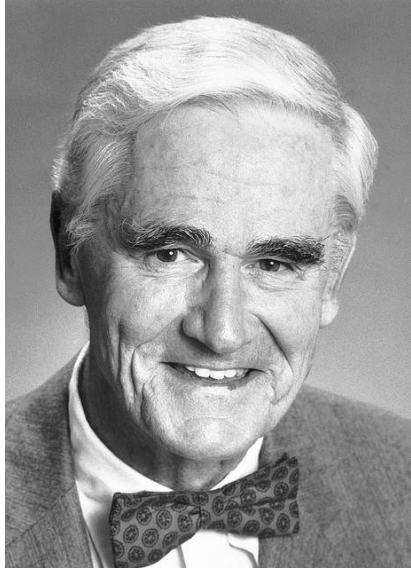


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Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

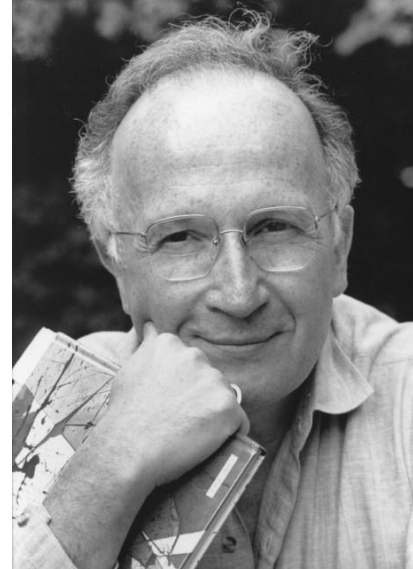
But what about this age of high specialization?



**Donald Cram, 1987 Nobel Prize, Chemistry. Artist, poet and musician.**



Peter Mitchell, 1978 Nobel Prize, Chemistry. Philosopher and artist.



**Roald Hoffman, 1981 Nobel Prize, Chemistry. Two collections of poetry.**



William D. Phillips, 1997 Nobel, Physics, Writer and science communication.

From: “Nurturing creativity in science takes breath of training”  
March 23, 2009, Michelle & Robert Root-Bernstein, *Imagine That*

Approaches to technical writing

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Nobel prize winners are rarely the best academic students. They do not have high IQs that are any higher than those of scientists overall. They don't test higher on other standardized tests.



Approaches to technical writing

Technical writing: A place to integrate the importance of liberal arts and the humanities with science and technology

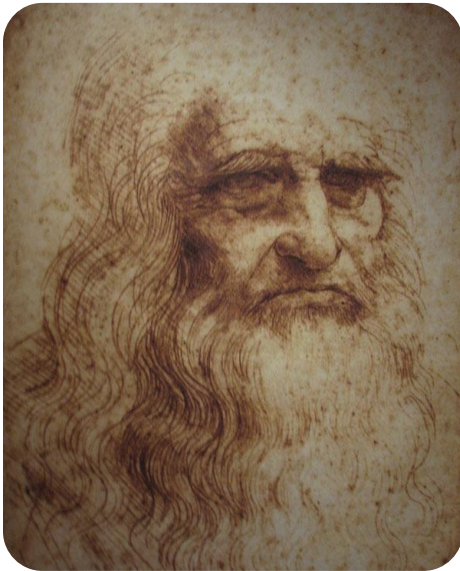
They DO bring a much wider range of skills, knowledge, talents, and methods to their work. So, instead of looking for scientific and mathematical prodigies and funneling them into early scientific specialization, we should be doing the opposite.



