

From Nuclear and Strategic Disarmament to Joint Worldwide Research and Development for Humanity Survival

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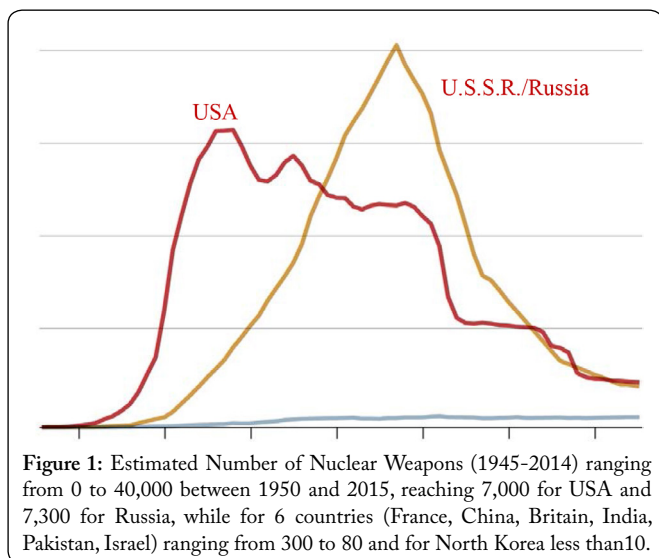
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Abstract

In the last few years the problems of humanity are growing in all sectors of the economy, from energy to environment and disasters induced by nuclear reactors, from cancer to hardware and space such as asteroids. More than 150,000 asteroids are now registered in the Smithsonian's Minor Planet Center and NASA estimates that more than 1,000 are characterized as Near-Earth Objects that can be stopped only by nuclear weapons which are on the hands essentially of United States of America and Russian Federation. Similarly, nuclear reactors are progressively deteriorating everywhere except in the only two nations where referendum (Italy) and governments (Germany) stopped them. Attempts to solve them at the national scale failed because of the magnitude of the crisis induced by the derivatives appears to have far lasting devastating effects in each country and because the magnitude of the technological problems long time underestimated became unmatchable at the scale of any nation regardless of its size. The scheme based on leading multinational companies, that in the past was able to work for Bioelectronics with the creation of ad hoc consortia, could still be valid now when properly extended to the two Russia and USA as in the past reaching the required critical mass with USSR and Europe within the Biochip Project according to rules and procedures set meritocratically. Even if present international situation makes prohibitive for both to transfer resources from nuclear and strategic armaments to science and technology, only jointly they appear capable to overcome the numerous open problems.

Introduction

The United States and Russian arsenals are greatly reduced from their Cold War peaks, but the superpowers each retain thousands of weapons. The combined arsenals of the other seven nuclear nations are a small fraction of the size of the American and Russian stockpiles, believed to have 7,000 weapons each or more (Figure 1). Only about a quarter of these are deployed, and most of the others are in reserve or set aside to be dismantled, 6 more Nations (France, China, Britain, India, Pakistan and Israel) have between 300 and 80, while North Korea in secret has fewer than 10 weapons. The fading of western economy with the emerging of big nations from the East could occur suddenly as for USA few years ago with the bank derivatives that have caused a dramatic crisis worldwide. The overall world priority and political theory has then to be rewritten centering the emphasis on the immediate solution (since time is running out) of the dramatic technological problems facing humanity (energy, environment) that have to be solved for the human race own survival and that can be approached only by a full immediate cooperation of the only two real superpower in both technological (since Peter The Great in Russia and since Abraham Lincoln in



USA), and military (strategic and nuclear dramatically clear after the end of second world war, when only the coalition among Roosevelt and Stalin saved humanity from nazism and fascism). It is from here that we have to start immediately again by taking to complete conclusion the total conventional, nuclear and strategic disarmament begun with Strategic Arms Limitation Talks (SALT) treaties which will free enormous resources from both Russia and USA to be invested promptly in Research and Development to find solution to humanity open problems. In the last few years the problems of humanity have grown in all sectors of the economy, from energy to environment and natural disasters, from cancer to hardware and space. Attempts to solve them at the national scale proven to cause failure because of the magnitude of the crisis induced by the derivatives appears to have far lasting devastating effects in each country (continuously coming to light and above any expectation) and because the magnitude of the technological problems long time underestimated became unmatched at the scale of any nation regardless of its size. The scheme based on multinational companies, that in the past for my direct experience was able to work for Italy and for Bioelectronics with the creation of two ad hoc consortia as Polo Nazionale Bioelettronica (PNB) and CIREF, centered around Italian-based multinational companies as ABB, Montedison, FIAT, ST-Microelectronics, Olivetti, Farmitalia; this very same strategy could still be valid now when properly extended, but this time only if the two largest countries, Russia and USA participate. An Institution indeed in the past (EL.B.A. Foundation) was born and grown in the past with the participation of organizations at the crossing of Europe, Russia and USA and constitute the proof of principle that something similar could become again the triggering factor to make it work across Europe, Russia and USA, with the final objective being that a final organism capable to solve the open technological problems will emerge at equilibrium with each nation convinced to provide full financial support according to rules and procedures set meritocratically. In the past the Biochip Project initiated by President Gorbachev through Academicians Velikov and Minister Bortnik (USSR) and President Craxi through myself and Minister Ruberti (Italy) did work and I do not see why should not work now, despite

the larger scale and the more ambitious objectives.

