

WORLD ACADEMY OF

MARCH, 1993



ART AND SCIENCE NEWS

The World Academy In 1993 and Beyond

By Harlan Cleveland

The year 1992 was supposed to be a productive year, and in some ways it fulfilled its promise. The Barcelona Olympics went off without a major hitch. By contrast the Columbus quincentenary mostly went off the screen. Europe's "single market" was mostly accomplished. But that historic drama's second act, a single currency, was indefinitely postponed. The United Nations reached new highs in the peacekeeping and peace enforcement its members wanted -- and generated complaints about its activism. In the United States, 204 years after its first president, the 42nd president still took office without a revolution, a coup d'etat, or an unfriendly takeover.

Meanwhile, the World Academy celebrated 1992 with two successes. In November the first Population Award was presented to an outstanding Brazilian scientist (story in next column).

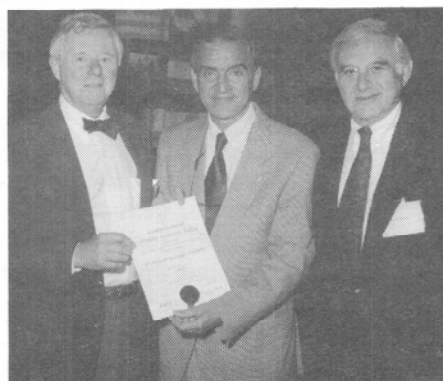
In December, the World Academy's European Division headed by **Eleonora Masini** pulled together at a workshop in Vinci, birthplace of Leonardo, a remarkable diversity of minds (including 16 Fellows of the World Academy) to think about "Art and Science." A report on the Vinci Workshop is on p.3, followed by an excerpt from **Umberto Colombo's** thoughtful opening speech.

Two puzzles of reconciliation have helped focus the World Academy's attention in recent years. One is how to reconcile the "two cultures of art and science (they seemed well reconciled in the brain of Leonardo), which engaged the good minds assembled at Vinci.

(continued on pg. 2)

Population Award Goes to Brazilian Scientist

The first award of the World Academy's new triennial prize for the person making the most important advance in the fields of population, contraceptive development, and family planning was presented to Professor **Elsimar Metzker Coutinho** of Brazil.



Fellow Luigi Mastroianni, Jr. M.D., Dr. Elsimar Metzkar Coutinho (awardee) and Fellow Sheldon Segal, M.D.

The Population Award is named for two World Academy Fellows, Dr. **Luigi Mastroianni** of the University of Pennsylvania School of Medicine and Dr. **Sheldon Segal**, who headed the work on population of The Rockefeller Foundation. The initiative in establishing the award and getting it funded should be credited to Dr. **Emily Mudd**, Professor Emeritus of Family Study at the University of Pennsylvania, an honorary Vice President of the World Academy.

The Selection Committee was chaired by Dr. **Horatio P.R.C. Menano**, Executive Director of the Gulbenkian Institute of Science in Lisbon, who is Chairman of the World Academy's Awards Committee. The other members were **Emily Mudd**; S. Sakamoto

(continued on pg. 5)

Global Issues Conference

*by John Proctor, USA
and Rem Petrov, Russia*

A most unusual demonstration of cross-cultural cooperation among intellectuals is scheduled for April 4, 1993. A conference, "The Push of Science and Technology, The Pull of Cultural Diversity, and Human Values," will be presented to discuss global problems and opportunities to be faced by humanity looking toward the year 2050. The discussions of World Academy of Art and Science Fellows from Russia and the United States will be videotaped before a live audience for later telecasts and discussions with young people throughout the world. The conference will be held from 1:00-3:00 p.m. in beautiful Gaston Hall on the campus of Georgetown University, Washington, DC.

The objectives of this first conference in, hopefully, a series of such conferences are: (1) to increase the awareness of global problems and opportunities; (2) to stimulate the interest of young people toward careers in science and art; and (3) to strengthen the foundations for joining efforts and new combinations of talent and resources.

A program plan was finalized during a visit to Moscow last August by Secretary General **John Proctor**. During this visit, a certificate of membership was presented to newly elected Fellow Academician **Igor Makarov**, Chief Scientific Secretary of the Academy of Sciences of Russia. In the photo on page 5, Fellow **Rem Petrov**, Vice President of the Academy of Sciences of Russia, is shown presenting our recognition pin to Fellow **Makarov**.