Approaches to technical writing

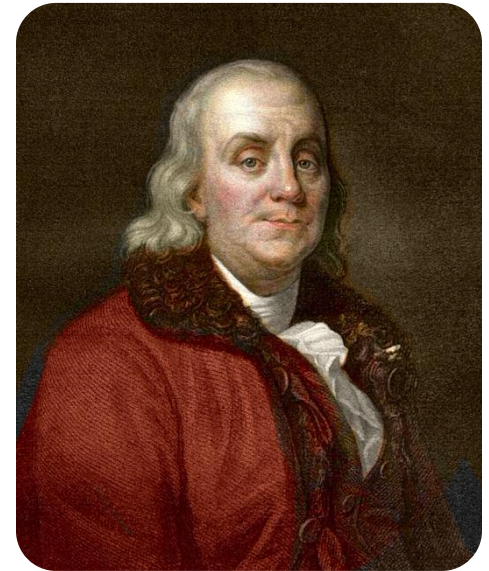


## The artist-scientist Jungian archetype



**Leonardo da Vinci**

- Inventor, builder, dreamer;
- Hyper focused, distracted by curiosity;
- Perpetual innovator, creativity rules;
- Beholds complicated solutions, ignores simplicity; and
- Somewhat naive and bumbling.



**Benjamin Franklin**

## Critical to being a good technical writer:

Creativity and reality directed imaginative thinking are critical to being a successful technical writer. It is important to bridge gaps, to be both objective and subjective, classical and romantic, Apollonian and Dionysian (Nietzsche), literary and scientific, right brained and left brained, relative and absolute and all the other ways we've learned to understand and reinforce this false dichotomy.

## Critical to being a good technical writer:

“I believe scientists have a duty to share the excitement and pleasure of their work with the general public, and I enjoy the challenge of presenting difficult ideas in an understandable way.”

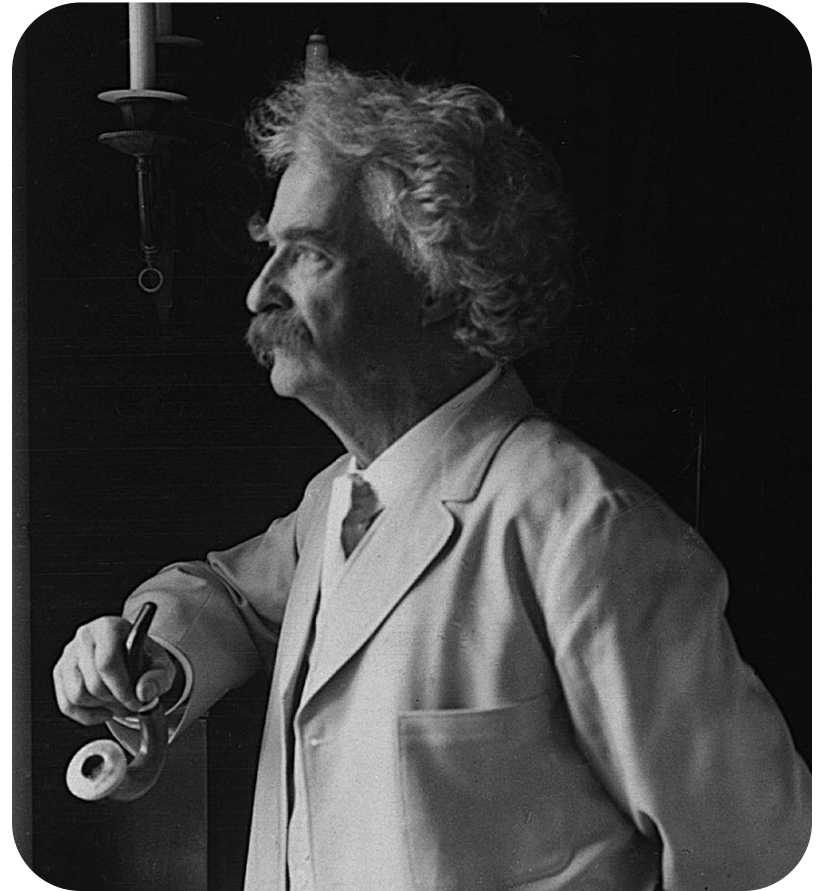


–Antony Hewish, British Radio Astronomer, Nobel Prize for Physics, 1974.

## Critical to being a good technical writer:

“The difference between the almost right word & the right word is really a large matter—it’s the difference between the lightning bug and the lightning.”

