

A Panoramic Perspective on Science Policy

The Honorable Kathie L. Olsen, Ph.D, former Deputy Director of the National Science Foundation (NSF), former Chief Scientist of the National Aeronautics and Space Administration (NASA), and now Founder and Managing Director of ScienceWorks International, LLC gave the luncheon remarks. Her premise was that the ARCS Foundation (Achievement Awards for College Scientists) is as important or even more critical in today's world than when ARCS was started (October 1958) by a group of women following the Soviet Union's launch of Sputnik.

Providing a long-term perspective on science and technology policy along with the Federal research and development budget, Olsen discussed how our Nation has moved from a primary focus on agriculture, then manufacturing, to technology, which led to the information economy and our present knowledge based society. Focusing on the speed and spin of globalization, she provided extensive data from variety of sources on the projected increase in employment in STEM areas in the next 10 years. While the average annual growth (2002-2009) in the number of researchers is rising in Asian countries and slightly in Europe, the United States rate has dropped as compared to the 1995-2002 time period. On a positive note, the total U.S R&D expenditures is still the highest in the world, the National Institutes of Health's budget was doubled in the early 2000s followed a few years later with an emphasis on strengthening the budgets of other research agencies, like the NSF and the Office of Science in the Department of Energy. However, many countries around the world also now recognize the importance of investing in research and higher education for their nation's ability to innovate, strengthen the economy, and improve the health and well being of their citizenry. Although estimated R&D expenditures world-wide have increased, Olsen provided data that demonstrated a downward trend (1960-2014) in US expenditures both as R&D share of the total federal budget and as share of Gross Domestic Product (GDP). Recently, the U.S. has fallen to 10th place in R&D investments as a percentage of GDP, among OECD nations. While businesses have increased their percentage of total R&D expenditures, the percent reduction by the federal government impacts support of basic research. Federal basic research is carried out primarily at our outstanding academic institution, like OHSU and OSU, which not only produces the next generation of scientists, engineers, and medical doctors, but the research that has proven to be the seed corn of innovation.

Dr. Olsen noted a plethora of reports on research and STEM education have been published, including by the National Academy of Sciences and, most recently (September 2014), the American Academy of Arts & Sciences (entitled: *Restoring the Foundation: The Vital Role of Research in Preserving the American Dream*) that address the issues raised in her presentation. She also indicated that while the U.S. is great at producing these reports, other countries and regions are actually reading the reports and acting on their recommendations to sustain long-term investments in both research support and in higher education.

Finally, Dr. Olsen interwove her presentation with the experience of growing up in Oregon. Having graduated from Cleveland High School in S.E Portland, she was always struck by the quote on one of the doors "What we are to be, we are now becoming." During those years, there

were few women pursuing careers in the sciences and she laughingly related her encounters with some explicit bias. While overt bias and discrimination have decreased globally, she highlighted the issue of unconscious/implicit bias as a major challenge. She showed data published by the Department of Commerce in 2012 that, whereas women represent 48% of the all employment, they still only represent 24% in STEM fields. She then addressed some very recent published articles that compared responses to identical CVs, with only difference the apparent gender of the name (*Moss-Racusin et al, PNAS, Vol 109, pg. 16474-16497, 2012*). Both men and women judged the male name to be more competent, and the apparent male was more likely to be offered a position and mentored, and with a larger salary, than the apparent female. She spoke of these issues for women in science, given that research indicates that implicit bias can be effectively addressed and diminished. Like the ARCS scholars being recognized at today's luncheon, it is important to recognize and support the vital contributions from members of all groups in our society.

Dr. Olsen noted the outstanding accomplishments of the Portland Chapter of the ARCS Foundation since starting in late fall of 2004. She congratulated all of the scholars and commented once again why ARCS Foundation still plays a vital role in the Nation's progress by enabling the next generation of scientists and engineers to flourish and succeed.