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A silent and unprecedented revolution in longevity has occurred in the 20th century. The industrialized world has gained over 25 years of life, and this achievement is nearly equal to the life expectancy attained during the preceding 5000 years of human history. Nearly 20% of this gain has been from base age 65. Soon, baby boomers will reach 65. They will constitute 20% of the population and some 25% of the vote. The United States is not unique. Japan will arrive at the point where 20% Of the population is over 65 a full decade ahead of the U.S. Europe, too, is aging rapidly.

Why are we experiencing a revolution in aging? Longevity is a function of social and economic progress, better public health and nutrition, and the application of important medical concepts, such as the germ theory of disease. Furthermore, In this century we have enjoyed steady success in meeting the challenges posed by the increasing number and proportion of older persons in many nations, through such advances as social security, health insurance, and biomedical research.

The longevity revolution is derivative of the Industrial-Scientific Revolution, and, like that revolution, fundamentally affects everything: the family, economic productivity, the health care system and culture. All major changes have unpredictable ramifications. For instance, the Industrial Revolution, which drastically transformed societies in positive ways, also contributed to adverse environmental changes, such as global warming. Similarly, along with the positive aspects of the longevity revolution we have acquired a significant minority of severely disabled and impaired people, devastated by Alzheimer's and vascular dementias, frailty, and problems with mobility,

The new longevity has resulted in considerable cultural, political and economic uncertainty, as nations consider rising public pension and health care costs. Social protections are under re-evaluation and four concerns are widely voiced:

1. Can we afford older persons? Are they a burden, given pension and health care costs?
2. How much can and should society and the individual bear?
3. Will costly medical and financial dependency take away resources from the young, creating intergenerational conflicts.
4. Will the overall aging of the population, its burdens and costs, cause stagnation of the economy? And society at large? A weakening of the national will? In war and peace?
5. Will there be an excessive concentration of power in the hands of older persons? Will we live under a gerontocracy?

However daunting the challenges of population aging appear, we must not be swayed by gloom and doom prognosticators. The odds are in favor of the growth of a vital, active, experienced, engaged and useful older population. We can point to positive developments, such as increased productivity - due to the reduction of disruptive illness and premature death - and the emergence, for the first time, of the

multigenerational family. Moreover, the now longevity has led people to plan seriously for the future, and to generate new savings through pensions, one primary source of capital formation today. The growing numbers of older persons have been the catalyst for basic research and clinical investigations into aging. There have been notable drops in disability rates and an improved quality of life.

The revolution in aging is also contributing to a transformation of our health care and service delivery systems by requiring a more comprehensive and integrated approach to patient care, by the development of new technology to deal more effectively than we presently do with the frail and bedridden, and by advancing long-term care programs for all ages and conditions. Increasing longevity is also forcing us to think through end-of-life decisions. Finally, it has stimulated a consideration of the ethical and philosophical aspects of aging, dying, and death, and the equitable allocation of resources among the generations.

But the adaptive responses required by the new longevity are incomplete as we approach the 21st century. We are living in a world very different from the one in which this revolution began a scant hundred years ago. Today, just as we are seeing the globalization of the economy, of science and culture, we are also seeing the globalization of population aging. Longevity has presented us with a new and vital stage of life. Each of life's stages has its own characteristics and goals, and only now have we begun to make an effort to understand the spirit and purpose of this stage. Of course, there have always been individuals who attained great age in the past, and to whom we ascribed great wisdom and spiritual power. Throughout history, the aged have been the seers, guides, myth-makers and moral beacons. But with the mass production of old age and technological advances, the roles and status of older persons have changed dramatically. The sheer numbers of older persons in society today serve to contradict stereotypes and undermine conventional wisdom. Society must find now ways to utilize the skills of older persons.

While remaining mindful of traditional values and honoring the best of the past, we need to reevaluate the philosophy of old age. As a society, we must reformulate the very concept of growing old, and approach this stage of life with a fresh eye and an awareness of its potential. Already, many older persons in the small towns and great cities of America are contributing to their communities in new ways, and discovering now possibilities for intergenerational relationships. For instance, older persons today provide the equivalent of billions of dollars in voluntary service to their communities.

