

# **The Pursuit of Longevity – The Bringer of Peace to the Middle East**

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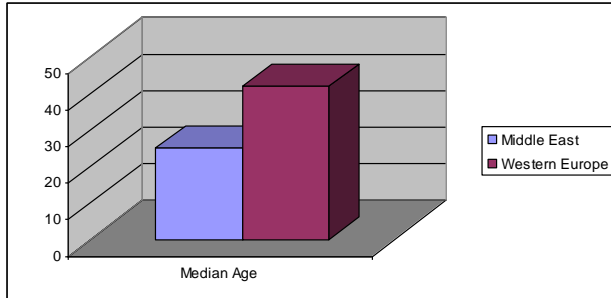
Department of Science, Technology and Society

Bar Ilan University

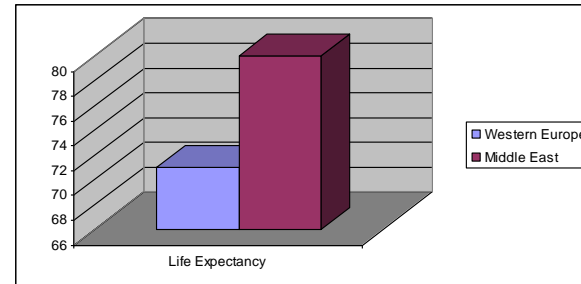
Ramat Gan

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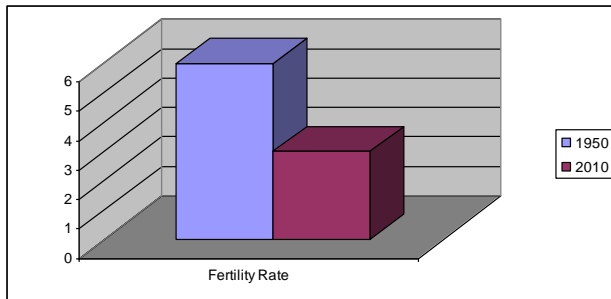
# The Middle East is young but growing up



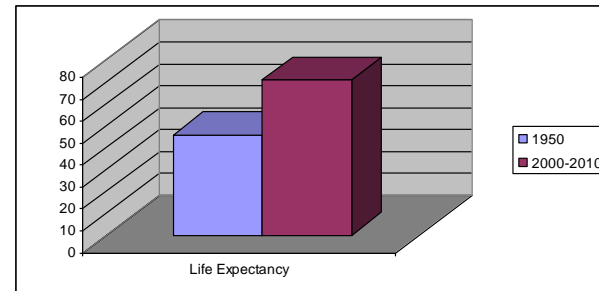
Median Age. 2010. ME vs. Western Europe



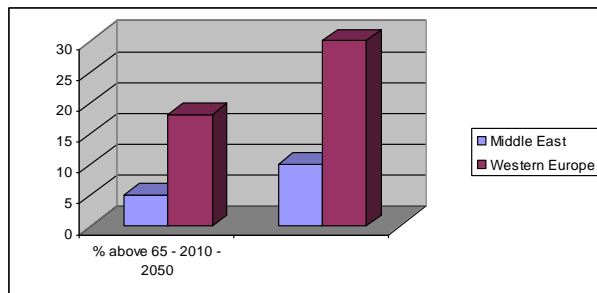
Life Expectancy. 2010. ME vs. Western Europe



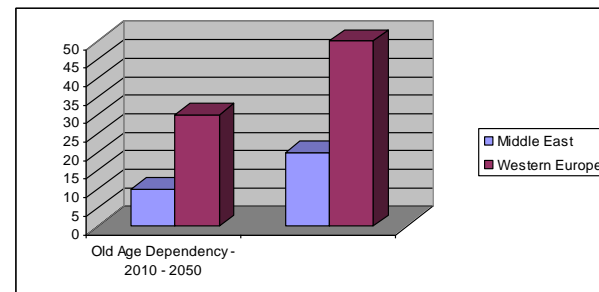
Fertility Rate. ME. 1950 - 2010



Life Expectancy. ME. 1950 - 2010

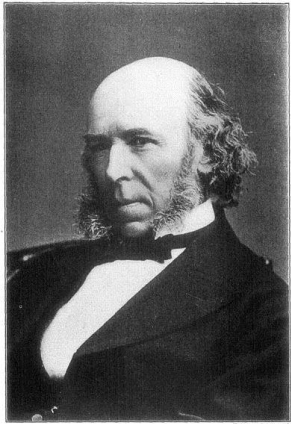


% above 65. 2010 – est. 2050



Old Age Dependency – % above 65 to working age – 2010 – est. 2050

## Longevity – Expression of the Valuation of Life



HERBERT SPENCER  
From a photograph

“Those who, on the other hand, take an optimistic view, ... must regard as conduct to be approved that which fosters life in self and others, and as conduct to be disapproved that which injures or endangers life in self or others...

