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EDITORIAL

NASA's New Science Vision

Congratulations are in order for NASA. The agency has embraced a vision around which researchers, educators, and the general public alike can rally. For the first time in its history, the U.S. space program has a set of sweeping, integrated *science* objectives. Now, at least in some parts of NASA, the advancement of scientific knowledge will drive the technology, not the other way around. Called "Origins,"* the new NASA program is designed to attack some of the most basic, time-honored questions confronting not only scientists but also philosophers and theologians. What are the origins of matter and life? How have order and structure emerged in the cosmos? Is there life beyond Earth? A minority of academics has long urged our government, and especially our universities, to address these and other big questions as part of an integrated effort to build a modern *weltgeschichte* that people of all cultures can adopt—a big-bang–to–humankind story that traces generative and developmental changes ranging from quark to quasar, from microbe to mind.

Although the Origins program is a new one at NASA, its broad theme represents an intellectual issue that has been in the air for some time. A few isolated scientists have been teaching and writing about such a grand science synthesis for the past 20 years, bucking the academic tide by offering expansive survey courses such as "cosmic evolution." Students have voted with their feet by making these classes very popular, often to the dismay, and sometimes incurring the derision, of academic colleagues who prefer to teach only their narrowly focused specialties. Intelligent taxpayers, too, have recently attended in droves public lecture series emphasizing the bigger science picture. And professional educators have noticed that precollege students respond best to the teaching of interdisciplinary science that topples the barriers between the conventional disciplines.

To make this new program really work, scientists especially will need to become more broad-minded and less specialized—to be willing to explore (or at least tolerate some of their colleagues exploring) holistic world views systemically and synergistically, not merely undertake the reductionistic science that has been so heavily supported by funding agencies for decades and just as myopically honored by our colleges and universities. The scientific community will have to welcome synthesis as well as specialization, teaching as well as research, dissemination as well as discovery. This is not by any means a call to abandon the specialized research efforts that have been the hallmark of a productive economy for many decades, but a recognition that now is the time to widen the span of intellectual effort in science and beyond—indeed, to engage the larger philosophical and religious communities in an ambitious attempt to understand who we are, whence we came, and how we fit into the cosmic scheme of things as wise, ethical human beings.

Space station nightmares and budgetary woes aside, NASA's Origins program, if pursued, can provide (even for NASA skeptics like me) a unifying core for its space science projects, tackling especially topics that are related to the origin and evolution of galaxies, stars, and planets. Other funding agencies and philanthropic foundations should participate in the effort, for many nonspace disciplines provide vital insights into the origin and evolution of life, intelligence, and humankind. NASA should not shoulder all the burden, nor hog all the credit, for organizing this grand intellectual quest for fundamental knowledge about our place in the universe. It also must not hype or oversell its intentions and progress.

We are entering an age of synthesis such as occurs only once every few generations. The years ahead will surely be exciting and productive times in the world of science, largely because the scenario of cosmic evolution will give us an opportunity to systematically inquire into the nature of our existence. As we approach the end of the millennium, such a coherent story of our origins—a powerful and true myth—can act as an effective intellectual vehicle to invite all our citizens to become participants, not just spectators, in the building of a whole new legacy.

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*The Search for Origins was a workshop convened by the National Research Council at the request of the White House in October 1996. The executive summary is available at http://www.hq.nasa.gov/office/codez/workshop.html.