Fondazione EL.B.A. (Electronics Biotechnology Advanced) Nicolini has been born in 1993 with participation of both governments (Europe and Russia) and privates (USA) and has brought to success the initiative on Bioelectronics with the required critical mass at the world scale through (a) the support of both the multinational companies organized within PNB, Scientific Technological Park of the Elba Island and CIREF-Industrial Consortium (Sorin, Fiat, Montedison, STM, ABB, Eltag-Bailey) and (b) the Biochip Project initiated by USSR through Emelyanov with Russian Academy of Sciences and Italy through Nicolini with Polo Nazionale Bioelettronica. Polo Nazionale Bioelettronica research activities concentrated in the public domain started in 1990 with numerous international collaborations with institutions and research organization from Russia, USA, Europe and Japan. After the first years of activity, the PNB decided to take on his shoulder directly the industrial research and the technology transfer issues of the overall bioelectronics, submitting a proposal for a Scientific and Technologic Park at the Elba Island that was selected in 1994 by the MURST in a wide open competition with other 42 proposals. The new members then entered the PNB were SGS Thomson Microelectronics, Finmeccanica Eltag Bailey and Alenia Spazio, Sorin Biomedica (FIAT), ABB and Eurochem. It is worthy of notice the participation of small companies from the Northeastern regions of Italy, such as AsseZ, Microtec, Biofutura and High Vacuum Process and of scientific institutes (Area Ricerca Trieste and Istituto Tientino Cultura-IRST) with the most advanced instrumentation and expertise concentrated for a decade in the island of Elba until 2012 entirely in industrial hands until his closure in Brixen.

In 2001 the fusion of all above organisms gave birth to the NanoWorld Institute entirely under a Scientific Umbrella still alive, initially located in Genova University successfully focusing on Nanoscale Sciences and Technologies, and on 15 March 2015 passed entirely under the umbrella of Fondazione EL.B.A. Nicolini at Bergamo (Italy) by a close agreement with Fondazione Piantoni leading on early 2014 to their fusion after the approval of the Italian Ministry and of the Bergamo Prefettura. The strategic alliance under the name of NanoWorld Institute was initiated in 2001 with the acquisition of numerous instrumentations, laboratories and detached personnel along with INBB, PNB, PSTELBA and ABB, giving birth on 5 October 2001 to the strategic alliance until 22 July 2010 when CIRSDNNOB formed by the Universities of Genoa and Sassari ceased its activities. This alliance involved over the first ten years Centro Ricerche FIAT, Tattile, STMicroelectronics, Montedison, ACEA, EDISON, FKL Engineering, IBM, Orlandi, Antibiotics, Ausimont, Safilo and Farmitalia. NanoWorld Institute (NWI) was born in 2001 as a research Institute, thanks to the award of a very large ad hoc grant (FIRB) to Claudio Nicolini (Figure 2) aimed to the integration between the public and the private from the Italian Ministry of University and Research which has de facto recognized in an open competition the NWI as Center of Excellence for Bio-Organic Nanotechnologies and Nanosciences. Until his existence in Genova on 22

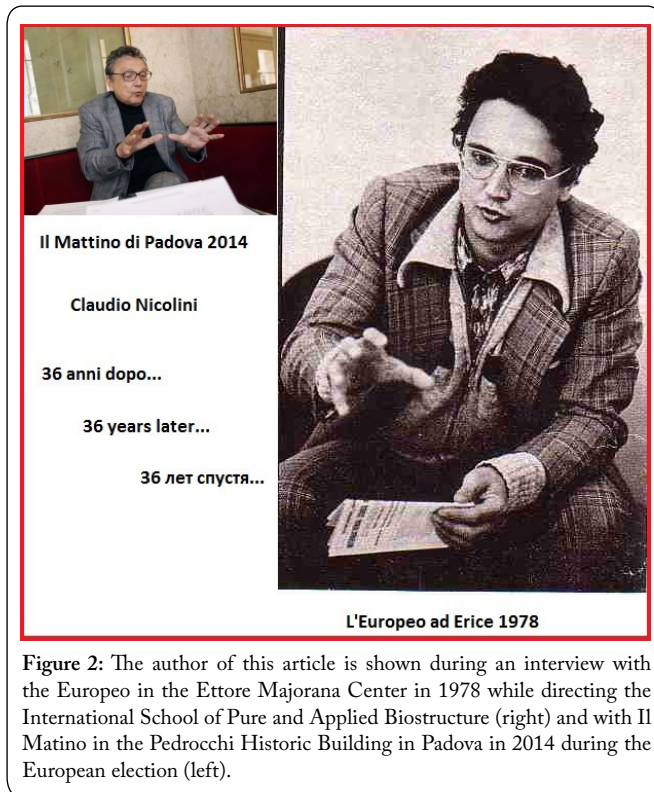


Figure 2: The author of this article is shown during an interview with the Europeo in the Ettore Majorana Center in 1978 while directing the International School of Pure and Applied Biostructure (right) and with Il Matino in the Pedrocchi Historic Building in Padova in 2014 during the European election (left).