The Forum moderator, Fellow **Lincoln Bloomfield**, will open the program and set the global view of life on this planet

(continued on pg. 2)



The World Academy in 1993 and Beyond (from pg.1)

The other puzzle is how to reconcile cultural human diversity with both individual human rights and with the global human opportunities that modern science and especially information technologies make possible. (I have been calling this three-way dilemma "the trilemma.")

These two are fascinating enough in themselves to engage members of a World Academy consisting of men and women who like to think -- which most of us also do for a living. But there is a third puzzle, a question of policy they raise.

Art and science share two common characteristics. Both are based on the initiative and imagination of individual human beings. Yet both are universal in their relevance and their appeal.

The future of both art and science in modern civilization is now threatened by powerful claims to exclusive and separate identity for cultural groups -- at the expense both of individual worth and of universal ideas, motives, and institutions.

The policy question is: to what extent either art or science can flourish in societies where people's individual initiative and imagination are

- repressed by a cultural citizenship that requires every citizen's loyalty to a political creed, a religious credo, or the perceived heritage of a dominant cultural majority; or
- culturally excommunicated as ethnic outsiders, religious infidels, women, minorities, or even "pathological individualists" (what a Soviet magazine once called Andrei Sakharov).

We can already foresee three occasions where this question will be somewhere near the center of the picture. One is the Panel Discussion on Global Issues, between Russian and U.S. academicians, described in this Newsletter.

Another prospect is for an Asian workshop, comparable to the Vinci seminar, to probe further the latterday convergence of Art and Science -- and the threats to their free development. Fellow **Mochtar Lubis** of Indonesia, who was at Vinci, is exploring this option.

We are overdue for a large Assembly to which all Fellows of The World Academy can be invited. The World Academy's tradition suggests a full Assembly once every five years; the last Assembly, featuring discussions of "300 Years After Newton," was held in Lisbon, Portugal, in 1987 -- hosted and co-sponsored by the Gulbenkian Foundation.

I will propose to our Executive Committee, at its next meeting in Washington April 3rd, that our next world assembly be held in Minneapolis, Minnesota, USA, in the late Spring of 1994 -- hosted among others by the University of Minnesota's Hubert H. Humphrey Institute of Public Affairs, which has been my own academic and professional "home" since 1980.

Colleagues in the World Academy will know from my notes in previous Newsletters my own leaning toward "the trilemma" as a useful theme for a wide discussion among Fellows of the World Academy. I would be glad to hear from any Fellows who would like to propose related, or quite different, topics for discussion at such an Assembly. I would also like to hear from any of you who might wish to contribute at a 1994 World Academy assembly on the "trilemma" theme. I prepared a paper on this subject for the Vinci proceedings which I would be happy to send to any Fellow who requests it.

[My address is: Prof. Harlan Cleveland, University of Minnesota, Hubert H. Humphrey Center, 301 19th Avenue South, Minneapolis, MN 55455, USA. The fax number is (612) 625-6351.]

Global Issues (from pg. 1)

to the year 2050. The panels and subject areas are:

Push of Science & Technology

Dr. I. Makarov (Russia)

Amb. Richard Benedick (USA)

Pull of Cultural Diversity

Amb. Chingiz Aitmatov (Russia)

Prof. Harlan Cleveland (USA)

Human Values

Dr. Yu. S. Osipov (Russia)

Prof. Michael Reisman (USA)

Biotechnology/Biomedicine

Dr. Rem Petrov (Russia)

Dr. Rita Colwell (USA)

Dr. **Bloomfield** will first recognize Prof. **Sergei Kapitza** who will comment on the global view of life on this planet to the year 2050 and introduce Fellow **Igor Makarov** to forecast the impact of technology (with English translation for other panelists and the audience). This will be followed by Ambassador **Richard Benedick** (with Russian translation) and alternately by other panelists.

A conference booklet containing the position papers prepared before the conference will be available to be used separately or in conjunction with videotapes of the conference. Booklets and videotapes in Russian will be available through a World Academy outlet in Moscow. Booklets and videotapes in English will be available to all for a charge to cover reproduction and handling. However, they are principally intended for World Academy Fellows and Members and Fellows of the Washington Academy of Sciences and its 52 affiliated scientific organizations, and the Russian Academy of Science, to use with young people.

Fellow **Horatio P.R.C. Menano**, Executive Director of the Gulbenkian Institute of Science, Lisbon, will observe the conference in Washington. Based upon these observations, videotapes and materials, Dr. **Menano** will determine with the World Academy's

(continued on pg. 5)



The Vinci Workshop (December 11-13, 1992)

by *Eleonora Barbieri Masini*
President, European Division

The meeting, held in the Leonardo Library of Vinci, was hosted with the support of the municipality of Vinci, Leonardo da Vinci's birthplace. Initiated by WAAS, it was jointly sponsored by ENEA, Cassa di Risparmio di Firenze, UNESCO, the Commission of European Communities and Alitalia.

