

18/7/95\*\* Hiroshima Prefecture. Greetings in absentia

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## THE ROCKEFELLER UNIVERSITY

*pro bono humani generis*

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I apologize deeply to Governor Yuzan Fujita, and to the children from Hiroshima Prefecture attending this lecture, for my having to excuse myself at the last minute. I am suffering from a bronchial illness and laryngitis that simply make it very difficult to speak; and it would be taking a great chance to travel 10,000 miles on a very tight time schedule.

Perhaps you will permit me to communicate a few notes, on the topic I would have spoken about.

Global communications technology is moving ahead very rapidly, thanks in large measure to the superb technology developed by Japanese companies. In a few years it will be commonplace that I would be giving you this lecture over the Internet, right from my own laboratory in New York, and very likely to your own classrooms at your home school. In using e-mail to compose and transmit this message I am already using the most primitive aspects of that technology. If you want to see my facial appearance, look me up on [www.rockefeller.edu](http://www.rockefeller.edu) This intimacy of communication is certainly one of the special features of the new world you are just entering.

But I want to say a few words about "children", youngsters facing a career in science. As a way to leave a mark on the world, on the human experience, science is very much like art and literature. Much more than the arts, science is cumulative: All scientists build directly on the work of others, often to correct and perfect their findings. In turn they hope and expect that their work will be built upon and used by others -- and those others might be anywhere on the earth (eventually perhaps elsewhere); and may be separated in time by years, decades, even (though rarely) centuries. So to do science is to be part of an ongoing experience, and one very widely shared. Not surprisingly, scientists correspond and travel very widely. There are thousands of Japanese studying in laboratories in the U.S. and Europe, and they are also welcomed for their reputation of hard work, loyalty, and

intelligence.

To be a scientist is to learn how to deal with many contrary impulses and demands. I take this list from a paper in

Excitement & Fascination of Science. Vol. III parts 1,2.  
 compiled by Lederberg, J. 1990. Palo Alto, CA:  
 Annual Reviews, Inc. v.1 1297 pp. + index  
 pt. 2 1301-2338.

which is a compilation of 120 scientific biographies. You might enjoy going through that some time.

These are the traits that have to be always present but kept in balance.

imagination vs. critical rigor  
 iconoclasm vs. respect for established truth  
 arrogant audacity toward nature vs. humility and generosity toward colleagues  
 efficient specialization vs. broad interest  
 experimentation vs. reflection, reading speculation  
 ambition vs. sharing of ideas and tools  
 celerity (priority) vs. deliberateness (reliability)

It is not always easy, and you may be accused of being schizophrenic!

As a scientist beginning to approach my wiser years, I am just past 70 now, I have always treasured what I call "the child in me". That has not changed in the 50 years since I started serious experimental work -- I was just 20 when I began the experiments that earned me the Nobel Prize.

The childlike includes innocence and ignorance, but that is freshness of approach, and the excitement of learning new things for the first time. It is curiosity, being willing to try anything, being eager to question everything that comes across your path. That may be a special problem in Japan, with your great respect for people of my age; and again it is something that has to be kept in balance. But I would never resent it if a youngster told me, he didn't understand, I had said something that didn't make sense, could I explain it? I have often made new discoveries when I tried to make such explanations to someone who was a novice -- often I might tell them, you can find a better answer for yourself, go to the library and search for a better answer.

Of course the "child" must be balanced with the "adult". Curiosity with Responsibility. Fantasy and imagination with rational criticism. Fun with work.

You won't get that balance overnight; but look for it -- it will bring many rewards.