July 2010, NWI won numerous large research grants from the Italian Ministry University and Research (FIRB 2001, FIRB 2004, FIRB 2008, three FISIR, three PNR, including the FIRB resulting from an international cooperation with Harvard University at Cambridge, USA), from the European Community and from national and multinational Industries. From 2009 until its closure, the NWI relied strictly on the scientific and technological cooperation between the University of Genoa Eminent Chair of Biophysics and the Fondazione EL.B.A. Nicolini, involving FKL Engineering, ELBATECH, Marburg University, ESRF, Moscow State University, and Harvard University. It is worth to notice that NWI while in Genova proved to have a structure well tested also in the conduction of higher education up to the of Master and Ph.D. with over 80 successful candidates. Fondazione ELBA Nicolini decided on 10 December 2010 to carry on a drastic rethinking and reorganization of the entire NanoWorld Institute initiative in New York at Marqui Marriot on 9 December 2013, effective full scale on 1 January 2014 placing its headquarter and central laboratory in Bergamo and opening new co-operations worldwide focusing into Russian Federation, USA and Europe , with advisory body the International Scientific Committee of the Fondazione EL.B.A. Nicolini in place since 2001. This has been pursued following the series of Nanoforums being held during 2012 in Phoenix, Boston, Rome, Genova, Moscow and Grenoble (and numerous meetings in Paris, Moscow, St. Peterburg, Rio de Janerio, Orlando, New York and Boston in 2013). The entrance of Russian Federation in June 2014 into the European Synchrotron Radiation Facility, quite central in Nanotechnology development, is also an indirect recognition of the correctness of our undertaking between Moscow and Grenoble at the highest level since 2007 and this event is presently the only good sign for the future among

the chain reaction of events and sanctions occurring lately. These two success stories, entirely different in their emphasis for Nanotechnology, the first industrial and international *now ended* and the second scientific and national *still alive*, mobilitated over two hundred top scientist from Russia, Europe and USA with big scientific and industrial return , called for an excellent example-*proof* of principles that can repeat itself even now in these dramatic days where a circular logic appear to take the world to confrontation and later on the humanity to its extinction caused be converging problems in energy, environment and health.

Problems Still Open to be Overcome with Research

As apparent from Figures 1, 3, 4 and Table 1 terrible challenges are in front of humanity (environmental, energetic and technological, such space, cancer and intelligent hardware) and the time is running out on us very fast. In USA, Obama has done well to set for all companies a 30% reduction in the CO₂ production, the minimum however that USA could have done today to compensate for the big refusal to sign the Kyoto treaty for the CO₂ reduction. Only massive CO₂ reduction can indeed hope to save humanity from a disaster. Last but not least is the objective to bring back the prestige of science among young people to correct the economical disasters caused by bankers and financial institutions.

World's top oil producers

Millions of barrels per day during the first 3 months of 2016	
Russia	10.5
Saudi Arabia	10
United States	9.2
Iraq	4.3
China	4.1
Canada	3.8
Iran	3.5
UAE	2.7
Kuwait	2.5
Venezuela	2.4

Data: US Energy Information Administration; Crude Oil Production per day during the first 3 months of 2016. Graphic updated July 22, 2016.

Figure 3: World's top oil producers

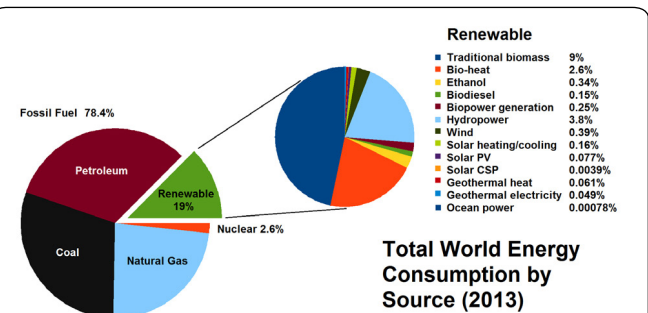


Figure 4: Total World Energy Consumption by Source (2013).

Strategy for energy and environment after Paris

A new version of the World Economic Forum focused

Table 1: Alternative Energy Sources.

Nonrenewable	Renewable
Oil sands, heavy oil	Wood/other biomass
Coal	Hydropower
Shale oil	Solar energy
Gas hydrates	Wind energy
Nuclear fission	Wave energy
Geothermal	Tidal power
	Fusion
	Ocean thermal energy conversion

on Energy and Environment as recently proposed by Prime Minister of Japan Shinzō Abe is fundamental after adopting the Paris Agreement, considering that the third Innovation for Cool Earth Forum occurred in October 2016 at Tokyo was the very first pertinent international meeting thereafter [1]. The limited scientific and technological progress in Energy and Environment appears still incapable to find solutions for effective carbon dioxide reduction and for new energy sources really alternatives to nuclear fission, gas, oil and carbon still dominating the scene worldwide, and this despite hopes being raised on nuclear fusion, energy storage and hydrogen energy for which quite more is needed and should be done with a new World Forum on energy and environment more aggressive and focused to make the difference.