One community-based project of note which we established is the Linkage House Intergenerational Program, located in the East Harlem section of New York City. Linkage House is a partnership of four East Harlem organizations, who collaborated to create a 70 unit supportive living environment dedicated to promoting healthy and productive lives for older adults. The name "Linkage House" reflects the shared vision of its sponsors: to link the residents with safe and affordable housing, to link the residents to the community through a variety of programs, and to link the generations through intergenerational educational and recreational activities. Further, the building is designed to promote interactions among the residents through two shared living areas on each residential floor. Linkage House was constructed and is supported by funding from the U.S. Department of Housing and Urban Development (HUD), Section 202 Housing for the Elderly. Linkage House would not have been possible without the contributions of a team of dedicated individuals, organizations and foundations representing a wide spectrum of backgrounds and skills. Residents serve as volunteer after-school instructors and mentors for latch-key school children ages 6 to 12.

In addition, many older persons continue to carry out traditional grandparenting roles. For example, one of eight older persons directly cares for his/her grandchildren.

The very concept of work in our society needs to be redefined. Our present work model is antiquated

and set in consecutive blocks - nearly airtight - of education, work and retirement (leisure), when they might better be interwoven throughout life. That the world of work can be - and has been - transformed in the past - is illustrated by reference to history. Consider the medieval guild system and the Industrial Revolution's factory system.

Today's testimony concerns the productive utilization of older persons in both the paid and volunteer sectors. Of necessity, this topic encompasses the preservation and extension of the physical and mental capabilities of the aging population. Major policy implications include:

1. The level of investment in medical research, especially gerontology and longevity science, to solve the problems of dementia and frailty, which are costly to society as well as personally devastating.
2. The reconstruction of Medicare - not simply of its financing - but of the entire health care delivery system to older persons, through the involvement of geriatrics and managed care, making it both clinically effective and cost effective. The field of geriatrics must be fully established in the United States and integrated within medical undergraduate, postgraduate and continuing education. Medicare's Graduate Medical Education fund, totaling nearly \$7 billion, is the obvious source of funding for this modest goal.
3. The vital connection between health, productivity and Social Security reform.

In 1982, I testified before the President's Commission of Social Security Reform. Alan Greenspan, who chaired the Commission, asked me, "Since people are living longer, shouldn't they work longer?" The equation is in the air today, and it needs to be addressed in tandem with another equation: If Social Security eligibility is raised to 68 or 70 years, it must be coordinated with an increasingly healthy and active life expectancy. Eligibility cannot simply be tied to chronological age. It seems clear that we need to coordinate the efforts of the Social Security Commission with those of the Bipartisan Commission on the Future of Medicare, and link these efforts with the National Institute on Aging and the National Institutes of Health. We must also aim to protect older workers by enforcing the Age Discrimination in Employment Act. And, since it is obvious that there is no shortage of work to be done, we must strive to create jobs.

A new era has dawned for humanity - the era of longevity - and society requires new organizations. The International Longevity Center (ILC) was created in 1990 to prepare the world for great longevity. A generous benefactor has provided the organization with a wonderful home, and the funds with which to recruit outstanding people in public health, medicine, economics and ethics. The ILC is not only concerned with older persons per se, but with the effects of population aging on the human family as a whole, including the equitable distribution of resources among the generations; societal productivity; health care and social protections; and the biological factors in aging that affect health and disease, among other topics. The ILC has autonomous centers in Japan, the U.S., France, the U.K. and the Dominican Republic.

The ILC is especially concerned that, because of disease, the developing world does not enjoy the same life expectancy as the developed world. Nonetheless, because of their large populations, 60% of all persons over 60 now live in the developing world, and as we approach the mid portion of the 21st century that percentage will rise to 80%.

While those of us at the ILC are interested in exploring the innovative changes that are taking place in society worldwide insofar as they relate to the graying of nations, we are especially concerned with the world of work and the world of health. We believe that nations can learn from one another, and take

heart from observation that the sky hasn't yet fallen on those nations who have higher percentages and greater numbers of older persons than we do.

I just returned from Paris, where I met with one of the American officials at the OECD. He gave me the summary of a document (to be submitted), which was just approved at the OECD's ministerial level, entitled "Maintaining Prosperity in an Aging Society". It emphasizes three points:

- Incentives for early retirement should be eliminated
- Medical research and technology should focus on the reduction of dependence rising from conditions which particularly affect older people
- Acton at the international level - studies such as the "collection and sharing of new statistical data on an internationally comparable basis."

As you can see, the research body of the world's 29 richest nations emphasizes the same issues, and is compatible with the spirit of today's Hearings.

This is the third occasion of Senate Hearings on the Graying of Nations. The first, in 1977, led to enduring relationships among research centers of various nations, e.g. the NIA and the Tokyo Metropolitan Institute of Gerontology; the second, in 1985, furthered discussions about both geriatrics and aging research. I feel certain that today's Hearings will serve to initiate new efforts to advance active aging and promote biomedical research that will keep people healthier and productive longer.