EPS
Roots & Future

ANTONINO ZICHICHI
University of Bologna and INFN, Bologna Italy
CERN, Geneva, Switzerland
Enrico Fermi Centre, Rome, Italy
Pontifical Academy of Sciences, Vatican City
World Federation of Scientists, Beijing, Geneva, Moscow, New York
Ettore Majorana Foundation and Centre for Scientific Culture, Erice, Italy
A.Z. is the youngest of the EPS founders.
This is why A.Z. knows the roots of EPS:
The first Institution where physicists from all Europe (East-West-North-South) wanted to be altogether.
During many years before 1968 A.Z. was active in trying to get the support of physicists for the creation of this new Institution.
The first great fellow was Lord Patrick Blackett, who was the leader of the most famous group of physics in the world and the winner of the Mediterranean Battle in the Second World War.
It is because of him that I had the privilege of spending an evening with his friend **Bertrand Russell** and getting to know his views on us physicists who were and are engaged at the frontiers of human knowledge in order to understand the Logic of Nature.

Professor Blackett and his friend Bertrand Russell were interested in identifying the real motor for progress in technological inventions that has allowed the quality of life to be at the level it is today.

This motor is the scientific discovery at the 1st level of Galilean Science.
Today, the centre of everyone’s attention are the problems concerning the role of Science as the source of high quality life instead of being (as it you was in the middle of last Century) just the source of high precision and high power weapons.

In the years after the Second World War, the problems on the role of Science were far from being of interest to the public. When I had the privilege of being in Professor Blackett’s Physics group I learned a lot about these problems, essentially as Professor Blackett was engaged not only in the frontiers of Physics but also with problems concerning the role of Science in the Culture of our time.
THE ROLE OF SCIENCE IN THE CULTURE OF OUR TIME

(1% MODERN AND 99% PRE-ARISTOTELIC)
For the Culture of our Time
(1% Modern and 99% Pre-Aristotelic)
called Modern
it is as if neither
Rigorous Theoretical Logic
(Mathematics)
nor
Rigorous Experimental Logic
(Science)
HAD BEEN DISCOVERED.
THE PROOF FOLLOWS

In everyday’s life we use as Basic Quantities

Length
Mass
Time

and as Units

cm
gr
sec
In his universal outlook of the world – independent of our restricted environment – Planck in 1899 wanted that the fundamental units of mass, length and time to depend only on the values of the Fundamental Constants of Nature:

\( c \) (the speed of light),
\( h \) (the Planck constant) and
\( G \) (the Newton gravitational coupling).
These quantities had a special meaning for Planck [1]:

“These quantities retain their natural significance as long as the Law of Gravitation and that of the propagation of light in a vacuum and the two principles of thermodynamics remain valid; they therefore must be found always to be the same, when measured by the most widely differing intelligence according to the most widely differing methods”.
The way Planck considered these quantities it is remarkable:

“In the new system of measurement each of the four preceding Constants of Nature \((G, h, c, k)\) has the value one”.
This is the meaning of measuring lengths, times, masses and temperatures in Planck’s units.
Our world is coming from the Planck Universe where the units of the BASIC QUANTITIES are not \( \text{cm}, \text{gr}, \text{sec} \) but the three fundamental Constants of Nature: \( c, h, G_N \)
Taking these units, the following values come out:

\[ \Delta T = 45 \cdot 10^{-45} \approx 5 \cdot 10^{-44} \text{sec} \]

\[ \Delta X = 10^{-33} \text{cm} \]

\[ \Delta E = 10^{19} \text{GeV} = 10^{28} \text{eV} \]
When Planck discovered these **units** no one knew what these quantities have to do with our Universe.
This is the reason why Planck’s discovery was forgotten during the XX Century.