While artificial photosynthesis removes CO₂ from atmosphere and hybrid vehicles are technologies capable to reduce CO₂ emissions, in order to be more effective however, while biofuels, solar energy, smart grid, geothermal and wind power should be enhanced, nuclear fission on one side and fossils utilization on the other side should be promptly discontinued maintaining only the essential carbon capture technology. Several countries do not appear indeed intended to do it and we have to face the problem with more determination, introducing other useful alternative as thorium fuels with the uncoupling of nuclear armaments from civil nuclear plants. India is presently a leader of thorium based research and the first nuclear reactor using thorium rather than uranium is being expected shortly hopefully without the plutonium production leading to atomic bombs. It is also by far the most committed nation as far as the use of thorium fuel is concerned, and no other country has done as much neutron physics work on thorium. The country published about twice the number of papers on thorium as its nearest competitors during each of the years from 2002 to 2006. Bhabha Atomic Research Centre (BARC) had the highest number of publications in the thorium area, across all research institutions in the world during the period 1982-2004. Analysis shows that majority of the authors involved in thorium research publications appear to be from India. India's government is also developing up to 62, mostly thorium, reactors which are expected to be operational by 2025. The overall emerging innovations in energy and environment fall mostly at the crossing of Molecular Bioelectronics [2], but they appear incapable to make a substantial difference with overall energy production being still 2/3 for fossils and 1/3 for nuclear fission produced

by uranium after the improper legal stop around 1972 in USA to thorium that should be reconsidered. The time is running out on us also to replace fossils close to terminate soon or later after 5 million years! Now 92% of world territory has highly poisoned atmosphere below minimum safety, mainly excluding North America [3] due to recent Obama efforts. Finally, the over 1,000 Near-Earth Objects bigger than 1,300 feet and eventually ongoing to smash Earth can be blown only by large nuclear weapons on the hands of United States of America and Russian Federation which should then be both urged to joint their efforts in this direction to save humanity once and whenever this should occur!

Energy sources

Oil fuels the modern world (Figure 3). It brought great changes to economies and lifestyles in less than 200 years. Nothing else to date can equal the enormous impact which the use of oil has had on so many people, so rapidly, and in so many ways around the world. But oil is a finite resource. The common question “How long will oil be produced?” is the wrong question. The critical question is “When is the date of the maximum daily amount of world oil production--the peak?” After that oil will be an irreversibly declining resource facing an increasing demand which cannot be met. The world passed its peak of rate of oil discoveries in the 1960s, but there is a lag time from discovery to full production. Although estimates differ slightly, it seems clear that the peak of world oil production will be reached at least by 2020, and possibly within the next decade [4].

Hydrogen and Fuel Cells

Questions are sometimes raised as to use these as fuel sources, but neither is a primary energy source. Hydrogen must be obtained by using some other energy source. Usually it is obtained by the electrolysis of water, or by breaking down natural gas (methane CH₄). Hydrogen is highly explosive, and to be contained and carried in significantly usable amounts, it has to be compressed to hundreds of pounds per square inch. Hydrogen is not easy to handle, and it is not a replacement for pouring 10 gallons of gasoline into an automobile tank. Fuel cells have to be fueled, most use hydrogen or some derivative of oil. Fuel cells are not a source of energy in themselves.

Oil

Oil is a unique energy source that has no complete replacement in all its varied end uses. The British scientist Sir Crispin Tickell concludes, “...we have done remarkably little to reduce our dependence on a fuel [oil] which is a limited resource, and for which there is no comprehensive substitute in prospect.”. Coming to realize that oil is finite, any and all suggestions of means to replace oil are welcomed. Cheerful myths are enthusiastically embraced. These include: that there are two trillion barrels of economically recoverable oil in the Colorado Plateau oil shales; that dams and their reservoirs are a source of indefinitely renewable energy and that they are environmentally benign; that solar, wind, geothermal, and hydro-electric power can supply the electrical needs, from the

Arctic to the tropics, of the Earth's nearly six billion people (likely to become at least 10 billion in the next fifty years); that coal, oil from oil sands, and biofuels can replace the 72 million barrels of oil the world now uses daily; and that somehow electricity produced from various alternative energy sources can readily provide the great mobility which oil now gives to the more than 600 million vehicles worldwide. Regrettably, none of these cheerful myths appear to be valid. The mega-myth is the popular public placebo that "The scientists will think of something" as I did witness myself few months ago at Orlando during a short visit to Disneyworld. The energy spectrum from burning wood to fusion that fuels the Sun is now well known. If there is some major exotic energy source beyond what has been listed, we have no evidence of it. What we know now is apparently what we have. The reality appears to be that the world is rapidly running out of a resource that in many ways is irreplaceable. The result will be a great change in economies, social structures, and lifestyles. We have been living on a great fossil fuel inheritance accumulated about more than 500 million years ago. We will soon exhaust this capital, and we will have to go to work to try to live on current energy income. It will not be a simple easy transition. In a remarkably perceptive book written in 1952, *The Next Million Years*, Charles Galton Darwin described historic changes in the human condition, calling them "revolutions." He wrote that there is one more revolution clearly in sight: "The fifth revolution will come when we have spent the stores of coal and oil that have been accumulating in the earth during hundreds of millions of years...it is obvious that there will be a very great difference in ways of life".

