

Yámana Science and Technology

Empowering Science and Scientists for the Greater Good and for the Individual Good

A proposal

How would you create a culture of science that develops the full potential of each individual to participate, innovate, and discover, such that they, society, and the environment thrive?

The predominant image of scientific research in the United States today is one of explosive progress. This image is accurate in many respects—scientists have achieved major breakthroughs in fields such as genomics, nanotechnology, and climate studies. We do indeed live in a golden age of scientific discovery.

However, the less promising reality behind that shining image is that the culture and structure of basic science fail to fulfill the true potential of invested time, money, and individuals' contributions. Putting more money into science, without self-assessment of how the scientific community works, is unlikely to engender the changes we feel are paramount.

Some Indicators of the Issues

- After investing many years of training and development in their scientific careers, an increasing number of scientists are leaving the academic research community in frustration. Our investment, both in and by these individuals, is lost to the research enterprise.
- Academic researchers starting their own laboratories face unreasonably challenging funding obstacles. In 1980, more than 50% of the recipients of research grants for the National Institutes of Health were under the age of 40; in 2005, less than 17% of NIH grants went to this age group, and the number of successful applications continues to drop.
- Parallel and competitive research programs create disincentives for collaboration and data sharing, which hinders scientific understanding of complex systems.
- Many structural issues that are firmly embedded in the academic scientific culture continue to create artificial barriers for individuals from particular groups, *e.g.* women and ethnic minorities. These include family issues, the culture of science, and the capriciousness of finding an effective mentor.

We don't know what the world would look like if we didn't lose the people that we are now losing from science.
—Richard Weibl, Director of the Center for Careers, American Association for the Advancement of Science

- The extreme demands on academic scientists' time means they are largely unavailable to contribute outside the workplace. This is not only a challenge to family life, but also hampers dialog between scientists and non-scientists - a loss to both them and their communities.
- A statistically invisible number of talented young people choose to pursue other careers when they see the lifestyle demands of a scientific research career. The lack of balanced lifestyles leads to loss of gifted and creative individuals from science.

The invisible costs of not reflecting, assessing, or changing our actions are the things we do not create, discover or invent and the diseases we do not understand

Our Vision

We envision a science culture where both people *and* ideas flourish in the presence of effective support, balanced lifestyles, and thriving workplaces. *Tools and resources for creating such a shift are available today.*

Creativity

Who *wouldn't* want to make a career in a place where exploration yields incredible insights, amazing discoveries and unforetold outcomes?

- A community that champions current approaches to basic research as well as exploration and testing of truly novel ideas, fosters the pursuit of understanding unexplored phenomena, and pursuit of 'discovery' based research.
- An environment that encourages scientific discoveries not only on an individual basis, but also those achieved through collaboration across institutional, disciplinary, geographical, and cultural boundaries.

In contrast, the current belief is that individuals and institutions should pursue research that is predictable, and highly likely to create known and desired outcomes. The larger outcome is a stifling of ideas, talent and creativity.

Science and Society

A research community will better fulfill society's need for scientific knowledge if it is strengthened by a more diverse work force, nurtures society's input into the research process, and effectively addresses life-style issues.

About half of today's doctoral students are lost to attrition...those who persist often take a long time to finish and along the way find their passion for the field sadly diminished.
- from the Carnegie Initiative on the Doctorate

- Balance in researchers' lives benefits society, through greater participation of scientists in their local and global communities.
- Balance in researchers' lives benefits the creative process, because regenerative periods of rest and diversion are needed for the brain to work at its highest creative potential.
- Quantum leaps in scientific knowledge, and unexpected outcomes from these leaps, are the fruit of research that follows unpredicted paths.

The list of breakthroughs in research that came as completely unexpected outcomes includes the development of lasers, penicillin, and even Viagra.

Creativity occurs from a playful, naïve place when there is no worry about failure, no self-consciousness, and no sense of time. — Mihalyi Csikszentmihalyi

Sustainability

We envision a research culture that sustains itself through:

- New paradigms for training students that are effective, inclusive and supportive.
- Robust, open and effective communication among scientists, including dynamic exchange of ideas between applied and basic researchers.

We believe greater innovation and productivity will be the fruit of active inclusion of approaches, ideas and collaborations between individuals from different disciplines as well as individuals that are currently missing from research.

Science should not be a military or a business operation, but nowadays it increasingly resembles one—for most, it is a vicious struggle to survive.
—Peter A. Lawrence, Laboratory of Molecular Biology, Cambridge, UK

Who Are We?

Yámana* Science and Technology is a non-profit, a team of scientists and other professionals who share a common sense of purpose and a vision of 'what could be.' We interact at the crossroads of basic research training and an active scientific research community, and are exploring organizational models and professional practices that are geared toward supporting and growing the existing scientific talent, reversing wasteful attrition and stemming loss of worthwhile projects and people from the scientific pipeline.

*Yámana (*def.*): highest form of life, living, to be alive (translation by Thomas Bridges, from *Blessed Unrest* by Paul Hawken)

What Do We Propose?

- Create forums that include grass-roots and leading-edge thinkers from diverse arenas to create robust interactions within the scientific community, between scientists and society and thus explore and enable cooperative synergies that support creativity and sustainability and are in harmony with nature.
- Introduce new business theories of the intelligence of groups, facilitated co-creation, and alternative ways of organizing work to develop synergies within and between groups, new models of the workplace, and more balanced lifestyles in science.
- Disseminate insights from various forerunners of change, including the Center for Work/Life Balance, the UC Berkeley Family Friendly Initiatives, Haas School of Business Diversity Conferences, and the Carnegie Initiative on the Doctorate to transcend the clutter that has accumulated around academic processes, and re-connect with the passion and productivity inherent in us all.
- Create conversations that catalyze change.
- We are not done until individuals in advanced stages of scientific training see a welcome and inviting path for having balanced lives and being scientists, too.

We invite you to join us in this endeavor

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