But now these quantities are those where our life comes from. In fact $\Delta T, \Delta X, \Delta E$ are the units of the 1$^{st}$ BIG BANG.
$10^{-44}$ sec is the Time of the 1$^{\text{st}}$ BIG BANG

$10^{28}$ eV is the Energy of the 1$^{\text{st}}$ BIG BANG

$10^{-33}$ cm is the Universe Radius during the 1$^{\text{st}}$ BIG BANG
This means that our Universe has its quantitative basis in the intellectual venture whose author is Max Planck [1].
Planck included the Boltzmann constant \( k \) which converts the units of energy into units of temperature. This allowed Planck to have a fundamental value also for the temperature, \( 3.5 \times 10^{32} \) kelvins (K).

Here are the orders of magnitude of Planck’s units in the “Planck Universe”:

<table>
<thead>
<tr>
<th>Unit</th>
<th>Formula</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td>((G \cdot h / c^3)^{1/2})</td>
<td>(10^{-33}) cm</td>
</tr>
<tr>
<td>Time</td>
<td>((G \cdot h / c^5)^{1/2})</td>
<td>(10^{-44}) s</td>
</tr>
<tr>
<td>Mass</td>
<td>((h \cdot c / G)^{1/2})</td>
<td>(10^{-5}) g</td>
</tr>
<tr>
<td>Temperature</td>
<td>(k^{-1} \cdot (hc^5/G)^{1/2})</td>
<td>(10^{32}) K</td>
</tr>
</tbody>
</table>
When Planck was expressing his ideas on the meaning of his fundamental natural units there was neither the Big Bang nor the Einstein equation.
And no one knew that the Einstein equation had a solution, discovered by Karl Schwarzschild [2], which describes the gravitational field of a massive point-like particle.
The evolution of the Universe seems to follow the conditions illustrated in Figures. 1 and 2 whose origin is the Schwarzschild equation and the three Fundamental Constants of Nature.
Figure 1
Figure 1: The Schwarzschild law between the radius of the horizon and the mass from the smallest to the largest SCH–object.
Figure 2

Outsise a primordial SCH-object

Inside a primordial SCH-object
Figure 2: The relation which exists between the value of the SCH radius ($R_{SCH}$) and the corresponding density ($\rho_{SCH}$), from the smallest (the Planck Universe) to the largest SCH–object (the Universe now).
Now the rigorous description of

$$\alpha_1 \alpha_2 \alpha_3$$
Figure 3: The present status of the unification of the three gauge couplings $\alpha_1, \alpha_2, \alpha_3$ is reported. This is the most accurate description of the unification whose mathematics is in Figure 4.
THE UNIFICATION OF ALL FUNDAMENTAL FORCES AND THE EGM EFFECT

The three lines \((\alpha_1^{-1}, \alpha_2^{-1}, \alpha_3^{-1})\) in Figure 3 result from calculations executed with a supercomputer using the following system of equations:

\[
\mu \frac{d\alpha_i}{d\mu} = \frac{b_i}{2\pi} \alpha_i^2 + \sum_j \frac{b_{ij}}{8\pi^2} \alpha_i \alpha_j
\]

\(\alpha_i, \alpha_j\) (with \(i = 1, 2, 3\); and \(J = 1, 2, 3\) but \(i \neq j\)).

This is a system of coupled non-linear differential equations which is valid to mathematically describe an experiment where three quantities play a fundamental role. In our case the three fundamental quantities are the gauge couplings \((\alpha_1, \alpha_2, \alpha_3)\) which vary with “\(\mu\)”, the basic parameter which depends on the energy of the elementary process, from the maximum level of Energy (Planck Scale) to the energy level of our world. During more than ten years (from 1979 to 1991), no one had realized that the energy threshold for the existence of the Superworld was strongly dependent on the “running” of the masses.