Fusion

Fusion involves the fusion of either of two hydrogen isotopes, deuterium or tritium. Deuterium exists in great quantities in ordinary water, and from that perspective fusion is theoretically an almost infinitely renewable energy resource. This is the holy grail of ultimate energy. Fusion is the energy that powers the Sun, and that is the problem. The temperature of the Sun ranges from about 10,000 degrees Celsius on its surface to an estimated 15 to 18 million degrees in the interior where fusion takes place. Containing such a temperature on Earth in a sustainable way and harnessing the heat to somehow produce power has so far escaped the very best scientific talent. However, even if commercial fusion were accomplished, the end product again is likely to be electricity, and not a replacement for oil.

From Research to Industrial Development

Keeping in mind the present unequal economic status of the various nations worldwide and the total energy consumption (Figure 4) and all other problems outlined before, a project named PADOVA EUROPE was presented on 6 June 2014 in Palazzo Zabarella pointing to the abandonment of bad national habits (national scandals, improvisation and underestimation) context. It should be remembered that the limiting factor in the success of the research and its translation into development is not the money but the excellent manpower with adequate critical mass on which to invest resources; only

these are in fact translated into concrete and decisive facts (healing from cancer, industrial production, new forms of energy or reducing the greenhouse effect). Hence, finally the relevance and strategic resolution of the second point related to the involvement of Russia and USA, which weighs heavily on the size and the consumption the greater responsibility to find resolution to the evils that threaten humanity. The University and organizations such as NRC, City of hope Foundation, Venetian Institute Molecule Medicine and RFX Consortium created in 1996 with the ten million degrees reached inside the nuclear fusion reactor, all in the international context were called for offering the city of Padua as a catalyst. An alternative one is being now also proposed in Bergamo (the second most industrial town in Europe) and named NanoBioEINet where the involvement of both the Italian-controlled multinationals appeared in my far and near past, represents the most likely key to success worldwide; see FIAT, ABB, STM, Ferruzzi, Montedison, Sorin and Olivetti, all with prominent managers of great international stature such as Pasquale Pistorio, Sergio Marchionne, Enrico Bondi and Bruno Lamborghini who were able to keep their companies ahead of world competition. NanoBioEINet represents indeed a unique example of recent technological development in area achievable with nanotechnology research in three distinct research areas (biotechnology, nanotechnology and electronics) pertinent to the pending problems in energy, environment and cancer successfully approached [2, 5-7] in the two key examples provided for energy and cancer in Figures 5 and 6.

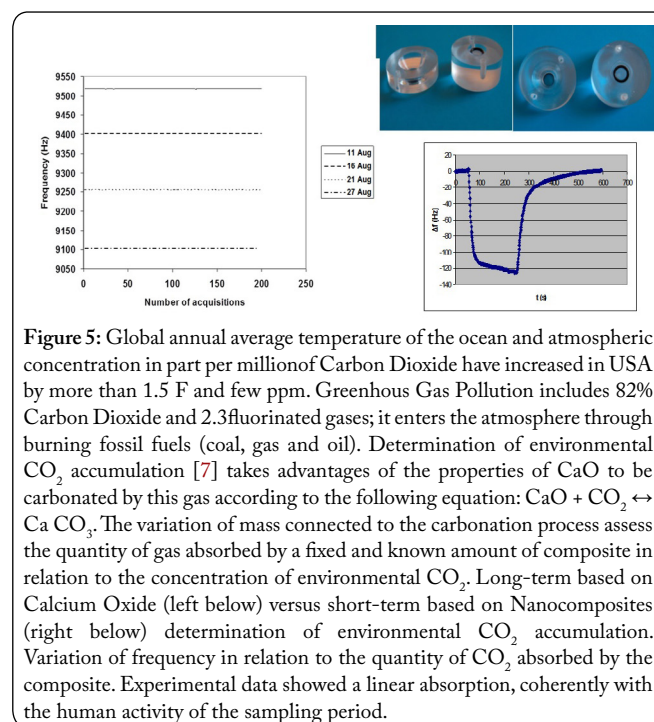


Figure 5: Global annual average temperature of the ocean and atmospheric concentration in part per million of Carbon Dioxide have increased in USA by more than 1.5 F and few ppm. Greenhouse Gas Pollution includes 82% Carbon Dioxide and 2.3 fluorinated gases; it enters the atmosphere through burning fossil fuels (coal, gas and oil). Determination of environmental CO₂ accumulation [7] takes advantages of the properties of CaO to be carbonated by this gas according to the following equation: $CaO + CO_2 \leftrightarrow CaCO_3$. The variation of mass connected to the carbonation process assess the quantity of gas absorbed by a fixed and known amount of composite in relation to the concentration of environmental CO₂. Long-term based on Calcium Oxide (left below) versus short-term based on Nanocomposites (right below) determination of environmental CO₂ accumulation. Variation of frequency in relation to the quantity of CO₂ absorbed by the composite. Experimental data showed a linear absorption, coherently with the human activity of the sampling period.