Mark Twain



Approaches to technical writing



## Critical to being a good technical writer:

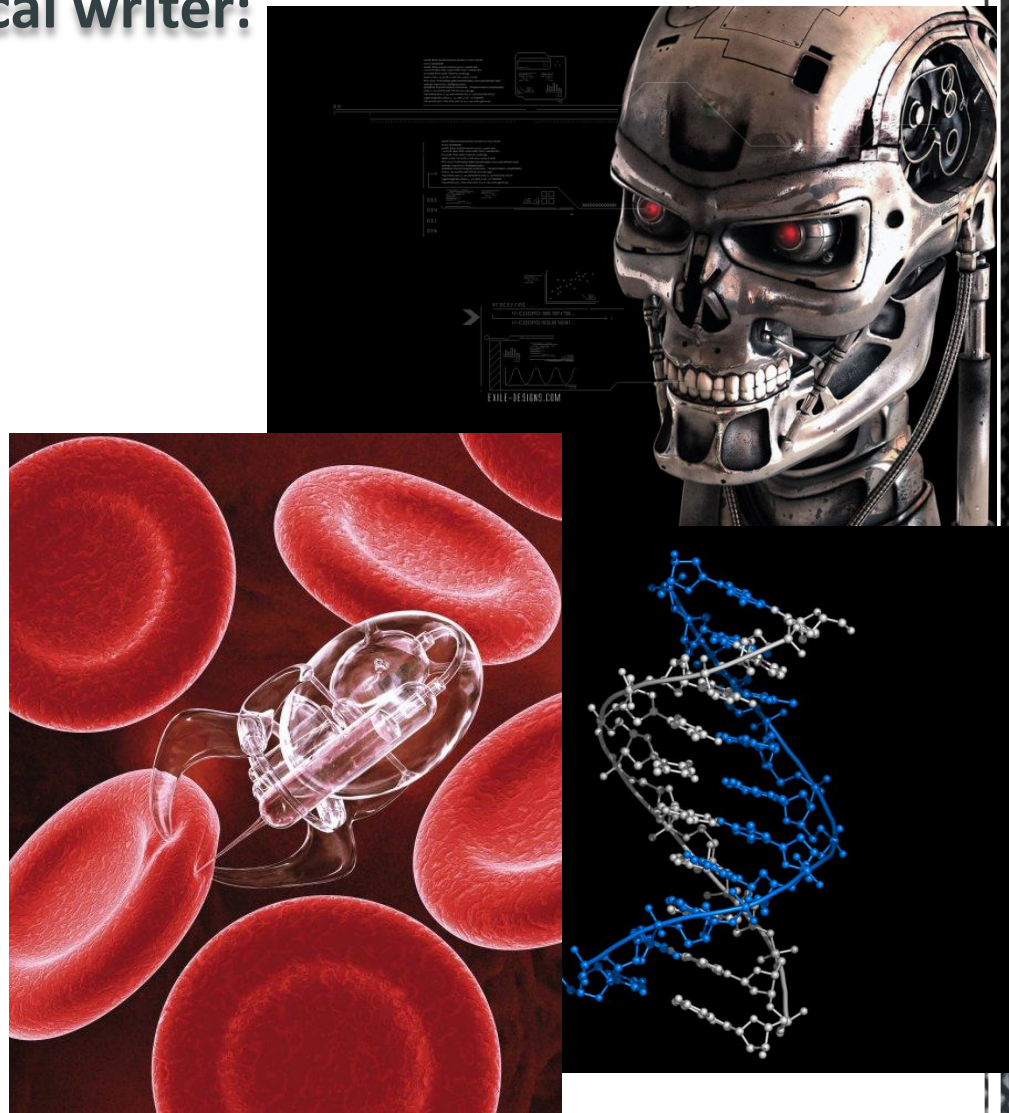
“Specialization is the price we pay for the advancement of knowledge. A price, because the path of specialization leads away from the ordinary and concrete acts of understanding the terms of which man actually lives his day-to-day life.”

—William Barrett, *Irrational Man*



# Critical to being a good technical writer:

Imagination becomes far more, not less, important if we have any real desire to manage this fast-changing world where genetics, nanotechnology (especially in medicine), and robotics/artificial intelligence will come to dominate our evolution, culture, brain chemistry, and, maybe, our survival.



Approaches to technical writing