This is now called: the EGM effect (from the initials of Evolution of Gaugino Masses). This effect produces a factor 700 in the threshold for the lightest supersymmetry particle. No one knows the value of the threshold Energy for the production of the lightest supersymmetry particle. The EGM effect lowers this value by a factor 700. Suppose that somebody would say that the threshold is at 700 TeV, thanks to the EGM effect this value is going to be 1 TeV.
Only one input \( \alpha_s (M_Z) = 0.118 \)

\[
\begin{align*}
\sin^2 \theta (M_Z) & \quad \text{Exp} - \sin^2 \theta (M_Z) \quad \text{Th} = 0.0004 \pm 0.0008 \\
\alpha_{em}^{-1} (M_Z) & \quad \text{Exp} - \alpha_{em}^{-1} (M_Z) \quad \text{Th} = 0.0 \pm 0.2
\end{align*}
\]
In the very first days of EPS the most famous physicist from Siberia Veniamin A. Sidorov came to Geneva, and he emphasized the relevance of Siberia being a member of USSR.
When A.Z. was in Physics Institutes in Siberia (Novosibirsk) A.Z. realized that our colleagues in this part of USSR were, what we call in our
Democratic Structures

Opposition
In fact all fellows who had something to say against Moscow were immediately displaced in Siberia.
The Siberian fellow, Veniamin Sidorov, was a very active member of all our EPS actions. You can find him in the following picture, many years after the EPS foundation.
The Holy Father, Pope John Paul II receiving in the Vatican the President of the European Physicists, A.Z., accompanied by the Council of the Presidency of the European Physical Society (EPS).
The next meeting took place later with fifty members of EPS whose names follow:

Dr. R.S. Pease, Abingdon
Prof. G.A. Smolensky, Leningrad
Dr. T. Riste, Kjeller
Mrs. L.A. Thomas, Wembley
Dr. P. Radvanyi, Orsay
Dr. B. Dreyfus, Grenoble
Prof. K.K. Rebane, Tallin
Prof. K.-H. Hausser, Heidelberg
Prof. B. Robinson, Paris
Prof. W. Martienssen, Frankfurt/Main
Dr. L. Cohen, London
Prof. E.R. Andrew, Nottingham
Dr. F. James, Geneva
Prof. E.R. Dobbs, London
Dr. A. Strzalkowski, Cracow
Prof. V. Goldenski, Moscow

Prof. L.A. Thomas, Wembley
Acad. A. Datzeff, Sofia
Prof. R.A. Ricci, Padua
Mr. E.N. Shaw, Geneva
Prof. E.A. Müller, Geneva
Prof. V. Ruuskanen, Jyvaskylä
Dr. C. Le Pair, Utrecht
Prof. I.R.A.M. Hoogenboom, Utrecht
Prof. A. Zichichi, Geneva
Prof. V. Sidorov, Novosibirsk
Mr. J. Béné, Geneva
Prof. G.-J. Béné, Geneva
Prof. A. Lösche, Leipzig
Prof. S. Kapitza, Moscow
Prof. G. Picozza, Rome
Prof. G. Preparata, Geneva

Prof. M. Guenin, Geneva
Prof. R. Scrimaglio, Frascati
Dr. J. Fischer, Prague
Prof. L. Kerwin, Ottawa
Prof. K. Hoselitz, UK
Mrs. A. Hoselitz, UK
Prof. J.M. Caraça, Lisbon
Dr. W.F. Druyvesteyn, Eindhoven
Prof. G. Eilenberger, Jülich
Prof. E. Matthias, Berlin
Prof. A. Milojević, Belgrade
Prof. C. Nordling, Uppsala
Dr. E.W. Otten, Geneva
The roots of EPS are in our activity devoted to convince the most relevant fellows to be with us in order to give life to new Institution called EPS.
A fellow who was of great help is Peter Higgs who in 1964 had the correct idea of solving the problem of allowing masses not to be zero.
Nobody could predict that this problem needed many decades (1964–2012) to be experimentally proved to be in the Logic of Nature. During these decades the Higgs–meson became the “God–Particle”.
In the Physics steps we started with the proof that the first discovery (1967) of the Higgs meson was not correct (1969). Then 50 years of experimental attempts to find this meson produced the “God–Particle”.
The presence of SIBERIA: neither geographical nor political boundaries for our fellows to be members of EPS
THE ROOTS
AND
THE FUTURE
In the 1985 Geneva meeting Gorbachev & Reagan adopted our EPS definition of Secret Laboratories
The Enemy Number One of Peace in the World are the Secret Laboratories
Reagan & Gorbachev:

We will open the Secret Laboratories
Now 2018

The Secret Laboratories are still closed but the project for East-West-North-South Scientific Collaboration is going on.
Being Physicist we cannot limit ourselves to uttering words: We must propose a Project Science for Peace the World Over
The Future of EPS must be linked to

- Science for Peace the World Over which comes after
- The New Manhattan Project
- Project for Mankind
ANTONINO ZICHICHI

SCIENCE FOR PEACE THE WORLD OVER
A New Manhattan Project as a Project for Mankind
The Physics coupled with EPS
The God Particle

- 1964 (im) Higgs
- 1967 The Higgs meson is discovered and called $S^0$.
- 1969 The $S^0$ does not exist.
THE EFFECTIVE ENERGY puts all production processes on the same basis, no matter if the interaction is Strong, Electromagnetic, Weak.
The multitude of final states produced by pairs of interacting particles, in Strong, Electromagnetic (EM) and Weak processes becomes only one state if the Effective Energy is the same:

<table>
<thead>
<tr>
<th>Strong</th>
<th>EM</th>
<th>Weak</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \pi \ p )</td>
<td>( \gamma \ p )</td>
<td>( \nu \ p )</td>
</tr>
<tr>
<td>( K \ p )</td>
<td>( e \ p )</td>
<td>|</td>
</tr>
<tr>
<td>( p \ p )</td>
<td>( \mu \ p )</td>
<td>|</td>
</tr>
<tr>
<td>( p \ n )</td>
<td>( e^+ e^- )</td>
<td>|</td>
</tr>
<tr>
<td>( \bar{p} \ p )</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Future

THE SUPERWORLD

SuperSpace
with 43 Dimensions
THE WHOLE OF OUR KNOWLEDGE AND THE THREE BIG BANGS

The Universe Now
10^{18} \text{ sec} \quad 10^{81} \text{ GeV}

Planck Universe
10^{29} \text{ cm}

62 \text{ POWERS OF TEN}

in Space \quad \text{in Time} \quad \text{in Energy}

h_{\text{Universe}} \approx 10^{124}

h_{\text{Planck}}

Planck \Rightarrow c = h = G = 1
10^{-33} \text{ cm} \quad 10^{-44} \text{ sec} \quad 10^{19} \text{ GeV}

UNIVERSE
Galaxies, Stars, Planets

THE SUPERWORLD
43 Dimensions
Super (Space-Time)
Supersymmetry B \equiv F

STANDARD MODEL

More Details in Figure 44

3 \text{ GAUGE CHARGES, } Q_G, \text{ FOR 3 FUNDAMENTAL FORCES}

12 \text{ FLAVOUR CHARGES, } Q_f, \text{ FOR 3 COLUMNS}

7 \text{ BASIC QUANTITIES}

\text{Li} \equiv \text{Life} \quad \text{Si} \equiv \text{Self Interaction} \quad \text{Cr} \equiv \text{Creativity}