Legislation conducive to increased longevity would, on the pessimistic view, remain blameable; while it would be praiseworthy on the optimistic view.” (Herbert Spencer, 1820-1903, *The Data of Ethics*, 1879)



“It is written: ‘When you build a new house, you should make a parapet for your roof so that you bring not bloodshed upon your house should any man fall therefrom’ [Deut. 22:8]. ...

This demonstrates, however, that there is no firmly determined time for death. Moreover, the elimination of harmful things is efficacious in prolonging life, whereas the undertaking of dangerous things is the basis for shortening life.” (Maimonides, Rabbi Mosheh ben Maimon, 1135-1204, *Responsum on Longevity*)



“If you could take a man, dissect him in such a way as to balance his natures [qualities] and then restore him to life, he would no longer be subject to death”

(Abu Mūsā Jābir ibn Hayyān – a.k.a. Jabir / Geber, c. 721-815)



“There are no intellectual reasons or rules to denote the impossibility of an extended life span; therefore, we cannot deny it”

(Allameh Tabatabaei, 1904-1981)



“We must rebel against the vulnerability of the human body. ... Life is now too precious ... More than ever therefore it is urgent to overcome death”

(Fereidoun M. Esfandiary, 1930-2000, *The Upwingers*, 1977)

# Longevity is a pragmatic value

- Human Development Index: Longevity, Education, Income

$$\text{HDI} = \sqrt[3]{\text{LEI} \cdot \text{EI} \cdot \text{II}}.$$

# Longevity – The Correlate of Wellbeing

- Longevity ↔ Education
- Longevity ↔ Intellectual Activity
- Longevity ↔ Prosperity
- Longevity ↔ “Indicator of economic success and failure” (GDP/GDP per capita)
- Longevity ↔ Equality (Gini Index)
- Longevity ↔ Peacefulness

# Objections to Extended Longevity (for the Individual)

- Objections:
- Diminishing change
- Spiritual and mental stagnation, boredom, lack of progress and achievement
- Prolonged suffering
- Death gives meaning to life
- Counterarguments:
- Stability is necessary
- Potential for learning and achievement is increased with increasing lifespan
- Suffering preventable
- Life has a meaning of its own

# Is extended longevity detrimental to the society?

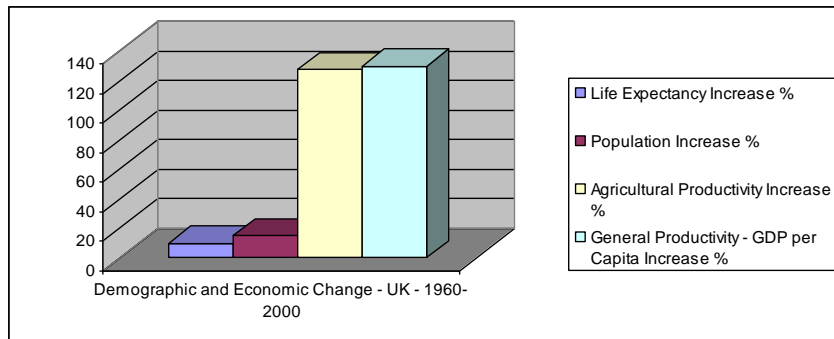
The question of “shortage of resources” and  
“overpopulation”

