

Audience of One—Jacob Bronowski

October 13, 1975

Number 41

A friend of mine admonishes me relentlessly that "an ability to appreciate and enjoy Shakespeare and Mozart is among the few things, Eugene, that make life worth living." I think he is truly concerned that I have been cheating myself of close contact with "two of the greatest of human minds," because I seem to him not to exert myself to know Shakespeare and Mozart to the extent he thinks I should.

But I have the forehand and vantage of my friend, as he might borrow from Shakespeare to express it. I have already enjoyed the privilege of contact with more fine minds--some of them indeed great minds--than I'm sure most people ever will in their lifetimes.

I owe this mainly to the requirements and nature of my work, though I gladly admit that a brash willingness to ask and to learn has played a part. My work has required me to travel a great deal, and I've been able to meet unusual and distinguished people all over the world. In addition, the subject of my work--information and communication in science--has fortunately been one that has interested men and women of extraordinary talent and ability. In

the simplest terms, a common interest has made it possible for me to talk with them, and that kind of contact with great minds has made my meetings with many eminent people rarely disappointing.

Many of us, I suppose, have imagined what it might be like to meet a favorite celebrity. In too many cases, I'm afraid, such meetings would be disappointing. There would be no common interest to ease the beginnings of conversation and to encourage the mutual curiosity of opinion that leads to unselfconscious discussion. Without this, such imagined meetings--the longed-for contact with a great mind--would likely result in little more than the meteorological trivia exchanged by strangers waiting for the same bus.

I had such a meeting once. If I had been forewarned of the circumstances, I should certainly not have expected to enjoy it as I did. I went to California to lecture on the *Science Citation Index*<sup>®</sup> (*SCI*<sup>®</sup>) and discovered that my audience consisted wholly and solely of Jacob Bronowski.

Shortly after foundation of the Salk Institute, its librarian invited me to come to LaJolla. He suggested a seminar on the *SCI* for the library

staff, and such other members of the Institute as he might be able to corral.

I set out early enough to spend a good part of the day with Professor Harold Urey at the University of San Diego, and towards evening went on to the Salk Institute Library.

I was shown to the room prepared for my seminar. I found it surprisingly small considering that the planned seminar was now being talked about as a 'lecture.' There was a screen for visual aids, and someone had given up an attempt to make even a few rows of the ten or so chairs scattered about the room. I remember thinking at the time that the planned-for turnout was a dismal proportion of the number of people who must then have been working at Salk.

After a few minutes, a rather short and slightly balding man arrived and took a seat in a second-row chair. The librarian introduced me to Jacob Bronowski, and then the three of us waited for others to arrive. We waited for what seemed to me an eternity for those others to arrive, but none did. Apparently the seminar or lecture had not been announced properly, notices had not been posted, publicity had been nil. But Bronowski was not discomfited at all. He seemed to have no doubts but that we should carry on. One had come to teach, and at least one had come to learn. What more was necessary?

I began poorly, feeling like a bumbling amateur auditioning for a part in a professional production. But

gradually, with steady nods of approval and interest from Bronowski, I began to feel more comfortable and confident of my purpose. By the time I finished I had forgotten about the forgotten seminar and about what I first felt when it was plain I was expected to lecture to this one man. When I had finished, Jacob Bronowski and I talked.

About two years ago an article by Bronowski appeared in the *Atlantic Monthly*.<sup>1</sup> It reminded me sharply of the charm, and above all of the humanity of the man who had been delighted that evening, as an audience of one, to 'learn' from me and afterward to exercise both our minds in a discussion of what I had 'taught' him in my lecture.

We included the article as a lead item in the *ISI Press Digest*: "The author quotes Max Born: 'I am now convinced that theoretical physics is actual philosophy.' And so Bronowski translates Heisenberg's Principle of Uncertainty into a Principle of Tolerance that titles this essay on the human condition, and on that 'unending adventure at the edge of uncertainty' that is true humanity and true science as well. From the beauty of this human uncertainty one can step only into a chasm of ignorance, arrogance and dogma. 'Science is a very human form of knowledge. We are always at the brink of the known, we always feel forward for what is to be hoped. Every judgment in science stands on the edge of error, and is personal. Science is a tribute to what we can know, although we are fallible.'"<sup>2</sup>

The millions of people in both the United Kingdom and the United States who watched Bronowski's "Ascent of Man" series on television were indeed fortunate to have shared something of the experience my lecture had offered me. It was a truly poetic blend of science and art presented by a man of tremendous sensitivity, knowledge, and enthusiasm.

Fortunately, *The Ascent of Man* has now been published in a beautifully designed book.<sup>3</sup> Like the television series, the book includes some of the article I've mentioned above, and all of it displays the same depth and eloquence, and the same thrilling optimism that is signalled by use of the title word *ascent* rather than *evolution*. I add here some other sentences from the book, because I have heard it described as a 'defense' of science. Bronowski's point was that science needs none, precisely because it is, with art, one of our two characteristically human, almost species-specific activities.

"One aim of the physical sciences has been to give an exact picture of the material world. One achievement of physics in the twentieth century has been to prove that that aim is un-

attainable... There is no absolute knowledge. And those who claim it, whether they are scientists or dogmatists, open the door to tragedy. All information is imperfect. We have to treat it with humility. That is the human condition, and that is what quantum physics says...

"The paradox of knowledge is not confined to the small, atomic scale; on the contrary, it is as cogent on the scale of man, and even the stars...

"It is said that science will dehumanize people and turn them into numbers. That is false, tragically false. Look for yourself. This is the concentration camp and crematorium at Auschwitz. This is where people were turned into numbers. Into this pond were flushed the ashes of some four million people. And that was not done by gas. It was done by arrogance. It was done by dogma. It was done by ignorance. When people believe that they have absolute knowledge, with no test in reality, this is how they behave. This is what men do when they aspire to the knowledge of the gods...

Bronowski himself was a proof of the sentence I like best: "Science is a tribute to what we can know although we are fallible."

1. Bronowski J. The principle of tolerance. *Atlantic Monthly* 232(6):60-66, December 1973.
2. *ISI Press Digest, Current Contents*® No. 5, 30 January 1974, p. 10.
3. Bronowski J. *The ascent of man*. Boston & Toronto: Little Brown, 1973, 448 pp.