L_{\text{W}} \quad L_0 \quad S_{1, 2, 3}

LIFE
with minimal level of REASON

SELF INTERACTION
Cogito ergo sum

CREATIVITY
Imagination becomes reality

REASON
Language \quad Logic \quad Science

BB1

BB2

BB3
THE SUPERWORLD

(9 + 1 + 1) ≡ 11 ≡ B ; 32 ≡ F

Space Coupling Time

Bosonic Dimensions

Fermionic Dimensions

4 expanded + 7 compactified
32 Dimensions all remain compactified

Total numbers of Dimensions

F_{EW} — Electroweak: The force acting between quarks & leptons

F_{QCD} — Quantum ChromoDynamics: The force acting between quarks & gluons

F_{G} — The Gravitational Force

THREE GAUGE CHARGES, $Q_G$, FOR THE THREE FUNDAMENTAL FORCES

THREE COLUMNS OF LEPTONS AND QUARKS WITH TWELVE FLAVOUR CHARGES $Q_f$

$\nu_e$ ; $\nu_\mu$ ; $\nu_\tau$

1967

$u$ ; $c$ ; $t$

1975

$\bar{d}$ ; $\bar{s}$ ; $\bar{b}$

TWELVE $Q_f$ FOR THE THREE COLUMNS

Q_{G} “Subnuclear Colour” Charges ; $Q_f$ “Subnuclear Flavour” Charges

Space Time Mass Energy Spin (generating the Fundamental Forces) (responsible for the stability of Matter)

SEVEN BASIC QUANTITIES

$c \approx \infty = \text{Fundamental Constant} ; \ h \approx 0 = \text{Fundamental Constant}$

A.Z. – EPS Roots & Future – Bologna, 07.09.2018
WE CANNOT REMAIN SILENT
WE SCIENTISTS CANNOT REMAIN SILENT when the great public is bombarded with topics such as:

- Complexity is the New Science
- The Reductionism is over. All Sciences must be Holistic
- The Artificial Intelligence will overcome the Human Intelligence
- Chaos is the origin of Life
• The global warming
• The energy crisis
• The information security
• The environment
• The Intelligent Design
• The Evolution
• and other Problems coming from the ‘Whole of Our Knowledge’.
Overview of the 72 Planetary Emergencies grouped into 15 Classes
# THE 72 PLANETARY EMERGENCIES

**Identified by the Erice Scientists and Classified into 15 Basic Sources**

<table>
<thead>
<tr>
<th>I</th>
<th>WATER</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>II</td>
<td>SOIL</td>
<td>3</td>
</tr>
<tr>
<td>III</td>
<td>FOOD</td>
<td>5</td>
</tr>
<tr>
<td>IV</td>
<td>ENERGY</td>
<td>5</td>
</tr>
<tr>
<td>V</td>
<td>POLLUTION</td>
<td>7</td>
</tr>
<tr>
<td>VI</td>
<td>LIMITS OF DEVELOPMENT</td>
<td>4</td>
</tr>
<tr>
<td>VII</td>
<td>CLIMATIC CHANGES</td>
<td>5</td>
</tr>
<tr>
<td>VIII</td>
<td>GLOBAL MONITORING OF THE PLANET</td>
<td>6</td>
</tr>
<tr>
<td>IX</td>
<td>NEW MILITARY THREATS IN THE MULTIPOLAR WORLD</td>
<td>3</td>
</tr>
<tr>
<td>X</td>
<td>SCIENCE AND TECHNOLOGY FOR DEVELOPING COUNTRIES TO AVOID A NORTH-SOUTH ENVIRONMENTAL HOLOCAUST</td>
<td>3</td>
</tr>
<tr>
<td>XI</td>
<td>THE PROBLEM OF ORGAN SUBSTITUTION</td>
<td>5</td>
</tr>
<tr>
<td>XII</td>
<td>MEDICINE, INFECTIOUS AND OTHER DISEASES</td>
<td>7</td>
</tr>
<tr>
<td>XIII</td>
<td>CULTURAL POLLUTION</td>
<td>8</td>
</tr>
<tr>
<td>XIV</td>
<td>INFORMATION SECURITY AND COMMON DEFENSE AGAINST COSMIC OBJECTS</td>
<td>2</td>
</tr>
<tr>
<td>XV</td>
<td>THE HUGE MILITARY INVESTMENTS</td>
<td>5</td>
</tr>
</tbody>
</table>