Resources to Science from Disarmaments

I hope that the time is passing for science to be at the service of arms race between USA and Russia, and the reduction of nuclear arsenals and waste being pursued in START (Strategic Arms Reduction Treaty) should further aim not only to avoid their falling in wrong hands and to increase global security, but also to transfer all these military resources in joint civilian

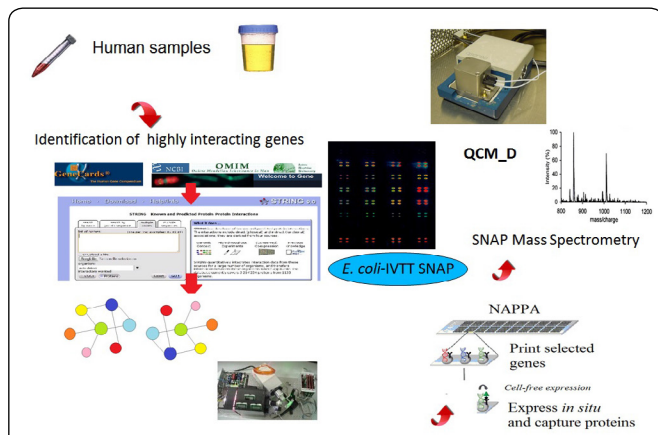


Figure 6: From human samples to leading genes identification by a combination of bioinformatics and DNASER genes microarrays, then characterized Label Free by QCM_D [5] and Mass Spectrometry [6] of SNAP NAPPA using Pure Express *E. coli*.

projects. Time ago in an open debate with President Putin organized by Russian television I raised a question via internet (subsequently acknowledged) about the opportunity of final disarmament within the “Measures to Further Reductions and Limitations of Strategic Offensive Arms” treaty between Russia and USA such that the enormous resources spent could be used for the development of joint projects in nanoscience and nanotechnology for Energy, Health, Electronics and Environment. Following the series of EL.B.A. Nanoforums held during 2012 in Phoenix, Boston, Rome, Genova, Moscow and Grenoble and a series of meetings during 2013 in Trieste, Moscow, St Petersburg, Orlando, Boston, Las Vegas and New York, we are now aiming with the Nanoworld Institute incorporation in 2015 into the Fondazione EL.B.A. Nicolini (www.fondazioneelba-nicolini.org) and with negotiation at government level worldwide to reorganize the NanoWorld Institute worldwide mainly within USA and Russia, but also Japan, India, China and Europe, maintaining *only* initially its headquarter in Bergamo and its research objectives on Cancer (differentiation, transformation and proliferation), Ecology (carbon dioxide), Energy (power generation and automation, nuclear reactors using thorium without plutonium production), Intelligent Hardware (communication, utilities and space) through grant applications and later multinational companies involvement. At the same time, I am directly appealing for a further drastic disarmament in strategic and nuclear offensive arms towards the solution of the humanity open problems (Table 2) with the creation of a Joint Committee of eminent scientists and industrialists from Russia, USA and later Europe/China/India to identify the optimal tasks and best centers capable to maximize the derived resources. The wide skepticism surrounding in 2007 my original proposal of Russia involvement in ESRF is what caused his materialization only in 2014! Recently USA President-elect on 23 December 2016 intensified his threat to “expand” America’s nuclear arsenal, saying he was willing to restart a nuclear arms race even as he released a letter from President of Russia that pointed toward the possibility of a “pragmatic” set of understandings between Washington and Moscow. Echoing the conciliatory approach toward Mr. Putin that he exhibited throughout the campaign, Mr. Trump praised the Russian leader for sending

a private holiday greeting that called for the two men to act in a “constructive and pragmatic manner. Discomforting is the threat to expand America’s nuclear arsenal after more than three decades in which the number of American and Russian weapons has shrunk. In summary I do think that it is the right moment for USA and Russia to unite with Europe their forces and to concentrate all the possible resources to solve problems affecting the entire world as those contained above, involving resources and facilities from leading multinational companies, as well manpower coming strictly from citizens of the above three large countries which had the most significant performances in science and technology world-wide during their long stories of success. I know this for my personal direct experience having passed my entire life in these three large communities extremely productive in R&D.

Table 2: Examples of Second World war victims per nation.

