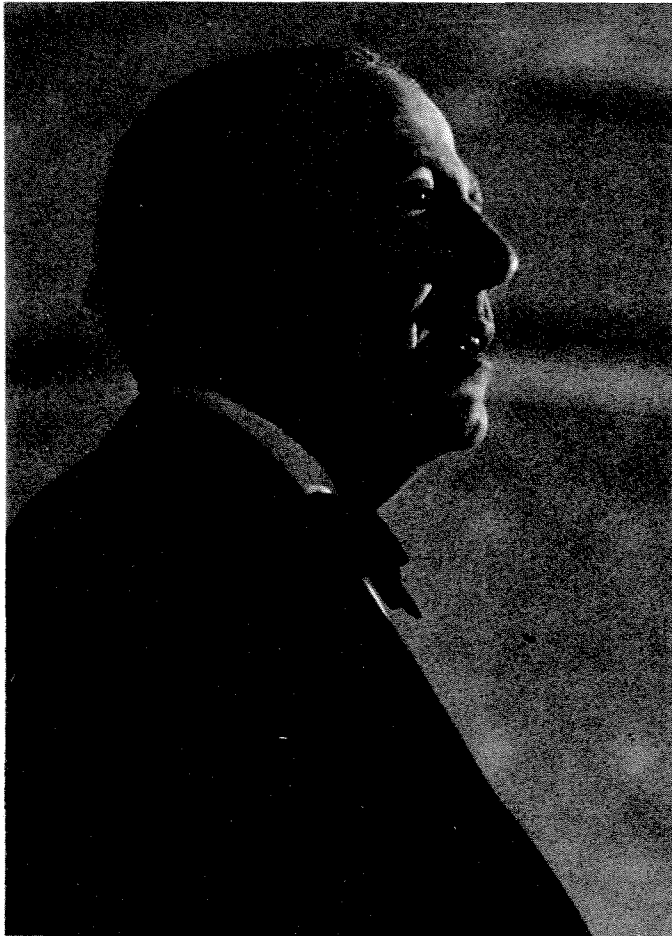


Science—at the Leading Edge of Hope

by Herman Wouk



“Science—at the Leading Edge of Hope” has been adapted from an extemporaneous talk given by Herman Wouk, author of **The Caine Mutiny** and **The Winds of War**, at the annual dinner of The Associates of the California Institute of Technology on March 6.

When I was invited to address the Caltech Associates, a strange and rare feeling came over me—modesty. I think very well of my novels, but I had some trouble with high school physics; and except as a subscriber to the *Scientific American*, my scientific knowledge since then has not expanded a great deal. When, therefore, I was invited to address this august group, C. P. Snow’s famous essay on the two cultures came to my mind. Well, I thought, here is a prime example of that gulf that has opened between two modes of thinking and looking at the world. I went back and read it—read it quite carefully.

It’s a classic description, of course, of the truth that people in the humanities—where I count myself—in literature and the arts, in political and economic thought, have moved off into one direction of looking at the world; while the technicians, the theoretical physicists, the engineers, and the applied research people, have moved so far in another direction that there has almost grown up a difference of language between the two communities. C. P. Snow was, I believe, rightly concerned about the deleterious effect on the future of the human race, which—under the pressure of the Industrial Revolution—needs much working together of these very different groups.

I then groped around for some profound additional insights on this question of the different languages these two different groups of humanity spoke, but all I could think of was the story of the mouse who got into a cupboard—a female mouse with her three babies. They found a marvelous cheddar cheese and were feasting royally off it when into the open door of the cupboard there sprang the house cat—humped, bristling, and glaring. There was no way out of the cupboard past that cat. Step by step the cat advanced toward the mice. Suddenly the mother mouse reared back and went, “Woof! Woof! Woof!” The cat turned and sprang out of the cupboard. The mother turned to the baby mice and said, “Now, children, you see the advantage of having a second language.”

Somehow or other I’ve been thinking a lot about my old, wonderful boss, Fred Allen. He brought me here to California on my first visit in 1937 as part of his staff. Few of us New York-based lads and girls had ever been to the West Coast before, and we expressed great excitement. And Fred, in an answer that has since become quite well known, said, “California is a great place—if you’re an orange.” This sounds like a prejudiced remark, but it really is not. Toward places west of the Hudson, Fred had no prejudices. He hated them all equally. I remember one evening just before the performance he looked around at a studio that was filling up with an audience of somewhat unsophisticated characters, and he said, “God! It looks as though there’s a slow leak in Idaho.”