**Total** 72
I
Total: 4

WATER

1. PROTECTION OF NATURAL RESOURCES
2. SEARCH FOR NEW SOURCES
3. DESALINIZATION
4. SAVINGS

PLANETARY EMERGENCIES

A.Z. – EPS Roots & Future – Bologna, 07.09.2018
II

Total: 3

SOIL

1. PROTECTION AGAINST POLLUTANTS
2. DEFENCE FROM CATASTROPHIC EVENTS
3. DROUGHT AND DESERTIFICATION

PLANETARY EMERGENCIES

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III  Total: 5

FOOD

1. PRODUCTION
   - CLASSICAL AGRICULTURE
   - MARINE AGRICULTURE

2. PROCESSING
3. STORAGE
4. NEEDS & WASTE

PLANETARY EMERGENCIES
IV - Total: 5

ENERGY

PRODUCTION

CHEMICAL

NUCLEAR

INCREASED EFFICIENCY & SAVINGS

DISTRIBUTION

RENEWABLE

FUSION (Future)

FISSION
(Now) Waste Transformation
Accelerator Driven
Reactors (I.S.)*

*I.S. = Intrinsically Safe

PLANETARY EMERGENCIES

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POLLUTION

GLOBAL

1. THE CO₂ PROBLEM

2. GREENHOUSE EFFECT

3. OZONE DEPLETION

4. ACID RAIN

LOCAL

7. INDUSTRY

6. URBAN AND DOMESTIC

5. OIL AND CHEMICAL SPILLS

PLANETARY EMERGENCIES

A.Z. – EPS Roots & Future – Bologna, 07.09.2018
VI  Total: 4

LIMITS OF DEVELOPMENT

① DEMOGRAPHIC GROWTH

② THE MEGA METROPOLISES AND THE COLLAPSE OF ALL VALUES

③ WATER, SOIL, FOOD, ENERGY

④ UNEMPLOYMENT

PLANETARY EMERGENCIES
CLIMATIC CHANGES

**The 1st Level Scientific Problems**

1. The Mathematics needed to simulate the meteorological motor

2. The experimental data needed in order to check the validity of the predictions

**The 2nd Level Scientific Problems (Global Effects)**

3. The problem of understanding the origin of clouds

4. The effective consequences of cosmic rays

5. The problems of now-casting, medium-range and galactic-range

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GLOBAL MONITORING OF THE PLANET

- Pollution Monitoring
- Atmospheric Monitoring
- Defence against Cosmic Objects
- Volcanoes & Caldera
- Earthquakes
- Defence against Floods and other Unexpected Extreme Events

PLANETARY EMERGENCIES
NEW MILITARY THREATS IN THE MULTIPOLAR WORLD

1. GLOBAL DEFENCE SYSTEM
2. DANGER OF PROLIFERATION OF WMD*
3. TERRORISM

*WMD = Weapons of Mass Destruction
SCIENCE AND TECHNOLOGY FOR DEVELOPING COUNTRIES TO AVOID A NORTH-SOUTH ENVIRONMENTAL HOLOCAUST

1. THE NATIONAL SCHOLARSHIP PROJECT

2. SCIENCE WITHOUT SECRETS AND THE PROBLEM OF TECHNOLOGICAL DEVELOPMENTS PRO AND AGAINST MANKIND

3. THE ROLE OF BIG SCIENTIFIC RESEARCH CENTERS USING INERT MATTER AND LIVING MATTER

PLANETARY EMERGENCIES
THE PROBLEM OF ORGAN SUBSTITUTION

① ARTIFICIAL ORGANS

② NATURAL ORGANS

③ THE UNDERSTANDING OF "MINIMAL LIFE"

④ FROM INERT TO LIVING MATTER

⑤ THE CONTRIBUTION COMING FROM GENETIC ENGINEERING

PLANETARY EMERGENCIES
CULTURAL POLLUTION

1. THE PROBLEM OF MODERN TECHNOLOGY & DEMOCRACY

2. RIGOROUS FOUNDATION OF DEMOCRACY: MATHEMATICS & DEMOCRACY

3. THE VALUES OF SCIENCE AND THE BASIC DISTINCTION BETWEEN SCIENCE & TECHNOLOGY

4. SCIENCE & FAITH

5. TV

6. RADIO

7. PRESS: SCIENCE & JOURNALISM

8. VIDEO & OTHER MEANS

PLANETARY EMERGENCIES
COMMON DEFENSE AGAINST COSMIC OBJECTS

1. DETECTION
2. DEFENSE

METEORITES AND COMETS

WITHOUT MEMORY THERE IS NEITHER SCIENCE NOR CIVILIZATION

DINOSAUR EXTINCTION
65 MILLION YEARS AGO (10^9 MT)