Introductory remarks were made by the Mayor of Vinci, who stressed how Leonardo was at the same time a great scientist and artist, and expressed the hope that the WAAS meeting would derive inspiration from the spirit of Leonardo as it was being held in his native town.

Eleonora Masini welcomed participants on behalf of WAAS and **Harlan Cleveland**, (who was unable to do so in person due to ill health.) **Masini** explained the genesis of the idea of holding a meeting in Vinci to study the relationship between the two major human forms of expression, producing art and science.

Umberto Colombo, (a member of WAAS) introduced the topic and illustrated the history of the relationship between art and science which relates to the very nature of knowledge. **Colombo** also stressed the role of creativity in the relationship between art and science (see **Colombo's** paper).

UNESCO was represented by **Vladimir Kouziminov**, Chief of the Regional Office of Science and Technology for Europe in Venice. He conveyed the greetings and support of the Director General of UNESCO, **Federico Mayor**, described his organization's contributions to the topic of the meeting and added some interesting comments on the relationship between art and science. **Manfredo Maciotti**, the European Community representative, underlined that the meeting was innovative in that the theme was science and art rather than science and technology.

Eleonora Masini concluded the meeting. She referred to the point made by WAAS Fellow **Prigogine**: we are living in an extremely exciting moment of history. Being the birth of a new epoch, like all births it can be very painful. Indeed this could be extended beyond art and science to the political and social "birth of a new world." **Masini** described the global context within which WAAS operates, expressing the view that the relationship between art and science may indeed lead to a new humanism, as **Cleveland** would have underlined.



Vladimir Kouziminov, Fellow Umberto Colombo, and Fellow Eleonora Masini.

These observations were made as a social scientist observing reality in its changes, and different paces of change, and the capacity of individuals to face the difficulties of the present, looking toward the future but with the knowledge of the past. In this process, culture is crucial, being the human-created mediator between nature and human beings.

At present, culture is seen as related mainly to science, whereas it should also be seen as mediating nature and art. **Prigogine's** important point that science is a dialogue with nature may perhaps be extended to the concept that artistic expression is also a dialogue with nature.

Topics raised in the debate:

1. Creative processes of art and science. Symmetries and ambiguities.
2. Different cultures: Philosophical attitudes and other attitudes and approaches

to art and science.

3. The perception of reality in art and science.

4. Art as an expression of social stresses.

5. The contribution of science and technology to the analysis and conservation of art.

The meeting concluded with proposals by **Irving Lavin** to initiate a cooperation between WAAS and the American Academy of Art and Science which has never discussed the relationship between art and science. UNESCO proposed that WAAS contribute to the World Commission for Culture.

Discussions were extremely lively and benefited greatly from the high level of the participants and their interdisciplinarity: physicists with an interest in art, art historians and scholars versed in the use of high technologies. ENEA provided sophisticated technological expertise thus guaranteeing excellent technical support. The beauty and symbolic meaning of Vinci and what was referred to as the "spirit of Leonardo" did the rest to deepen the relationship between art and science in the past, the present and, possibly, the future.

Science And Art By *Umberto Colombo*

[Discussion of the connections and contradictions between art and science, at the Vinci workshop of the World Academy December 11-13, 1992, was introduced by Fellow Umberto Colombo, head of the Italian public agency ENEA, which explores and promotes renewable forms of energy. Here are some excerpts from his opening remarks.]

In the remote past, science and technology were all one with myth and religion, cosmology, the observation of Nature on Earth and in the heavens, the needs of ordinary life and everyday expression of thought and feeling -- that is, art.

Take the figures in cave paintings and
(continued on p.4)



Colombo Talk at Vinci (from p.3)

rock carvings, for instance, and what they meant to the peoples who made them. Or the Mesopotamian hero Gilgamesh, his yearning for knowledge to help his people, the ethical and existential drama that accompanied him, and the poetry and sculpture he inspired.

There are the great Bible stories and the interpretations of the Universe produced by the Ionian school: Thales, Anaximander and Anaximenes. Culture was still a unique whole; whatever distinctions did exist were those that separated the culture of power (the kings and the priests) from the culture of the common folk. Myth was still intertwined with the scientific and mathematical exactitude we find, for example, in Thales' theorems and predictions of eclipses.