I have been working now for almost a decade on an immense panoramic romance comprised of two novels—

each one almost a thousand pages long. The first has been published. It's *The Winds of War*, and I'm working on the second one now. If there is any point of contact between myself and the Caltech community, I make bold—abandoning my brief pose of modesty—to say that this panoramic work is an effort to come to grips with something of the first importance in human experience; to understand it, and if possible to make that understanding available for the use of my fellow men. It's a vauntingly ambitious task, and one can ask oneself, "Why do it?" I might have written more, shorter books with much less challenge for research and the kind of labor that has gone into *The Winds of War* and will go into the sequel. It's because the Second World War was a cataclysm in human experience which we have not fathomed—in the shadow of which we still live—and the real outcome of which none of us can yet wholly foresee. You can look at it from many viewpoints, but in essence it was an intersection of old ways of doing things and a new technology which these old ways could not master. The result was an explosion that all but wrecked the future of the human race. It was a very near thing.

My novel, however, is not—as those of you who have read it know—a work of despair. Most of the novels of the Second World War—and indeed most recent fiction—are what one would call anti-hero literature. In one way or another they say that man is trapped in an absurd universe and is surrounded by a technology that has run away from him. He has no fixed stars by which to steer because all traditional values have broken down and all human structures are toppling.

This is not a new cry. It emerged in the 19th century as the opposite side of the coin, the dark romantic face of the strident optimism of the socialists. It emerges in Nietzsche and in Schopenhauer, and it bursts into fiction with those great masters of modernism, Dostoevski (especially in the *Notes from Underground*), Proust, Kafka, and Joyce—all of them one way or another offering the anti-hero as the central figure. In the case of Proust, a nervous, sick man at least recording each detail of this phosphorescently glowing civilization as it sinks in decay. Kafka, hauntingly and everlastingly the man trapped in the world that has grown too big and too dark for him—in a social structure that is beyond penetration and fathoming, but which is slowly killing him. Joyce, in the figure of Leopold Bloom, the trivial man who is every man, struggling to keep his nose above water when religion has gone and nothing works and all the world is a ruin of cultures that are dying and disintegrating.

That, I say, is the modern note. But my book is centered on a prosaic American who most strikingly is a man of action—a senior naval officer, who gets around, gets things done. He is a doer, not a D'Artagnan nor a Don Quixote, but the kind of guy we know well—a first-

class guy who is outside of the war all during my book (because it ends at Pearl Harbor) but who is very active. And with this active, moving, strong figure, one sweeps through the panorama of the years before Pearl Harbor.

Question. Why, if you are serious—and I am deadly serious—move with this figure rather than with the almost obligatory anti-hero despairing of war, as most typically in the amusing figure of Yossarian in *Catch 22*? The reason is, above all, because I have a different view of the Second World War, which has come out of my experience of it and my study of it.

In the manner of Caltech, let's strike at the fundamentals. First of all, we won. We won the war. And when I say we won, I mean it quite literally, *pace* the revisionist historians. Men of good will, by the skin of their teeth, turned back a mortal challenge to the future of the human race. Had they failed to turn it back, our world would have sunk into a night of barbarism, in a fall unmatched even by the fall of Rome. I see—in this—hope.

It is true that every means of technology was used for murder, but that is nothing new. Yesterday, I had the immense privilege of talking to half a dozen members of the distinguished Caltech faculty who took part in the great Los Alamos effort. I did this as research for the sequel that I am writing. What emerged was what I had gathered from my reading: As quickly as this hellish stuff was boiled out of the substances that would not blow up—as soon as this horrible dynamite was isolated—it was rushed out to the Pacific to be used. As one man after another said, "We did not think then about not using it. It was war and we used it—or it was used." I'm sure that the first hominid who picked up a rock, and found that he could hold it, used it to smash the skull of his nearest neighbor and took the food from his hands and ate it—if, indeed, he did not eat the spattered brains. It is not by accident that the Bible begins with one brother slaying another.

Yet each time we have gone through a cycle of history there has been painful progress, and I see in this bleak picture around us, painful progress. We have shrugged off slavery. We have shrugged off human sacrifice. We have shrugged off feudalism, and it is my glimmering faith—but my faith—that we will shrug off war. Because we must.

I think I have some grounds for that faith—not only in my study of the Second World War, or in the fact that no one marches to these small or spin-off wars singing any more—but in the things that happen at Caltech. I'm not a scientist, but I'm the brother of one; and he has reported to me the things that are happening in science, and I have tried to follow them in the popular writings.