STATE	Inhabitants	Number of Victimes	Victimes/1000 Inhabitants
France	41,700,000	560,000	13,4
Germany	78,000,000	7,600,000	97,4
India	345,000,000	1,536,100	4,5
Italy	43,800,000	443,000	10,1
Japan	78,000,000	2,630,000	33,7
Soviet Union	169,500,000	23,000,000	164,0
United Kingdom	47,800,000	365,500	7,6
USA	132,000,000	413,000	3,1
Jugoslavie	15,400,000	1,100,000	71,4
China	489,000,000	15,000,000 about	30,6 about
Total	1,899,500,000	71,087,910	35,9

In summary, the progressive changes in world communication mainly among the above named three large countries themselves, opening also to China, Japan and India, will work for the world benefit over the time. Sanctions against Russia from Europe and USA (leading the struggle) are bringing back to the cold war of thirty years ago, despite apparent indication to the contrary by Obama. Several conflicts are exploded worldwide in Gaza, Syria, Iraq, Iran, Libya and Ukraine at the Europe gate and are growing with increasing intensity depending critically on the relationship among United States and Russian Federation that in the last century represents as superpowers the key source for the equilibrium war-peace to overcome sectorial entities and religious war. As a result of this, gas and oil emergency appear very close to dramatically involve all Europe, mainly Italy and Germany. Russia has 50 billion euros exchange with USA and 500 billion euros with Europe, largely Italian and German. Obscure analysts coming out of the wood against Russia are frequently anticipating that the voted sanctions from the West are going to place Russia in the knees, forgetting that despite the 23 million deaths (Table 3) Russians were able by themselves to defeat deadly the German nazists down to Berlin and thereby freeing the entire world along with USA. The time is running out on humanity and exceptional resources and attitudes are called for to overcome growing problems on deteriorating world environment and terminating energy

Table 3: Petition to be proposed on 3 April 2017 in Newton (Boston) at the end of the World Peace Forum of the second NanoWorld Conference and send them to the NanoWorld Journal in Texas, USA, submitting it at the same time to the White House and the Kremlin directly via the proper Web connection.

WE PETITION THE USA and Russian Federation ADMINISTRATION TO Negotiate the further Nuclear and Strategic Disarmament and Transfer Saved Military Resources In Joint Scientific And Technological Projects. Many big challenges remain unsolved in front to humanity, namely cancer, energy, intelligent hardware and environment, that only a truly internationalised broad research carried out down to the nanoscale could successfully undertake, namely

- New Energy Sources
- Carbon Dioxide Reduction
- Cancer Defeat
- Space Exploration
- Asteroids Distraction

Efforts at the national scale did provide so far a limited response due to the magnitude of the economical crisis and to the magnitude of technological and scientific problems still largely underestimated.

The time is indeed running out on humanity and exceptional resources and attitudes are called for, and we are thereby directly appealing to both United States and Russia Federation for the further reduction of nuclear arsenals and waste and for the needed nuclear disarmament to transfer saved military resources in joint scientific and technological projects described above.

resources. I am thereby directly appealing to Russia and United States of America for the further reduction of nuclear arsenals and waste being pursued in START and for the further disarmament within the “Measures to Further Reductions and Limitation of Strategic Offensive Arms” treaty, aiming to not only avoid their falling in wrong hands for increasing global security, but mainly to progressively and synchronously transfer military resources of Russia and USA in joint civilian project directly involving themselves overcoming existing crisis quite marginal for the dramatically emerging human priorities. USA and Russia should jointly implement the needed development of nanoscience and nanotechnology for Energy and Environment, uniting their forces with Europe, China, Japan and India, involving also resources and facilities from the leading multinational companies (which should leave behind the priority of profits to the survival of human race), as well as manpower coming strictly from citizens of the above countries which due to the economic crisis cannot use their potentially exceptional performances in science and technology world-wide as proved by their long stories of successes. The time is running out on us, on all of us!

Forum for Peace and Humanity

Other examples as well as the Biochip earlier cited of productive scientific cooperation between West and Russia exists as The Project For Mankind: ‘Science For Peace The World Over’ headed by Antonino Zichichi [8] initiated under the umbrella of Erice Statement in 1982, the creation of Skolkovo Institute (www.skoltech.ru) despite all the political clouds of the last few year). In order to support the cause described for the humanity survival and for attaining peace in the world an international forum has been now promoted by NanoWorld Journals and Conferences for April

3-5 2017 involving Institutions active since long time in this undertaking as Ettore Majorana Center Scientific Culture, JF Kennedy School at Harvard University, Fondazione ELBA Nicolini and Russia Academy Sciences. May be we are over ambitious but we have to make the first step, considering in fact that even a marathon also starts with a single step to have proper and adequate information available in the public domain. Tremendous resources and strong collaboration are needed to win the enormous challenges facing humanity in the climate control and the environment, new energy sources (nuclear fusion, hydrogen, biomass, solar based on conductive polymers and biopolymers). The Ukraine, Syria and Iraq crisis must become an opportunity rather than problems. Schroeder, former Prime Minister of Germany, from 2008 elected a member of the Russian Sciences Academy like myself, has remembered time ago that EU and US sanctions and isolation of Russia does not lead to anything. No other country in the world except the United States, which I am also a citizen from 34 years, have been so decisive in defeating fascism and most of Europe have forgotten. My involvement with Russia began when I was invited in 1985 by then President Gorbachev at the Kremlin with the cream of all human activity for the announcement of his Perestroika that prevented a global explosion, and was completed in 2008 with my election by unanimous vote as a member of the Russian Academy of Sciences in Biophysical sciences, the same day of 2008 in which the former German Prime Minister Schroeder was elected in political sciences. Without Russia Federation and United States sacrifice (Table 3), the world could still be under Nazi domination. The current roads taken by the European Union will only lose additional time without producing benefits neither for the peace nor for the development of Europe out of the crisis, not helped by recent aperture of natural gas and technology from the Russian Fedarazione to China.