As time went on, the various aspects making up what we regard as classical culture grew somewhat apart. Nevertheless, they continued to interact, in a close embrace between mathematics, astronomy, natural science, philosophy and the various forms of art, from rhetoric to the figurative arts, manual and economic arts, from agriculture to the crafts. Pythagoras linked the wondrous relations of numbers to the harmony of music. Democritus intuited the existence of atoms, Epicurus put them into his conception of nature and morals, and Lucretius gave these ideas impassioned expression in his poetic masterpiece, *De Rerum Natura*.

These notions, though weakened by ignorance and superstition, were never entirely lost in the West's Dark Ages. Much credit for keeping them alive goes to Arab culture, which expressed mathematical knowledge and religious thought in pure architectural shapes and designs known as arabesques.

A key sign that culture in the West was set to flower again was in the fascination held for geometric perspective in the Renaissance. The humanism of the Genoese Leon Battista Alberti was a synthesis of art, architecture, music philosophy, and scientific inquiry. He,

along with masters like Paolo Ucelli and Piero della Francesca, discovered and expounded the rules of perspective. ... Here, in his birthplace, the Tuscan Leonardo da Vinci -- scientist, engineer, painter, architect, thinker and writer, paradigm of the synthesis of learning -- is rightly held to be the eternal emblem of the humanistic spirit.

As the intellectual ferment of the Renaissance gave way to modern times, a division began to appear which, in time, was to lead to our notion of disciplines and individual branches of knowledge. Kepler bowed before the rigorous harmony of the motions of the heavenly bodies, which appeared to him divine; Newton, with his mechanics, systematized it in a doctrine perhaps unparalleled in the whole history of human thought. Though Newton avowed he would "frame no hypotheses" about the phenomena he studied, for "hypotheses, whether metaphysical or physical, have no place in experimental philosophy," in his heart he believed that the laws governing the Universe emanated from God. Three generations later, Kant was fascinated by Newton's theories and concepts. He translated Newtonian space and time into philosophic thought in the *Prolegomena* and the *Critique of Pure Reason*.

This new encounter between science and philosophy gave rise to a cultural synthesis which, in its logical expression, contained a strong passion for learning and for exploring the condition of Mankind, joined with a lofty moral vision that was to permeate intellectual expression and endeavor, including the arts, for at least a century. Seen from the vantage point of today, the subsequent history of the two cultures would seem to indicate that this was the last of the great encounters between scientific and humanistic learning. In reality, the thread linking the two never broke.

A single aspect informs all cultural experience: the creative drive, whether artistic or scientific or technological,

of the people who engage in it. Rationalization and systematization of works, ideas and knowledge comes later, originating divergent bodies of culture, but the labour of the creation, with its intuitive aspects, is similar in all these endeavors.

Creativity is precisely what offers the chance for continuous contact and feedback among science, technology and art. Every form of art needs material resources and tools, scientific knowledge and technological solutions: paper to write on, substrates to codify, preserve and communicate ideas, verbal and graphical language, telematics, musical instruments, painters' pigments and oils, and so forth. Improvements in these change technique and influence taste. In addition, now science and technology are being called upon to help solve problems involved in preserving our artistic heritage for future generations.

Such are the deep, variegated and close ties among science, technology and art that have inspired the World Academy of Art and Science, with the collaboration of other international and Italian institutions, to organize the Workshop on "Art and Science," two of the supreme expressions of man's creative imagination, at Vinci, Leonardo's birthplace in Tuscany. Our meeting is taking place 500 years after the European discovery of America, and 500 years after the death of the Renaissance master Piero della Francesca.

I am confident that with the participation of men and women of different cultural backgrounds and training, the subjects of the papers presented -- ambiguity of art and science, construction and interpretation of reality, instinctive and irrational aspects of the creative process, visualization and the role played by mathematics, modes of perception, the relationship between Art and Nature -- will produce a stimulating and thought-provoking encounter. The analysis and the debates will not only expand our sources of culture, but also reveal gaps and incongruities in our knowledge.



World Academy Population Award (from pg.1)

of Japan, President of the International Federation of Fertility Societies (IFFS); William Andrews, a member of the IFFS Executive Committee and Markku Seppala of Finland, Professor of Obstetrics and Gynecology at the University Central Hospital in Helsinki.

An Award Certificate from the World Academy and the prize of \$5,000 were presented in November 1992 to Dr. Coutinho by Dr. Mastroianni at the XIV World Congress on Fertility and Sterility, held in Caracas, Venezuela. The World Academy's special contribution was celebrated by the President of Venezuela in his address to the World Congress.

