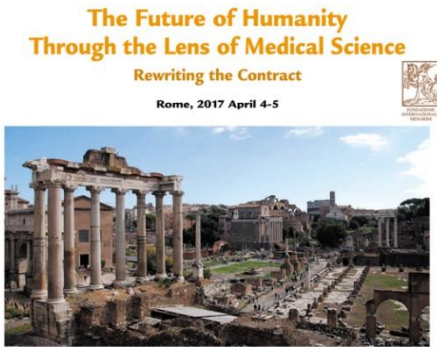


The Future of Humanity Through the Lens of Medical Science Rewriting the Contract Highlights Rome (Italy), April 4-5, 2017

Introduction



Prof. Remuzzi chairman of the symposium and Cardinal Ravasi, opened the congress, by highlighting the importance of the dialog between Science and Religion for the future of humanity at the dawn of a new era that aims to link the natural intelligence with the artificial one. The key words were Anthropology and Epistemology. This symposium was attended by top researchers - three of them Noble Prizes - in climate, pollution, environment and pharmacology and also by young physicians coming from Italy and other countries.

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Can science and religion have true dialogue?

**The Future of Humanity
Through the Lens of Medical Science**

Rewriting the Contract

Rome, 2017 April 4-5



Prof. Horton, co-chairman of the congress, spoke about Science and Religion and the choice to have a true dialog. The speaker, coming from (UK), went deeper in his talk, by highlighting that the opposite of trust is not mistrust but fear. This devastating feeling of fear suggests a lost in trust, in democracy, in institutions even in ourselves, the speaker pointed out. Going deeper in his lecture, Prof. Horton pointed out that we live in paradoxical times, where climate, pollution and environment are themes at the core of the discussion between nations, but this is also the time

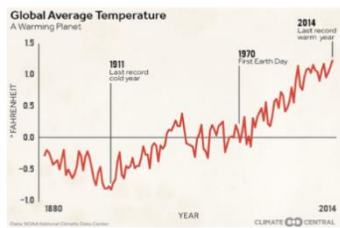
where the most powerful nation in the world is proposing to cut back its investments on the means to generate the most reliable form of knowledge. This meeting was a wonderful occasion for starting a true dialog between two worlds, the first one of the science and the second one of the religion.

- **What is the real opposite of trust from the speaker point of view?**
- **What's about terrorism from the speaker point of view?**
- **Why people are bewildered and confused from the speaker point of view?**
- **What is the main expression of fear of the middle classes?**
- **Why we live in paradoxical time from the speaker point of view?**

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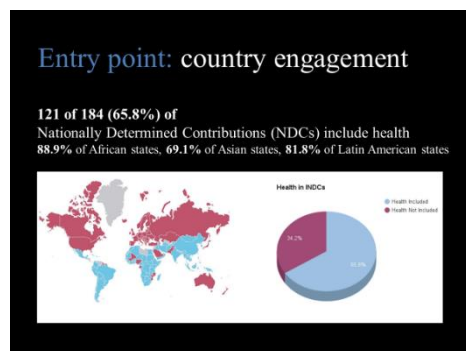
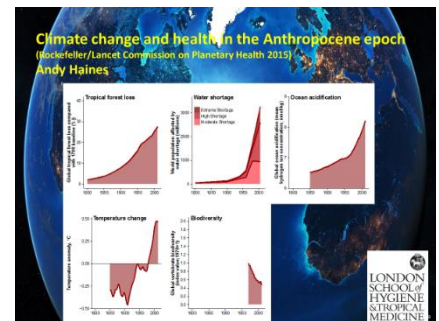
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Climate Change, Pollution and the Environment: Implications for Human.