Conclusions

World-wide present situation makes now extremely difficult to start a true internationalisation involving the leading countries in economic, military and financial terms, that in my opinion is essential to find concrete solutions to the growing problems in all sectors of the economy and science, from energy to environment and natural disasters, from cancer to hardware and space. No country alone can do it, even if big. Only a close cooperation among the Russian Federation and the United States of America mediated by Europe, China and India, in my opinion, can open a route capable to bring to solution and under control all above big challenges in front to the all humanity, devastated by growing economic and geopolitical crisis exploded in Ukraine, Iraq, Syria and Gaza, along with many other world regions and religions in Asia, Middle East and South America. Indeed, growing economic and political powers are China and India with significant worldwide consequences occasionally anticipated in the web.

Only in a world in Peace steadily maintained by the two biggest and alternative nations in the last century (both politically and militarily) indeed, we can hope to embark on the gigantic undertaking to solve all above named problems, with some degree of success only with nanotechnology

and nanosciences, while keeping at the same time the environment and the earth viable and growing in the process. The two biggest world powers must find a way to resume the interrupted negotiations, initiated by Obama and Medvedev, up to a bilateral total disarmament in the field of strategic and nuclear weapons. The clock run fast against humanity. Cornerstone of this proposal remains the Organism we are going to attempt to create among the participants in April 2017 with the cooperation of SM Companies, research institutions and multinational Industries. As the positive outcome of the meetings at Palazzo Zabarella in 2014 and at Bergamo in just now 2017 encourages to pursue with a good quality participation, aiming to solve also problems which affect safety and survival of humanity, in particular energy (Figures 2-4), environment (Figure 5) and cancer (Figure 6), space, intelligent Hardware. In nuclear energy Italy was really by far the most advanced nations worldwide in 1935 (with top physicists escaping the fascism, as Enrico Fermi and Emilio Segrè, Nobel Prize winners which move to USA and Bruno Pontecorvo who instead move to USSR) and started to produce nuclear energy in the early 1960s. All these nuclear plants were later closed in 1990 following the Italian nuclear power referendum that 30 years later [9] I am now still happy to have contributed to call and I hope to spread worldwide. After an unsuccessful attempt in 2008 by the conservative government to change the decision made, and following the 2011 Japanese nuclear accidents, on 11-12 June 2011, Italian voters passed a new referendum to permanently cancel plans for new reactors (reactors that are collapsing everywhere in the world and no referendum yet stop). Over 94% of the Italians voted in favor of the construction ban, with 55% of the eligible voters participating, making the vote irreversibly binding. In 1934 Pontecorvo contributed to Fermi's famous experiment showing the properties of slow neutrons that led the way to the discovery of nuclear fission. An Italian patent was granted for the process in October 1935, in the name of Via Panisperna boys Fermi, Pontecorvo, Edoardo Amaldi, Franco Rasetti and Emilio Segrè. A landmark paper on slow neutrons reporting that hydrogen slowed neutrons more than heavy elements, and that slow neutrons were more easily absorbed, with a US patent granted on 1940.

Plan of Actions

In close synphony with the Erice statement written in 1982 by Pail Dirac, Piotr Kapitza and Antonino Zichichi [8] an international union among the leading institutions from USA, Russian Federation, Europe and International attending the World Peace Symposium of the Second NanoWorld Conference held in Boston 3 April 2017 is being pursued (Table 3) in order to attempt:

A. Based on the present known national distribution of nuclear armaments worldwide (Figure 1), the outlining in a proposal to the respective Governments of USA and Russia of the initial steps for further Bilateral strategic and nuclear disarmament (hopefully mediated by the European Union, China, Japan and/or India) initially suggested by Obama and Medvedev starting from the SALT treaties subscribed; assume in this

context the use of resources saved with disarmament in Joint Research to resolve previously outlined critical issues still open for humanity.

- B. Propose starting from previous successful models properly transferred (PNB, NWI and FEN) possible points of agreement and cooperation in order to deal with technological problems still open in the world, jointly developing Intelligent Hardware/cancer at the molecular level/space/environment control/New forms of energy. The starting point will be the use of top scientists present worldwide in disciplines relevant to the project and multinational companies in the areas designated for industrial and social development compatible with the environment and energy, more and more problematic for the whole humanity.
- C. Seek resources from public and private entities to enable Government scholarships for graduate students and Ph.D. in the areas mentioned above at multinational laboratories and government laboratories in USA and Russia (Skoltech in cooperation with Massachusetts Institute Technology, Ettore Majorana Center Scientific Culture) to identify, leaving open the possibility of involving other parts of the World contributing to the project, as European Union, China, Japan and/or India.

No one specific organism is intended to head this movement, but such mandate can appear only as a result of a wide public discussion and consent triggered by this manuscript and by the evolution of the World Peace Forum initiating on 3 April 2017 in Boston within the second NanoWorld Conference.

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