In his keynote address at the World Congress, Dr. Coutinho reviewed the contributions of Latin American scientists to the development of contraceptives. It has been, he said, well out of proportion to Latin American contributions to other areas of medical research. It was also "out of proportion with the importance of the subject to Latin America in comparison to other continents such as Asia and Africa, where the population pressure was much greater."

Besides, he added, "this took place during the past three decades when the continent was swept by political instability, severe economic difficulties, and social unrest. Latin American universities, where most of us conducted our studies and clinical trials, were during this period far from being the secure and serene ivory towers of legend. They were in fact at the very epicenter of political and social turmoil."

Despite such obstacles as these, some outstanding Latin American "firsts" are listed by Dr. Coutinho: the first potent orally active progestin, by a Mexican chemist; the first commercial oral contraceptive pill (tested mostly in Puerto Rico); the long-acting contraceptive effect of Depo Provera; the

idea of a long-acting estrogen as a monthly contraceptive, which after a generation of controversy and research has been declared safe by the World Health Organization and the U.S. Food and Drug Administration; an oral contraceptive containing norgestrel; several developments in injectable and implant contraception, including the finding of studies led by Dr. Coutinho that a single implant of a drug called ST-1435 could inhibit ovulation for six months.

Dr. Coutinho gives special credit to the Rockefeller and Ford Foundations, the Population Council, and the WHO Special Programme for providing core support to researchers in contraceptive development and family planning. After reviewing the pioneering work of Latino scientists from Anibal to Zipper, he registers a gentle complaint that too little credit has come their way: "... recognition is the only real compensation for dedicated work, and the frustration of seeing it ignored can only do harm and benefits none."

The Awards program of the World Academy of Art and Science is designed to provide just that kind of recognition.

Deceased Fellows

Frits W. Went (USA), internationally renowned plant physiologist and research pioneer, who established in 1965 the Desert Research Institute's Biological Sciences Center in Reno, Nevada, died May 2, 1992.

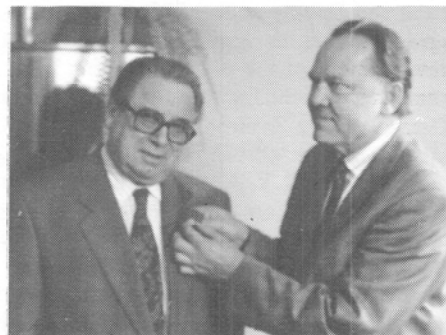
Professor Tadeusz Kielanowski (Poland) passed away May 6, 1992 after a long illness.

Fellow Florence M. Hetzler died last year. For those of us who attended the Vinci Workshop and knew this gifted professor of philosophy, we're certain she would have enjoyed beyond measure the discussions on the interdependence of art and science. Her bequest of \$5000.00 to the World Academy helps make such workshops possible.

Global Issues (from pg. 2)

European Division's Executive Committee if a proposal for a similar undertaking should be made. Such a program could involve a panel of Fellows in Western Europe discussing global issues of concern with a panel of Fellows from former "Eastern Bloc" countries.

It seems reasonable to believe that major television networks could be



Academician Igor Makarov and Dr. Rem Petrov

persuaded to carry a two-hour discussion of global issues as a major event in 1996 -- panels in Europe, the Far East, Russia, and North America in simultaneous video broadcast. Afterwards, four or five panels of young people could comment on the contributions of their elders using the interactive video format. Again, materials generated in this program would be available worldwide, and their use in the education of young people would be encouraged.

The World Academy of Art and Science and the Washington Academy of Sciences, with its fifty-two affiliated scientific organizations, are the principal co-sponsors of Phase I. The Russian Academy of Science is an additional co-sponsor of Phase I. The Barbara Gauntlett Foundation -- Environmental Stewardship in Global Development -- has pledged \$10,000.00 and a pledge has been received from the World Man Fund. Georgetown University has graciously agreed to provide the conference facilities.



News of Fellows

John H. Proctor
Secretary General

Fellow **Eugene M. Schwartz** (U.S.) has written a beautiful book, *You Are Not Far From The Kingdom of God*, a plea for the reestablishment of Jewish-Christian brotherhood, (publisher: the Second Creation Press in New York).