The climate change, pollution, the environment and the implication for the humanity, was the first topic of this meeting. Prof. Chivian introduced this theme by highlighting that climate, pollution and environment are the more important issues for humanity in the twenty-first century, more in particular, the rising of the global temperature, together with the global average absolute sea level change can start a very alarming process leading to profound and radical changes of our earth and threatening the life of a large amount of the world population. Another issue is linked with the instability of the seasons, threatening

agriculture and plants production, the speaker pointed out. Finally, Prof. Chivian spoke about the acidification of the oceans due to the raising of the CO₂ emissions, this phenomenon leads to the destruction of millions of species living in the sea, the speaker pointed out. Prof. Andrew Haines, Timothy Bouley, and John Sweeney were the discussants and presented very interesting data. The speakers coming from UK, USA and Ireland, started this discussion by highlighting that in these last 35 years, the heart temperature has been raised of about 1.1 degree, with the consequence of a loss of water in rivers, lakes and falls too, leading to a dramatic impact on economy, more in particular of the poorest people. Another consequence is the raising of death, more than 150.000 per year and the raising of diseases like CVDs and respiratory diseases. Finally, a substantial increase in the frequency of fatal heatwaves in mid latitude cities is expected. Other issues discussed by the speakers were about the tropical forest loss, the water shortage, the loss in biodiversity and their dangerous consequences on the world populations but also about the “low carbon” policies that can significantly improve health and economy. In the last part of this very interesting discussion, the speakers talked about finance and economics, health indicators and country engagement. In conclusion, the speakers pointed out that impacts and opportunities are well known and funders are mobilizing for financing the needed



actions.

- How many time we have for achieving the large scale decarbonization necessary to avoid dangerous climate change?
- What are the most important health impacts exacerbated by the climate change?
- What are the most important consequences of the rising of the mean global temperature around the world?
- What's about the raising in mortality based on the data presented by the speakers?
- What are the key points of the countries engagement based on the data presented by the speakers?
- What's about the approach and the action plan to the climate change and health presented by the speakers?

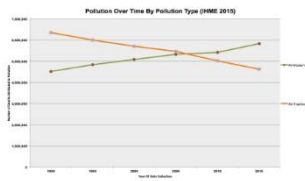
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Report of the Global Commission on Pollution and Health

Pollution and Disease are Changing

Deaths from modern pollution now predominate over deaths from traditional pollution



The Environmental Risk Transition

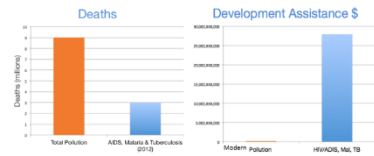
premature death and more in particular the modern pollution is at the core of this problem. In the main part of his presentation,

Recommendations for Research

- Identify, map, and quantify exposures to well-known but poorly defined sources of pollution such as lead and mercury.
- Identify, map, and quantify exposures to new and emerging forms of pollution.
- Discover undiscovered links between pollution and disease - endocrine disruptors, developmental neurotoxicants, new classes of pesticides, and pharmaceutical wastes.
- Study links between pollution and the health of children
- Improve estimates of the economic costs of pollution and disease.
- Quantify benefits of interventions against pollution.
- Further elucidate linkages between pollution and global climate change.

The report of the Global Commission on Pollution and Health, was the topic at the core of the lecture discussed by Prof. Landrigan. At the beginning of his talk the speaker, coming from USA, presented very interesting data on the scope of the commission's review pollution in all its forms. Going deeper in his lecture, Prof. Landrigan highlighted that pollution is the world's largest avoidable cause of

Pollution is Undercounted Its Solutions Are Underfunded



the speaker talked about the multiple pathways that link climate change and pollution and about the costs of pollution, by highlighting that pollution is undercounted and its solutions are underfunded. In the final part of his talk, Prof. Landrigan spoke about recommendations, the major one and those stated for the heads of Governments, for the Agencies, for the international community, for the health professional and finally for the researchers.

- What is the definition of pollution from the speaker point of view?
- How many lives are saved per year based on the data presented by the speaker?
- What are the costs of pollution based on the data presented by the speaker?
- What are the main recommendations for the researchers?
- What's about the recommendations to governments and agencies?
- What is the main recommendation of the Global Commission on Pollution and Health?