ARIZONA
15MT (Fe) - 50,000 YEARS AGO

SIBERIA
10MT (H_2O) - 1908

PLANETARY EMERGENCIES
THE HUGE MILITARY INVESTMENTS

① DISMANTLING OF THE 60,000 NUCLEAR WARHEADS

② DESTRUCTION OF CHEMICAL WEAPONS

③ RECONVERSION OF WAR INDUSTRIES

④ NEW INITIATIVES TO CHANNEL MILITARY RESOURCES TOWARDS PROJECTS FOR PEACE

⑤ THE NEW ARMS RACE FOR HIGH PRECISION WEAPONS

PLANETARY EMERGENCIES

A.Z. – EPS Roots & Future – Bologna, 07.09.2018
## UEEC IN HISTORY AND IN SCIENCE

<table>
<thead>
<tr>
<th>In History = EWRL</th>
<th>In Science = EBUS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>I</strong></td>
<td>What if Julius Caesar had been assassinated many years before?</td>
</tr>
<tr>
<td><strong>II</strong></td>
<td>What if Charles VII had not been able to win the 100 years war?</td>
</tr>
<tr>
<td><strong>III</strong></td>
<td>What if America had been discovered a few centuries later?</td>
</tr>
<tr>
<td><strong>IV</strong></td>
<td>What if Napoleon had not been born?</td>
</tr>
<tr>
<td><strong>V</strong></td>
<td>What if Louis XVI had been able to win against the ‘Storming of the Bastille’?</td>
</tr>
<tr>
<td><strong>VI</strong></td>
<td>What if the 1908 Tunguska Comet had fallen somewhere in Europe instead of Tunguska in Siberia?</td>
</tr>
<tr>
<td><strong>VII</strong></td>
<td>What if the killer of the Austrian Archduke Franz Ferdinand had been arrested the day before the Sarajevo event?</td>
</tr>
<tr>
<td><strong>VIII</strong></td>
<td>What if Lenin had been killed during his travelling through Germany?</td>
</tr>
<tr>
<td><strong>IX</strong></td>
<td>What if Hitler had not been appointed Chancellor by the President of the Republic of Weimar Paul von Hindenburg?</td>
</tr>
<tr>
<td><strong>X</strong></td>
<td>What if Pyotr Kapitza accepted to be the leader of the USSR H-bomb Project as wanted by Stalin?</td>
</tr>
<tr>
<td><strong>XI</strong></td>
<td>What if Nazi Germany had defeated the Soviet Union?</td>
</tr>
<tr>
<td><strong>XII</strong></td>
<td>What if Karol Wojtyła had not been elected Pope, thus becoming John Paul II?</td>
</tr>
<tr>
<td><strong>XIII</strong></td>
<td>What if Gorbachev had not been defeated by Yeltsin?</td>
</tr>
<tr>
<td><strong>XIV</strong></td>
<td>What if the USSR had not collapsed?</td>
</tr>
</tbody>
</table>
A Lesson for the Future of Our Science

My Testimony on Lord Patrick M S Blackett
References

[1] M. Planck, Sitzungsber. Preuss. Akad. Wiss. 5, 440 (1899); the problem of the Fundamental Units of Nature was also presented by M. Planck in a series of lectures he delivered in Berlin (1906) and published as Theorie der Wärmestrahlung (Barth, Leipzig, 1906) the English translation is The Theory of Heat Radiation (trans. M. Masius, Dover, New York, 1959).