There has been a tremendous outpouring of discovery in the last 50 years, but you need only go back as far as Tycho Brahe and Kepler to see the beginnings of this whole avalanche of discovery. In this relatively short time there has been an uncovering of dazzling, orderly wonders in the universe, the structure of matter, the motions of the heavens, the workings of light. These are stunning in their beauty and their design. Where the classic theological argument from design was knocked out of court long ago in technical philosophy, it seems to overwhelm you again—in the words of the Psalmist, “the heavens declare the glory of God”—from the discoveries of science. Order in the heavens, order in the world about us, however mysterious and ill-defined, at least suggests mind and order that may care about human fate.

If there I lose you, being a religious man, surely you will agree that there is another wonder, perhaps greater than all these, and that is the wonder of the human mind—which is measuring this vast and complex universe, seeing it, understanding it. From Jesse Greenstein at the 200-inch telescope, peering as far into the business of God and the distant reaches of the universe as any human being ever has, to Dick Feynman, battering at the sub-nuclear world, mankind is showing a dignity, a power, and a stature in which one can find hope.

The distinguished author Saul Bellow recently gave a speech at the Smithsonian in Washington on “The Artist in the Age of Technology.” He was gloomy about the future of the arts in a technological society. It was a wonderful speech. At one point he said, “This is not a time for the singing of the nightingale.” He was expressing his fear that the arts and the life of thought would be crushed by the onrush of technology, and he was pleading against this.

It’s not easy to wave off the fear of technology—and indeed the risk is a real one—but I’m not sure that Snow’s useful separation of the two cultures may be quite the thing. He says, himself, in a later discussion, that it’s always a mistake to divide anything into two and say, “Either this or that.”

Going back to my Fred Allen days, you remember Nelson Eddy, the saccharine hero of every third musical. Groucho Marx once said: “There are only two kinds of people in the world, those who hate Nelson Eddy and those who despise him.” This kind of oversimplification, I need not tell you scientists, haunts every attempt to schematize and diagram things.

I think, nevertheless, that there are at least two more groups that should be added to the humanities people and the scientists. And the interaction among these four, I suggest, is vital to all our futures. There are the people of power—the men of government that I have come to know in Washington, and for whom I’ve acquired considerable respect. They live in the tactical and in the

contingent, but it is they who take the discoveries of the men of science and somehow or other lead people in the use of them. And there are the men of industry—the producers for whom I have also acquired much-increased respect in my study of the Second World War.

I had something confirmed yesterday in my chats with the distinguished men who served at Los Alamos. They concurred in saying that the picture of the atomic bomb as the work of a few great scientists getting together, discovering something, and loosing it on the world is distorted; that, in fact, there was also a stupendous industrial effort, most characteristic of this country. It would perhaps have been better for the human race without that effort, although I doubt it. Eventually the idea would have surfaced—the idea and the dreadful fact.

Some of you in industry are here tonight. Speaking to you as an artist, I profoundly feel that these people of Caltech and the scientific community are at the leading edge of hope for the world. Because so much remains to be done. This thin film of water and air on a dead ball, this biosphere wherein we live, is threatened; and the answers to the threats must come mainly from the scientists. It will then be up to the thinkers and the artists to make, if you will, the people at large aware of what our dilemmas are and where we must have leadership. And when that awareness is widespread, the masters of the contingent and the tactical can lead people in the directions in which they must go.

I think that’s why I am an Associate. I was recruited by my brother. My arm survived the twisting because I am keenly aware that, in the first instance, the future lies with those things that these men who mark paper and blackboard can teach us in the way of mastering and saving our precious little earth.

The clangor of technology is terrifying; the smoke and the murk are dense and gloomy. But these things, I believe in my deepest heart, can—with the pursuit of knowledge and excellence, with leadership, with the penetration of thought into new ways and new habits of man’s governing himself, and with the support that science must have—lead us to a better day.

The contribution that I have given to Caltech in money, modest though it is, is the largest I’ve given to any one institution except the divinity school which is headed by my Rabbi and teacher. If I put divinity ahead of science, it is because—in back of all this—the heart of my hope is a sense that the Redeemer, masked, mysterious, and loving, is there. For me His still small voice is the voice of the nightingale. By His grace, if not we, then our grandchildren and their children may yet hear the voice of the nightingale, thanks to technology, in a peaceful garden.