***60 years of Europe:***

***“Research in Support to a United Europe***

***The Possible Contribution of Scientists***”

April 7, 2017

Rome

In these testing times it is wise to reflect upon the forces that can bring us together and upon the role that scientists play, can play and should play, in this process.

Indeed, recent theories[[1]](#footnote-1) on why modern science began to emerge in Europe in the 1500s emphasise the crucial role of network of scholars. A bit later, at the time of the Enlightenment, a set of conditions arose that allowed a transnational community of brilliant thinkers known as the “Republic of Letters” to freely circulate and distribute ideas and writings.

So the development of science by engaged individuals has always been collective, public and across borders since rumours of Copernicus' heliocentric theory first reached educated people all over Europe. But this did not happen without resistance by many forms of power (political, religious, military, and even the people) and steps backward.

A dramatic example of the struggle for this spirit to overcome nationalist views took place in October 1914, a critical year if any.

On 4 October 1914, 93 prominent German scientists, scholars and artists, including the physicist Max Planck and the mathematician Felix Klein, issued a proclamation now known as the *“Manifesto of the Ninety-Three”*. It was originally titled “*Manifesto to the civilised world*”. It was a protest against what the writers felt were lies being spread about Germany’s role in starting the war, its reasons for “trespassing” neutral Belgium and the denounced brutality of the actions of its troops there. Its purpose was to increase support for the war throughout German schools and universities and to win a moral and morale war.

What is little known however is that one of the signatories Wilhelm Förster soon grew to regret having signed the document. And he, along with the physicist Georg Friedrich Nicolai, drew up an alternative *Manifesto to the Europeans*. Only Otto Bük and Albert Einstein agreed to sign it and it remained unpublished at the time[[2]](#footnote-2). But it was subsequently brought to light by Einstein.I would like to read some of it to you now. Because it is an amazingly humane and prescient document.

*“We wish merely to emphasize as a matter of principle that we are firmly convinced that the time has come when Europe must act as one in order to protect her soil, her inhabitants, and her culture. We believe that the will to do this is latently present in many. In expressing this will collectively we hope that it gathers force.*

*To this end, it seems for the time being necessary that all those who hold European civilization dear, in other words, those who in Goethe’s prescient words can be called “good Europeans" join together. After all, we must not give up the hope that their collective voice—even in the din of arms—will not trail off entirely unheard, especially, if among these “good Europeans of tomorrow,” we find all those who enjoy esteem and authority among their educated peers.*

*First it is necessary, however, that Europeans get together, and if—as we hope—enough Europeans in Europe can be found, that is to say, people for whom Europe is not merely a geographical concept but rather a worthy object of affection, then we shall try to call together a union of Europeans. Such a union shall then speak and decide.”*

Can you imagine that this was written at the moment the First World War was gaining momentum? And not in some neutral country but in Berlin, i.e. in the heart of Germany, one of the key combatants? And is it not wonderful that we have lived to see their dream come true? And not only did we see the dream come true but we have also been able to see it grow and flourish for over sixty years!

But there is something else here that shows the force of science not being hampered by nationalism. As we know, Einstein moved from Zurich to Berlin in 1914 at the invitation of the Prussian Academy. His general theory of relativity, elaborated with his friend and codisciple Marcel Grossmann but also the mathematician David Hilbert, was accomplished in 1915. The first experimental test of the theory is due to the famous expedition of the British physicist Arthur Eddington to measure the bending of light at a total solar eclipse in 1919. But how did the British come to test the theory of a German scientist only one year after the end of the war? It was because Eddington was friends with the astronomer Willem De Sitter, who sat in neutral Holland at the time. De Sitter received copies of Einstein’s papers, and passed them onto Eddington in 1916. Eddington was impressed by the beauty of Einstein’s work, and immediately began to promote it. In a report to the Royal Astronomical Society in early 1917, while the First World War was raging, he particularly stressed the importance of testing the theory using measurements of light bending[[3]](#footnote-3). The organisation of the necessary expeditions was therefore made during the war itself. So we can see that, even at the height of a World War, the Republic of Letters still survived.

The message shown by this story and of the Manifesto to the Europeans: “even during the darkest days there are individuals who can extract themselves from the horrors they witness, can dream of and work towards a better future”.

My wish today: can scientists, in these challenging times, take over the torch from these brave thinkers of 1914? Wouldn’t it be wonderful if one could show the world that there are still some people who dream of a better future, and conditions to achieve it? Moreover, wouldn’t it be wonderful that scientists belong to this group? Wouldn’t it be appropriate for our own sanity of mind if we could contribute and write our own manifesto?

Such an idea was taken up already last year, at a moment when the world did not look as dark as today, or at least when we had not yet fully realized the way the world was going. At the initiative of a few Italian politicians and the CNR, a meeting gathered in this building to examine how an up-to-date version of a Manifesto to the Europeans could emerge. To me this looked like a clever move. Now, my feeling is that this has become an urgent matter!

Should this be our project? Should it be, now that we know what we know about the present state of the world, that we modify a bit the project and together draft a ‘Manifesto for Science’? My wish is that the signatories would vow to promote the values at the root of the development of science. To continue to pursue ‘truth’ (almost an offensive to a growing number of people) and collaborate across borders beyond all characteristics which can be used to divide us. To support the pursuit of the scientific method at all levels from primary school to the most prestigious labs and university departments.

My dream is that we could make such a proclamation on a day when scientists around the world come together. And such a day may be coming soon because, as many of you already know, on 22 April 2017 all around the world scientists and people convinced of the importance of science are planning to walk out of their homes and their labs into the streets[[4]](#footnote-4).

