

3rd International Conference on **Biodiversity & Sustainable Energy Development**

June 24-26, 2014 Valencia Conference Centre, Valencia, Spain

Demographic impact, alimentary resources and global bioethics

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On an average, every human individual requires 2,000 Kcal per day for the acquisition of the 3F: Food, Fuel and Fiber. From the origins of the human phylum (which came about through the centric fusion of two chromosomes 6-5 million years ago) to the Lower Pleistocene (2 million years ago), hunting and gathering activities in savannah environments had to cater for the subsistence of not more than 500 thousand individuals in the Earth's ecosystem. It was during the 'aquatic phase' of human evolution in Eastern Africa, around 2 million years ago, that our ancestors underwent considerable physical alterations (loss of fur, more streamlined bodies with subcutaneous fat, the development of the cartilaginous portion of the nose, differentiation in facial hair of men and women, breasts in women, voluntary breath control and language, and cerebral increase from 800 to 1500 c.c.). Furthermore, the consumption of a lacustrine diet, particularly molluscs, rich in essential properties, and the need for increased manual dexterity and tools for their procurement, were important triggers which boosted the survival of Hominids leading to significant population growth and diffusion throughout the various continents. Culture, as the adaptive product of the human mind to different environmental situations and the sum of all previous experience, spanning the last 2 million years, has facilitated the survival of increasing numbers of individuals. The human population has increased enormously over the past few centuries. From the time of Christ, when the population was around 250 million, it took 15 centuries (to the discovery of America) for it to double. Nevertheless, this increase is not distributed equally throughout the Planet. In the last century, this growth has been twofold in Europe, fourfold in North America and Asia, sixfold in Oceania, sevenfold in Africa, and tenfold in Latin America. Even so, the impact of our species on the ecosystem was naturally sustainable until 8,000 B.C., in other words, until the end of the Pleistocene, with less than 10 million individuals spread throughout the entire ecosystem. Apart from energy demands (Fuel) and those for the protection of our bodies (Fibers), the cultivation of plants has produced changes which today merit being reconstructed to facilitate the introduction of genetically modified organisms (GMO), which, despite causing controversy, offer the only viable solution to ensure the future survival of Humanity. Such interventions are not recent, support for this statement can be found in the example of the transition of Teosinte to Maize, produced in an interval of a few hundred years by the Aztec and Mayan populations in Central America. These populations, despite having no conception of genetics, reversed the actions of just 4 genes in Teosinte to produce Corn.

Later, it was the importation of plant species, like the potato, corn and tomatoes, in Eurasia after the undertakings of Colombo, that led to an increase in the population from almost 500 million to 1 billion in 3 centuries (1492-1835), then 7 billion today, in less than 2 centuries. New technologies are promoting an increase in energy and nutritional resources, which will help to overcome this phase of Human impact on the Earth's ecosystem, but a revolution in traditional ethical concepts is also required. Hence the proposal for a 'Global Bioethics'.

Biography

Brunetto Anton Chiarelli is Professor Emeritus of Anthropology at the University of Florence, Italy. He is author of more than 500 scientific publications dealing mainly with comparative genetics, cytogenetics, taxonomy of Primates, biology of human populations and global bioethics. More than thirty years ago he established the International Institute for Humankind Studies (IHS) at the University of Florence to offer an international forum for the promotion of ideas pertaining to the study and conservation of Man. He was also Founder and Editor of '*Journal of Human Evolution*' from 1972-86. He is also President of the European Association of Global Bioethics and member of the Accademia delle Scienze of Turin, not to mention many other prestigious Italian and international organizations, such as the American Association for the Advancement of Science etc.

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