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Migration, gender discrimination and disabilities.



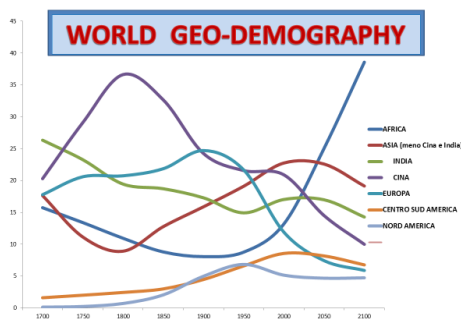
The effect of these multi-stage eugenic selection practices is to increasingly standardize modern liberal communities by reducing human biological and social diversity.

Migration, gender discrimination and disabilities was the second topic of the congress. Prof. Garland-Thomson from USA introduced this theme, then Telmo Pievani, Mauro Bonazzi, Carlos Del Rio, Alberto Piazza, and Francis L. Delmonico, went deeper in this discussion. The speakers, coming from Italy and USA, introduced their talks by presenting very interesting data. More in particular Prof. Garland-Thomson spoke about the bioethics shaping the human community. Going deeper in her lecture, the speaker talked about the moral conflict between the liberal eugenics and the human rights covenants. She spoke about the bad and the right eugenics, the old one and the new eugenics

leading to the creation of children with the best chance of the best life. The liberal eugenics creates a conflict in modern liberal societies between the right to procreative self-determination and the right for people with disabilities, the speaker pointed out. In the main part of her presentation Prof. Garland-Thomson spoke about the human right covenants and its implementation and presented very interesting examples of people with disabilities who became leaders in many fields of life. Prof. Del Rio pointed out that many diseases like the non-communicable but also the communicable ones affect the poorest people and it is necessary pass through human rights for solve these problems. Prof. Pieverani talked about migration, by highlighting that this is a very stable evolutionary phenomenon started almost 2 million years ago, with the first migration out of Africa. Going deeper in his lecture, the speaker presented very interesting data on the changes the migration produced



on the human evolution and therefore on the world. In the main part of his presentation Prof. Pieverani talked about the migration we live today, by highlighting that this a new phenomenon due to issues like Mass extinction, population growth and global inequalities. Prof. Piazza spoke about the sustainable development at the down of a quite logarithmical explosion of new born in Africa leading to more than 9 billion living people in 2048. The speaker presented very interesting data on populations in working age and their variations from 2015 to 2050 and on the differences in capita income between rich and poor people.

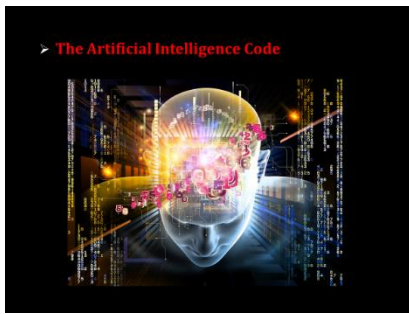


- What are the main effects of the multi-stage eugenic selection from the speaker point of view?
- What are the key points of the United Nations Declaration on Human Rights delivered in 1948?
- What are the main human rights covenants delivered by Institutions and the Catholic Church, based on the data presented by the speaker?
- What are the main human rights covenants examples presented by the speaker?
- Who is the killer of the preceding human races based on the data presented by the speaker?
- What is the common link of all the migrations developed in the past?
- What is the sense to speak about human nature from the speakers point of view?

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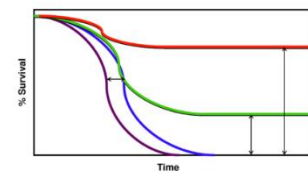
Will novel medicines and artificial intelligence help humanity and how?



