

Additional information about the posters:

## **Population, discoveries and inventions of different sectors**

### **Idea and Aim:**

Malthus constellate in his Essay on the Principle of Population (1798) that the growth of population is restricted by food subsistence. Nowadays we know that Malthus steps into a trap, because he did not consider knowledge and human capital as well as technological progress. As D. Gale Johnson ascertains food is cheaper than ever before, the population are nourished better than ever before; whereas there have never lived so many people on planet earth than ever before.

The world population still grows and are fed not only because of improved technological processes in food production, efficient crop cultivation but also of various discoveries and inventions.

The basic Idea was provided by R. W. Fogel. He presented in his paper "Changes in the disparities in chronic disease during the course of the twentieth century" (2004) a graphic about the growth of world population and some major events in the History of Technology.

The purpose of these posters is to investigate the coherence between population growth and inventions or discoveries in different sectors. With increasing population growth, more mental activity/capacity results in more inventions and discoveries. Important findings of the human evolution are pictured according to the topics food, agriculture and IT.

### **Method and Resources:**

We compiled the coherence how the growth of population was enabled by inventions. Our main source was Asimov's "Chronology of science and discovery" (1989). This book covers discoveries from the period 4,000,000 B.C. to 1988; started with bipedality and stone tools to greenhouse effect, shroud of turin and distant galaxies. After working through the book, we sorted the inventions and discoveries according to our research interests in food, agriculture and IT-Sector. In an Access data base we comprise information about: name of invention/discovery, sector also categorisation in material, cognitive or process, year, inventor, continent, location, culture and some details, as long these facts are provided. This database can be downloaded for free under <http://www.agric-econ.uni-kiel.de/Abteilungen/II/inventions.mdb>. It contains 196 entries in total, whereas 77 agricultural ones, 45 of the food sector and 76 IT ones (multiple classification possible).

Furthermore we used Bunch's "The History of science and technology", which goes up to 2003. Unfortunately this book does not provide detailed information about inventions and discoveries, so we had to use the world wide web for some more and specific information, especially for the food sector.

Because there is no statistical database for reliable data of the world population since 10,000 B.C, our evidence is based on different estimations. The U.S. Census Bureau - Population Division provides a summary of different sources. Due to the fact that there are "lower" and "upper" estimations of the world

population for the past, it is a kind of "tricky" to find THE amount of the world population. Our calculations of a mean of the population are based on these materials. Since 1950 the world population data are obtained from the United Nations – Population Division. The illustration of the world population was produced by using SigmaPlot 10.0.

For each poster we choose approximately 25 to 30 inventions or discoveries, which are of our point of views innovative/meaningful/important for the evolution, graphically mixed with a couple of quotations with related content.

## **References**

Asimov, Isaac: Chronology of Science and discovery. Harper & Row, Publishers. New York. 1<sup>st</sup> ed. ISBN: 0-06-015612-0. 1989.

Bunch, Bryan with Alexander Hellemans: The History of Science and Technology. Houghton Mifflin Company. Boston, New York. ISBN: 0-0618-22123-9. 2004.

Fogel, R. W.: Changes in the disparities in chronic disease during the course of the twentieth century. NBER Working Paper 10311. 2004.

Johnson, D.G. → Herr Müller, die Aussagen stammen aus ihren Folien, wie lautet die Quelle?

United Nations, Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, World Population Prospects: The 2004 Revision and World Urbanization Prospects: The 2003 Revision, <http://esa.un.org/unpp>, (accessed January 2007).

U.S. Census Bureau, Population Division: Historical Estimates of World Population <http://www.census.gov/ipc/www/worldhis.html> (accessed January 2007).