MEMOS FOR THE NEXT MILLENNIUM

Introductory Remarks at the 1999 Fermilab Users Meeting

CHRIS QUIGG

IT IS 1999, and only a few brief moments stand between us and a New Millennium. The Law of Conservation of Energy teaches us that the millennium is a purely arbitrary designation. But while Nature's laws are invariant under translations in time, human events frame our human perceptions. In human terms, the millennium about to end has seen the flowering of modern languages—among them, mathematics—and of the natural philosophy that has explored the expressive, cognitive, metaphorical, and imaginative possibilities of these languages.

DURING THIS MILLENNIUM we found the courage to reject Authority. We learned instead to listen to Nature by doing experiments—our inheritance from Galileo, Newton, and the eighteenth-century gentlemen of the Royal Society of London. Organized scientific communication arose through journals and electronic archives, through scholarly exchanges and Users Meetings, and fostered a transnational scientific community with shared values, standards, and aspirations.

PERHAPS IT IS A SIGN of our millennium's end that postmodernist voices proclaim a retreat of science into metaphysics—citing as evidence the received wisdom that so-called Theories of Everything can never be tested. Perhaps it is a sort of millennarian giddiness that leads some of our own colleagues to invite such misjudgments by announcing that we—or at least *they*—have become so advanced in our thinking that experiment is now superfluous. Perhaps the calendar also influences those lesser pessimists who are certain that particle physics is over because it is too costly, or too difficult, or too remote from common experience.

I DON'T HAVE MUCH PATIENCE for that sort of cynicism. The end-of-science voices are wrong on every count. The plain and remarkable truth is that ever more questions—including some that previously seemed to be "metaphysical" questions—come within the reach of science with each passing day. In the midst of a revolution in our perception of Nature, the successes of particle physics have brought it closer to everyday life than ever before. We have begun to see with newly appreciative eyes the beauty, symmetry, and logic of the natural world.

THE ÆSTHETIC SCIENCE APPROACH embodied in string theory has much to recommend it, and the noblest aspirations of its practitioners are the same as ours: to comprehend a real physical universe. My confidence in the future of experimental science—and of particle physics—consists in the knowledge that there are some precious things that only experimental science—and only particle physics—can give us. It is an extraordinary joy for me to be at Fermilab today among friends and colleagues whose optimism, curiosity about the physical world, and energetic devotion to experimental science will help realize the TRUE PROMISE OF THE NEW MILLENNIUM.