The third topic of the congress was about novel medicines, artificial intelligence and their impact on humanity. Prof. Garattini moderated this session and Prof. Rasetti introduced this very intriguing theme. Prof. Vincenzo Barnaba, Jacques Demotés-Mainard, Salim Yusuf and Gianvito Martino coming from Italy, France and Canada were the discussants. More in particular Prof. Rasetti highlighted that we are in era of the digital revolution, in the era of the big data, in these last years we have produced more data than in all the years before and Precision Medicine is based on Big Data. Going deeper in his lecture Prof. Rosetti spoke about the

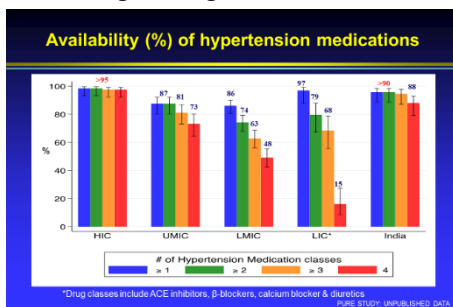
complex system of science, by highlighting that we are in the era of the machine learning and google is one of the main examples. Finally, the speaker talked about the Human Technopole as a large-scale, cross-disciplinary research infrastructure aimed to Precision Medicine in a healthy aging perspective and about the contradiction between the lack in health care and prevention and their need for counteracting the lifestyle leading to the onset of the multi-chronic diseases. Prof. Martino spoke about advanced medicine and more in particular, about the gene therapy and the possibility to reconstruct damaged nerves. In the main part of his talk he presented very interesting data on the so called “brain-machine interface” that transforms thoughts into actions. Prof. Barnaba presented very interesting data on precision medicine applied to tumor cells immunotherapy, by highlighting that more than 80% of melanoma tumors can be cured with immunotherapy. Going deeper in his lecture, the speaker talked about the mechanism of

The immunotherapy doublet combination led to a median progression-free survival of 11.4 months compared with few months with the standard therapies



the prevision is that more than 80% of melanoma or 50% of NSCLC patients will survive up to 10 years with this therapy

action of immunotherapy through the production of new antibodies able to kill the majority of the tumor cells. The very big problem is linked with the incredible costs of these therapies, the speaker pointed out. Prof. Demotés-Mainard talked about artificial intelligence, the development of neuroscience, the innovative ecosystem and the affordability of innovative healthcare. In the main part of his lecture, the speaker talked about the onset of a new ecosystem for the health innovation, by highlighting that the most of the health innovation arise from academia, but there is a dissociation between discovery, innovation and manufacturing and distribution. Finally, Prof. Demotés-Mainard talked about ECRIN, the european clinical research infrastructure network. Prof. Yusuf presented very interesting data given by the PURE study, aimed to study the availability and the affordability of the



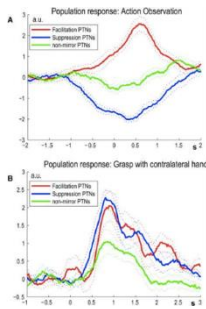
low-cost treatments for hypertension, CVD and diabetes, by highlighting that when it is necessary to use more than one drug, the compliance dramatically drops in the low-income countries compared to the high-income countries. Going deeper in his lecture, the speaker presented very impressive data, demonstrating that in the low-income countries the availability and the affordability of the low-cost medicines is very low the same for foods like fruits and vegetables.

- What's about the challenge of Big Data from the speakers point of view?
- What's about the therapeutic plasticity of the neural stem cells based on the data presented by the speakers?
- What's about the costs of the new immunotherapy agents based on the data presented by the speakers?
- Is health a public good or an individual asset?
- What's about the low-costs medicine and their affordability in the low-income countries?