Because, as we have seen with the “Manifesto of the Ninety-Three”, this open attitude refusing building walls is not guaranteed even among the leading minds of a culture. It would therefore be inappropriate to give the impression that scientists have some kind of monopoly in the pursuit of truth or virtue.

Actually, if anything, we scientists first bear a particular level of responsibility.

It is astonishing what many people in society have managed to accomplish with what the present understanding brought by science has allowed to build, often through the democratization of informed practices and technological objects.

We are now richer and live longer than at any other time in human history. Since 1800 the now-rich countries got anywhere from 18 to 30 times better off. And we are adding to the list of rich countries each year[[5]](#footnote-5).

In 1800 43% of the world’s new-borns died before their fifth birthday. In 1960 child mortality was still 18.5% globally. In 2015 child mortality was down to 4.3% – ten times lower than 2 centuries ago. And child mortality (children under 5) in rich countries today is much lower than 1%[[6]](#footnote-6).

Since 1900 the global average life expectancy has more than doubled and is now approaching 70 years. No country in the world has a lower life expectancy than the countries with the highest life expectancy in 1800[[7]](#footnote-7).

These days the ability to communicate with friends and family anywhere in the world and unprecedented access to information and entertainment.

But these achievements have come at the cost of a near continual disruption of our societies and ways of life since the start of the Industrial Revolution. We have seen crises and depressions. We have seen wars and revolutions. We are witnessing a probably unprecedented change in the organisation of the society in the last 20 to 30 years. And it seems likely that we are on our way to yet another great disruption in what some are calling the fourth industrial revolution.

We must remember that, if Technology is neutral, it is how the decision to use it is reached that matters. Some years back, in the last century, some, such as Martin Heidegger and Jacques Ellul, have warned that Technology may already have surpassed our ability to control it.

In a 1955 article entitled *“Can We Survive Technology?”*, John Von Neumann, one of the developers of the first computers, asked: *“In all its stages the industrial revolution consisted of making available more and cheaper energy, more and easier controls of human actions and reactions, and more and faster communications. Each development increased the effectiveness of the other two. All three factors increased the speed of performing large-scale operations--industrial, mercantile, political, and migratory. But throughout the development, increased speed did not so much shorten time requirements of processes as extend the areas of the earth affected by them. The reason is clear. Since most time scales are fixed by human reaction times, habits, and other physiological and psychological factors, the effect of the increased speed of technological processes was to enlarge the size of units--political, organizational, economic, and cultural—affected by technological operations. That is, instead of performing the same operations as before in less time, now larger-scale operations were performed in the same time. This important evolution has a natural limit, that of the earth's actual size. The limit is now being reached, or at least closely approached.”*

Indeed science itself increasingly shows us the limitations of our own domain of action and may be even of our reason.

And scientific developments of the last century have also shown us that the nature of reality, with its particles and fields, is alien and hidden from our normal senses.

This shows us the strength of science, the incredible knowledge that we have gathered. It is an amazing achievement that we can even contemplate ourselves and the world in this way? That we can make progress and deepen our understanding. But there are conditions for this to continue.

So we should be looking deep inside ourselves, for those who continue to believe that our destiny is in our hands. What kind of society do we want to live in? What kind of society do we want for our children? How can we live better lives? It is an illusion that science and technology can answer these questions alone. Only WE can. But these goals can be reached only with the help of science and technology.

And I can turn to Einstein again when he spoke at the Fifth Nobel Anniversary Dinner just after the end of the Second World War in 1945.

*“The war is won, but the peace is not… Territorial questions and arguments of power, obsolete though they are, still prevail over the essential demands of common welfare and justice… And we feel the duty to speak up and to remind those responsible that: there is no escape into easy comforts; there is no distance ahead for proceeding little by little and delaying the necessary changes into an indefinite future; there is no time left for petty bargaining.*

*The situation calls for a courageous effort, for a radical change in our whole attitude in the entire political concept.  May the spirit that prompted Alfred Nobel to create this great institution -- the spirit of trust and confidence, of generosity and brotherhood among men, prevail in the minds of those upon whose decisions our destiny rests. Otherwise, human civilization will be doomed.”*

It is time for scientists to speak up. They did it on a number of occasions. One of their successful attempts was to convince the European Union to create the European Research Council, which I have the privilege to serve and whose success will be celebrated this afternoon here in Rome on the occasion of its 10th anniversary as a programme of the European Commission.

Scientists should speak up not only as specialists but as citizens conscious that the values that undermine their profession, the respect for truth, the value of exchange, the necessity to doubt and to challenge, must be shared with all the other citizens, and be used to give a solid fundation for a new Manifesto.

I thank you for your attention.

1. **A Culture of Growth: The Origins of the Modern Economy** Joel Mokyr

   <http://press.princeton.edu/titles/10835.html>

   <https://www.ft.com/content/982f6108-95f1-11e6-a1dc-bdf38d484582> [↑](#footnote-ref-1)
2. <https://en.wikipedia.org/wiki/Manifesto_of_the_Ninety-Three> [↑](#footnote-ref-2)
3. <https://arxiv.org/pdf/astro-ph/0102462.pdf> [↑](#footnote-ref-3)
4. <https://www.marchforscience.com/> [↑](#footnote-ref-4)
5. <http://www.prospectmagazine.co.uk/magazine/ideas-that-built-the-world-joel-mokyr-liberalism> [↑](#footnote-ref-5)
6. <https://ourworldindata.org/child-mortality/> [↑](#footnote-ref-6)
7. <https://ourworldindata.org/life-expectancy/> [↑](#footnote-ref-7)