"Earth Summit," 3-14 June, in Rio de Janeiro, Brazil, was led by Fellow **Maurice Strong** (Canada), Secretary General of the United Nations Conference on Environment and Development. 172 governments agreed to act to ensure the sustainable development of the planet. Helping bring about agreement on Agenda 21, the Rio Declaration on Environment and Development, and the global forests principles, was Fellow **T.T.B. ("Tommy") Koh** (Singapore), Chair of the Main Committee, and Fellow Ambassador **Richard E. Benedick** (U.S.), World Wildlife Fund.

A participant in the World Academy's Vinci Conference, Fellow **Lillian F. Schwartz** has a new book, *The Computer Artist's Handbook*, available from W. W. Norton & Company, New York.

Fellow **Roger A. Blais**, Ecole Polytechnique of Montreal, has been recently appointed Professor Emeritus at the Ecole, Canada's largest engineering school. In June 1990, the International Council of Small Business awarded him a prize for the best competitive research paper.

Our Representative to the United Nations in New York, Fellow **Bertrand Chatel**, is a member of the United Nations Institute for Training and Research (UNITAR) faculty, teaching on the role of Science and Technology in Development. Fellow **Mirko Bunc** is Director, Academic Programme, in UNITAR.

President **Harlan Cleveland** was immobilized for several months after a heart attack in April 1992, followed by triple-bypass surgery. As soon as he was out of the hospital, he selected a publisher (Jossey-Bass, San Francisco, and Macmillan, New York) for his next book, *Birth of a New World: An Open Moment for International Leadership*, which will be out in April 1993.

The book is the product of four years of consulting with a group (31 people from 24 countries) on "Rethinking International Governance." The book, with a Foreword

by Fellow **Robert S. McNamara**, presents "an upbeat way of thinking about this extraordinary time of our lives," and proposes "an across-the-board agenda: how most fruitfully to use, for human needs and purposes, this open moment of world-scale ferment."

Fellows of the World Academy participated in "The Group" which worked together on this project: **Lincoln P. Bloomfield**, **Yehezkel Dror**, **Carl-Göran Hedén**, **Calestous Juma**, **Hahn-Been Lee**, **Mochtar Lubis**, **Kishore Mahbubani**, **Mircea Malitza**, **Magda Cordell McHale**.

In April of 1987, we had 377 Fellows. At this time we have 444 elected Fellows and 11 Associate Fellows appointed by the President. By statute we are limited to 500 Fellows. Please send your nominations (with a seconding letter and the nominee's CV) to Professor **Magda Cordell McHale**, Chair, Admissions Committee, School of Architecture and Planning, State University of New York at Buffalo, Hayes Hall, 3435 Main Street, Buffalo New York, 14214 (USA), Fax (716) 829-2297.

New Fellows

The following Fellows were elected during 1992:

Dr. P. M. Bhargava
Chemistry, Cellular and Molecular Biology
Hyderabad, India

Dr. Mirko Bunc
Economics, International Consultant
New York, New York, USA

Dr. Elsimar M. Coutinho
Pharmacy, Contraceptive Research
Salvador, Bahia, Brazil

Prof. Hugues de Jouvenel
Strategic Planning, Socio-economic Systems
Paris France

Dr. Heitor Gurgulino de Souza
Educator, Physics
Sao Paulo, Brazil

Prof. Mihai Draganescu, Ph.D.
Electronics, Information Sciences,
Philosophy
Bucharest, Romania

Ms. Jean Erdman
Dancer, Choreographer, Director
Honolulu, Hawaii

Dr. Nancy Flournoy
Biomathematics
Washington, DC, USA

Dr. Susantha Goontilake
Sociology, Economic Affairs
Sri Lanka

Dr. John G. Honig
Physical Chemistry, Operations Research
Bethesda, Maryland

Prof. Mochtar Lubis
Author, Philosopher, Journalist
Jakarta, Indonesia

Dr. Joanna Macy
Eco-philosopher, Scholar of Buddhist
Philosophy
Berkeley, California, USA

Ambassador Kishore Mahbubani
Foreign Affairs, Educator
Singapore

Acad. Igor M. Makarov
Informatics, Automation
Moscow

Dr. Kursheed Ahmad Malik
Microbiology, Biotechnology
Braunschweig, Germany

Prof. Nduka Okafor
Industrial Microbiology
Enugu, Nigeria

Dr. Cyril Ponnannperuma
Chemistry, Chemical Evolution
College Park, Maryland, USA

Dr. George B. Udvarhelyi
Neurosurgery, Arts
Baltimore, Maryland, USA

Mr. Timothy George Wilkinson
Biologist, Chemistry, Environmental
Pollution
York, England