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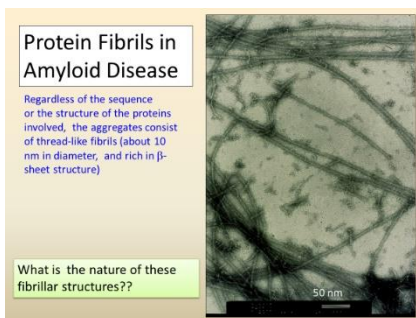
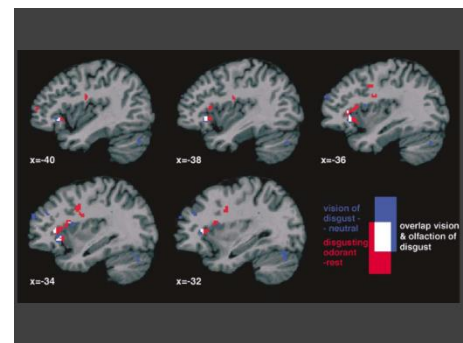
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Basic biological mechanisms can be changed in positive ways by moral/religious precepts or in negative ways by aberrant ideologies



Basic biological mechanisms can be changed in positive ways by moral/religious precepts or in negative ways by aberrant ideologies, was the fourth topic discussed in this very interesting congress. Prof. Maffei moderated this session and Prof Giacomo Rizzolatti introduced all the themes discussed by Prof. Jane Dacre, Marcello Massimini, Maurizio Brunori and Tomasz Trafny. The speakers coming from Italy and UK, presented very interesting data on the basic biological mechanisms and their effects. More in particular, Prof. Rizzolatti in his lecture spoke about the neurophysiological

mechanisms leading to consider other people as persons and not things. Going deeper in his lecture, the speaker presented very interesting data given by neurophysiological studies performed in his center on mirror neurons in monkeys but also in humans and highlighted that the results are the same. In the main part of his presentation, Prof. Rizzolatti spoke about the consequences of the mirror mechanism and on the intracortical recordings in humans. In the last part of his lecture the speaker presented very interesting data on the understanding emotion, by highlighting that when a person sees another person feeling a specific emotion, the neuronal mechanisms involved are the same in both persons. Prof. Massimini started his talk speaking about Tamagotchi, the toy that in 1996 moved the emotions of a lot of people all around the world. Going deeper in his talk, the speaker presented Nadine that is an artificial intelligence able to full interact with humans and spoke about the relationship between function and consciousness in artificial intelligences, by highlighting that till now have been performed very huge improvement in function, but not in consciousness and experience and it is the time to improve them. Prof. Dacre talked about the link of the biological mechanisms leading to prolonging life and religion. Going deeper in her lecture, the speaker presented very impressive examples on two personal cases where her decisions as a physician on other human lives have had to take account for some religious precepts. Prof. Brunori spoke about Alzheimer disease and the protein fibrils leading to its clinical symptoms. The speaker went deeper in his talk and presented very interesting data on the misfolded protein diseases, pointing out that if anything is done for understanding the underline mechanisms in the next 20 years we will be threatened by the Alzheimer tsunami. Finally, Prof. Trafny, spoke about his experience on the effect of religion on the biological structure of the human being. Going deeper in his lecture, the speaker addressed the audience with this question, there are any connections between religion identity and the individual biology? and through examples given by biology, but also by theology he tried to find a comprehensive answer.



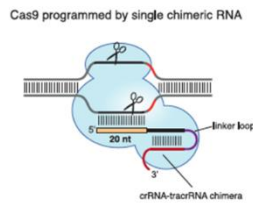
- What's about the circular process presented by the speakers?
- Which are the actions that we understand when using the mirror mechanism?
- What are the main characteristics of the protein fibrils typical of the amyloid diseases?
- How biological mechanisms can influence our behaviours and decisions?
- What are the main unanswered questions from the speakers point of view?

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What will synthetic biology and genome editing really mean for generations to come?