## Ethical counterarguments:

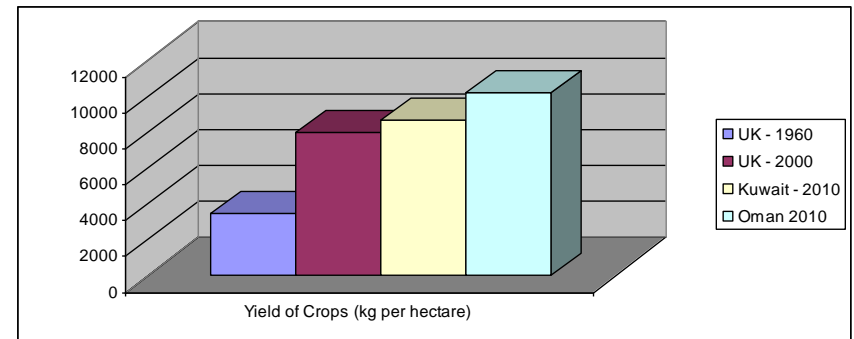
- Valuation of life overrides inconvenience
- Controlled social development preferable over blind selection
- Social solidarity and unification desirable even at some loss of resources



# Empirical counterarguments – “Will Malthus continue to be wrong?”



Demographic and economic change – UK – 1960-2000



Yield of crops – kg per hectare

## World (1963)

- Land and Food Requirements: ~550 people per square kilometer (over 700 if all the food comes from nutritious crops); minimal food requirement ~500 kilograms dry weight per person per year; the world dry land available for agriculture ~82 million square kilometers
- Agricultural productivity – Yield of wheat in the UK (best in 1960) – 3,500 kg per hectare
- **Enough to feed at least 45 billion people**  
(The Agricultural Economics Research Institute of Oxford, Clark 1963)
- **Since that time, both agricultural and industrial productivity increased dramatically**

# Overpopulation unlikely for the Middle East

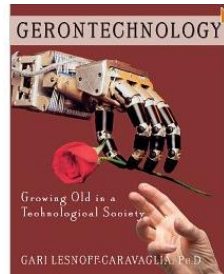
## Middle East (UN Western Asia region, plus Iran, Egypt and Afghanistan):

- Population density ~ 50 people per square kilometer (170 in Western Europe)
- Population growth rate ~2.4% (0.21% in Western Europe)
- >400 million inhabitants
- Area > 6 million square kilometers
- Over 70% arid land (aridity can be overcome e.g. by desalination and dripping irrigation)
- At least 1 to 2 million square kilometers usable for agriculture.
- Yield of crops in Oman > 10,000 kg per hectare
- **Enough to feed from 2 to 4 billion people?**
  
- **Still, efforts for egalitarian development are necessary.**
  
- **Given the benefits, longevity needs to be actively pursued.**

# Program for the pursuit of longevity is needed

## From the outside:

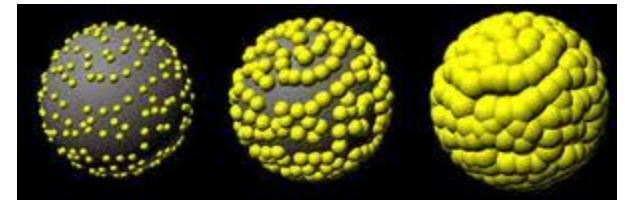
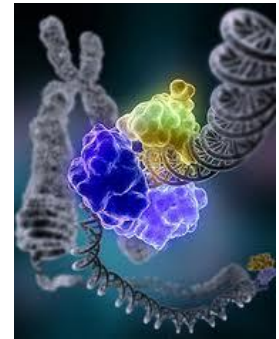
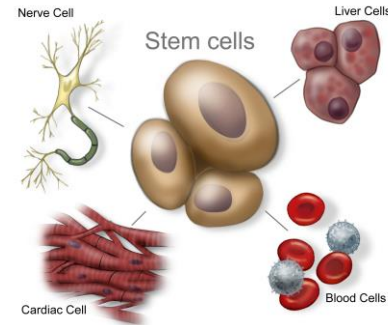
- Gerontotechnologies
- Preventive geriatrics
- Cognitive and psychological techniques
- Environmental technologies
- Improving conditions of daily life, means of access and convenience for the aged
- Social, educational and occupational integrative frameworks for the aged



# The pursuit of longevity

## From the inside:

- Regenerative medicine: stem cells and their products
- Regulators of cell cycle: inducers of regeneration and cell death
- Gene therapy: activators of sirtuins, telomerase, other “longevity genes”
- Geroprotectors
- Nanomedicine
- Tissue engineering
- Artificial organ replacement
- Quantified self



**Thank you!**