CRISPR/Cas9



“What will synthetic biology and genome editing really mean for generations to come?” was the fifth topic discussed in this congress. Prof. Guido Forni moderated this session, Prof. Mario Capecchi from USA introduced this theme and Prof. Carlo Casonato, Bruno Dallapiccola and Elena Cattaneo, coming from the Netherlands and Italy, were the discussants. More in particular Prof. Capecchi in his introduction presented very interesting data on a particular problem: the need for increasing the yield of the rice, maize and wheat per unit land by $\approx 110\%$. Going deeper in his lecture, the speaker pointed out that conventional breeding will not likely

meet this demand of the anticipated world population growth and the alternative is represented by the CRISPR/Cas9 editing. In the main part of his lecture, Prof. Capecchi spoke about this alternative, by highlighting the methods used for generating site specific double strand breaks. Finally, Prof. Capecchi spoke about GMOs and their regulation, by highlighting that sometimes regulation limits the science development and this is a very big problem when there is the need to find new practicable ways for feeding the human beings. Prof. Casonato, in his lecture talked about the role of the law in rewriting the contract, by highlighting that law has to be open, updated and attentive, in order to go ahead together with science. Prof. Dallapiccola talked about the acceptability to use human embryo in basic biological research, by highlighting that also in a Roman Catholic view, genome editing can represent a major challenge for an effective gene therapy. Finally, Prof. Dallapiccola pointed out that the future of the genome editing technique will depend on two elements, the new chemical capacities and the regulations aimed to put a true and effective control on them. Prof. Cattaneo, talked about the relationship between science and religion, by highlighting that it is not science but its application to be frightening. Going deeper in her lecture, the speaker pointed out that science and religion probably have different boundaries, different methods and goals and they should maintain their differences, but at the same time they have to collaborate and remove their specific stigma. In conclusion, Prof. Cattaneo, pointed out that geno-medicine applied to agriculture in the low-income countries is of high importance and it needs for the real collaboration between science and religion.

A resilient law?



- What are the alternatives other than the conventional breeding for increasing the yield of rice, maize and wheat, presented by the speaker?
- What is CRISPR/Cas9 editing based on the data presented by the speaker?
- What are the advantages of CRISPR/Cas9?
- What are the desired traits of a gene product?
- What are the main characteristics of a Law from the speaker point of view?
- Why the law has to put particular attention in order to distinguish the single problems linked with the science development?
- What's about a resilient law from the speaker point of view?
- What's about genome editing for the speaker point of view?
- What is the solution of undernutrition in the low-income countries from Prof. Cattaneo point of view?

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Panel discussion on the issues of the meeting in the context of science and religion



This was the last session of the congress, open to the discussion of all the participants. More in particular Prof. Kathryn Pritchard and Prof. Walter Ricciardi from UK, introduced this session, by highlighting that this congress has been the start point of a voyage leading to a mutual commitment between science and religion to be going on. One point was about to share vocabularies, for science and religion have different vocabularies and in order to develop sharable projects it is of high importance to speak comprehensive languages. In order to start a profitable dialogue

probably should be important to understand that science and religion share the same human experiences towards poor and frail people. During the discussion, was raised the problems linked with the climate changes and the need for mutual actions going on by science and religion. The climate change was one of the main topic raised during this session and the conclusion was about the need for a mutual collaboration between science and religion for its solution. Cardinal Ravasi pointed out that this congress was as a first phase in this dialogue running on the main topics dealing with science and religion and proposed to continue this dialogue starting from the artificial intelligence theme. Cardinal Ravasi, proposed also to open these meetings to students in order to highlight the communicational dimension of the relationship. In conclusion, Cardinal Ravasi highlighted the importance to involve theologians and philosophers together with scientists in this dialogue from a methodological point of view. Finally, Prof. Horton, as a conclusive remark, pointed out that science cannot be go ahead alone, but needs to collaborate with religion in order to give a sustainable answer to the poorest in the world.

- To what extent a person coming from medical community should understand something from religion in order to start the dialogue?
- What's about the heterogeneity of languages between science and religion?
- What are the main points sharable between science and religion on Nature?
- What's about the link between bioethics, theology and philosophy from the speakers point of view?
- What's about the importance to include theology and philosophy in this dialogue from a methodological point of view?
- Why science needs to share projects with religion from the speaker point of view?

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**The Future of Humanity
Through the Lens of Medical Science**

Rewriting the Contract

Rome, 2017 April 4-5



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